



## Research paper

## Temperaments in psychotic and major affective disorders



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## ABSTRACT

**Background:** Assessment of affective temperaments with the extensively validated, 110-item TEMPS-A auto-questionnaire has been used to characterize patients with mood disorders, and its scores have been associated consistently with suicidal behavior. Much less has been reported about comparisons of characteristics of such assessments in psychotic and other psychiatric disorders.

**Methods:** We analyzed results of TEMPS-A assessments in 1081 psychiatrically hospitalized patients in Rome and compared subscale scores (anxious [*anx*], cyclothymic [*cyc*], depressive [*dep*], irritable [*irr*], hyperthymic [*hyp*]) and a composite score ( $anx + cyc + dep + irr - hyp$ ) among diagnoses and subjects with vs. without a suicide attempt.

**Results:** TEMPS-A subscale scores differed significantly among diagnoses and were higher with major affective than psychotic or other disorders. Suicide attempts were 1.5-times more frequent among women than men and with affective versus nonaffective disorders, ranking: bipolar-II > major depression > bipolar-I > other disorders > psychotic disorders. TEMPS-A subscores were significantly higher among suicidal subjects (ranking:  $anx \geq cyc \geq dep > irr$ ) except *hyp* (lower), but the composite score differed most (1.37-fold higher). Multivariable logistic regression modeling indicated that suicide attempt was significantly and independently associated with: TEMPS-A composite score > female sex > affective disorder > older age.

**Conclusions:** TEMPS-A scores, particularly a composite score ( $anx + cyc + dep + irr - hyp$ ) may help effectively evaluate suicidal risk in association with nonaffective as well as affective disorders.

## 1. Introduction

Major affective and psychotic disorders often lead to psychosocial impairment, disability, and sometimes suicidal behavior (Nordentoft et al., 2015; Pompili et al., 2012). Temperamental dysregulation is proposed to represent a critical predisposition to major psychiatric disorders (Greenwood et al., 2013; Rihmer et al., 2010), and personality traits and affective temperaments appear to be stable risk factors

contributing to the onset of psychiatric disorders (Akiskal et al., 2005; Karam et al., 2010; Vázquez et al., in press). Affective temperaments may also contribute to particular components of major affective and psychotic disorders, such as the illness trajectory or course, predominant polarity of moods, manifestations of specific clinical symptoms, risk of suicidal behavior, and responses or adherence to treatment (Liraud and Verdoux, 2001; Sayin and Aslan, 2005; Oedegaard et al., 2009; Rihmer et al., 2010; Azorin et al., 2015; Karam et al., 2015;

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Baldessarini et al., 2016a; Vázquez et al., 2017).

Akiskal and colleagues [2005] proposed the following affective temperaments as especially relevant to mood disorders: *cyclothymic*, *depressive*, *hyperthymic*, *irritable*, and possibly *anxious* subtypes, and introduced the TEMPS-A autoquestionnaire to assess such temperaments (Akiskal et al., 2005). *Cyclothymic* individuals usually alternate between mildly hypomanic or irritable periods and depressive or dysthymic states, sometimes accompanied by particular neurocognitive and behavioral changes; *depressive* or *dysthymic* temperaments show sustained depressive traits; *hyperthymic* types tend to be optimistic and active; and *irritable* temperaments tend toward anger and irritability (Akiskal et al., 2005).

Several studies have investigated associations between suicidal behaviors and affective temperaments in psychiatric disorders, commonly assessed with the TEMPS-A autoquestionnaire (Akiskal et al., 2005; Azorin et al., 2009; Ardani et al., 2015; Vázquez et al., in press). Patients with a history of suicidal behavior have scored significantly higher in depressive, cyclothymic, irritable, and anxious temperaments and lower in hyperthymic temperament relative to non-suicidal subjects (Pompili et al., 2008a; Rihmer et al., 2009, 2013; Eksioğlu et al., 2015; Karam et al., 2015; Baldessarini et al., 2016b; Vázquez et al., 2017). In addition, hyperthymic temperament has been found to be prevalent among patients with bipolar I disorder, cyclothymic temperament with bipolar II disorder, and depressive temperament with unipolar major depression (Rihmer et al., 2009; Baldessarini et al., 2016a; Vázquez et al., 2017). Furthermore, in a large Lebanese study, suicide attempts were associated with relatively high scores for anxious temperament, even among subjects without an identified Axis I psychiatric diagnosis (Karam et al., 2015). Moreover, among Austrian university students lacking a DSM diagnosis, suicidal ideation was associated with relatively low hyperthymia ratings (Skala et al., 2012).

Although much of the reported research in this field is consistent in finding associations of particular temperament types with suicidal behavior, usually among patients with a major mood disorder, it remains unclear whether such associations are found in other psychiatric illnesses, including psychotic disorders. Accordingly, the present study was undertaken to investigate affective temperament ratings with the standard, validated TEMPS-A autoquestionnaire for associations with particular psychiatric diagnoses and with suicidal behavior, based on assessments of a large sample of psychiatrically hospitalized adults.

## 2. Methods

### 2.1. Subjects and clinical assessments

Participants were inpatients consecutively hospitalized at psychiatric units of Sant'Andrea Medical Center, an affiliate of the Sapienza University of Rome, between January 2008 and April 2015. Study subjects participated voluntarily and provided written informed consent, following review and approval of the study protocol by the Sant'Andrea Hospital research ethics review board, with assurance that data would be reported only anonymously and in aggregate form.

Inclusion criteria were unselected adult inpatients aged  $\geq 18$  years, with an expert, clinically determined DSM-IV-TR psychiatric diagnosis supported by examination based on the Mini International Neuropsychiatric Interview (MINI) at intake (Sheehan et al., 1998), who completed the Temperament Evaluation of Memphis, Pisa, Paris and San Diego auto-questionnaire (TEMPS-A) (Akiskal et al., 2005). Reliability of TEMPS-A was assessed with Cronbach's  $\alpha$ -coefficients for the components, which were quite high ( $\alpha = 0.74$ – $0.89$ ), as we have found previously (Pompili et al., 2008b) Cronbach alphas for the TEMPS-A dimensions in the present sample were 0.72, 0.83, 0.82, 0.78, and 0.86, respectively for depression, cyclothymia, hyperthymia, irritability, and anxiety. Temperaments were assessed near hospital discharge when subjects were no longer acutely ill. Diagnoses included bipolar I, bipolar II, major affective, nonaffective or schizoaffective

psychotic, and other [mainly anxiety and substance abuse] disorders.

The 110-item TEMPS-A questionnaire assesses and scores affective temperaments, including predominantly depressive (*dep*), cyclothymic (*cyc*), irritable (*irr*), anxious (*anx*), and hyperthymic (*hyp*) subtypes (Akiskal et al., 2005). All study participants also had a clinical assessment of lifetime suicidal status by an experienced psychiatric investigator backed by a suicide-assessment component of the MINI examination (Sheehan et al., 1998).

Being considered “ever suicidal” required having made at least one lifetime self-injurious act with apparent suicidal intent, or hospitalization primarily for emerging threat of suicide. Potential subjects with a coarse disorder of the central nervous system, including dementia, epilepsy, or Parkinson's disease, were excluded. Cognitive status was assessed with the Mini Mental State Examination (MMSE), and a score  $> 24$  was required for inclusion. Exclusion criteria included denial of informed consent and presence of major general medical illnesses requiring close medical supervision.

### 2.2. Data analyses

Preliminary assessments of individual factors of interest were made with bivariate comparisons of subjects rated as ever-suicidal versus nonsuicidal. In addition, we tested each subscale of the TEMPS-A as well as a composite score (sum of [*anx* + *cyc* + *dep* + *irr* – *hyp*] scores) for: [a] association with five DSM-IV-TR psychiatric diagnostic groups (bipolar disorder type I or II, major depressive disorder, psychotic disorders, and others [mostly anxiety, substance abuse, or personality disorders]), and [b] differentiation of suicidal from nonsuicidal subjects. Finally, we used multivariable logistic regression modeling with suicidal status as outcome measure. The modeling considered diagnosis and the composite TEMPS-A score, with sex and age as additional covariates, to obtain an Odds Ratio (OR) for each covariate. Data are presented as means  $\pm$  standard deviation (SD) or with 95% confidence intervals (CI). Data were analyzed with commercial statistical software (Statview.5 for data spreadsheets [SAS Institute; Cary, NC] and STATA.13 [StataCorp]; College Station, TX).

## 3. Results

### 3.1. Subjects

Of a total of 1161 consecutive potential study participants, we included 1081 psychiatrically hospitalized, adult participants (559 women, 522 men) of average ( $\pm$  SD) age  $39.0 \pm 12.3$  years, during psychiatric hospitalization for a variety of disorders. Most of the 80 (6.9%) excluded were too ill or excessively sedated to take part in the study. The distribution of primary DSM-IV-TR psychiatric diagnoses included: nonaffective (schizophrenia [13.1%] or brief psychosis [6.7%]) or schizoaffective (12.9%) *psychotic* (32.7%), *bipolar-I* (BD-I; 36.8%), *major depressive* (MDD; 10.8%), *bipolar-II* (BD-II; 6.5%), and *other* (13.2%) disorders (Table 1).

### 3.2. TEMPS-A scores and diagnosis

TEMPS-A subtype scores differed significantly among diagnoses overall, with considerable selectivity for post-hoc comparisons of pairs of diagnoses (Table 1). Scores for anxious (*anx*) and depressive (*dep*) temperaments were highest among subjects diagnosed with BD-II and MDD. Hyperthymic (*hyp*) temperament scores were highest with BD-I, psychotic, and other diagnoses. Cyclothymic (*cyc*) and irritable (*irr*) temperament scores were highest with BD-I and BD-II diagnoses.

A proposed composite TEMPS-A score (*anx* + *cyc* + *dep* + *irr* – *hyp*) is the sum of four individual temperament type scores minus that for hyperthymia (owing to its reported negative association with suicidal behavior). This composite score was significantly greater in mood-disorder subjects (BD-I, BD-II, MDD) than among those with nonaffective

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