

Cognitive Reactivity to Sad Mood: The Importance of the First Depressive Episode

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Cognitive reactivity to sad mood refers to the degree to which a mild dysphoric state reactivates negative thinking patterns. In this research, the contribution of the history of depression, the length of the current depressive episode and the intensity of the depressive symptoms were assessed in explaining the cognitive reactivity to sad mood measured with the Leiden Index of Depression Sensitivity (LEIDS). The sample consisted of 123 depressed outpatients. The results of principal components analysis suggested a three-factor solution of the LEIDS. The intensity of depressive symptoms, the history of depression and the length of the current depressive episode were all significant in explaining cognitive reactivity to sad mood. We have also found out a significant effect of interaction of the history of depression and the length of the current depressive episode, which demonstrated that a prolonged depression does not induce a stronger cognitive reactivity to sad mood during the relapse of a depressive episode, while during the first depressive episode a longer duration of depression does induce a stronger cognitive reactivity. Such a result demonstrates that the length of the first depressive episode, regardless of its intensity, is crucially important for the formation of cognitive reactivity.

Key words: depression, cognitive reactivity to sad mood, history of depression, length of the current depressive episode, Leiden Index of Depression Sensitivity

Dysfunctional cognitions are considered to be important causative and maintaining factors of depression (Ellis, 1963; Beck, 1967). Research has shown, however, that dysfunctional cognitions of depressed persons disappear once the depressed persons reach full remission of depressive episode after medication or cognitive therapy (Coyne & Gotlib, 1983; Simons, Garfield, & Murphy, 1984). Cognitive theories have explained these findings by stating that dysfunctional cognitions do not disappear during remission of depressive episodes, but remain “latently present” and could be easily activated by stress (Teasdale, 1988;

Miranda & Persons, 1988; Segal, Williams, Teasdale, & Gemar, 1996). This phenomenon is well known in research literature as cognitive reactivity.

The results of the very important previous research (Segal, Gemar, & Williams, 1999) suggest that the cognitive reactivity to sad mood is a residual of the previous depression. Depressive episodes leave a latent cognitive deficit which can be easily activated with the feeling of sad mood with which it is associatively connected in the memory. However, further research of aetiology of cognitive reactivity to sad mood is needed, including the contribution of the length of the previous depressive episode and the intensity of the depressive symptoms. Also, the fact that cognitive reactivity predicts recurrences of depression leaves it undetermined whether cognitive reactivity is causally implicated in the first episode of depression (Segal, Kennedy, Gemar, Hood, Pederson, & Buis, 2006).

Previous research of this construct has predominantly made use of laboratory assessment of changes of dysfunctional cognitions produced by experimentally induced sad mood. Some of the objections to this method suggest that such an approach does not make it possible for assessment of cognitive reactivity to sad mood to be made in natural conditions and that it exposes vulnerable subjects to an increased risk of development of a new depressive episode (Van der Does, 2002). Data also suggest that 25% of experimental subjects do not react to the induction of sad mood at all, which produces sample dropout (Martin, 1990). These objections have repelled researchers, so studies of cognitive reactivity to sad mood have remained scarce in comparison to studies of other constructs. One of the ways to overcome such a situation was the creation of the Leiden Index of Depression Sensitivity (LEIDS, Van der Does, 2002). Since this instrument permits self-assessment of cognitive reactivity to sad mood in natural conditions, we believed that it would be a useful tool.

This research aims to assess the contribution of the history of depression and the length of the current depressive episode in explaining the cognitive reactivity to sad mood measured with LEIDS subscales. Given the theoretical position that during a depressive episode there occurs a strengthening of the associative link between negative thoughts and sad mood (Ingram, Miranda, & Segal, 1998; Segal et al., 1999), we can predict that persons with a previous history of depressive episodes would have higher levels of cognitive reactivity to sad mood than persons who were never depressed. We can also predict that the length of the current depressive episode would affect the level of cognitive reactivity to sad mood, because a long depression strengthens associative links between negative thoughts and sad mood. However, it is possible that the length of the first depressive episode is more influential than the length of subsequent depressive episodes. If this hypothesis comes to be true, we could expect a significant interaction effect between the history of depression and the length of a depressive episode.

Method

Participants and procedure: Our sample consisted of 123 female outpatients who had been diagnosed as suffering from unipolar mood disorder (nonpsychotic major depression) in several medical institutions in Serbia. None had a history of bipolar affective disorder or concurrent drug and alcohol abuse. In the sample, there were 86 participants whose current depressive episode had been lasting less than 6 months and 37 participants whose current depressive episode had been lasting more than 6 months. There were 30 participants without history of depression and 93 participants with history of depression. Participants' age varied from 19 to 65 years ($M = 36$, $SD = 14.6$). These patients were assessed by psychiatrists using ICD-10 (WHO, 1992). The participants also filled out self-assessment scales at their homes and brought them back, over a period of two weeks.

Measures: Leiden Index of Depression Sensitivity Subscales (LEIDS; Van der Does, 2002; Marić, 2008). The original LEIDS (Van der Does, 2002) is a 26-item scale measuring cognitive reactivity to sad mood. Prior to answering the questionnaire, the participants are instructed to imagine feeling somewhat sad (but not depressed) and then to fill out 26 items. In a previous study carried out in a student sample in Serbia (Marić, 2008) the results of factor analysis revealed three factors. Two items were excluded for MSA lower than .50 (Cerny & Kaiser, 1977) and two other for equal loadings on two factors. Factor Negative Self-Evaluation (10 items) was predominantly made of items reflecting "depressive cognitive triad" (Beck, 1996), since it measures negative evaluation of self, in regard to personal future, capabilities and life. Factor Avoidance (7 items), was consistent with the cognitive problem solving theory (D'Zurilla & Nezu, 2001) since it expresses an avoiding style of problem solving. Factor Interpersonal Sensitivity (5 items) corresponded to the dimensions of the trait "interpersonal sensitivity" (Boyce, Parker, Barnett, Cooney, & Smith, 1991). Internal consistencies for the subscales Negative self-Evaluation and Avoidance were good (Cronbach's alpha .90 and .83), while the subscale Interpersonal Sensitivity had a somewhat weaker internal consistency (Cronbach's alpha .71). Moreover, the three months prospective study examined the predictive validity of the three subscales and revealed that they significantly explained the variance of depressive symptoms independently of the explanation of initial symptoms of depression, dysfunctional attitudes, ruminative style and chronic suppression (Marić, 2008). In this study we calculated summation scores for the three subscales according to the results obtained in the previous study.

Beck Depression Inventory (BDI-II; Beck, Steer & Garbin, 1988). BDI consists of 21 categories of statements relating to depressive symptoms over the previous two weeks. Each of the categories contains statements that can be ranked on a 4-point scale according to the intensity of symptoms. In studies carried out in Serbia, the Beck Depression Inventory revealed a good internal consistency and validity (Marić, 2002, 2003).

A questionnaire about the history and length of depression (Marić, 2008). Data on the history of depression comprised answers to two questions: a. "Have you ever had, earlier in your life, a period of depression (when you were very sad most of the time and/or uninterested in the things you usually enjoy)?" (1-yes; 2-no); b. "If you have, how long did it last?" (1. less than two weeks; 2. more than two weeks, but less than six months; 3. more than six months). The participants who had experienced a period of depressive mood that had lasted more than two weeks were defined as participants "with a history of depressive symptoms", while others were defined as participants "without a history of depression". Data on the length of the current depression comprised answers to two questions: a. "Have you been depressed during the last two weeks (very sad most of the time and/or uninterested in the things you usually enjoy)?" (1-yes; 2-no), b. "If you have, how long ago did it start?" (1. less than two weeks; 2. more than two weeks, but less than six months; 3. more than six months).

Data were analyzed in the SPSS statistical package. The data analysis comprised descriptive analysis, reliability analysis and MANCOVA.

Results

Descriptive data

Means and SDs of the LEIDS subscales are given in Table 1. We calculated summation scores and SDs for the whole sample and for the subgroups formed according to the length and the history of depression. For the variable “length”, we assigned number 1 to the patients who are depressed less than six months, but more than 2 weeks and number 2 for the patients who are depressed more than 6 months. For the variable “history”, we assigned number 1 to the patients with no history of depression, and number 2 to the patients with history of depression. Additionally, means and SD for the BDI and age were calculated for the whole sample. The mean age for the whole sample was 35.57 (SD = 14.61), and the mean Beck Depression Inventory score was 24.71 (SD = 11.81).

Table 1. Means and standard deviations of the LEIDS subscales for the subgroups formed according to the length and the history of depression and for the whole sample

History	Length	N	Negative Self-Evaluation		Avoidance		Interpersonal Sensitivity	
			Mean	SD	Mean	SD	Mean	SD
1	1	19	14.63	7.98	13.58	7.04	6.47	5.21
	2	11	27.09	10.23	20.91	4.85	8.73	4.24
2	1	67	25.46	7.64	19.69	5.39	7.06	3.70
	2	26	29.35	7.36	18.77	5.38	8.19	5.06
Whole sample		123	24.77	9.05	18.66	5.99	7.36	4.31

Reliability data

Cronbach’s alpha coefficients for LEIDS subscales were expected, given the number of items per subscale. The results are shown in Table 2 bellow.

Table 2: Reliability analysis

	Number of items	Alpha	Inter-item (average r)	Item-total (range r)
Negative Self-Evaluation	10	.84	.35	.38 – .65
Avoidance	7	.76	.31	.37 – .62
Interpersonal Sensitivity	5	.66	.28	.36 – .49
Beck Depression Inventory	21	.90	.31	.24 – .72

Correlations

The subscale Negative Self-Evaluation had significant positive zero-order correlations with subscales Avoidance and Interpersonal sensitivity, while the subscale Interpersonal Sensitivity did not have a significant correlation with the subscale Avoidance. All subscales have significant positive correlations with severity of depressive symptoms. The results are shown in Table 3 below.

Table 3. Correlations (zero-order)

	Negative Self-Evaluation	Avoidance	Interpersonal sensitivity	BDI
Negative Self-Evaluation	1.000			
Avoidance	.518**	1.000		
Interpersonal Sensitivity	.185*	.177	1.000	
BDI	.586**	.392**	.243**	1.000
Age	.255**	.314**	.045	.552**

** Correlation is significant at the 0.01 level (2-tailed)

Contribution of the history of depression and the length of the current depressive episode in predicting scores on LEIDS subscales

To test our hypothesis we applied the method of multivariate analysis of covariance (MANCOVA) with the three subscales of the LEIDS *as dependent variables*. Categorical variables of the history of depression and the length of the current depressive episode were treated as fixed factors (independent variables), while the intensity of depression and age were treated as covariates in the model. The results of MANCOVA demonstrated a significant main effect for the length of the depression. The main effect for the history of depression was not significant. The interaction effect of the history and the length of the depression was significant, suggesting that prolonged depression affects LEIDS scores differently in patients with and without history of depression. The main effect is significant independently of the intensity of the depression and patients' age. The results for the effects are shown in Table 4.

Table 4. Multivariate Tests

	Wilks' Lambda	F	Sig.
History of Depression	.93	2.54	.059
Length of the Depression	.88	4.77	.004
History * Length	.91	3.63	.015

Univariate Test of Between-Subjects Effect for the subscale Negative Self-Evaluation indicated the significant main effect for the history of depression ($F(1, 117) = 7.37, p = .008$), for the length of the depression ($F(1, 117) = 13.04, p = .000$), and for the interaction between history of depression and length of depression ($F(1, 117) = 5.92, p = .017$). The results for the subscale Avoidance indicated the significant effect for the interaction between history of depression and length of depression ($F(1, 117) = 8.73, p = .004$). The main effects for the history of depression and the length of depression were not significant. The significant main effects are independent of current depression intensity and age, since we treated BDI scores and age as covariates in the model. The results for the subscale Interpersonal Sensitivity indicated no significant main effects. All main effects are significant independently of the intensity of the depression and patients' age.

Figure 1 demonstrates the interaction effects for the subscale Negative Self-Evaluation and Figure 2 for the subscale Avoidance. As we can see, the length of depression did not significantly affect the two LEIDS subscales in the subsample of persons with a history of depression (the dotted line). In the subsample of persons without a history of depression (the full line), a longer duration of current depression was related to higher scores of the total of the LEIDS and two subscales.

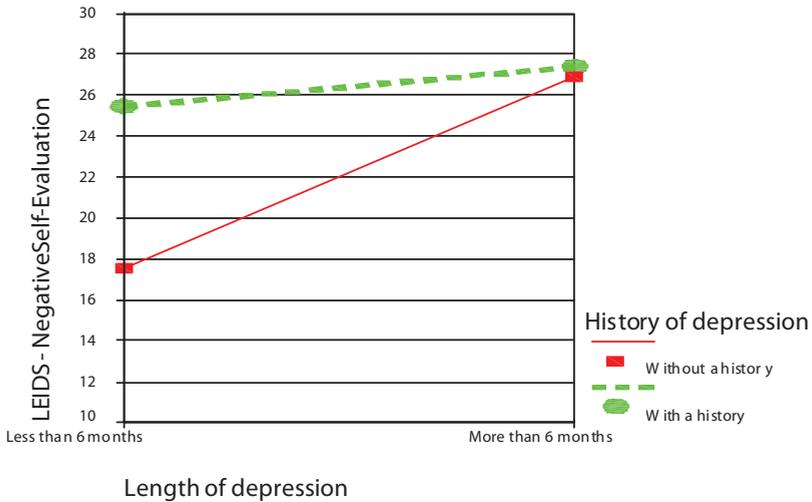


Figure 1. The interaction effect between history of depression and the length of the current depressive episode for the subscale Negative Self-Evaluation

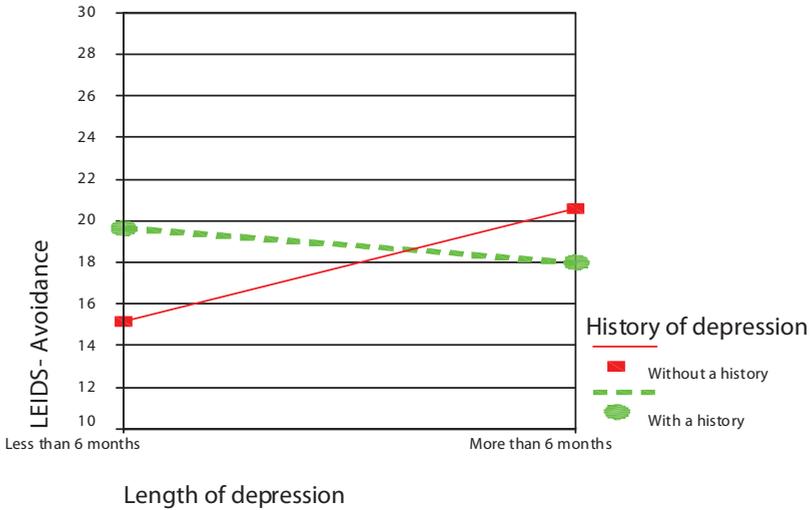


Figure 2. The interaction effect between history of depression and the length of the current depressive episode for the subscale Avoidance

DISCUSSION

The results demonstrated that there was a significant effect of interaction of the history of depression and the length of depressive episode in explanation of the variance of the results on the subscales Negative Self-Evaluation and Avoidance. This result demonstrated that the length of depression did not identically affect the scores of these subscales in the sample of persons who had already had depression in the past and those who had been experiencing it for the first time. The latter had higher results on the subscales, if their depression had been lasting more than six months, while the persons who had already been depressed in the past had the same results on these subscales, regardless of the length of the current depressive episode. Therefore, the results are in accordance with the assumption that depressive episodes produce a latent cognitive deficit that can easily be activated with feelings of sadness with which it is associatively linked (Van der Does, 2002). On the basis of our results, we can conclude that the length of the first depressive episode, regardless of its intensity, is crucially important for the formation of a propensity to react to sad mood by negative self-evaluation and avoidance of problems and difficulties. In recurring depressive episodes, the propensity to react to sad mood by negative self-evaluation and avoidance of problems does not change significantly with a prolonged duration of depression.

The results could be explained by the model of information processing (Ingram et al., 1998) that relies on the construct of associative memory network (Bower, 1981). This construct relates to a memory system made of memory

units that are mutually connected by associative networks. The wider and more elaborated an associative network is, the easier its activation and the more complicated its deactivation become. Associative networks grow stronger and wider when emotional and cognitive units are simultaneously activated several times. Therefore, if a depressive episode lasts longer, a depressive cognition associated with sad mood and dysphoria will be more often used. Repeated use of depressive cognitions strengthens associative links between depressive thoughts and sad mood (Segal et al., 1999). This means that persons with a history of depression are more cognitively vulnerable and therefore exposed to a higher risk of development of a new depressive episode.

Our study has several limitations. The participants were diagnosed through usual clinical interviews conducted by psychiatrists in the course of their regular examinations of outpatients by ICD-10 criteria. Because of temporal and financial limitations, no use was made of a DSM-IV standardized diagnostic interview that would demand more time and necessitate a previous professional training. The history of depression and the length of the current depressive episode were assessed on the basis of the participants' memory alone, which means that these data can be unreliable. The intensity of a depressive episode was assessed by the Beck Depression Inventory, the commonly used instrument of assessment of depressive symptoms in cognitive-behavioural studies (Kendall, Hollon, Beck, Hammen, & Ingram, 1987). Although this inventory is a reliable and valid measure of depressive symptoms, it is not sufficient for a diagnosis of clinical depression. According to the advocates of the theory of discontinuity of depression, the unique valid procedure is a structured clinical interview for depression (Gotlib & Hammen, 1992). Finally, it is obvious that our conclusions are limited to females, since our sample consisted of female patients.

Future research could test the hypothesis of the relation of the Leiden Index of Depression Sensitivity and the history and the length of depression in a mixed clinical sample, where assessment of clinical depression could be accomplished in better conditions. Moreover, there remains the possibility to prospectively examine whether the subscales Negative self-Evaluation and Avoidance could predict the acute beginning of clinical depression. In that case, a test-retest sample should be large, in order to comprise a sufficient number of persons who are in stable remission from a previous depressive episode, as well as a sufficient number of persons who were never depressed.

CONCLUSION

Among many significant results, one of the most important ones suggests that the length of the first depressive episode, regardless of its intensity, is of crucial importance for the formation of cognitive reactivity to sad mood. The results also give directions for conclusions about the construct-validity of the Leiden Index of Depression Sensitivity. They suggest that the subscales Negative

Assessment and Avoidance are valid indicators of cognitive reactivity to sad mood in a clinical sample. The results also question the construct-validity of the subscale Interpersonal Sensitivity, given the fact that this subscale did not perform according to the hypothesis of the origins of cognitive reactivity.

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