BRIEF ARTICLE

Interpersonal distances, coping strategies and psychopathology in patients with depression and schizophrenia

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Abstract

AIM: To explore (1) intergroup differences in comfortable interpersonal distances (CIDs) and the use of coping strategies; (2) the association of these parameters with individual symptomatology; and (3) the interplay between CIDs and coping styles in patients with depression and schizophrenia.

METHODS: The parameters of interest were assessed by means of standardized questionnaires: CID and Coping Inventory for Stressful Situations. Psychopathology was evaluated with the Beck Depression Inventory and Positive and Negative Syndromes Scale. ANOVA, Pearson's correlations and multiple regression analyses were used to examine relationships among the variables.

RESULTS: Compared with controls, depressed patients were more distanced from family members, significant others and self-images, whereas patients with schizophrenia were less distanced from neutral and threat-related stimuli. Distancing from self-images was mostly associated with depression severity in depressed patients, whereas distancing from hostile and threat-related stimuli with the severity of psychotic and affective symptoms in patients with schizophrenia. Both patient groups used more emotion-oriented than task-oriented and avoidance-oriented coping strategies. Self-distancing among patients with schizophrenia was positively associated with the use of the social diversion coping, implying social support seeking.

CONCLUSION: Patients with depression and schizophrenia use different maladaptive emotion-regulation strategies to cope with their symptoms and related distress. Training in stress management might provide these patients with skills for more effective emotion regulation.

Key words: Interpersonal distance; Coping strategies; Psychopathology; Depression; Schizophrenia

Core tip: This paper takes a unique approach by investigating two emotion-regulation strategies, interpersonal distancing and coping with stress, in patients diagnosed with both adjustment disorder with depression and schizophrenia, and the relationships of these strategies to symptomatology of the disorders. The findings generally supported the hypotheses that the patient groups would display greater interpersonal distances from both positively and negatively valenced stimuli, and greater use of emotion-focused coping than controls. The findings suggest that patients with depression and schizophrenia use different maladaptive emotion-regulation

strategies to cope with their symptoms and related distress. Training in stress management might provide patients with skills for more effective emotion regulation.

INTRODUCTION

Despite accumulating evidence of the important role of emotional regulation and coping with stress in the development and maintenance of psychopathology, little is known about the interplay between distinct emotion-regulation strategies and individual clinical symptoms in different mental disorders. Based on the models of emotional regulation[1], coping with stress[2] and personal space[3] in the frameworks of the stress-vulnerability model of psychopathology[4,5], this study will explore the relationships among interpersonal distancing, coping styles, psychopathology and associated emotional distress in patients diagnosed with adjustment disorder (AJD) with depressed mood (as a model of stress-induced depression) and schizophrenia. We assume that this integrative approach will enable the identification of findings that can have useful implications for treatment.

Conceptual foundation

Emotion regulation: In recent decades there has been increased interest in affective phenomena in psychopathology and emotion-regulatory strategies incorporated into psychopathology models[6-10]. Emotion regulation is defined as a mixture of conscious and unconscious processes by which individuals modulate their emotions to appropriately respond to environmental stress[1,11-15]. Regulatory strategies modify either the magnitude or the type of individual emotional response to the emotion-inducing event[1,16].

The well known stress-vulnerability model of aetiological impact in psychiatry suggests that due to genetic or psychological predispositions individuals who are selectively vulnerable to environmental risks respond to stressors with increasing levels of emotional distress and by mobilizing psychosocial resources[4,5,17,18]. From the stress-process perspective, the distress-related disorders are viewed as the outcome of emotion dysregulation[9,11,14]. Several researchers have also empirically demonstrated that individuals who are unable to effectively manage their emotional responses to external or internal stresses, experience more severe and protracted periods of emotional distress that may evolve into diagnosable depression or anxiety disorders[5,9,19,20]. The stress-vulnerability models also suggest that training in specific stress management techniques could provide benefits to

patients with schizophrenia and affective disorders[21,22].

Different emotion-regulation strategies have been hypothesized to function as either risk factors or protective factors against a defined type of psychopathology. For example, in their recent meta-analytic review, examining the relationships between emotion-regulation strategies (acceptance, avoidance, problem solving, reappraisal, rumination, and suppression) and symptoms of mental disorders, Aldao *et al*[10] demonstrated that mood-related disorders (anxiety and depression) were more consistently associated with regulatory strategies than behavioral disorders (eating and substance-related disorders).

Regarding schizophrenia research, there are conflicting results on widely used emotion-regulation strategies and their association with specific psychopathology. For instance, van der Meer *et al*[23] reported increased use of suppression and less use of reappraisal strategies by patients with schizophrenia than by healthy controls, and found that it was associated with depressive symptoms. Conversely, Henry *et al*[24] found neither such differences nor an association between the use of suppression and reappraisal strategies and blunted affect ratings. There are also studies that show specific differences in stress-reactivity among different psychopathologies, *e.g.,* relative to normal controls, patients with schizophrenia show significantly more frequent and higher levels of trait emotional reactivity[25], whereas depressive patients significantly more often report an impaired tolerance to certain stresses[26].

Coping strategies: According to the Folkman *et al*[2] stress-coping transactional model, coping strategies are used to change the person-environment relationship either by using strategies regulating emotional distress (emotion-oriented coping) or by using strategies directed to reframe the problem precipitating the distress (problem-oriented coping). In either way, the coping strategies function as emotion modulators and in this sense they are similar to the above concept of emotion regulation. Research on coping with stress has indicated that individuals with schizophrenia are inflexible in their use of coping strategies[27], tend to use maladaptive emotion- oriented coping styles[28-30], and rely more on passive avoidant strategies and less on active problem solving[31,32]. Maladaptive coping patterns in people with schizophrenia have been associated with higher levels of negative symptoms, depression, and anxiety[33]. A previous study found a significant relationship between different coping strategies and both severity of symptoms and emotional distress[34]: particularly avoidance-oriented coping strategies (*e.g.*, distraction) were negatively correlated with paranoid symptoms. Another study of the same researchers reported that patients with schizophrenia used emotion-oriented coping significantly more frequently, and task-oriented and combined task-avoidance oriented coping patterns significantly less often than healthy controls[35]. Obviously, the vulnerable patients with high levels of trait emotional reactivity who use maladaptive emotion-oriented coping

strategies are at an increased risk of psychotic relapse under stress conditions.

Approach-avoidance distress regulation: Another mechanism providing affect regulation when faced with environmental stress operates through approach-avoidance behavior responses that maintain comfortable interpersonal distance (CID) in social interactions[36,37]. In some sense, this mechanism resembles Gross' strategy of "situation selection"[1], which comprises approaching or avoiding people, places or objects in order to regulate emotions. The boundaries of personal space, with underlying interpersonal distances outlining an invisible circle surrounding oneself, known as comfort, buffer, safe or security zone, if violated, cause a person to become vulnerable or defensively aggressive to protect him/herself[3]. These boundaries develop during infanthood through interpersonal interactions, when a child develops his/her self-concept and becomes unique and distinct from others[38]. During adult life, keeping a distance from strangers, potentially dangerous or threatening figures[39], as well as proximity seeking to attachment figures[40], become important defensive mechanisms, the normal functioning of which may be considerably disturbed in psychopathological states.

The relation between symptomatology of mental disorders and approach-avoidance responses to environmental stress are thought to play an important role in individual defensive reactions to stress. Unfortunately, the psychiatric literature rarely refers to personal space, although closeness and distance, as well as the relative position of the patient and therapist, are intuitively used and modulated in psychotherapy[41]. The relationship between CIDs and psychopathology has been explored by only few studies[42-45]. These found that compared with normal controls, people with schizophrenia maintained significantly larger distances from generally close persons and themselves and smaller distances from neutral and threatening people[44], and that this inversion was related to the negative syndrome severity. We are aware of no research investigating interpersonal distances in relation to symptomatology and coping abilities among patients diagnosed with depression and schizophrenia.

Given the importance of a multi-sample approach to the study of psychopathology[10], in the present study we decided to compare patients diagnosed with depression and schizophrenia versus non-patient controls in order to explore (1) between-group differences in CIDs from word stimuli distinguished by emotional valences, and coping strategies used in stressful situations, (2) associations between CIDs and the severity of specific symptoms, and (3) the relationships between the CIDs and coping strategies used by patients with both disorders. Based mostly on our clinical observation and the relevant literature, we hypothesized that comfortable interpersonal distance would be specifically associated with (1) psychiatric diagnosis (schizophrenia *vs* depression *vs* normal); (2) clinical symptoms (positive *vs* negative *vs* affective); and (3) coping strategies (task- *vs* emotion- *vs* avoidance-oriented coping).

MATERIALS AND METHODS

Participants

Depressive group: Seventy patients (29 men and 41 women) aged 18-50 years were recruited, who consecutively attended a community outpatient clinic (Talbieh Mental Health Center, Jerusalem, Israel) in 2006, and had a Diagnostic Statistical Manual, Fourth edition (DSM-IV) diagnosis of adjustment disorder with depressed mood (AJD, 309.0). This diagnosis was used as a model of stress-induced depression, because in psychiatric practice AJD is very often subsumed under the label of "reactive" or "situational" depression. For reasonable homogeneity of the sample we evaluated and excluded competing diagnoses of other stress-related and mood disorders, such as posttraumatic stress disorder (309.81), generalized anxiety disorder (300.02), dysthymia (300.4), and major depressive disorder (296.2).

Schizophrenia group: Fifty-one patients (36 men and 15 women) aged 18-50 years, with DSM-IV diagnosis of schizophrenia (295.0-9) and who had been stabilized on antipsychotic medication, were recruited during 2007 in an open ward of the Kfar Shaul Mental Health Center, Jerusalem, Israel. Patients with other comorbid Axis-I disorders, personality disorders and those with comorbid medical illness were not included.

Comparison group: Sixty-one subjects (30 men and 31 women) age-matched to the patient groups and without known history of mental disorders were enrolled from staff members of the same centers as a comparison group.

Ethical considerations: After explanation of the study aims and procedure all participants provided written informed consent for participating in the study as approved by the Institutional Review Boards for Human Studies.

Clinical assessment

Depressed group: In the extended clinical interview performed by an experienced psychiatrist, all patients were diagnosed as fulfilling the DSM-IV criteria for AJD with depressed mood (309.0). A senior psychiatrist was consulted for all unclear cases requiring differential diagnosis. Depending on the case complexity, the interview lasted from 1 to 1.5 h.

Schizophrenia group: Diagnoses were made by two senior psychiatrists using the Structured Clinical Interview for DSM-IV[46]. The schizophrenia group included 27 patients with paranoid type (295.30), 10 with undifferentiated type (295.90), 7 with disorganized type (295.10), and 7 with residual type (295.60) of the disorder. All patients were stabilized on antipsychotic drugs: 35 were receiving typical antipsychotics (*e.g.*, haloperidol, perphenazine) and 16 atypical ones (*e.g.*, risperidone, olanzapine).

Comparison group: In order to exclude any psychiatric

disorder among non-clinical participants, a short clinical interview was conducted with each of them. In addition, to exclude sub-threshold depressive symptoms, controls completed the Beck Depression Inventory (BDI)[47].

Measures

Severity of current depressive symptoms was evaluated with the Beck Depression Inventory (BDI-abridged form)[47]. The BDI is an extensively validated self-report measure of depressive symptoms (sadness, pessimism, past failure, loss of pleasure, guilt feelings, self-dislike, suicidal thoughts or wishes, loss of interest, indecisiveness, change in appearance, loss of energy, fatigue, and changes in appetite). Each of its 13 symptom and attitude categories score from 0 (absence of the symptom) to 3 (extreme severity of the symptom). Total scores range from 0-4, none or minimal, to 5-7, mild, 8-15, moderate; and 16 and over, severe depressive symptoms. The Cronbach's α for the present study is 0.93.

The Positive and Negative Syndromes Scale (PANSS)[48] was administered as a Structured Clinical Interview[49] for assessing the severity of psychopathology in the schizophrenia group. This instrument assesses the symptomatology in three subscales reflecting positive, negative and general psychopathological symptoms, as well as a total score. The 30 items are scored from absent (1) to extreme problem (7). The Cronbach's α for the present study was 0.70 for the positive scale, 0.92 for the negative scale, and 0.87 for both general psychopathology scale and PANSS as a total.

To evaluate the parameters of interest, all participants were asked to complete two standardized questionnaires, the Comfortable Interpersonal Distance scale (CID)[50] and the Coping Inventory for Stressful Situations (CISS)[51]. The time-frame for all the instruments was the 10 days preceding the interview.

The CID determines safe interpersonal distance. The original instrument displays a plane with 8 radii emanating from a common point, each 90 mm of the radius being associated with a randomly numbered "entrance" to what is described as an imaginary "round room". Subjects are instructed to imagine themselves at the center-point of the diagram (room) and to respond to imaginary persons (stimuli) approaching them along a particular radius by marking on the radius the person's preferred closeness to themselves (stop-distance procedure[39]). Responses are scored as the distance in millimeters between the mark and the center of the CID. Psychological distance, as measured by this projective technique, has been found to be highly correlated with physical distances in "real life" interactions[52,53]. In this study, we used the CID to measure 20 distances between the subject and emotionally-valenced stimuli grouped in 5 subscales: (1) close family members (mother, father, sibling, child); (2) significant others (friend, doctor, neighbor, boss); (3) self-images (myself in the childhood, recent past, present and future); (4) neutral persons (builder, salesman, shoemaker, tailor); and (5) threat-related/hostile images (murderer,

robber, gangster, monster)[44]. The Cronbach's α for the present study ranged from 0.87 for the family member scale to 0.78 for the neutral person scale.

The CISS consists of 48 statements describing ways people can cope with various difficult, stressful, or upsetting situations. The statements represent three 16-item orthogonal factors - task-oriented coping (*e.g.*, "Schedule my time better" or "Analyze the problem before reacting"), emotion-oriented coping (*e.g.*, "Blame myself for not knowing what to do" or "Worry about what I am going to do"), avoidance-oriented coping, including social diversion ("Try to be with other people" or "Phone a friend") and distraction ("Go out for a snack or meal" or "Watch TV") subscales. In the present study, the patients were asked to indicate how often they currently used each of the 48 coping devices, on a 5-point Likert scale ranging from 1 ("not at all") to 5 ("very much"). The CISS has demonstrated high reliability, as well as convergent and concurrent validity[5,35]. The Cronbach's α for the present study ranged from 0.84 for the task-oriented coping scale to 0.77 for the avoidance-oriented coping scale.

Statistical analysis

Statistical analyses were performed with SAS-9.1 software package (SAS Institute Inc, Cary, NC). We computed frequency distributions and mean scores for the participants' sociodemographic and clinical characteristics. Yates' chi-squared tests were used for intergroup comparisons of categorical variables. Mean scores and standard deviations were computed for the parameters of interest. To test our hypotheses, first, univariate analyses comparing intergroup measures were performed using ANOVA with post-hoc Tukey single comparisons, and Pearson correlations among the measures were computed. In addition, we calculated correlations between each interpersonal distance and the PANSS individual items for the schizophrenia group, as well as between each distance and the BDI items for the depression group. Then, multiple regression analysis was performed on four linear models to predict PANSS general psychopathology and BDI scores (the outcome variable) from both CID domains' and CISS dimensions' scores (the outcome variables) in patients with schizophrenia and depression, separately. Only five and three predictor variables were included in the respective models to keep the variable-to-patient ratio large enough to prevent multicollinearity. For all analyses, the level of statistical significance was set at $P < 0.05$.

RESULTS

Participants' characteristics

Table 1 presents and compares participants' demographic and selected clinical characteristics. All groups were comparable by age, but they differed significantly by gender, marital status and years of education. The depression group had more females and the schizophrenia group more males, while both patient groups, in particular schizophrenia had more singles than the con-

Table 1 Basic characteristics of patients and controls

Characteristics	Depression group ($n = 70$)	Schizophrenia group ($n = 51$)	Control group ($n = 61$)	Significance test
Gender				
Male	29 (41.4)	36 (70.6)	30 (49.2)	$\chi^2 = 9.1$, $df = 2$, $P = 0.01$
Female	41 (58.6)	15 (29.4)	31 (50.8)	
Age (yr)	37.4 ± 13.4	33.8 ± 10.5	35.7 ± 11.3	$F = 1.09$, $df = 129$, $P = 0.27$
Marital status				
Single	34 (48.6)	40 (78.4)	24 (39.3)	$\chi^2 = 19.1$, $df = 4$, $P < 0.001$
Married	26 (37.1)	6 (11.8)	31 (50.8)	
Divorced/separated/widowed	10 (14.3)	5 (9.8)	6 (9.8)	
Schooling (yr)	13.4 ± 1.7	11.2 ± 3.0	14.1 ± 2.3	$F = 1.96$, $df = 129$, $P < 0.05$
Age at onset (yr, range)	35.5 ± 13.6 (15-39)	25.3 ± 9.4 (14-29)	--	$t = 4.61$, $df = 119$, $P < 0.01$
Duration of disorder (mo, range)	12.8 ± 7.7 (1-36)	28.0 ± 13.4 (6-131)	--	--
Depressive symptoms[1]	13.3 ± 5.7	--	1.2 ± 1.9	$t = 15.82$, $df = 129$, $P < 0.001$
PANSS[2] total score	--	54.5 ± 18.5	--	--
Positive syndrome	--	11.0 ± 5.5	--	--
Negative syndrome	--	15.8 ± 7.9	--	--
General psychopathology	--	27.6 ± 9.6	--	--

[1]Beck depression inventory- short form (Beck *et al*[47]); [2]Positive and negative syndrome scale (Kay *et al*[48]). Data are expressed as *n* (%) and mean ± SD.

Table 2 Comfortable interpersonal distance from stimuli with different emotional valence and coping patterns (coping inventory for stressful situations) across the study groups

Variable	Depression group ($n = 70$)	Schizophrenia group ($n = 51$)	Nonpatient group ($n = 61$)	ANOVA F	*P* value	Tukey post-hoc single comparisons[1]
Interpersonal distance (from)						
Family members	115.5 ± 80.6	99.2 ± 57.5	80.4 ± 48.8	3	0.05	D > N
Self-images	129.1 ± 83.6	103.7 ± 75.9	59.5 ± 56.0	9.02	0.001	D > N < S
Significant others	192.5 ± 68.1	178.0 ± 68.3	158.8 ± 63.9	3.76	0.03	D > N
Neutral people	270.5 ± 63.1	219.2 ± 73.7	268.8 ± 76.6	9.02	0.001	D > S < N
Hostile images	336.2 ± 44.6	312.1 ± 75.9	348.0 ± 20.9	4.92	0.01	D > S < N
Coping pattern						
Task-oriented	3.5 ± 0.8	3.1 ± 0.9	3.8 ± 0.7	7.45	0.001	D > S < N
Emotion-oriented	3.2 ± 0.9	3.0 ± 0.8	2.3 ± 0.8	14.01	0.0001	D > N < S
Avoidance-oriented	2.8 ± 1.0	3.0 ± 1.0	3.0 ± 0.9	0.82	0.44	D = S = N
Distraction	2.6 ± 1.2	2.7 ± 1.2	2.4 ± 1.1	0.53	0.59	D = S = N
Social diversion	3.0 ± 1.2	3.3 ± 1.2	3.6 ± 1.1	2.99	0.05	D < N

Mean score ± SD are shown. [1]All comparisons are significant at the 0.05 level.

trol group, and the depression and control groups were more educated than the schizophrenia group ($P < 0.05$). The patient groups differed in mean age at onset of the disorder, with earlier onset in patients with schizophrenia ($P < 0.01$). Likewise, in comparison with the depressed patients, those with schizophrenia had a longer duration of the disorder ($P < 0.001$). There was also a significant between-group difference in depression severity, with moderate depression for the depressed group (BDI score > 8 but < 15) versus no depression (BDI score < 4) for the control group ($t = 15.82$, $df = 129$, $P < 0.001$).

Comfortable interpersonal distance
Table 2 presents inter-group comparisons of CID subscale mean scores. As can be seen, distances from stimuli with different emotional valences significantly differed between the study groups. Distances from family members ($P < 0.05$), self-images ($P < 0.001$), and significant others ($P < 0.02$) were significantly larger in depressed

individuals, compared with controls. Distances from neutral people ($P < 0.001$) and hostile images ($P < 0.01$) were also significantly larger for depressed individuals than for patients with schizophrenia. Compared with the controls, patients with schizophrenia were less distanced from neutral people ($P < 0.001$) and hostile images ($P < 0.01$) but more distanced from themselves ($P < 0.001$).

Despite the between-group differences in the relative size of interpersonal distances, rank order (hierarchy) of preferable interpersonal distances was similar within each group, except that compared to the control group, both patient groups maintained a larger distance from their self image than from family members, the opposite of the control group. All groups maintained the largest distance from threat-related stimuli, with distances from emotionally neutral and significant others following in descending order.

Coping strategies
Table 2 also compares the study groups by the coping

Table 3 Significant Pearson correlations between comfortable interpersonal distance and specific symptoms measures

Symptoms	Distance from				
	Family members	Significant others	Self-images	Neutral persons	Threat-related persons
Schizophrenia sample (*n* = 51)					
PANSS items:					
Conceptual disorganization		-0.32[a]		-0.30[a]	
Excitement					0.35[b]
Suspiciousness/persecution					0.26[a]
Anxiety					0.27[a]
Guilt feelings			0.28[a]		
Tension					0.33[a]
Motor retardation					0.34[a]
Lack of judgment and insight					-0.34[b]
Depression sample (*n* = 70)					
BDI items:					
Sadness		0.28[a]	0.40[b]		
Guilt		0.26[a]	0.28[a]	0.29[a]	
Self-dislike		0.44[d]	0.32[b]	0.30[b]	0.30[b]
Self-harm			0.28[a]		
Social withdrawal	0.26[a]	0.40[b]		0.41[b]	
Indecisiveness			0.23[a]		
Self-image change		0.28[a]	0.24[a]	0.32[b]	
Work difficulty			0.23[a]		
Fatigability			0.23[a]		

PANSS: Positive and negative syndrome scale (Kay *et al*[47]); BDI: Beck depression inventory (Beck *et al*[48]). Comfortable interpersonal distance *vs* specific symptoms measures: [a]*P* < 0.05, [b]*P* < 0.01.

strategies used to overcome stressful situations. Compared with healthy individuals, both patient groups used significantly more emotion-oriented coping (*P* < 0.0001), while depressed patients used less avoidance-oriented coping in its social diversion form (*P* < 0.05). Patients with depression exceeded patients with schizophrenia (but not controls) in the use of task-oriented coping strategies. The three groups did not differ in the use of the distraction type of avoidance-oriented coping.

To examine the relationships between distinct interpersonal distances and specific measures of psychopathology in the depressed and schizophrenia groups, we calculated Pearson's correlations among the CID, BDI and PANSS scores. In the depressed group, the depression severity positively and moderately correlated with distances from significant others and self-images (both *r* = 0.40, *P* < 0.01) and from neutral people (*r* = 0.41, all *P* < 0.001) and also significantly correlated with distance from family members (*r* = 0.26, *P* < 0.05). In the schizophrenia group, a significant positive correlation was found between distance from threat-related images, PANSS total score (*r* = 0.28, *P* < 0.05) and General Psychopathology scale score (*r* = 0.38, *P* < 0.001), and between the latter and distance from family members (*r* = 27, *P* < 0.05).

Table 3 shows the significant correlations between each interpersonal distance and the PANSS individual items for the schizophrenia group, as well as between each distance and the BDI items for the depression group. As can be seen, for the former group, most significant correlations were found between the distance from threat-related stimuli and selected psychotic and affective symptoms (excitement, *r* = 0.35, *P* < 0.01; suspicious-

ness/persecution, *r* = 0.26, *P* < 0.05; lack of judgment and insight, *r* = 0.34, *P* < 0.01; anxiety, *r* = 0.27, *P* < 0.05; tension, *r* = 0.33, *P* < 0.05; motor retardation, *r* = 0.34, *P* < 0.05). For the latter group, significant correlations were noted between the distance from self-images and most BDI items (8 items out of 13), as well as highly significant correlations were found between the distance from significant others and neutral persons and BDI items of self-dislike (*r* = 0.44 and 0.30, respectively, *P* < 0.01) and social withdrawal (*r* = 0.40 and 0.41, respectively, *P* < 0.01) and between the distance from neutral persons and self-image change (*r* = 0.32, *P* < 0.01).

To explore the relationship between the two affect-regulation strategies, Pearson intercorrelations between CID and CISS scale scores were calculated separately for each disorder. In depression, distance from self-images negatively correlated to task-oriented coping (*r* = -0.27, *P* < 0.05) while positively to emotion-oriented coping (*r* = 0.27, *P* < 0.05). Distancing from significant others was associated negatively with both task-oriented coping (*r* = -0.29, *P* < 0.05) and avoidance-oriented coping in the form of social diversion (*r* = -0.38, *P* < 0.001). In schizophrenia, distance from self-images was significantly and positively correlated only to social diversion coping strategy (*r* = 0.34, *P* < 0.05).

To test the hypothesis that the distinct affect-regulation strategies (interpersonal distancing and diverse coping styles) are differentially associated with the severity of affective psychopathology in both disorders, multiple regression analyses were performed on four models (Table 4). In model 1 (interpersonal distancing in schizophrenia) only two of the five distances under test (from family members and threat-related images) predicted the

Table 4 Multiple regression models for predicting the severity of general psychopathology[1] in patients with schizophrenia and current depressive symptoms in patients with depression by regulation strategies

Predictor variables	Schizophrenia[1]				Depression[2]			
	β	t value ($\beta = 0$)	P value	Total% variance accounting for	β	t value ($\beta = 0$)	P value	Total% variance accounting for
Interpersonal distances[3] from								
Family members	0.22	7.3	0.007	7.1	0.28	6.8	0.011	9.5
Hostile images	0.29	12.7	< 0.001	11.8	0.01	1.8	--	--
Neutral people	0.04	0.15	0.148	--	0.23	9.1	0.012	6
Self-images	-0.06	0.35	0.179	--	0.32	7.5	< 0.001	13.4
Significant others	-0.05	1.3	0.091	--	--	6.2	0.017	8.7
Model properties	$R^2 = 0.48$, adjusted $R^2 = 0.36$, $F = 4.2$, $P < .001$				$R^2 = 0.54$, adjusted $R^2 = 0.37$, $F = 5.7$, $P < 0.001$			
Coping patterns[4]								
Task-oriented	-0.31	6.1	0.016	8.8	-0.17	2.8	0.009	4.2
Emotion-oriented	0.23	5.4	0.025	7.2	0.11	4.7	0.032	7.2
Social diversion	0.17	2.8	0.097	--	-0.09	5.1	0.027	7.6
Model properties	$R^2 = 0.45$, adjusted $R^2 = 0.34$, $F = 3.3$, $P < 0.001$				$R^2 = 0.35$, adjusted $R^2 = 0.23$, $F = 3.1$, $P = 0.002$			

[1]PANSS: Positive and negative syndrome scale (Kay *et al*[47]); [2]BDI: Beck depression inventory (Beck *et al*[48]); [3]CID: Comfortable interpersonal distance; [4]CISS: Coping inventory for stressful situations.

severity of PANSS general psychopathology, accounting for 18.9% of the total variance (7.1% and 11.8%, respectively; $R^2 = 0.48$; Adjusted $R^2 = 0.36$; $F_{4,51} = 4.2$, $P < 0.001$). In model 2 (interpersonal distancing in depression), all but distances from threat-related images predicted the severity of current depression, accounting for 37.6% of the total variance in BDI scores ($R^2 = 0.54$; adjusted $R^2 = 0.37$; $F_{2,68} = 5.7$, $P < 0.001$). The most robust predictor - distancing from self-images - accounted for 13.4% of the variance, followed by distance from family members (9.5%), significant others (6.7%), and neutral people (6%). In the third model (coping in schizophrenia), task- and emotion-oriented coping styles predicted PANSS general psychopathology scores, accounting for 8.8% and 7.2%, respectively, of the total variance ($R^2 = 0.45$; adjusted $R^2 = 0.34$; $F_{4,51} = 3.3$, $P < 0.001$). Finally, the fourth model showed that all coping styles contributed to the prediction of depressive symptoms, altogether accounting for 19% of total variance ($R^2 = 0.35$; Adjusted $R^2 = 0.36$; $F_{2,70} = 4.2$, $P < 0.001$).

DISCUSSION

The results of this study confirmed the hypothesized associations between CIDs and (1) psychiatric diagnosis; (2) psychopathological syndromes; and (3) coping strategies used by the patients for emotional regulation.

Distancing and diagnosis

Contrasting the study groups, we observed that each group had established a similar rank order of interpersonal distances, with maximum distance from emotionally neutral and hostile stimuli and minimum from family members and self-images, with the spacing pattern from significant others intermediating in between. This observation is consistent with the conception of "personal space as a dynamic process that is continually open to modification but that shows considerable stability due to the persistence of previously maintained distances[39].

However, as hypothesis 1 predicted, distances from generally positively-valenced stimuli (self-images, family members and significant others) were significantly larger for depressive individuals than for healthy subjects but they were similar to the analogous distances for patients with schizophrenia. However, contrary to our postulate, distances from strangers (emotionally neutral and hostile stimuli) were similar in the depressed and control participants, although substantially exceeded those in the schizophrenia group. The findings suggest that for depressed individuals the tendency to enlarge personal space is an attempt to down-regulate emotional distress resulting from interaction with generally close people; the distancing responses to strangers in depressed patients are in the normal range, whereas people with schizophrenia down-regulate their emotional distress by reducing distances from strangers. Thus, the same protective mechanism of emotion regulation (modulation of personal space) works differently in diverse mental disorders.

Regarding intra-personal distancing, we did find that compared with the controls, both clinical groups demonstrated a larger distance from themselves than from family members. This finding suggests that in psychopathology the intrusion-discomfort function of personal space[55] is impaired in such a way that approaching the patient's own self-images induces a greater feeling of discomfort (emotional distress) than if others would intrude into his/her personal space. This internal self-alienation may play an important role in defending the patient's ego from emotional distress associated with psychopathology.

Distancing and symptomatology

There were surprising findings highlighting the role paranoid symptoms play in avoidant social behavior of the patients with schizophrenia. In contrast to previous studies which found an association between safe interpersonal distance and negative syndrome[44,45], in this study interpersonal distancing from threat-related and hostile figures was associated with psychotic and affective fea-

tures of the disorder. The findings suggest that patients with increased paranoid symptoms ("suspiciousness/persecution" and "excitement" items) selectively maintain a greater distance from hostile images.

In order to take into account findings from literature[56-59] that comorbid depression occurs approximately in 50% of patients with schizophrenia at some point in the course of the disorder, we also analyzed the relation of affective symptoms to safe distancing. We found that affective symptoms (PANSS anxiety, tension, and motor retardation items) were associated with safer distancing from threat-related figures, confirming previous findings that mood-related disorders (anxiety and depression) are closely related to certain problems in emotion regulation[9,10,19], especially to focusing on the inability to separate oneself from threatening situations[60].

Another important finding was that patients with expressed thinking disorders ("conceptual disorganization") maintained similarly smaller distances from both significant others and neutral people. In line with previous research which showed that a negative syndrome attenuates differences in distances from generally close and distant persons[44], this finding suggests that conceptual disorganization (*e.g.*, loosening of associations) could also operate in the same way, attenuating normal differences in the maintenance of safe interpersonal distance from persons with different emotional valences.

In depression, our findings support the view that distancing is a passive defensive strategy to secure a "safety zone", which protects one from external and internal threats[41]. In accordance with our predictions, we found positive correlations between intra-personal distancing and the severity of depressive symptomatology. Although interpersonal distancing (from significant others and neutral people) also demonstrated the role of specific symptoms in the avoidant social behavior of depressive patients, it accounted for a significantly smaller number of associated symptoms than intra-personal distancing. The associations were mostly with cognitive symptoms, indicating the characteristic negative self-appraisals of depressed individuals accounting for guilt feelings, self-dislike, indecisiveness, and self-image change. However, there were also associations with mood (sadness), behavioral (social withdrawal, self-harm, work difficulty) and physical (fatigability) symptoms of depression. In sharp contrast with patients with schizophrenia, there was only one symptom (self-dislike) associated with distancing from threat-related/hostile images.

The between-group differences in the objects of distancing associated with the specific symptomatology deserve further consideration. Distancing themselves from threat-related/hostile figures reduces anxiety and fear (and, in turn, enhances a sense of safety) among patients with paranoid schizophrenia as well as among depressed and normal individuals in stressful situations. However, patients with depression distance from themselves more than patients with schizophrenia and controls. These findings suggest that depressive individuals perceive and appraise themselves as an additional source of threat for their safety and well being. Therefore, like interpersonal distancing, intra-personal distancing could play an important role in emotion regulation strategy, enhancing the patient's sense of security and coping with distressing symptoms.

Distancing and coping

In this regard, there was a counterintuitive finding. Despite the fact that depressed patients adopted task-oriented coping more frequently than patients with schizophrenia, they experienced a more intense emotional distress. In other words, this adaptive coping strategy, actively directed towards transformation of a more stressful situation into a less stressful one, did not reach its goal. In accordance with studies showing that depressive individuals lack social support[61,62], we found that they employed social diversion (*i.e.,* the coping strategy oriented to social support seeking) significantly less often than their nonclinical counterparts.

Regarding inter- and intra-personal distancing and coping with stress as the distinct emotion regulation strategies having the common aim of reducing clinical symptoms and associated emotional distress, we examined the relationship between the two. Correlation analysis revealed several significant findings. In depression, the use of adaptive task-oriented coping was associated with reduced distance from themselves and others, whereas the use of maladaptive emotion-oriented coping strategies correlated with increased self-alienation. In schizophrenia, distancing from self-images was associated with the increased use of avoidance-oriented coping in the form of social diversion. In other words, the more the patients were alienated from themselves, the more they looked for social support and emotional help from others (by contrast, the use of social diversion by depressed patients was associated with reduction of distance from significant others). Another coping pattern, the task-oriented coping, was associated with greater distancing from neutral surroundings.

The robust regression models supported, in general, our findings obtained at the bivariate level of analysis. They showed that distancing from threat-related/hostile images was the strongest predictor of the severity of general psychopathology in patients with schizophrenia, whereas distancing from self-images strongly predicted the severity of depressive symptoms in depressed patients. The analogous models for the relations of coping patterns with psychopathology severity also were consistent with the previous results, demonstrating that task-oriented and emotion-oriented coping strategies predicted, respectively, reduction and increasing in general psychopathological symptoms in the schizophrenia group, as well as in the severity of depressive symptoms in the depression group.

Clinical Implications

Consistent with other studies[10], our findings emphasize the importance of a multi-sample approach in psychopathology research, consisting of simultaneous investigation of both

clinical and normative populations. Direct comparisons between different clinical and normative groups can be critical in delineating how and when normative processes become pathological. The relationship between emotion-regulation strategies and psychopathology may be stronger, once more extreme groups are compared. In this study, we were able to show that specific symptoms in patients with depression and schizophrenia were differentially associated with emotion dysregulation in the form of a larger intra-personal distancing (self-alienation), and a greater use of emotion-oriented coping relatively to social diversion. This is consistent with research demonstrating that emotion regulation plays a central role in the etiology and maintenance of clinical levels of psychopathology[6-9,63].

Of particular interest are the findings of greater self-alienation in the depressive subgroup of patients, an issue that has implication for treatment interventions such as CBT, aiming at creating a more positive relationship with the patient's own self. For people with schizophrenia, training to improve task-oriented coping skills could reduce the use of passive-avoidant coping strategy of social diversion (associated with increased self-distancing) in favor of greater self-confidence and self-efficacy. For example, a recent study[64] showed that an intervention enhancing specific self-efficacy for coping with stress significantly reduced psychotic symptoms in patients with schizophrenia or schizoaffective disorder, as well as heightening their well-being and satisfaction with outcomes, and that these effects were observed not only at post-intervention, but also at three- and six-month follow-ups.

Undoubtedly, more extensive studies on the relationship between interpersonal distancing (in both therapeutic and diagnostic aspects) and coping mechanisms in normal and clinical groups will increase our understanding of the psychopathological processes involved in reaction to stress in both conditions of depression and schizophrenia.

Limitations

The main limitation of this study is its cross-sectional design which precludes inferring cause-effect relationships between parameters studied. Since mentally ill people may use different strategies over the course of their disorder or even during single emotional events, the temporal course of emotion-regulation strategies should be investigated in the future. Although we have confirmed the relationships between some emotion-regulation strategies (distancing and coping) and psychopathological symptoms (depressive and schizophrenic) severity, most relationships still remain untested. Another limitation is the relatively small sample size for both patient groups that precluded examining a greater number of predictors. Finally, a self-report measure (BDI) for assessing the severity of depression in clinical samples should be supported by an observer-rated instrument. However, relevant literature shows that BDI is among the most used self-rating scales for measuring depression due to its high internal consistency, high content validity, validity in differentiating between depressed

and nondepressed subjects, sensitivity to change and international recognition[65].

In a conclusion, our results suggest that depressive patients use emotion-regulation strategies, such as inter- and intra-personal distancing to a greater extent than do normal controls and even patients with schizophrenia. Depressive symptomatology is associated with a greater self-alienation but also with a larger distancing from significant others and neutral people, whereas positive and affective symptoms in schizophrenia are related to a greater distancing from hostile figures. Training in stress management might provide patients with skills for more effective emotion regulation.

COMMENTS

Background

Despite the increased interest in affective phenomena in psychopathology and emotion-regulatory strategies incorporated into psychopathology models, little is known about the interplay between emotion-regulation strategies (intra- and inter-personal distancing and coping with distressing symptoms) and individual symptoms of mental disorders, such as stress-induced depression and schizophrenia.

Research frontiers

The important areas of research are (1) the differences in the use of distancing and coping strategies between patients with depression and schizophrenia; (2) the association between emotional regulation strategies and individual symptomatology of the mental disorders; and (3) the interplay between distinct forms of emotional regulation in these mental disorders.

Innovations and breakthroughs

This is the first study that compared the use of emotional regulation in the form of safe distancing and coping with distressing symptoms in patients with different mental disorders versus healthy controls. The results showed that distancing from threat-related/hostile images was the strongest predictor of the severity of general psychopathology in patients with schizophrenia, whereas distancing from self-images strongly predicted the severity of depressive symptoms in depressed patients. The authors found also that task-oriented and emotion-oriented coping strategies predicted, respectively, reduction and increase in general psychopathological symptoms in the schizophrenia group, as well as in the severity of depressive symptoms in the depression group.

Applications

The finding of greater self-alienation in the depressive subgroup of patients has implication for treatment interventions such as cognitive behavioral therapy, aimed at creating a more positive relationship with the patient's own self. For people with schizophrenia, training to improve task-oriented coping skills could reduce the use of passive-avoidant coping strategy of social diversion (associated with increased self-distancing) in favor of greater self-confidence and self-efficacy.

Terminology

Emotion regulation is defined as a mixture of conscious and unconscious processes by which individuals modulate their emotions to appropriately respond to environmental stress. Similarly, coping strategies are used to change the person-environment relationship either by using strategies regulating emotional distress (emotion-oriented coping) or by using strategies directed to reframe the problem precipitating the distress (problem-oriented coping). The boundaries of personal space, with underlying interpersonal distances outline an invisible circle surrounding oneself, known as comfort, buffer, safe or security zone, which if violated, cause a person to become vulnerable or defensively aggressive to protect him/herself. These boundaries develop during infanthood through interpersonal interactions, when a child develops his/her self-concept and becomes unique and distinct from others. During adult life, keeping a distance from strangers, potentially dangerous or threatening figures, as well as proximity seeking to attach-

ment figures, become important defensive mechanisms, the normal functioning of which are considerably disturbed in psychopathological states.

Peer review

The paper is well-written; the topic is of interest and potential clinical relevance. The study has been completely described, results are clear and discussion is adequate; and only minor revisions are needed to enhance the quality of the paper.

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