HOW AUTOBIOGRAPHICAL MEMORY DEFICITS AFFECT PROBLEM-SOLVING IN DEPRESSED PATIENTS

H. Kaviani*, **M. Rahimi, P. Rahimi-Darabad, K. Kamyar and H. Naghavi**

Department of Psychiatry and Clinical Psychology, Roozbeh Hospital, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

Abstract- Over the past decade, there have been several studies showing autobiographical memory retrieval and problem-solving deficits in depressed population. The present study aimed to first to examine the roles of autobiographical memory specificity and problemsolving effectiveness in Iranian depressed people with or without suicide ideation and secondly, to test the correlations between autobiographical memory and problem-solving components. A group of depressed patients with suicide ideation (n=20, aged 18-45) and a matched control group (depressed without suicide ideation) were tested by a autobiographical memory test, a means-ends problem-solving task, Beck Depression Inventory (BDI), and Beck Hopelessness Scale (BHS). Both groups met DSM-IV criteria for major depression disorder without psychotic features. In line with hypotheses, the suicide ideators scored significantly higher on the hopelessness scale than the control group. The suicide ideators also provided significantly less effective problem-solving strategies and more over-general memories than the control group. A significant correlation was found between low effectiveness of problem-solving strategies and over-general memory retrieval. The present results suggest that access to non-specific memories in depressed people can lead probably to ineffective problem solutions and subsequently hopelessness and suicide.
Acta Medica Iranica, 41(3): 194-198; 2003

INTRODUCTION

Cognitive psychology has provided sufficient evidence showing an association between memory retrieval and problem-solving (e.g. Williams Hollan, 1981) (1). Williams & Broadbent (2) examined autobiographical memory in parasuicides (taken a delibrate overdose of drugs). The results showed that parasuicide depressed patients produced over-general memories. The study showed that over-general memories were not due to effects of drugs taken, or to the influence of transient mood levels. Seemingly, in order to solve a problem, one needs to have access to the information previously stored in memory database. Shortage of data or lack of precise and specific material in this regard can cause failure in solving problems (including personal problems), and then hopelessness leading to suicide; it shows how accumulation of life events interacts with memory and problem-solving deficits to increase probabilities of parasuicide. This probable relationship was later

scientifically shown (3-6). Williams and Broadbent (1986) suggested that the tendency of parasuicides to retrieve less specific autobiographical memories may precipitate suicidal attempt. In one previous research, we also found a significant correlation between autobiographical specificity retrieval and problem-solving effectiveness in depressed patients who had attempted suicide (7).

Applying an experimental paradigm identical to our previous work on suicide-attempters, the present study was designed to extend our knowledge of cognitive aspects of memory retrieval and problem-solving in other groups of clinically depressed patients, namely suicide-ideators and nonsuicide ideators.

MATERIALS AND METHODS

Subjects

Participants reported here were 20 depressed patients with suicide ideation (10 men, average age= 25.50; and 10 women, average age=29.70) and 20 without suicide ideation (10 men, average age= 25.20; 10 women, average age= 28.70). They were matched for age (±5 years), sex and educational level and were between 18 to 45 years. They met DSM-IV (8) criteria for major depressive disorder. Such decisions were

made by consultant psychiatrists at the outpatient department of Roozbeh Psychiatric Hospital, Tehran. All participants were screened for any background of neurological disorder, mental disorder (except depression) and drug abuse, being excluded from the study. The criterion to split subjects into two groups was based on a clinical measure, the scale for suicide ideation (9,10).

Clinical measures

Beck Depression Inventory (BDI) (11) and Beck Hopelessness Scale (BHS) (12) were used to measure depression and hopelessness, respectively.

Also in order to divide the depressed patients into suicide ideator and non-suicide ideator groups, the scale for suicide ideation (SSI) (9) was used. This scale that contains 19 three-choice questions, was completed by the experimenter (MR) during a semi-structural interview. The subjects who scored 3 or more were alocated in the ideator group; the final score for each patient was the average scores of the experiment's and the second rater's.

Experimental Measures

1. Autobiographical Memory Test:

The same cue-word paradigm as used in our lab (7) was applied to assess autobiographical memory retrieval. In fact, it was a 15-cue-word task, including 5 pleasant, 5 unpleasant and 5 neutral Persian adjectives. The series of adjectives were presented orally by the experimenter (MR) in a counterbalanced fashion. After presenting each word, subjects had 1 minute to recall specific personal memory. The time taken to start within the 60-second period was regarded as latency to response onset; if the subject did not retrieve any memory within this time limit, a 60-second time was recorded as the latency.

An 11-point scale (from 0 as "very overgeneral" to 10 as "very specific") was used by the experimenter and an independent judge to rate specificity-overgenerality.

Indeed, to rate the subjects' responses, a checklist (including items specifying time, place, persons, objects and situation in a given memory) was used by the two judges. The inter-rater correlation was highly significant (r=79). The final scores used in data analysis were obtained by averaging the two judges' ratings.

2. Means-end problem-solving task:

A culturally modified task, (7) and the same as used in our previous study (Kaviani et al submitted), were applied. In fact, five different situations (each

consists of a story with a stated need and a desired need). After presenting each story, the subject was asked to complete the middle part of the story so that the protagonist would achieve the desired outcome. Latency (first word of response), number of means (including both relevant and irrelevant means), relevancy ratio (number relevant means/number of means) and means effectiveness were scored in the present study. The two judges quantified effectiveness based on the criteria mentioned by Evans et al (3) on a three-point scale (0= "not at all"; 1 = "effective"; 2= "very effective"). The average of the raters' scores was used in the final data analysis. The inter-rater correlation was highly significant (r= .77). The second rater basically acted as a control to rule out the experimenter's rating bias. The second rater was blind to the ratings of the experimenter's.

Procedure

The patients currently referred to the out-patient clinic at Roozbeh Psychiatric Hospital, Tehran, were interviewed and screened on the basis of the inclusion and exclusion criteria. The target subjects then read and signed an informed consent form (2 refused to take part). First the clinical measures and then the experimental test and task were administered. Total testing time for the experimental part of the study varied 25-40 min.

RESULTS

Clinical assessment

[T-test was performed to compare the scores on BDI and BHS in the two groups]. Depression level was higher in the ideator group (mean= 35.00) than the non-ideator group (mean= 30.59), though the difference did not reach significance.

However, the level of hopelessness was signify-cantly higher in the ideator group (mean= 11.50) than the non-ideator group (mean= 7.15) (t_{19}= 3.40, $P<0.01$).

Autobiographical Memory Retrieval

[A three-way [2 (Group: ideators, non-ideators) $\times$ 3 (Valence: pleasant, neutral, unpleasant) $\times$ 2 (Sex: men, women)] multivariate repeated measures analysis of variance (Wilk's Lambda) was performed to analyse (separately) the data on latency and specificity. If there was any group interaction effect, the data in each group was separately subjected to a two-way multivariate repeated measures analysis of variance, followed by polynomial contrast tests (assessed by *t*)

on the valence effect (orderded pleasant, neutral, unpleasant). Moreover, to detect further the differences between pleasant/unpleasant and neutral cue words, a series of paired tests was conducted].

The analyses showed no significant main or interaction effect for sex variable. There was not any significant effect for the data on latency. The statictical analysis yeilded a significant valence group interaction effect [$F_{(2,17)}= 7.32$, $P<0.01$]. Separate analyses for either group revealed significant valence effects [ideators: $F_{(2,17)} = 4.03$, $P<0.05$; non-Ideators: $F_{(2,17)}= 4.70$, $P< 0.051$ with a linear trend for the ideator group ($t =3.04$, $P<0.01$) and a quadratic trend for the non-ideator group ($t= 2.17$, $P< 0.05$) (Table 1) that is, the suicide ideators tended to retrieve over-general whilst the suicide non-ideators tended to retrieve more specific information from their memory. Supplimentary analyses showed that the ideator group retrieved more specific memories in responses to negative cue-words ($t_{19}=2.91$, $P<0.01$) and the non-ideator group retrieved more specific memories in response to positive cue-words ($t_{19}=3.07$, $P<0.01$), both compared to the neutral condition.

Problem-solving performance

In order to detect the differences between the two groups on problem-solving performance, a series of paired tests were conducted (see Table 2 for details). The latency difference in the two group was not statistically significant. A marginally significant difference was observed for relevancy ratio between the ideator and non-ideator groups.

The solutions produced by the ideators were more effective than those produced by the non-ideators ($t_{19}=2.14$, $P<0.05$). Neither main nor interaction effect was found for sex factor.

Associations between autobiographical memory and Problem-solving

To detect the associations between autobiographical memory and problem-solving, the Pearson's correlation method in either group and in entire subjects were conducted (Table 3). No significant correlations appeared in each group.

However, when all subjects were considered together, four significant correlation coefficients were observed: memory specificity was negatively correlated with memory latency and positively correlated with problem-solving effectiveness and relevancy ratio; relevancy ratio was also positively correlated with effectiveness.

DISCUSSION

This study followed our previous attempt to examine the relationship between autobiographical memory and problem-solving deficits of suicide attempters (13), detecting further such deficits in another subgroup of depressed patients, i. e. with or without suicide ideation. In fact, the experiment was designed to find out if the levels of depression, hopelessness and suicidal thinking can affect the defected processes in these two groups, as observed for memory retrieval and problem-solving of people who attempted suicide, and if the differences in these cognitive aspects varied linearly across the suicidal ideation axis.

The results showed that the depressed suicide-ideators were more hopeless than their non-ideator counterparts. Also an overall tendency was found for the ideator group to retrieve less specific memories compared to the non-ideator group. Moreover, in fact, the ideators were more specific in response to negative cue-words, while the non-ideators were so in response to positive cue-words, both relative to the neutral condition. This finding is consistent with the constructs accessibility view (14) which proposes that depression is associated with increased accessibility to negative constructs. This view has been supported by experimental works showing a pattern of congruent recall, normally, depressed subjects are more likely to recall negative rather than positive experiences (15,16). However, there exist findings from some other studies which confirm a reverse pattern e.g. (17). Furthermore, compared to non-ideators, suicide-ideators provided less effective and fewer relevants problem-solving strategies. This is consistent with the findings we found in our previous research for (depressed) suicide-attempters (13). Some researchers (3) previously asserted that people with serious difficulty to retrieve specific memories also have great difficulty to provide effective problem-solutions. In fact, the present findings support the hypothesis that the inability to retrieve specific information (which is largely needed for producing problem-solving strategies) from memory database, could give rise to inadequacy for providing effective solutions. The positive correlations between autobiographical memory specificity with problem-solving relevancy ratio and effectiveness further support this hypothesis; having access to over-general information facilitates frustration in problem-solving, then probably resulting in hopelessness, and therefore suicidal ideation; indeed the suicide-ideators, taken part in the present study,

were more hopeless than the non-ideators. The present brief report aimed to extend our knowledge of the association between cognitive aspects of depression and suicide-ideation in different groups of depressed patients and attempted to picture a more detailed perspective of the complexity; though to complete the jig saw puzzle, further research will be required. At our department, a research project using the same methodology is underway to examine autobiographical and problem-solving among patients with anxiety disorders.

Table 1. Specificity and latency of autobiographical memories in response to the cue-words in the ideator and non-ideator groups

	Ideator Group	Non-ideator Group
	Average (SD)	Average (SD)
Specificity		
Positive	2.93 (1.41)	4.23 (.98)
Neutral	2.82 (1.21)	3.71 (1.00)
Negative	3.73 (1.60)	3.98 (.99)
Latenc*y*		
Positive	24.92 (14.43)	20.84 (5.81)
Neutral	26.51 (27.76)	18.52 (6.23)
Negative	17.06 (13.36)	15.08 (5.40)

Table 2. Statistics on problem-solving measures

Groups	Df	Average (SD)	T	P
Effectiveness				
Ideator	19	3.20 (2.02)	2.14	0.046
Non-ideator		4.45 (2.19)		
Relevancy ratio				
Ideator	19	0.70 (0.27)	1.88	0.07
Non-ideator		0.83 (0.17)		
Latency				
Ideator	19	17.35 (13.56)	1.53	ns
Non-ideator		12.15 (5.95)		

Table 3. Pearson's correlations between autobiographical memory and problem-solving across entire sample (n= 40)

		2	3	4
1	Memory specificity	R= -0.55 P< 0.001	R= 0.42 P< 0.01	R= 0.40 P< 0.01
2	Memory latency		R= 0.19 P= n.s.	R= -0.06 P= n.s.
3	Problem-solving relevancy ratio			R= 0.76 P< 0.001
4	Problem-solving effectiveness			

REFERENCES

1. Williams JM, Hollan JD. Processes of retrieval from very long-term memory. Cognitive Science 1981; 5: 87-119.

2. Williams JMG, Broadbent K. Autobiographical memory in attempted suicide. Journal of Abnormal Psychiatry 1986; 95: 144-149.

3. Evans L, Williams JMG, O'Loughlin, S, Howells K. Autobiographical memory and problem-solving strategies of parasuicide patients. Psychological Medicine 1992; 22: 399-405.

4. Goddard L, Dritschel B, Burton A. Role of autobiographical memory in social problem-solving and depression. Journal of Abnormal Psychology 1996; 105: 609-916.

5. Goddard L, Dritschel B, Burton A. Social prolem-solving and autobiographical memory in non-clinical depression. British Journal of Clinical Psychology 1997; 36: 449-451.

6. Sidley GL, Whitaker K, Calam RM, Wells A. The relationship between problem-solving and autobiographical memory in parasuicide patients. Behavioural and Cognitive Psychotherapy 1997; 25: 195-202.

7. Kaviani et al. (submitted). Autobiological memory retrieval and problem-solving deficits of Iranian depressed patients attempting suicide. European Journal of Cognitive Psychology.

8. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders 4th Ed. APA: Washington, DC 1994.

9. Beck AT, Kovaca M, Weissman A. Assessment of suicidal ideation: The scale suicide ideation. Journal of Consulting and Clinical Psycholog 1979; 47: 343-352.

10. Beck A.T, Rush A L, Shaw BF, Emery G. Cognitive theory of depression. Guilford Press: New York 1979.

11. Beck A T, Steer RA. Beck depression inventory. The psychological corporation: New York 1984.

12. Beck AT, Weisman A., Lester D, Trexler L. The measurement of pessimist: the hopelessness scale. Journal of Consulting and Clinical Psychology 1974; 42: 861-865.

13. Kaviani H, Naghavi, HR, Rahimi P. Autobiographical memory retrieval deficits and problem-solving strategies of Iranian parasuicidal patients. International Journal of Psychology 2000; 35, 3/4 (10315.03) (abstract).

14. Bower GH. Mood and memory. American Psychologist 1981; 36: 129-148.

15. Blaney PH. Affect and memory: A review. psychological bulletin 1986; 99: 229-246.

16. Parrott GW, Sabiny J. Mood and memory under natural conditions:Evidence for incongruent recall. Journal of Personality and Social Psychology 1990; 59: 321-336.

17. Theasdale JD, Taylor ML, Cooper Z, Hayhurst H, Paykel ES. Depressive thinking: shifts in construct accessibility or in schematic mental model? Journal of Abnormal Psychology 1995; 104: 500-507.