5-Silvestri

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Perception of subjective time and affective temperament in patients with depressive disorders

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ABSTRACT

Background: The perception of time passing depends on various variables such as the age, culture, relationships, and emotions of each human being. During Covid-19 outbreak, the perception of time was altered by a variety of variables: objective such as, Lockdown, vaccine, fear of infections, etc. and subjective, for example, temperament and personality traits. As showed by previous studies, patients with depressive disorder have a compromised evaluation of time. In light of this, the objectives of this study were to explore the possible correlation between the perception of time, the affective temperament and the fear of covid-19 infection in patients with depressive disorders.
Method: We studied 70 patients, through Preliminary personal data sheet dedicated to the collection of socio-demographic and clinical data and information about any previous Covid-19 infection and any vaccination. The psychological instruments regard Zimbardo Time Perspective Inventory (ZTPI); Irritability, Depression, Anxiety Scale (IDAS); Temperament Evaluation of Memphis (TEMPS-A); Fear of Covid-19 Scale (FCV-19S).
Results: The results of this study showed that anxious temperament correlates negatively with the hyperthymic temperament, and anxious temperament correlates negatively in women with the irritable temperament. There are not significant correlations in relation to the fear of Covid-19 infection.
Conclusion: In conclusion emerged a strong relationship between the attitude towards a temporal perceptual typology and the affective humoral temperament.

Keywords: *Subjective Time Perception; Mood Alterations; Fear of Covid; Affective Temperament*

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Introduction

Subjectivity is a fundamental variable in the perception of time passing. This perception depends on various variables such as the age, culture, relationships, emotions of each human being. The emotional experience seems to be a powerful modulator in the perception of the passage of time (Lake, *et al*., 2016). The restrictions imposed by the lockdown due to Covid-19 pandemic, the particularly widespread nature, the pathogenicity of virus, the fear of contagion, have had a dramatic impact on the population (Zerbin *et al*., 2020). Nowadays this condition has further affected the subjective well-being and health of the population. In particular, there is an increase in negative emotions, changes in lifestyle and work that have exposed a large part of the population to psychopathological alterations, including mood disorders (Siracusano and Rossi 2020). According to Holman and colleagues (2020), Covid-19 outbreak is a collective trauma, and altered how we perceive time of the futures. The pandemic period has challenged our way of life and made our futures, both near and far, less certain. Previous studies showed that correlation between time perception, fear of contagion and trauma. Quarantine and pandemic period changed in perceptions of time and our views of the future. Lewin (1942) demonstrated that disrupting the flow of time could have serious psychological consequences. Trauma can expand the current traumatic experience so that it fills conscious awareness (Zimbardo *et al*., 2015, Holman *et al*., 2020; Torales *et al*., 2020).

The perception of time is a subjective process; according to Phil Zimbardo, each of us has a time profile that orients him by guiding his choices and behaviors (Zimbardo and Boyd, 2008). The interior time, the individual time, is different from the objective chronological time: it marks the phases of life; it is centered on recollection and autobiographical memory. The passing of time brings with it the elusive characteristic, it is not seen, we experience it and we are able to perceive it; consequently, in some circumstances we can adapt our behavior, those less mediated by emotionality. This demonstrates how the relationship of time with subjective internal representation is systemic, complex and of great psychological importance. A relationship between time and space always exists as well as between time and age (Vasile, 2015). An elderly person perceives time differently than an adult or a young person. It is clear how some parameters such as life experience, routine, and cognitive processes such as memory and attention will make perceive time in a different way (Riemer, Wolbers, van Rijn 2021). According to telescope effect the time is faster for adults than for young people due to a tendency to chronologically place events in memory. Recent events are more distant in time than they really are while more remote ones are closer (Wittmann *et al*., 2005; 2009).

Our emotions are also powerful modulators of time perception. The time perceived emotionally it is different from the one measured with the instruments. Emotions are capable to speed up or slow down

the perception of time as it passes. In certain situations, emotional distorsions and some highly arousing emotional stimuli can lead to an overstimation as well as understimation of the perception of passing time. In fact, minutes that never pass or hours that pass quickly are sensations experienced by many people depending on negative or positive situations, also stress related (Agnoletti 2016). The sense of time, the value that each of us attributes to time, certainly depends on individual characteristics but is conditioned in a conscious way and not also by some strongly rooted beliefs in the culture and society we live (Merchant *et al*., 2013).

In conclusion, the perception of time is a very important psychic function and it is equally important to investigate how a different perception of time is connected to other psychic variables. In general, it has a positive or negative impact on people's behavior and quality of life. An example of this is the studies on cognitive, mood and sleep alterations in the lockdown period (Morin, Vector, 2021). The emotional distress experienced led to an increase in psychiatric disorders, the intake of anxiolytics, antidepressants as well as suicidal behavior (Vasile 2015; Torales *et al*., 2020).

This work analyzes the state of art relating to the perception of subjective time, together with a collection of data on a sample of patients suffering from mood disorders. The aim of the work is to examine the relationship between the perception of temporal dimensions and the psychological and psychopathological variables (fear of contagion, emotional temperaments, irritability) in the clinical observation group. Everyone has an internal o' clock, and in depressed patients time passes more slowly and with less quality. During Covid-19 long period, the collective trauma is ever actually, time has acquired a great subjective experience, and perhaps, similarly to depressed patients, people perceived time to pass more slowly. In the light of this, we asked ourselves if there is a correlation between fear of contagion (therefore risk of spending one's time in quarantine), emotional temperament and perception of time.

Method

Sample

The clinical observation group consists of 70 patients (22 men and 48 women) from July to September 2021, recruited at the Mental Health Center (CSM) of Taurianova (Italy).

The patients joined the data collection by signing a consent to the protocol. Patients meeting the following criteria were included in the study: Diagnosis of mood disorders (disorders of the anxious-depressive and bipolar spectrum code ICD-10) and age between 18 and 75 years old.

In Table 1 are summarized the percentage of the principal aspect of participants' sociodemographic characteristics (Table 1). The subject have an age average of 52.46 with a standard deviation 0f 13.92. Most of the subjects have obtained the middle school (47.1%), are married (62.9%) and are employed (28.6%).

		%
Gender	Females	68,6
	Male	31,4
Marital status	Single	18,6
	Divorced	14,3
	Married	62,9
	Widower	4,3
Education	Diploma	31,4
	Degree	7,1
	Primary School	14,3
	Secondary School	47,1
Occupation	Housewife	11,4
	Unemployed	15,7
	Employee	28,6
	Indipendent	15,7
	Retired	27,1
	Student	1,4

Table 1. Descriptive sociodemographic data results.

The 35.7% of the sample have a diagnosis of Depressive Disorder, 31.4% of Reactive Depression, 15.7% of Bipolar Disorder, 11.4% of Depressive Disorder with Panic, 4.3% of Disorder persistent mood and 1.4% anxiety disorder. 11.4% of the sample contracted Covid-19 and 61.4% said they were afraid of contagion. The 65.7% of the subjects was vaccinated, the 5.7% had only the first dose and the remainder had not yet been vaccinated (28.6%).

Instruments

For the research, the following tests were used:

- Preliminary personal data sheet dedicated to the collection of socio-demographic data, such as gender, age, schooling, marital status, children, occupation, clinical data (medical history and psychiatric diagnosis) and information about any previous COVID 19 infection and any vaccination.
- The *Fear of COVID-19 FCV-19*, (Ahorsu *et al*., 2020) is a scale composed of seven items related to the fear of COVID-19 contagion. Items ("I'm more afraid of coronavirus-19") are rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The higher the total score, the higher the fear of COVID-19. The Italian version was tested on 15 different age groups and educational levels and to avoid the occurrence of order and sequence effects, the items were randomised, allowing the validity and reliability of the instrument to be confirmed (Soraci *et al*., 2020).
- The *Temperament Evaluation of Memphis, Pisa, Paris and San Diego Autoquestionnaire (TEMPS-A)* is the abbreviated and self-filling version of the TEMPS-I semi-structured clinical interview for the evaluation of affective temperaments (Akiskal *et al*., 1998 Akiskal *et al*, 2005). The full version of the questionnaire includes 110 items. Its subscales and constitutive items were formulated on the

basis of the diagnostic criteria for affective temperaments (cyclothymic, dysthymic, irritable, hyperthymic and anxious), originally developed by the first author. TEMPS-A is a dichotomous (yes - no) response and was designed to measure temperaments in both psychiatric patients and healthy volunteers. The TEMPS-A made up of 39 items, includes the following sections in each temperamental scale (Preti *et al*., 2010): "emotional reactivity" (Depressive, labile, irritable, joyful); "cognitive" (Pessimism vs optimism); "psychomotor" (Low vs high energy); "circadian" (some behavioral traits as a gregarious and / or leader, frequent falling in love and / or breaking up of romantic relationships).

- *Zimbardo Time Perspective Inventory (ZTPI)* (Zimbardo & Boyd, 1999) is a questionnaire that allows to reflect on the perception of temporal dimensions of past, present and future. It is also a cross-culturally validated tool in 24 countries (Stolarski *et al*., 2014). The questionnaire consists of 56 items relating to 5 factors considered to be main components of the time perspective: Past-Negative (PN), Past-Positive (PP), Present-Fatalist (PF), Present Hedonist (PE), Future (F). The items consist of statements on which it is required to express the level of agreement on a 5-point Likert scale. Zimbardo and Boyd (1999) identify as ideal temporal perspectives those that have simultaneously values: highs of Positive Past (value close to 4.5); negative past lows (value close to 2); moderately high Hedonistic Present (value close to 4); lows of Present Fatalist (value close to 1.5); moderately high in the Future (value close to 4).
- *Irritability, Depression, Anxiety Scale (IDAS)* (Snaith *et al*., 1985) The Italian version (Conti, 1999) was designed to measure irritability, understood as impatience, intolerance and short temper, in mental disorders and in particular in depressive and anxious ones. The scale is made up of 14 items that explore Irritability, Anxiety and Depression by a 4-point scale (0 absence of pathology to 3, maximum severity). The graduation is different in the various items proceeding, from normality to pathology.

Results

The data are reported in mean values with the respective standard deviations in table 2. The Statistical Package for the Social Sciences SPSS-25 was used for the correlation analysis.

The correlations between all variables are reported in table 3. The "anxious" temperament correlates negatively with the "hyperthymic" temperament ($r = -0.31$; $p < 0.01$). The "Present Hedonistic" subscale of the ZTPI tool correlates significantly with the "cyclothymic" temperament ($r = 0.387$; $p < 0.01$) and with the "hyperthymic" temperament ($r = 0.42$; $p < 0.01$); while, it negatively correlates with the "depressive" temperament ($r = -0.35$; $p < 0.01$). The "Present Fatalistic" subscale correlates significantly with the "Past Negative" ($r = 0.56$; $p < 0.01$) and "Future" ($r = 0.31$; $p < 0.01$) subscales.

	All Sample		Man		Women	
	M	SD	M	SD	M	SD
Fear of Covid	18.20	6.73	18.50	7.46	18.06	6.45
Cyclothymic	.87	.833	.73	.767	.94	.861
Depressive	1.26	.736	1.27	.631	1.25	.786
Irritable	.57	.627	.64	.727	.54	.582
Hyperthymic	.33	.503	.23	.429	.38	.531
Anxious	1.91	.371	1.82	.501	1.96	.289
Past negative	3.79	.572	3.62	.593	3.87	.551
Present Hedonistic	2.53	.526	2.6	.683	2.50	.441
Future	3.14	.804	3.19	1.25	3.12	.495
Past Positive	3.67	.555	3.57	.505	3.72	.575
Present Fatalistic	3.21	.568	3.18	.707	3.23	.499
Depression	9.37	2.72	9.14	3.24	9.48	2.47
Anxiety	7.84	2.43	7.68	2.96	7.92	2.18
Irritability	7.30	2.12	6.95	2.51	7.46	1.92

Table 2 – Descriptive Statistics of all sample and man and women separately

The “Depression” subscale of the IDAS instrument correlates significantly with the “Depressive” temperament ($r = 0.39$; $p < 0.01$), while it negatively correlates with the “hyperthymic” temperament ($r = -0.32$; $p < 0.01$). Anxiety correlates significantly with the "irritable" temperament ($r = 0.37$; $p < 0.01$) and with the “depression” subscale ($r = 0.52$; $p < 0.01$). The “Irritability” subscale correlates significantly with the “irritable” temperament ($r = 0.39$; $p < 0.01$) and with the "depression" subscales ($r = 0.55$; $p < 0.01$) and “anxiety” ($r = 0.58$; $p < 0.01$).

In relation to gender differences (see table 3), in man, the “Past Negative” subscale in men correlates with the “depressive” temperament (rho = 0.57; $p < 0.01$) and “Present Hedonistic” subscale correlates with the “cyclothymic temperament” (rho= 0.66; $p < 0.01$). In addition, the “Irritability” subscale correlates with the temperament “Anxious” (rho= 0.58; $p < 0.01$). In women, the “Depression” subscale correlates significantly with the “depressive” temperament (rho = 0.47; $p < 0.01$) while “Irritability” subscale correlates with the temperament “irritable” (rho = 0.49; $p < 0.01$).

		Fear of Covid	Cyclothymic	Depressive	Irritable	Hyperthymic	Anxoius	Past negative	Present Hedonistic	Future	Past Positive	Present Fatalistic	Depression	Anxiety
All Sample	Cyclothymic	-.026												
	Depressive	.171	.031											
	Irritable	.051	.198	.054										
	Hyperthymic	.015	.275*	-.153	.131									
	Anxious	-.005	-.083	.029	-.098	-.313**								
	Past negative	.008	.206	.089	.035	-.066	.251*							
	Present Hedonistic	.060	.387**	-.349**	.203	.417**	-.225	-.001						
	Future	.004	.189	-.174	-.138	.042	.001	.076	.236*					
	Past Positive	.149	-.015	-.084	-.041	.083	.011	.098	.190	.079				
	Present Fatalistic	.093	.268*	.017	.050	-.086	.243*	.564**	.214	.313**	.230			
	Depression	.153	.028	.386**	.146	-.324**	.248*	.209	-.248*	.048	-.263*	.115		
	Anxiety	.137	.076	.120	.373**	-.099	.194	.220	.017	.008	-.056	.289*	.528**	
	Irritability	.187	.112	.238*	.392**	-.148	.291*	.253*	-.079	-.029	-.125	.245*	.553**	.579**
Man	Cyclothymic	.269												
	Depressive	.355	.214											
	Irritable	.069	.121	-.008										
	Hyperthymic	.043	.333	-.365	.122									
	Anxious	.357	-.111	.367	.170	-.731**								
	Past negative	193	.147	.574**	.202	-.318	.288							
	Present Hedonistic	.117	.665**	-.281	.113	.497*	-.385	-.239						
	Future	.044	.312	-.289	-.130	.094	-.081	.082	.456*					
	Past Positive	-.055	-.088	-.131	.126	.197	-.172	.198	.172	.090				
	Present Fatalistic	.277	.366	.488*	.012	-.326	.286	.741**	.088	.403	-.016			
	Depression	.299	.169	.355	.101	-.408	.512*	.159	-.123	-.113	-.435*	.323		
	Anxiety	.235	.246	.190	.432*	-.311	.360	.207	-.041	-.025	-.308	.407	.640**	
	Irritability	.400	.134	.188	.251	-.242	.581**	,356	-.082	.052	-.300	.458*	.679**	.439*
Woman	Cyclothymic	-.116												
	Depressive	.108	.003											
	Irritable	.008	.215	.078										
	Hyperthymic	-.014	.224	-.097	.146									
	Anxious	-.222	-.179	-.148	-.274	-.190								
	Past negative	.040	.234	-.060	-.009	.011	.216							
	Present Hedonistic	-.064	.324*	-.365*	.257	.359*	-.169	.203						
	Future	.153	.237	-.147	-.016	.167	.016	.273	.136					
	Past Positive	.278	-.065	-.045	-.141	.014	.111	.041	.055	.278				
	Present Fatalistic	.110	.162	-.169	.077	-.039	.211	.445**	.258	.272	.367*			
	Depression	.099	-.037	.475**	.140	-.357*	-.016	.200	-.311*	-.276	-.171	-.051		
	Anxiety	.268	.009	.120	.361*	.050	-.160	.162	.244	-.168	.064	.176	.378**	
	Irritability	.146	.102	.310*	.487**	-.083	-.139	.104	.009	-.210	-.074	-.009	.476**	.573**

*. The correlation is significant at the 0.05 (two-tailed) level. **. The correlation is significant at the 0.01 (two-tailed) level. Table 3 Correlation analysis in all sample and to gender differences

Discussion

According to Karam and colleagues (2010), affective temperament has been linked to mental disorders, in fact anxious temperament was shown to be a predictor, especially within the anxiety and depressive clusters, in particular the hyperthymic temperament. Our's findings are in line with results reported in previous studies, regarding the presence of an anxious temperament which has an inverse relationship with the hyperthymic temperament.

The "Present Hedonistic" subscale significantly correlates with the "cyclothymic" temperament and with the "hyperthymic" temperament; this data allows us to understand the relationship between the hedonistic attitude and an extroversive tendency; while the inverse trend results with the more humoral depressive aspect "depressive" temperament. The dimension instead of the "Present Fatalistic" correlates significantly with the "Past Negative" and "Future". This research is in line with previous study of Akiskal, 2005, in this study the author showed possibility that negative experiences of the past condition a fatalistic attitude both in the present and in the future.

In other study Ariskal et al., (1998), our's results showed that the "Depression" subscale of the IDAS instrument correlates significantly with the "Depressive" temperament, while it negatively correlates with the "hyperthymic" temperament. The data is in agreement with the assumption and the depressive mood construct detected. Unlike this, anxiety has a direct relationship with the "irritable" temperament and with the "depression" subscale. The "Irritability" subscale correlates significantly with the "irritable" temperament and with the "depression" subscales and "anxiety" confirmed the relationship with a mood pattern of psychopathology.

In relation to gender differences, the Past Negative time perception in men, releave a relationship with a depressive temperament, moreover, a Present Hedonistic time perception, is centered on the cyclothymic trait of temperament dimension in men. The data highlights the depressive temperamental tendency is contrary to a present vision centered on hedonism. Such as, if people have a hyperthymic temperament, as delineated in study of Preti et al., (2010), have a high number of positive traits, for example, upbeat, fun-loving, outgoing, optimistic, so the subjective perception of time will probably be optimal. In women, the depression subscale correlates with the "depressive" temperament and the Irritability subscale with the temperament "irritable", and confirmed in relation to clinical group, the present of the association of the personality traits.

Conclusions

In clinical setting is important to pay attention at affective temperaments, because could play a major role in the origin of psychopathology. The data collected allows us to observe the attitude towards the perception of time and gender variations in a clinical population with a prevalent mood disorder. The correlations that emerged provide us a way to detect a strong relationship between the attitude towards a temporal perceptual typology and the affective humoral temperament. Further investigations could be made thanks to an increase in the research in order to be able to set treatment indications for a better management of quality of life of patients. In addition, the importance of an interdisciplinary approach must be underlined, in guiding future research, to determine the impact on their quality of life and psychological implications related to mood diseases, for treatments ad hoc centered on the subjective perception of the future time and to promote skills and planning ability in patients.

The study has a limitation concerns small sample and more adhesion of the female population. Further specifications should be placed on the years of mood pathology they are suffering from and on greater homogeneity for disorder and drug treatment. In this study, did not appear significant relations to the fear of Covid-19 infection. This data appears relevant in a population with a prevalent mood disorders.

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Declaration of Interest statement: none.

Authors' contribution

Mento, Silvestri, Agnoletti assisted with concept, study design, data analysis and interpretation, manuscript preparation and editing and study supervision; Zappone assisted with the generation of the initial draft of the whole manuscript, manuscript editing and data interpretation; Pagano Dritto and Lombardo assisted with manuscript editing and study concept. All authors contributed to and have approved the final manuscript.

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