

RESEARCH ARTICLE

Pathways into psychopathology: Modeling the effects of trait emotional intelligence, mindfulness, and irrational beliefs in a clinical sample

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We investigated possible pathways into mental illness via the combined effects of trait emotional intelligence (trait EI), mindfulness, and irrational beliefs. The sample comprised 121 psychiatric outpatients (64.5% males, mean age = 38.8 years) with a variety of formal clinical diagnoses. Psychopathology was operationalized by means of 3 distinct indicators from the Millon Clinical Multi-Axial Inventory (mild pathology, severe pathology, and clinical symptomatology). A structural equation model confirmed significant direct trait EI and mindfulness effects on irrational beliefs and psychopathology. Trait EI also had a significant indirect effect on psychopathology via mindfulness. Together, the 3 constructs accounted for 44% of the variance in psychopathology. A series of hierarchical regressions demonstrated that trait EI is a stronger predictor of psychopathology than mindfulness and irrational beliefs combined. We conclude that the identified pathways can provide the basis for the development of safe and effective responses to the ongoing mental health and overmedication crises.

Key Practitioners Messages

- Self-perception constructs concerning one's beliefs about oneself have a major impact on the likelihood of developing psychopathological symptoms.
- Emotional perceptions captured by trait emotional intelligence were stronger predictors of psychopathology than either or both mindfulness and irrational beliefs in a clinical sample of adults.
- If the seed factors of psychopathology are mainly psychological, rather than mainly biological, and given that psychological constructs, like trait emotional intelligence, mindfulness, and irrational beliefs, are amenable to training and optimization, the findings herein provide the impetus for a much needed shift of emphasis from pharmacological to psychological treatments.

KEYWORDS

clinical psychology, mental health, personality, personality disorders, TEIQue, trait emotional intelligence

1 | INTRODUCTION

Like many constructs in psychology, psychopathology lacks a consensually agreed definition (Maddux, Gosselin, & Winstead, 2012). From a statistical point of view, it has been proposed that abnormality is located in the negative tail of a bell-shaped distribution. According to the dimensional model of psychopathology, normal and abnormal personalities as well as effective and ineffective psychological functioning lie along a continuum of underlying level of risk for disorder that is

graded in severity, rather than discrete and categorical (Krueger & Markon, 2006). Psychopathology has been concisely conceptualized as harmful dysfunction (Wakefield, 1992), ultimately resulting in maladaptive behaviors that also involve experiences of psychological suffering or loss of well-being.

Recent research from a clinical perspective has suggested the possibility of a general dimension of psychopathology, labelled the "p factor" by Caspi et al. (2014; see also Lahey et al., 2015). This development had been foreshadowed by Rushton and colleagues

(Rushton & Irwing, 2009; Rushton, Irwing, & Booth, 2010), who successfully extracted general factors from the Millon Clinical Multi-Axial Inventory (MCMI), the Dimensional Assessment of Personality Pathology, and the Personality Assessment Inventory. On the basis of these results, they suggested that a general factor occupies the apex of the multifactorial hierarchies of personality disorders, mirroring the general factor identified in nonclinical personality traits (Rushton et al., 2009), and the general factor in the hierarchy of cognitive abilities (Carroll, 1993).

2 | MILLON'S THEORY AND PSYCHOPATHOLOGY

Following evolutionary principles, Millon (1969) outlined a theory that views personality as a collection of stable qualities, including temperament, sensitivities, proclivities, preferences, behavioral patterns, and coping strategies (Strack & Millon, 2013). According to Millon, each personality style comprises three polarities: pleasure-pain, active-passive, and self-other. Millon's theory, which incorporates universal guiding principles, stages of development based on neuropsychology, and a taxonomic classification system (Tringone & Bockian, 2015) has exerted a major impact on the development of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM; Millon, 1981; Pincus & Krueger, 2015).

The MCMI is one of the most widely used diagnostic inventories in Spain (Muñiz & Fernández-Hermida, 2010), where the present sample originates, as well as in Europe (Evers et al., 2012) and the United States (e.g., Prins, 2014). It was developed in accordance with Loevinger's (1957) three-stage model of test construction, involving theoretical foundation, internal structural checks, and external criterion validation (Choca & Grossman, 2015). The MCMI has been utilized in numerous clinical studies to assess personality disorders. Examples of recent topics include alcohol and cocaine abuse (López-Goñi, Fernández-Montalvo, & Arteaga, 2015), mood disorders (Osma, García-Palacios, Botella, & Barrada, 2014), pathological gambling (Maniaci et al., 2015), posttraumatic stress disorders (Palic & Elklit, 2014), and somatoform disorders (Herrero, Ramírez-Maestre, & González, 2008). Its profiling accuracy has rendered it highly popular in research with forensic samples, such as domestic violence perpetrators (Gibbons, Collins, & Reid, 2011) and fire-setters (Ó Ciardha et al., 2015).

Given that psychopathology underpins a broad range of disordered behavior (e.g., Carragher, Krueger, Eaton, & Slade, 2015; Lahey & Waldman, 2012), it seems imperative to investigate potential psychological drivers of individual differences in psychopathological traits. Such investigations should preferably be conducted on clinical samples, because they alone can ensure clinical utility by allowing the extrapolation of results to clinical populations. Furthermore, the means, factor structures, and nomological networks of constructs may vary substantially between clinical and nonclinical samples (e.g., Bagby et al., 1999; Sinclair & Feigenbaum, 2012; Williams & Paulhus, 2004). It follows that without clinical data (of which there is a severe dearth in emotional intelligence research; Hansen, Lloyd, & Stough, 2009), it is very difficult to establish whether, and with what caveats,

research conclusions obtained in nonclinical samples may apply to clinical groups.

The present paper focuses specifically on the constructs of trait emotional intelligence and mindfulness in combination with a construct whose roots can be traced back to Greek sage Socrates, namely, irrational beliefs (Ellis, David, & Lynn, 2010).

3 | TRAIT EMOTIONAL INTELLIGENCE

Trait emotional intelligence (trait EI or trait emotional self-efficacy) refers to a constellation of emotional perceptions assessed via questionnaires and rating scales (Petrides, Pita, & Kokkinaki, 2007). Essentially, the construct concerns people's perceptions of their emotional abilities. In recent years, trait EI has emerged as a variable of central interest in the broader field of personality, with promising applications in clinical psychology (Delhaye, Kempnaers, Stroobants, Goossens, & Linkowski, 2013; Petrides, Hudry, Michalaria, Swami, & Sevdalis, 2011; Petrides et al., 2016; Sinclair & Feigenbaum, 2012).

A large meta-analysis by Martins, Ramalho, and Morin (2010; see also Petrides, Pérez-González, & Furnham, 2007) established that trait EI is a strong positive predictor of mental health. The construct has been positively associated with adaptive coping styles, peer relations, and socioemotional competence (e.g., Frederickson, Petrides, & Simmonds, 2012) and negatively associated with a wide range of mental disorders, in clinical (e.g., Kornreich et al., 2011) as well as nonclinical (e.g., Mikolajczak, Petrides, Luminet, & Coumans, 2009) samples. Nevertheless, there continues to be a relative dearth of theory-driven trait EI research in clinical samples (Hansen et al., 2009; Zeidner, Matthews, & Roberts, 2012).

4 | MINDFULNESS

Mindfulness is a state of consciousness, attention, and awareness of present events and experiences. Although its precise factor structure remains under investigation (Siegling & Petrides, 2014, 2016), the construct includes characteristics like clarity of awareness, nonconceptual awareness, ability to focus attention, nonevaluation or judgment of sensory experience, and orientation to the present (Brown, Ryan, & Creswell, 2007).

As regards its relevance to emotions, it has been shown that mindfulness correlates positively with the capacity to be more aware of emotional states and the ability to change them so as to fulfill basic psychological needs (Brown & Ryan, 2003). Mindfulness has also been linked to emotional stability (Kumar, Feldman, & Hayes, 2008) and emotion regulation (Wallace & Shapiro, 2006). These associations are pertinent to the present research because emotion regulation problems are strongly related to psychopathology (Davidson, 2000). Lack of mindfulness can lead to avoidance of, or preoccupation with, negative emotions, which are common agents of psychopathology (Gross, 2002). Indeed, several mindfulness-based interventions have proven effective in enhancing emotion regulation and reducing depression and rumination (Kabat-Zinn, 2003; Kumar et al., 2008).

5 | IRRATIONAL BELIEFS

Irrational beliefs have been defined as “unrealistic reasoning processes by which external events are interpreted and through which emotional distress is mediated” (Koopmans, Sanderman, Timmerman, & Emmelkamp, 1994, p. 15). They are generally illogical, absolutist, and sincerely held, even though not provable or falsifiable, and rational beliefs are those that are logically self-helping or socially helping (Ellis, 1995). By virtue of their involvement in dysfunctional behaviors, psychological disturbances, and unhealthy emotions (Davies, 2008), irrational beliefs play a central role in psychopathology.

Modeled on the teachings of the Greek philosopher Epictetus, Ellis' rational-emotional behavior theory (e.g., Ellis, 1989) suggests that psychological problems and self-defeating behaviors are not caused by external events, but by beliefs about the events. Distorted perceptions and irrational beliefs are key factors in the etiology of many disorders, such as depression and anxiety (Haaga, Dyck, & Ernst, 1991), bulimic symptomatology (Lohr & Parkinson, 1989), posttraumatic stress disorder (Hyland, Shevlin, Adamson, & Boduszek, 2015), and workaholism (Van Wijhe, Peeters, & Schaufeli, 2013).

6 | THE PRESENT STUDY

Recognizing their theoretical connections, sporadic studies have explored the interrelationships between various permutations of trait EI, mindfulness, and irrational beliefs. For example, Bao, Xue, and Kong (2015) showed that trait EI and mindfulness are positively related and that aspects of the former mediate the latter's impact on stress (see also Schutte & Malouff, 2011), and Whitfield (2006) went so far as to propose integrating mindfulness-based and rational-emotive behavior therapies.

To our knowledge, however, no empirical research has tried to model these interrelationships simultaneously in a multicomponent system. Furthermore, even those studies that previously examined these variables in a pairwise fashion have been overwhelmingly conducted on normative samples, which compromise their informational value with respect to clinical populations.

The present study contributes towards addressing these theoretical gaps and methodological limitations in the literature by formulating and testing the model depicted in Figure 1. According to this model, trait EI and mindfulness are permitted to have direct and indirect effects on a latent variable of psychopathology (defined through the three MCMI indicators, namely, mild pathology, severe pathology, and clinical symptomatology), and irrational beliefs are modeled as a potential mediator of trait EI and mindfulness, with the additional possibility of a direct effect.

The model was set up with trait EI as the upstream variable, reflecting its precedence as a partly genetically determined construct (e.g., Vernon, Petrides, Bratko, & Schemer, 2008), and with psychopathology as the downstream variable as the main outcome of interest in the study. In between, mindfulness takes precedence over irrational beliefs because awareness of the contents of our mind informs our beliefs, rather than the other way around.

A secondary aim of the study was to investigate the incremental validity of trait EI vis-à-vis mindfulness and irrational beliefs. From a clinical perspective, the relevant analyses will help us establish whether emotional disturbances are more important than mechanical or illogical thinking patterns in predicting psychopathology. In the light of previous results (e.g., Andrei, Siegling, Aloe, Baldaro, & Petrides, 2016; Petrides, Pérez-González, et al., 2007; Petrides, Pita, et al., 2007; Siegling, Vesely, Petrides, & Saklofske, 2015) and theoretical accounts giving more weight to emotions than to cognitive evaluations in the development of psychological illness (e.g., hyper-emotion theory; Johnson-Laird, Mancini, & Gangemi, 2006), we hypothesized that the trait EI would be a stronger predictor of psychopathology than both mindfulness and irrational beliefs.

This hypothesis was tested by means of three distinct statistical tests: (a) a hierarchical regression, whereby the global trait EI score was evaluated against the total mindfulness and total irrational beliefs scores (hypothesis H1); (b) a more stringent hierarchical regression, whereby the global trait EI score was evaluated against the five mindfulness factor scores and the two irrational beliefs factor scores (hypothesis H2); and, last, (c) a hierarchical regression, whereby the four trait EI factor scores were evaluated against the five

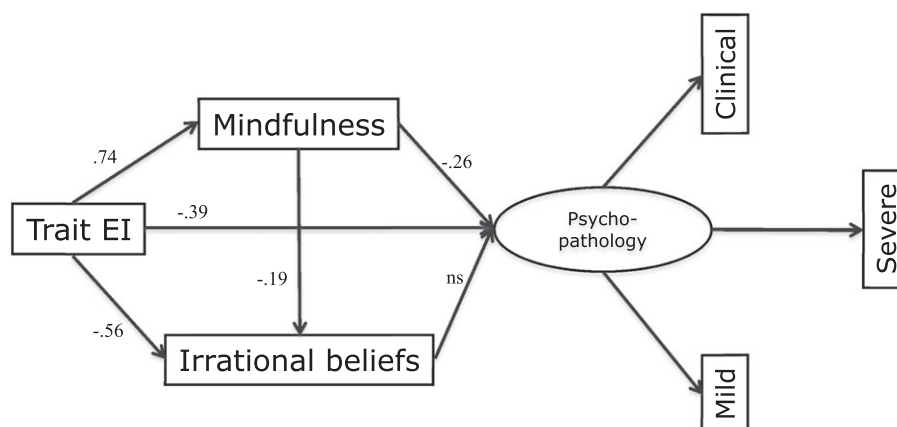


FIGURE 1 Path model of trait emotional intelligence, mindfulness, and irrational beliefs as predictors of psychopathology

mindfulness and two irrational beliefs factor scores (hypothesis H3). All three hypotheses predicted significantly negative incremental trait EI effects.

7 | METHOD

7.1 | Participants

One hundred twenty-one psychiatric outpatients (64.5% males and 35.5% females) at the Molina del Segura Hospital in Spain with formal Axis I diagnoses according to the DSM-IV-TR participated in the study. The sample comprised the following clinical diagnoses: 25.6% personality disorder (cluster A: 4 paranoid, 3 schizoid, and 3 schizotypal; cluster B: 1 antisocial, 5 borderline, 2 histrionic, and 6 narcissistic; cluster C: 2 dependent and 5 obsessive-compulsive), 17.4% anxiety (7 generalized anxiety disorder, 4 panic disorder-agoraphobia, 4 social phobia or social anxiety disorder, and 6 obsessive-compulsive disorder), 15.7% dysthymia, 13.2% obsessive-compulsive disorder, 11.6% schizophrenia, 8.3% bipolar, and 8.3% depression. In 78.5% of the cases, participants had been suffering from mental disorders for over a year.

Mean age was 38.80 years ($SD = 10.26$; range 23 to 65). Fifty-seven percent were married, 41.3% single, and 1.7% widowed. With respect to education, 30.6% had completed primary school, 36.4% secondary school, and 33.1% held university degrees. With respect to occupational status, 45% were employed and 55% unemployed. Assessments of physical health confirmed that 19% of the sample also suffered from various physical conditions.

7.2 | Measures

7.2.1 | Trait emotional intelligence

Trait EI was measured using the Spanish adaptation (Pérez-González, 2010) of the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF; Petrides, 2009). The TEIQue-SF consists of 30 items designed to measure global trait EI, although it can also yield fairly reliable scores on the four factors of the construct, namely, well-being, self-control, emotionality, and sociability. Items are responded to on a 7-point Likert scale. For a psychometric investigation of the TEIQue-SF using item-response theory, see Cooper and Petrides (2010). Cronbach's alphas on our sample were .85 for the global score, and .87, .61, .61, and .66 for well-being, self-control, emotionality, and sociability, respectively.

7.2.2 | Mindfulness

To assess mindfulness, we used the Five Factors Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). The FFMQ consists of 39 items, responded to on a 5-point Likert scale. The five factors of the FFMQ are as follows: observing, which refers to noticing or attending to internal and external experiences, such as thoughts, body sensations, or emotions; describing, which refers to labeling internal experiences with words; acting with awareness, which refers to focusing on one's activities at a given moment as opposed to behaving mechanically; nonjudging of inner experience, which refers to

taking a nonevaluative stance toward thoughts and feelings; and nonreactivity to inner experience, which refers to allowing thoughts and feelings to come and go, without getting carried away by them. The Spanish adaptation of the FFMQ has shown good psychometric properties, with Cronbach's alphas ranging from .80 to .91 (Cebolla et al., 2012). In our sample, the FFMQ exhibited satisfactory levels of reliability (ranging from .70 to .87; see Table 1).

7.2.3 | Irrational beliefs

We used the brief Spanish adaptation (Calvete & Cardeñoso, 1999) of the Irrational Beliefs Test (Jones, 1968), which comprises 57 statements and 10 subscales: demand for approval, high self-expectations, blame proneness, frustration reactivity, emotional irresponsibility, anxious over-concern, problem avoidance, dependence, helplessness, and perfectionism. Participants rated their agreement or disagreement with each statement on a 6-point Likert scale.

A total score was derived by summing up the scores on 7 of the 10 subscales. Three subscales were excluded due to negative or very low item-total correlations (problem avoidance, dependency, and perfectionism). The internal consistency of this total score was .75. For the purposes of the second set of hierarchical regressions (hypothesis H2), which required the extraction of a smaller number of factors for analysis, a principal axis factor analysis with PROMAX rotation of the seven subscales was performed (full FA results are available from the corresponding author). Two factors emerged, explaining 58.73% of the variance. They were labeled as Emotional Irrational Beliefs (comprising frustration reactive, emotional irresponsibility, anxious over-concern, blame proneness, and helplessness) and Social Irrational Beliefs (comprising high self-expectations and demand for approval). Factor pattern loadings ranged between .409 and .907, and the two

TABLE 1 Descriptive statistics and internal consistencies for the key variables in the study

Variable	Cronbach's α	Mean	SD
1. Emotional irrational beliefs	.70	114.61	21.90
2. Social irrational beliefs	.66	44.57	10.44
3. Total irrational beliefs	.75	159.18	28.11
4. Mindfulness observe	.70	20.65	5.91
5. Mindfulness descriptive	.87	21.48	7.49
6. Mindfulness awareness	.88	21.44	8.11
7. Mindfulness nonjudgement	.88	19.12	7.79
8. Mindfulness nonreaction	.78	17.08	5.46
9. FFMQ total score	.80	99.78	26.11
10. Millon personality style	.80	30.66	7.06
11. Millon personality pathology	.86	33.09	14.19
12. Millon clinical symptomatology	.92	24.54	9.72
13. Millon total	.92	88.29	29.88
14. Trait EI well-being	.87	3.57	1.36
15. Trait EI self-control	.61	3.25	1.01
16. Trait EI emotionality	.61	4.34	.93
17. Trait EI sociability	.66	3.44	1.13
18. Global trait EI	.85	3.53	.77

Note. SD = standard deviation; trait EI = trait emotional intelligence.

factors intercorrelated at -44 . factor score coefficients for the two factors were estimated by means of the regression method. Their alphas were $.70$ and $.66$, respectively.

7.2.4 | Psychopathology

Personality features and symptom syndromes were assessed with the Spanish version (Ávila-Espada, Jiménez Gómez, et al., 2002) of the Millon Clinical Multi-Axial Inventory II (MCMI-II; Millon, 1987).¹ The MCMI-II is a 175-item true or false questionnaire designed for use in clinical populations. It yields scores on 10 mildly pathological personality facets (aggressive-sadistic, antisocial, avoidant, compulsive, dependent, histrionic, narcissistic, passive-aggressive, schizoid, and self-defeating), three severely pathological personality facets (borderline, paranoid, and schizotypal), and nine facets of clinical symptomatology (alcohol dependence, anxiety disorder, bipolar manic disorder, delusional disorder, drug disorder, dysthymic disorder, major depression, somatoform disorder, and thought disorder). Last, it also includes three validity indices (debasement, desirability, and disclosure). The MCMI has been constructed in accordance with a "polythetic" structural model, which permits item overlap between scales. We focus on four MCMI scores in this study (alphas in parentheses): mild personality pathology ($.80$), severe personality pathology ($.86$), clinical symptomatology ($.92$), and the total score ($.92$).

7.3 | Procedure

The research protocol was approved by three experienced psychiatrists, and ethical approval for the study was granted by the collaborating hospital's Ethics Committee. The recruitment phase of the study lasted approximately 8 weeks. Inclusion criteria for the study were age (between 18 and 65 years), ability to read and write, and ability to respond meaningfully to the interview questions. Exclusion criteria were age outside the 18–65 bracket, illiteracy, and mental or physical symptomatology that prevented meaningful participation in the study.

Patients were initially assessed by a psychiatrist and then referred to a psychologist for the implementation of the study. Diagnosis was based on a structured diagnostic interview during which symptoms were considered strictly in relation to DSM-IV-TR criteria. The interview lasted approximately 1 hr and included a structured assessment of sociodemographic characteristics. Data provided by the psychiatrist included an objective evaluation of symptomatology and diagnosis through formal consultation, age of onset of disorder, number of disease relapses, and physical health information. Fourteen patients declined to participate citing reasons like fatigue or more urgent commitments. All participants gave written informed consent to participate in this study.

¹The Spanish translation of the MCMI-III has been available for several years, and there is a growing support for its convergent and predictive validity, however, not in clinical samples yet (Rossi & Derksen, 2015). As a result, the MCMI-II remains one of the most widely used personality inventories in research and clinical practice in the Spanish language (López-Goñi et al., 2015).

8 | RESULTS

The descriptive statistics and internal consistencies for the variables in the study are presented in Table 1. The average global trait EI (TEIQue-SF) score in our clinical sample was two standard deviations ($M = 3.53$; $SD = .77$) below normative means (Cooper & Petrides, 2010: $M = 5.02$, $SD = .73$; Pérez-González, 2010: $M = 4.90$, $SD = .65$). It can be seen in that table that the study variables exhibited generally satisfactory internal consistencies. A pattern of associations consistent with theoretical expectations can be detected in the variable intercorrelation matrix (see Table 2). We note, in particular, the strong negative correlations between all five trait EI variables (four factors and the global score) and the four psychopathology variables (three MCMI factors and the total score). Given that most variables in the table are moderately-to-strongly interrelated, it is possible to introduce a structure to the correlation matrix in accordance with the path diagram in Figure 1.

8.1 | Structural equation model

Using MPlus, we tested a structural equation model with maximum likelihood estimation, because the data were relatively normally distributed. A latent variable of psychopathology was operationalized via the three Millon indicators, namely, mild pathology, severe pathology, and clinical symptomatology. This latent variable was regressed onto trait EI, irrational beliefs, and mindfulness. In turn, irrational beliefs were regressed onto trait EI and mindfulness, and, last, mindfulness was regressed onto trait EI. The resultant standardized path estimates are depicted in Figure 1.

The model represented a satisfactory fit to the data as judged against the Hu and Bentler (1999) criteria: $\chi^2_{(6)} = 42.89$, comparative fit index = $.96$, Tucker-Lewis index = $.91$, standardized root mean square residual = 0.03 . The root mean square error of approximation value was unsatisfactory ($.23$; 90%, confidence interval = $0.17-0.29$), however, this index tends to be inappropriate and misleading for models with low degrees of freedom, such as the present one (Kenny, Kaniskan, & McCoach, 2015). As can be seen in Figure 1, all paths reached statistical significance with the exception of that from irrational beliefs to psychopathology. Thus, both trait EI and mindfulness had significant direct effects on irrational beliefs and psychopathology, although the former's were somewhat stronger in both cases ($-.559$ versus $-.189$ for irrational beliefs and $-.387$ versus $-.255$ for psychopathology). Overall, 44% of the total variance in psychopathology was accounted for in the model.

8.1.1 | Direct and indirect effects

The total standardized effect of trait EI on psychopathology was -0.637 . This can be broken down to a direct part (-0.387 , as reported above; $p < .01$) and an indirect part (-0.25 ; $p < .01$). The bulk of the indirect part involved the path via mindfulness (-0.189 , $p < .05$).

The total standardized effect of mindfulness on psychopathology was -0.272 . The direct part formed the bulk of this effect (-0.255 , as

TABLE 2 Correlation matrix for the key variables in the study

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Emotional irrational beliefs	-																
2. Social irrational beliefs	-.52**	-															
3. Total irrational beliefs	.94**	-.73**	-														
4. Mindfulness observe	-.28**	.30**	-.33**	-													
5. Mindfulness descriptive	-.42**	.30**	-.42**	.36**	-												
6. Mindfulness awareness	-.41**	.44**	-.42**	.17	.47**	-											
7. Mindfulness nonjudgement	-.49**	.42**	-.50**	.22*	.50**	.66**	-										
8. Mindfulness nonreaction	-.67**	.39**	-.61**	.43**	.60**	.52**	.54**	-									
9. Five factors mindfulness questionnaire	-.60**	.49**	-.60**	.54**	.79**	.79**	.81**	.80**	-								
10. Millon personality style	.47**	-.34**	.47**	-.02	-.32**	-.34**	-.50**	-.44**	-.44**	-							
11. Millon personality pathology	.53**	-.31**	.50**	-.09	-.48**	-.47**	-.59**	-.53**	-.59**	.94**	-						
12. Millon clinical symptomatology	.55**	-.28**	.51**	-.26**	-.53**	-.48**	-.59**	-.55**	-.65**	.81**	.90**	-					
13. Millon total	.55**	-.32**	.51**	-.13	-.48**	-.46**	-.59**	-.54**	-.60**	.94**	.99**	.94**	-				
14. Well being	-.61**	.40**	-.62**	.38**	.50**	.37**	.53**	.52**	.61**	-.44**	-.52**	-.55**	-.53**	-			
15. Self control	-.58**	.33**	-.56**	.25**	.45**	.44**	.48**	.58**	.59**	-.36**	-.46**	-.49**	-.46**	.57**	-		
16. Emotionality	-.63**	.26**	-.54**	.12	.54**	.28**	.30**	.51**	.46**	-.45**	-.51**	-.53**	-.52**	.50**	.34**	-	
17. Sociability	-.26**	.21*	-.32**	.27**	.56**	.28**	.42**	.22*	.48**	-.20*	-.31**	-.31**	-.30**	.42**	.20*	.18	-
18. Global trait EI	-.72**	.38**	-.70**	.34**	.72**	.46**	.60**	.64**	.74**	-.51**	-.64**	-.66**	-.62**	.84**	.70**	.71**	.63**

Note. Trait EI = trait emotional intelligence

**p* < .05;

***p* < .01

reported above; $p < .01$), and the indirect part (via irrational beliefs) did not reach significance levels ($-0.017, p = ns$).

8.2 | Hierarchical regressions

Using Statistical Package for the Social Sciences (SPSS), a hierarchical regression was performed with the total Millon score as the dependent variable in order to test hypothesis H1, that is, that trait EI will be a stronger predictor of psychopathology than irrational beliefs and mindfulness. Full details are presented in Table 3. At step 1, the total scale scores for irrational beliefs and mindfulness were jointly entered into the equation ($R^2_{adj} = .38, F_{(2, 118)} = 38.13, p < .01$). At step 2, with global trait EI added to the equation, $R^2_{adj} = .45, F_{(3, 117)} = 31.27, p < .01$ ($\beta_{TEI} = -.386, t = 3.32, p < .01$). These results support hypothesis H1.

Subsequently, we conducted a hierarchical regression with the same dependent variable (total Millon score), but this time with the five factor scores of mindfulness, the two factor scores of irrational beliefs, and global trait EI as predictors, in order to test hypothesis H2. This is a more stringent test of the incremental validity of trait EI, contrasting its one degree of freedom against two degrees of freedom for irrational beliefs and five degrees of freedom for mindfulness. Full details are presented in Table 3. At step 1, the factor scores for irrational beliefs and mindfulness were jointly entered into the equation ($R^2_{adj} = .44, F_{(7, 113)} = 14.53, p < .01$). At step 2, with global trait EI added to the equation, $R^2_{adj} = .50, F_{(8,$

$112) = 14.20, p < .01$ ($\beta_{TEI} = -.347, t = 2.59, p < .05$). These results support hypothesis H2.

A third and final hierarchical regression was performed with the same dependent variable (total Millon score), and the factor scores of irrational beliefs, mindfulness, and trait EI as predictors. This was in order to investigate which of the four trait EI factors are mainly responsible for the effects of the global score. Full details are presented in Table 3. The first step was identical to the corresponding step in the hierarchical regression above. At step 2, with the four trait EI factors added to the equation, $R^2_{adj} = .53, F_{(11, 109)} = 13.15, p < .01$ ($\beta_{WB} = -.469, t = 4.08, p < .01$; $\beta_{SC} = -.009, t = 0.11, p = ns$; $\beta_{EMO} = -.151, t = 1.54, p = ns$; and $\beta_{SOC} = .082, t = .91, p = ns$). Thus, only the well-being factor reached significance levels in this equation.

9 | DISCUSSION

Our emotional perceptions, reasoning processes, and ability to maintain awareness on a moment-to-moment basis play an important role in the development and maintenance of mental illness. Up to about half the variance in total MCMI scores can be accounted for by individual differences in trait EI, mindfulness, and irrational beliefs. The structural equation and hierarchical regression models suggest that negative emotional self-perceptions are perhaps more fundamental than irrational thinking or lack of awareness in the development of

TABLE 3 Hierarchical regressions of psychopathology (total Millon MCMI score) on mindfulness, irrational beliefs and trait EI

MCMI ^a			MCMI ^b			MCMI ^c		
Step 1	$F_{(2, 118)} = 38.13^{**}, R^2_{adj} = .38$		Step 1	$F_{(7, 113)} = 14.53^{**}, R^2_{adj} = .44$		Step 1	$F_{(7, 113)} = 14.53^{**}, R^2_{adj} = .44$	
Step 2	$F_{(3, 117)} = 31.27^{**}, R^2_{adj} = .45$		Step 2	$F_{(8, 112)} = 14.20^{**}, R^2_{adj} = .50$		Step 2	$F_{(11, 109)} = 13.15^{**}, R^2_{adj} = .53$	
	Beta	t		Beta	t		Beta	t
Step 1:			Step 1:			Step 1:		
FFMQ	-.451	5.03**	Descriptive	-.168	1.86	Descriptive	-.168	1.86
Irrational Beliefs	.241	2.68**	Observe	.128	1.63	Observe	.128	1.63
			Awareness	-.012	.13	Awareness	-.012	.13
			Non-judgement	-.333	3.38**	Non-judgement	-.333	3.38**
			Non-reaction	-.138	1.24	Non-reaction	-.138	1.24
			EIB	.265	2.65**	EIB	.265	2.65**
			SIB	.029	.34	SIB	.029	.34
Step 2:			Step 2:			Step 2:		
FFMQ	-.258	2.47*	Descriptive	-.007	.07	Descriptive	-.022	.99
Irrational Beliefs	.088	.91**	Observe	.140	1.83	Observe	.127	1.70
			Awareness	-.033	.34	Awareness	-.020	.23
			Non-judgement	-.260	2.60*	Non-judgement	-.220	2.22*
Trait EI	-.386	3.32**	Non-reaction	-.150	1.37	Non-reaction	-.110	1.01
			EIB	.094	.80	EIB	-.020	.18
			SIB	.006	.07	SIB	-.021	.27
			Trait EI	-.347	2.59*	Well-being	-.469	4.08**
						Self-control	-.009	.11
						Emotionality	-.151	1.54
						Sociability	.082	.91
$F_{change (1, 117)} = 11.04^{**}, R^2_{change} = .05$			$F_{change (1, 112)} = 6.72^*, R^2_{change} = .03$			$F_{change (4, 109)} = 6.13^{**}, R^2_{change} = .10$		

Note. EIB = emotional irrational beliefs; MCMI = Millon Clinical Multi-Axial Inventory; SIB = social irrational beliefs; trait EI = trait emotional intelligence.

^aRegression was based on total scores for irrational beliefs, mindfulness, and trait EI.

^bRegression was based on factor scores for irrational beliefs and mindfulness, and total scores for trait EI.

^cRegression was based on factor scores for irrational beliefs, mindfulness, and trait EI.

* $p < .05$.

** $p < .01$.

psychopathology. It seems that such self-perceptions lead to psychopathology both directly, but also indirectly, through clouding awareness and fueling irrational thinking.

Previous research on typical samples has shown that trait EI correlates negatively with psychopathology (Martins et al., 2010) and irrational beliefs (Kamae & Weisani, 2014), and positively with mindfulness (Schutte & Malouff, 2011). In turn, mindfulness and irrational beliefs are, respectively, negatively and positively associated with psychopathology (e.g., Browne, Dowd, & Freeman, 2010; Gregório & Pinto-Gouveia, 2013) and inversely interrelated between them (Mellinger, 2010).

Our study adds weight to this body of knowledge by integrating the foregoing variables within a structural equation model and scrutinizing it on a clinical sample. This sample exhibited a very low level of trait EI (two standard deviations below the normative mean), which accords with findings from other studies that have compared personality profiles of typical versus clinical populations (e.g., Bagby et al., 1999; Sinclair & Feigenbaum, 2012). Clinical samples are as rare as they are necessary for this type of research because they do not leave any doubts as to whether the findings are theoretically and practically relevant to clinical groups (e.g., Wupperman, Neumann, & Axelrod, 2008). Studies using clinical samples are needed to identify personality correlates of mental health problems as well as to determine whether these differ from correlates in nonclinical samples (Resurrección, Salguero, & Ruiz-Aranda, 2014).

However, it should be recognized that clinical samples may inflate the relationships between trait EI and mental health and that their findings cannot be extrapolated to the general population. Normative samples may provide a more accurate estimate of the increased mental health risk associated with low trait EI. Therefore, both clinical and nonclinical samples are necessary to develop a full understanding of the relationship between personality and health (Ferguson, 2013).

The integration of the study's key variables within a structural equation model enabled the examination of specific pathways into psychopathology, in contrast to the dominant research designs in the literature that examine permutations of variables in a rather haphazard fashion. An important conclusion of the analysis concerns the primacy of emotional perceptions in the genesis of mental illness. Broad patterns of unhealthy emotional perceptions are at the root of irrational thinking, of mechanical and ruminative cognition that undermines mindfulness, and of maladaptive coping styles leading to self-harming, personality disorders, and general psychopathy (e.g., Gardner & Qualter, 2009; Mikolajczak, Petrides, & Hurry, 2009; Peña-Sarrionandia, Mikolajczak, & Gross, 2015; Sinclair & Feigenbaum, 2012).

The practical implications of this finding are thought-provoking when considered in a treatment context. Identifying seed factors at the start of psychopathological pathways can help us target our intervention efforts more precisely and efficiently. If it is eventually established, in accordance with the present findings, that these seed factors are mainly psychological, rather than mainly biological, as large meta-analyses also seem to suggest (Risch et al., 2009), this can provide an impetus for a much-needed shift from pharmacological to psychological treatments (Deacon, 2013). This would be most desirable, given that drugs tend to operate on the basis of symptom suppression

(Hollon, Thase, & Markowitz, 2002) and are attended with problems of addiction, tolerance, and a range of, potentially very severe, side-effects (Read, Cartwright, & Gibson, 2014; Weich et al., 2014).

Related to this point are the facts that psychotherapy has been shown to be at least as effective in the treatment of various psychopathologies as standard psychotropic drugs (e.g., DeRubeis, Siegle, & Hollon, 2008) and that experiential and social influences (e.g., cognitive therapy and meditation) are most powerful in inducing plastic change in the brain (Davidson & McEwen, 2012). Such findings appear to be inspiring a new wave of research that, like the present study, focuses on the theoretical links and pathways interconnecting fundamental self-perception constructs (see also Brockmeyer et al., 2015).

If dysfunctional emotional perceptions, as reflected in uniformly depressed trait EI profiles, are at the root of pathways to psychopathology, an important question arises as to whether these profiles can be adjusted via training. Experimental studies with adults have shown that trait EI is amenable to training, which leads to parallel and lasting improvements in well-being, subjective health, quality of social relationships, and employability (e.g., Nelis et al., 2011). There is additional evidence from similarly rigorous research that trait EI training has long-term (lasting for at least 1 year) beneficial effects in terms of reducing perceived stress levels, somatic complaints, and even diurnal cortisol secretion, a biological marker for stress (Kotsou, Nelis, Gregoire, & Mikolajczak, 2011). Preliminary research with young adolescents has suggested that cognitive behavioral groupwork (Rutledge & Petrides, 2012) or yoga interventions (McIlvain, Miller, Lawhead, Barbosa-Leiker, & Anderson, 2015) can have positive effects on trait EI scores (see also Khalsa, Greiner-Ferris, Hofmann, & Khalsa, 2015). Collectively, this evidence is important both for its practical consequences in people's lives and for what it implies about the causal effects of trait EI on a range of psychological and behavioral outcomes.

As far as the incremental validity of trait EI is concerned, a spate of research, including meta-analyses, has shown that not only is it a strong protective factor against mental illness but also that it actually protects over and above multiple established susceptibility factors, like maladaptive coping styles, negative affect, and neuroticism (e.g., Andrei et al., 2016; Martins et al., 2010). The hierarchical regressions revealed that the emotional perceptions captured by trait EI are stronger predictors of psychopathology than both mindfulness and irrational beliefs. Of the four trait EI factors, the well-being factor had the strongest incremental predictive validity, which further highlights the key role that this factor plays in mental health (see also Edmondson & MacLeod, 2015).

Although the incremental predictive effects of trait EI tend to be modest, especially in methodologically stringent designs whereby the global trait EI score is pitched against multiple baseline constructs (as in the second hierarchical regression herein), however, they are still statistically and practically significant (Andrei et al., 2016). We must also carefully distinguish between prediction and explanation and appreciate that the latter is at least as important as the former, if not more (Scriven, 1959). It is in its explanatory power and intervention possibilities, which can enhance people's everyday lives, where the utility of trait EI mainly rests.

9.1 | Limitations

The main limitations of this study are as follows. First, the sample size, although fairly large for clinical standards, was on the low end for structural equation modeling, which prevented us from fully modeling the observed indicators of the latent variables. Second, as previously mentioned, the clinical nature of the sample means that the results of the study do not necessarily generalize to the general population. Third, the heterogeneous nature of the clinical sample, comprising a range of psychiatric diagnoses, prevents us from proposing specific therapeutic actions. Fourth, the study was conducted on a Spanish-speaking sample and it is not certain that its results will generalize to other languages. An important goal for future research, then, is to examine the circumstances and extent to which the findings replicate in other contexts, countries, and cultures.

9.2 | Conclusion

Millions of people of all ages are suffering from debilitating mental disorders, despite the ever-increasing popularity of psychotropic drugs (Brugha et al., 2004; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Kessler et al., 2005; Merikangas et al., 2010; Mojtabai & Jorm, 2015; Mojtabai & Olfson, 2014). The present study demonstrated that emotional perceptions, reasoning processes, and general awareness create intertwined, but clearly identifiable, pathways leading to psychopathology. More specifically, the results revealed significant paths, direct and mediational (via irrational beliefs and mindfulness) from trait EI into psychopathology in a clinical sample. Understanding in greater detail and in multiple contexts the pathways uncovered in this study can help us develop effective, nontoxic responses to the mental health and overmedication crises that are scarring the lives of adults, adolescents, and children alike.

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