Review of Psychology,
2010, Vol. 17, No. 2, UDC 159.9

Affective temperaments and trait impulsivity in the group of bipolar outpatients and healthy volunteers: Could it also be relevant in the early diagnostic picture of bipolar mood disorder?

BARBARA DOLENC and LILIJANA ŠPRAH

Affective temperaments have been linked with major mood disorders. Less attention has been paid to the association of affective temperaments with the trait impulsivity, which is commonly associated with clinical picture of bipolar disorder. The aim of our study was to examine the features of affective temperaments and impulsivity and their relationship among remitted bipolar outpatients and healthy volunteers. 1096 students, 45 euthymic bipolar outpatients and 45 comparable controls were self-assessed with the Temperament Evaluation of Memphis, Pisa, Paris and San Diego – Autoquestionnaire (TEMPS-A) and Barratt Impulsivity Scale (BIS-11). In the group of bipolar outpatients higher mean scores on depressive, cyclothymic, irritable and anxious temperament, as well as on attentional and general impulsivity scales have been found in comparison to the control and students group. Our data also revealed positive correlations between impulsivity and certain aspects of affective temperaments. The results are in agreement with numerous studies where authors emphasized that more pronounced depressive, cyclothymic, irritable and anxious temperament as well as impulsivity could indicate a vulnerability to pathological mood regulation also during the remission phase of bipolar disorder. Besides, associations between affective temperaments and impulsivity could imply that those traits may be relevant in early diagnostic picture for affective disorders.

Key words: bipolar disorder, affective temperament, impulsivity

The concept of affective temperaments is rather old; however, studies by Akiskal and colleagues (Akiskal, Djenderedjian, Resenthal, & Khani, 1977) revived the concept by postulating that temperamental dysregulation may constitute the link between predisposing familial-genetic factors and affective disorders such as bipolar disorder. According to their view, temperament could represent the earliest subclinical phenotype of mood disorders. Several studies on affective temperaments found associations with affective disorders such as mania and depression (Hantouche et al., 1998; Matsumoto et al., 2005; Mazzarini et al., 2009), possibly representing a potential contributor to the bipolar spectrum (Akiskal & Pinto, 1999).

Beside considerable association between temperamental traits and bipolar disorder, a number of studies have shown that the presence of a mood disorder is correlated with a significantly higher level of impulsiveness (Peluso et al., 2007; Swann, Steinberg, Lijffijt, & Moeller, 2008). However, there is a scarce of information about quantitative relationships between impulsivity and the course of illness in bipolar disorder. Swann and colleagues (Swann, Anderson, Dougherty, & Moeller, 2001) report that impulsivity as measured by Barratt Impulsiveness Scale (Patton, Stanford, & Barratt, 1995) appeared similarly elevated in the patients with bipolar disorder regardless of the phase of illness (mania or depression), suggesting that impulsivity might represent a stable component which is not purely a manifestation of mood state.

Although affective temperaments and impulsivity represent personal traits which are frequently linked with mood disorders, less is known about the specific relationship between them. Signoretta, Maremmani, Liguori, Perugi and Akiskal (2005) report that cyclothymic disposition is associated with lifetime psychopathology and impulsivity, whereas Stanford, Greve and Dickens Jr. (1995) report of high correlation between impulsivity as measured by BIS-11 and irritability. Impulsive individuals often reported of explosive, uncontrolled and accumulated anger, which is a key characteristic of irritable temperament. These authors

Barbara Dolenc, Sociomedical Institute at Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Novi trg 2, 1000 Ljubljana, Slovenia, E-mail: dolenc.barbara@gmail.com (the address for correspondence).

Acknowledgements:

The study has been co-founded by the Slovenian Research Agency and Astrazeneca, Contract No. L3-9698-2485-06.

suggest that both, irritability and impulsiveness are a constitutive part of a behavioural control dimension which is involved in the inhibition of aggressive outbursts. Some authors emphasized that depressive and manic symptoms are differentially related to specific aspects of impulsivity. Attentional-cognitive impulsivity was found to be increased with either depression or mania, whereas motor impulsivity correlated with mania, and non-planning impulsivity with depression (Swann et al., 2008).

The aim of our study was to assess the relationship between temperamental traits and impulsivity among bipolar euthymic outpatients and healthy volunteers as well as the differences in all aspects of temperament and impulsivity between those groups of participants.

METHODS

Participants

The TEMPS-A Auto-questionnaire was first translated and then administered together with BIS-11 to a group of 1096 students from different Slovenian universities. After psychometric analyses, the questionnaires were administered to 45 bipolar remitted outpatients and 45 controls, matched for gender and age and without any history of affective disorders. All the participants gave written informed consent. The demographic data of all included groups are displayed in Table 1.

Table 1
Demographic data of the samples included in the study

		Group		
		Students (N=1096)	Bipolar outpatients (N=45)	Control group (N=45)
N	Female (%)	680 (62.0)	23 (51.1)	23 (51.1)
	Male (%)	416 (38.0)	22 (48.9)	22 (48.9)
Age	M	20.55	41.91	42.16
	SD	1.81	11.55	12.42

Measures

The TEMPS-A Scale (Temperament Evaluation of Memphis, Pisa, Paris and San Diego – Autoquestionnaire, Akiskal, & Akiskal, 2005) is a "yes" or "no" type of self-report questionnaire. The questionnaire assesses five subscales, namely depressive, cyclothymic, hyperthymic, irritable and anxious.

The BIS-11 (Barratt impulsiveness Scale, Patton et al., 1995) scale identifies three components of impulsivity, namely attentional, motor and nonplanning. The items are scored on a four point scale. Descriptions of both scales with item examples are displayed in Table 2.

Procedure

In order to examine the relationship between affective temperaments and trait impulsivity, we first applied the Slovenian version of TEMPS-A and BIS-11 auto-questionnaires to the group of students (N=1096). After the psychometric analyses of the TEMPS-A Autoquestionnaire and preliminary correlation analyses with impulsivity traits, TEMPS-A was applied on the group of remitted bipolar outpatients and healthy controls, together with BIS-11. We analysed the differences in affective temperaments and impulsivity between separate groups by using Mann-Whitney U-test. A Bonferroni correction was applied; therefore all effects are reported at a .0167 level of significance. We also calculated Cohen's d effect size measure. To determine the relationships between affective temperaments and impulsivity traits, Spearman's bivariate correlations were calculated together with Fisher Z-test to determine the significant dif-

Table 2
Descriptions of the scales used in the study with item examples for each scale

Scale	Subscale	Number of items	Description of the scale	Example of an item
TEMPS-A	Depressive	21	Increased sensitivity to life's sorrows and disappointments.	I am a sad, unhappy person.
	Cyclothymic	21	Labile mood swings.	I get sudden shifts in mood and energy.
	Hyperthymic	21	Enterprising, ambitious and driven.	I am always on the go.
	Irritable	20/21*	Angry and dissatisfied.	I complain a lot.
	Anxious	26	Prone to worrying and anxiety.	I am unable to relax.
BIS-11	Attentional	8	Lack of cognitive persistence with inability to tolerate cognitive complexity.	I have racing thoughts.
	Motor	11	Tendency to act on the spur of the moment.	I make up my mind quickly.
	Nonplanning	11	Lack of sense of the future.	I plan tasks carefully.

* Irritable subscale of the TEMPS-A questionnaire consists of 20 items for males and 21 items for females.

ferences in correlation coefficients between groups. Statistical analyses were conducted with SPSS 16.0 for Windows.

RESULTS

The psychometric analyses of the TEMPS-A autoquestionnaire showed relatively good reliability and internal consistency. Except for the depression scale, which consisted of few items that discriminated negatively with the scale and therefore had lower reliability (α=.65), the reliabilities of other scales ranged from .73 to .91. In addition, the preliminary analyses revealed some important correlations between affective temperaments and different aspects of impulsivity in the group of students. Cyclothymic and irritable temperament proved to be positively linked with the trait impulsiveness. Attentional impulsiveness revealed significant positive correlations with depressive, cyclothymic, irritable and anxious temperament and negative correlation with hyperthymic temperament.

The analysis of differences in affective temperaments (Figure 1) and impulsivity traits (Figure 2) in all three groups revealed that bipolar outpatients demonstrated higher depressive (Z(2)=-3.66; p<.0167; d=0.86), cyclothymic (Z(2)=-4.20; p<.0167; d=0.89), irritable (Z(2)=-3.19; p<.0167; d=0.65) and anxious (Z(2)=-3.85; p<.0167; d=0.86) temperament scores as well as higher attentional (Z(2)=-2.815; p<.0167; d=0.64) and general impulsiveness (Z(2)=-2.54; p<.0167; d=0.57) in comparison to the control group. On the other hand, bipolar outpatients showed lower hyperthymic traits in comparison to the controls (Z(2)=-3.13; p<.0167; d=-0.65). Similar results were found in comparison of bipolar outpatients to students. Except for the cyclothymic (Z(2)=-4.66; p<.0167; d=-0.62) and irritable

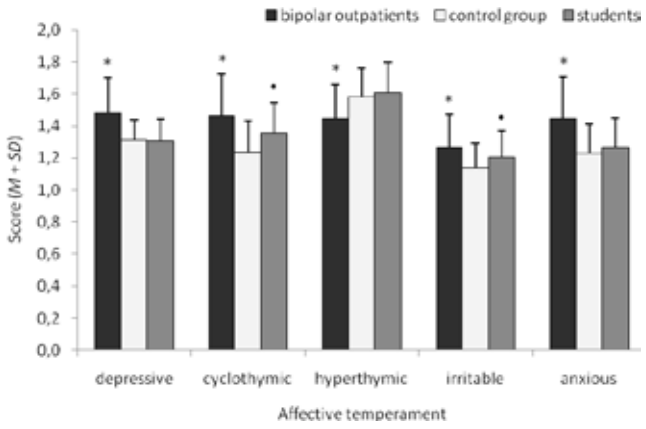

Figure 1. Comparison of mean scores (M) and standard deviations (SD) of all affective temperaments as measured by TEMPS-A in euthymic bipolar patients (N=45), control group (N=45) and university students (N=1096)
*p<.0167 (bipolar outpatients in comparison to the control group and students);
•p<.0167 (control group in comparison to students).

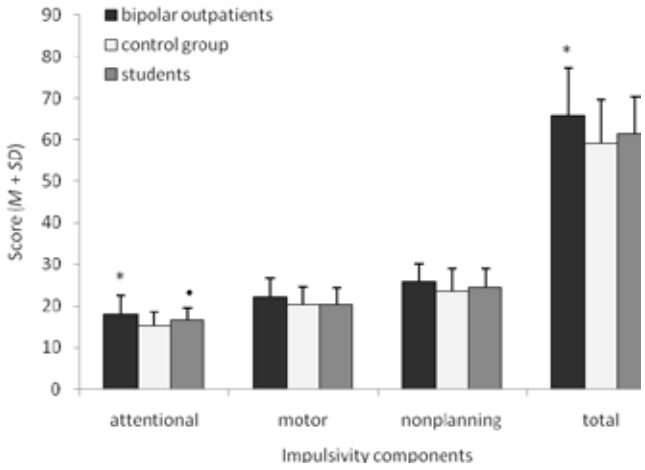

Figure 2. Comparison of mean scores (M) and standard deviations (SD) of impulsivity components in euthymic bipolar patients (N=45), control group (N=45) and university students (N=1096)
*p<.0167 (bipolar outpatients in comparison to the control group and students);
•p<.0167 (control group in comparison to students).

Table 3
Spearman's coefficients of correlation between affective temperaments and impulsivity subscales in the group of bipolar outpatients (N=45), control group (N=45) and students (N=1096)

	Impulsivity			
	Attentional	Motor	Non-planning	Total Score
Depressive temperament				
Bipolar outpatients	.569*[a b]	.186	.162	.357*[b]
Control group	.086 [a]	.031	.029	.042
Students	.149*[b]	-.116*	-.086*	-.040 [b]
Cyclothymic temperament				
Bipolar outpatients	.671*[b]	.513*[b]	.378*	.658*[b]
Control group	.616*	.364*	.248	.440*
Students	.390* [b]	.201* [b]	.153*	.289* [b]
Hyperthymic temperament				
Bipolar outpatients	-.325	-.016	-.283	-.225
Control group	-.371*	-.039	-.130	-.181
Students	-.227*	.099*	-.110*	-.090*
Irritable temperament				
Bipolar outpatients	.665*[b]	.454*	.486*[b]	.667*[a b]
Control group	.489*	.322	.126	.332 [a]
Students	.324* [b]	.208*	.116* [b]	.252* [b]
Anxious temperament				
Bipolar outpatients	.759*[a b]	.428*[b]	.348 [b]	.620*[a b]
Control group	.410* [a]	.177	.067	.210 [a]
Students	.186* [b]	-.060 [b]	-.117* [b]	-.019 [b]

*p<.0167 (within group correlations);
[a]p<.0167 (difference between the group of bipolar outpatients and the control group);
[b]p<.0167 (difference between the group of bipolar outpatients and students);
[c]p<.0167 (difference between the control group and students).

($Z(2)$=-2.85; p<.0167; d=-0.37) temperament and attentional impulsivity ($Z(2)$=-2.99; p<.0167; d=-0.43), where students proved to have higher results then the control group, both groups of healthy volunteers showed no significant differences.

Euthymic bipolar outpatients also differed notably from both groups of healthy volunteers in the relationship between affective temperaments and impulsivity traits (Table 3). Attentional and general impulsivity were significantly correlated with almost all affective temperament scales in the group of bipolar outpatients. On the other hand, cyclothymic, irritable and anxious temperament proved to be strongly connected with all aspects of impulsivity as well as general impulsivity in bipolar outpatients group since the correlation coefficients ranged between +.35 and +.76. Significant correlations also exist between depressive temperament and attentional and general impulsiveness. Besides, the correlations seem to be stronger than in both groups of healthy volunteers, whereas the correlations between impulsivity and affective temperaments are not significantly different in the group of students and the control group. In general, cyclothymic and irritable temperament proved to be positively linked with several aspects of impulsivity in all three groups.

DISCUSSION

The aim of our study was to examine the differences in affective temperaments and trait impulsivity among healthy volunteers and bipolar outpatients during the remission phase. We also closely examined the relationships among all traits.

Our results demonstrate that depressive, cyclothymic, irritable and anxious temperaments are significantly more pronounced in the clinical group of remitted bipolar outpatients in comparison to non-clinical groups. Cohen's d showed medium to large effect, showing a very important effect of affective disorder. These results are in agreement with some previous studies (Hantouche et al., 1998; Mazzarini et al., 2009) where authors emphasized that elevated depressive, cyclothymic, irritable and anxious temperamental scores could indicate a vulnerability to pathological mood regulation, also during the remission phase of bipolar mood disorder. However, in our study the bipolar group demonstrated a significantly lower score in hyperthymic temperament than non-clinical groups. So far, studies on hyperthymic temperament are conflicting, showing a vague boundary between adaptive attributes that could be a constitutional part of a healthy personality on one hand and pathology on the other. Although some studies suggest that hyperthymic temperament could be a premorbid personality trait of manic patients (Akiskal & Pinto, 1999), our results do not support the hypothesis of a specific link between the hyperthymic temperament and bipolarity. Some studies (Matsumoto et al., 2005) imply that recovered bipolar patients are faced with impaired recognition of hyperthymic traits in themselves as they usually have the tendency to overlook the symptoms that are in the direction of mania. Akiskal and Akiskal (2005) on the other hand suggest that the traits constituting the hyperthymic profile are so desirable, that healthy individuals tend to endorse them. Indeed the hyperthymic temperament, as delineated in the TEMPS-A, has a high number of positive traits, therefore they might be positively evaluated and socially approved. This again reflects a vague nature of the scale itself.

Besides specific picture of temperamental traits, euthymic bipolar outpatients demonstrated more pronounced impulsive traits in comparison to non-clinical participants, which is in agreement with some previous studies (Peluso et al., 2007; Swann et al., 2001). Although several authors agree that there is an association between bipolar disorder and impulsivity, it still remains unclear whether interepisode impulsivity is a risk factor for the disorder or a consequence of it (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). Yet various findings suggest that impulsivity plays an important role in bipolar disorder (Swann et al., 2001; 2008) as both, the state impulsivity that predominates in the manic phase of bipolar disorder, and the stable (trait) impulsivity that is independent of mood states are important features of bipolar disorder. These findings support the hypothesis that the relatively high level of impulsivity found in bipolar patients also during the remission, may be a stable component, which is not merely a manifestation of mood state (Peluso et al., 2007). This hypothesis is even more plausible if we look at the relationships between affective temperaments and impulsivity traits. Our results show strong positive correlation between different aspects of impulsivity and cyclothymic, irritable and anxious temperament and moderate correlation with depressive temperament in the group of remitted bipolar outpatients. This could indicate that those traits represent a distinctive, relatively stable picture of bipolar mood disorder, which is maintained even during the remission phase of disorder.

Nevertheless, more research needs to be done to ascertain, whether this picture is a consequence of the illness or predictor of it. Our findings are comparable with some previous studies, where researchers suggested that the cyclothymic temperament or stable affective instability is associated with impulsivity (Signoretta et al., 2005) and that irritability and impulsiveness are both part of a dimension of behavioural control which is involved in the inhibition of aggressive outbursts (Stanford et al., 1995). However, our clinical sample was relatively small, which could have an impact on the results and their applicability. Some limitations of the present study highlight the need of further critical examination of hypothesis whether affective temperaments and impulsivity traits could be distinctive predictors of increased vulnerability to bipolar disorder, and to what extent those traits are interrelated. This could serve as an important cue in the early diagnostic of the bipolar disorder

and might have significant implications for a better understanding and treatment of the disorder.

CONCLUSIONS

In the present study we demonstrated that several TEMPS-A scales differentiate among patients with bipolar disorder and healthy volunteers. Our study also revealed some important associations between temperamental traits and impulsivity indicating that both traits could be relevant in early and later phases of bipolar mood disorder.

REFERENCES

Akiskal, H. S., Djenderedjian, A. H., Resenthal, R. H., & Khani, M. K. (1977). Cyclothymic disorder: validation criteria for inclusion in the bipolar affective group. *American Journal of Psychiatry, 134(11)*, 1227 – 1233.

Akiskal, H. S., & Pinto, O. (1999). The evolving bipolar spectrum. Prototypes I, II, III, and IV. *Psychiatric Clinics of North America, 22(3)*, 517 – 534.

Akiskal, K. K., & Akiskal, H. S. (2005). The theoretical underpinnings of affective temperaments: implications for evolutionary foundations of bipolarity and human nature. *Journal of Affective Disorders, 85(1)*, 231 – 239.

Hantouche, E. G., Akiskal, H. S., Lancrenon, S., Allilaire, J. F., Sechter, D., Azorin, J. M., Bourgeois, M., Fraud, J. P., & Châtenet-Duchêne, L. (1998). Systematic clinical methodology for validating bipolar-II disorder: Data in mid-stream from French national multisite study (EPIDEP). *Journal of Affective Disorders, 50(2-3)*, 163 – 173.

Matsumoto, S., Akiyama, T., Tsuda, H., Miyake, Y., Kawamura, Y., Noda, T., Akiskal, K. K., & Akiskal, H. S. (2005). Reliability and validity of TEMPS-A in a Japanese non-clinical population: application to unipolar and bipolar depressives. *Journal of Affective Disorders, 85(1-2)*, 85 – 92.

Mazzarini, L., Pacchiarotti, I., Colom, F., Sani, G., Kotzalidis, G. D., Rosa, A. R., Sanna, L., De Rossi, P., Girardi, N., Bonnin, C. M., Sanchez-Moreno, J., Vazquez, G. H., Gasto, C., Tatarelli, R., & Vieta, E. (2009). Predominant polarity and temperament in bipolar and unipolar affective disorders. *Journal of Affective Disorders, 119(1-3)*, 28-33.

Moeller, F. G., Barratt, E. S., Dougherty, D. M., Schmitz, J. M., & Swann, A. C. (2001). Psychiatric aspects of impulsivity. *American Journal of Psychiatry, 158(11)*, 1783-1793.

Patton, J. H., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barratt impusliveness scale. *Journal of Clinical Psychology, 51(6)*, 768-774.

Peluso, M. A. M., Hatch, J. P., Glahn, D. C., Monkul, E. S., Sanches, M., Najt, P., Bowden, C. L., Barratt, E. S., & Soares, J. C. (2007). Trait impulsivity in patients with mood disorders. *Journal of Affective Disorders, 100(1-3)*, 227-231.

Signoretta, S., Maremmani, I., Liguori, A., Perugi, G., & Akiskal, H. S. (2005). Affective temperament traits measured by TEMPS-I and emotional-behavioral problems in clinically-well children, adolescents, and young adults. *Journal of Affective Disorders, 85(1-2)*, 169-180.

Stanford, M. S., Greve, K. W., & Dickens Jr., T. J. (1995). Irritability and impulsiveness: relationship to self-reported impulsive aggression. *Personality and Individual Differences, 19(5)*, 757-760.

Swann, A. C., Anderson, J. C., Dougherty, D. M., & Moeller, F. G. (2001). Measurement of inter-episode impulsivity in bipolar disorder. *Psychiatry Research, 101 (2)*, 195-197.

Swann, A. C., Steinberg, J. L., Lijffijt, M., & Moeller, F. G. (2008). Impulsivity: Differential relationship to depression and mania in bipolar disorder. *Journal of Affective Disorder, 106(3)*, 241-248.