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DEPRESSION AND OVERGENERAL AUTOBIOGRAPHICALMEMORIES: A RANDOMIZED CONTROL TRIAL

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## ABSTRACT OBJECTIVE



To assess overgeneral autobiographical memories (OGMs) and specific autobiographical memories (SAMs) in depressed patients and controls. by cueing thembywords,imagesandolfactorycues.

## STUDY DESIGN

Between-subject randomized experimental design.

## PLACE AND DURATION OF THE STUDY

Thestudy wasconductedin the department of Psychology,Government College University Lahore fromFebruary 2016toJune2016.

## SUBJECTS AND METHODS

35 participants were employed in the study. The experimental sample for the study included 18 depressed participants (nine males and nine females), while controlgroupincluded 17 healthy controls(ninemalesand eightfemales).Level of depression was assessed by Beck Depression Inventory II. The participants were presented with the images, words and odor cues and were asked to produce specific memories using the Autobiographical MemoryTest (AMT),and later they were rated as being specific or generalized by two judges. Response timeestimates werealso takenon thesevariables.

## RESULTS

Depressed participants retrieved significantly (t = 3.22, p < .005) more OGMs

collapsed for different cues (M = 3.38, SO= 1.14) than controls (M = 2.11, SD= 1.23). However, control group retrieved significantly (t = -4.72, p < .001) more

SAMs collapsed for cues (M = 3.83, SO = 1.09) in comparison to depressed participants (M = 2.22, SD =.09). We found depressed participants took

significantly longer response time (M= 13.94, SO = 4.03) to respond to cues

compared with controls(M =4.61,SO=2.35). Separate analysesfor cuesrevealed

the same pattern of results. Multiple regression analysis found, depression significantly (B = 4.97, p < .01) predicted response time in participants, R2 for

OGMsmodel was43%,indicating thatdepression canimpair memoryfunction as delayand contentof memories.

## CONCLUSION

The study found a significant association between depression and OGMs. Depressed individuals have an inability to retrieve more specific memories in comparison to OGMs. In addition, depressed individuals had lower response times compared to controls, indicative of a general cognitive slowing down of response in depressed individuals compared to healthy controls and that depression predicted OGMs.

## KEYWORDS

Cognitiveslowness,Words, Images,Olfactorycues.

## INTRODUCTION

Autobiographical memory {AM) is primarily concerned with personal events and episodes from our lives, however, different terms interchangeably describe autobiographicalmemories and can include episodic memory and event memories'. Research has shown that AM is adversely effected when an individual experiences psychopathological conditions such as depression. One phenomenon

**that**has beenidentified across a number of studies is

over generality in the retrieval of AM-'"'. These memories of the depressed patients areprimarily of a general nature anddo not contain any specific details about the event or target beingrecalled, for example, if an individual is asked to recall a happy event from herlifeshe is likely to say "I was on vacation", without givingmuch details on what made her happy at that vacation.This isatypical example ofovergeneralityin AMretrieval.'

Depression is a leading form of psychopathology which includes symptoms and states of experiencing negative mood, hopelessness and aversion with different activitieswhichcancause severeimpacton a person's thoughts, behaviors, emotions and level of psychological wellbeing'. A number of studies have established that there is an association between depression and OGMs. Individuals with major depression are morelikely to display overgenerality in their autobiographical memories (AMs) in comparison with healthy controls. There is also an evidence to show that not only depression but also other clinical disorders like bipolar disorder, postpartum depression and post-traumatic stress disorder (PTSD) also show similar effects on AM'. However, there is a lack of evidence on whether an association exists between OGMs and depression'. The present study aimed to assess the association betweendepression and OGMsand to fill in the gapin literature on thisarea.

We predict depressed patients will report greater OGMs than healthy controls and that controls will retrieve SAMs. Depressed patients will retrieve more OGMs for all cue-types, and would take longer respondin theirretrieval thancontrols.



## SUBJECTS AND METHODS

#### Participants

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quantity ofessencepresentedto eachparticipant in a bottlewas1 ml size.The same quantity was used for all forms of essence that were

used. It was also ensured that the inter-trial gap between the presentations of cues was about 15 minutes in order to avoid

35 participants were employed in the study. The experimental sample for the study included18 depressed participants (ninemales and nine females),while control groupincluded 17 healthy controls (nine males and eight females). **We** used purposive sampling in the study and included depressed patients from mental health clinic outpatient facilities; and undergraduate and graduate students as healthy controls. Block randomization was used to assign the participants to different treatment blocks.Forthe present study,the researcher had used Microsoft Excel(2013) for block randomization•. First,the experimenter had divided the subjects into gender blocks and then randomly assigned them to three treatment conditions to them for word,pictureandodorcues.

**Instruments**

# *Beck Depression Inventory II*

For assessing depression of participants before and after the experiment, Beck Depression Inventory II (BDI II) was used, which contains 21-questions. It is a widely used tool for assessing depression•. This versionisdesigned for individuals aged 13 years or older and is effective in targeting multiple symptoms of depression.

Each items for this instrument is rated on a O to 3 scale. Higher

composite scores indicate severe depressive symptoms. Research suggests that BDI II is positively correlated (r = .71) with Hamilton Depression Rating Scale and the testhasa high internalconsistency (a =.91)0•

# *Autobiographical Memory Test (AMT)*

Weused AMT for datacollection in response to wordcues. A number of studies on OGMs have used this test11 11 It involves asking the participants to produce specific memoriesto specificcue words with aresponse timethatrangesfrom30to 60seconds.Halfoftheten cue words have positive valence and the other half have negative valence. The word cues used in the experiment were drawn from relevant research evidence '. A total of 3 positive cue words and 3 negative cue words were used. Positive word cues included: happy, successful and surprised. The negative wordcues wereangry,lonely and sorry.Theoriginal ten word cuesweren't useddue to the overall length of the experiment which included the presentation of olfactory and visualcuesaswell.

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In addition, sixpicturesrelated to the wordsin AMTwereused(three pleasant and three unpleasant. The images had been selected from theInternational Affective Picture System(IAPS)and elicited positive responses included (e.g.a couple, teenagers having fun in a parkand a happy man standing on a cliff in a happy mood; the negative images included: a fighting couple, a scene from a funeral and an image of a man in a state of depression"). The participants were asked to produce specific memories in response to these images. Sufficient time was givento them in order to be able to response to these visualcues.

The olfactory cues used in the experiment were: tobacco, soap, camphor, roses, jasmine and lavender. The olfactory cues were presented using essence bottles obtained from a local market. The

lingeringodoreffects.

It is important to note that studies have identified jasmine, lavender and smellofroses asbeing effective in aromatherapy and in relieving depressive and traumatic symptoms while tobacco, soap and camphorhave beenassociated withdepressive and traumatic mood states.''

# *Response Time Estimates*

For the purpose of measuring response time DMDX AUTOMODE software was used, which a widely used tool for obtaining accurate and precise response time. It is well-suited for experiments using wordandvisualcuesand can be adjusted forother forms of cues."

#### Procedure

Theparticipants wereaskedto complete informedconsent and were insured that their personal information will remain confidential. Participants had the right to refuse participation at any time during the study. The participants in the experimental and control group wereprovided withstandardized instructions.

"I am interested in knowing your memory of events that happened during the differentphasesof yourlife.Iamgoingto present you with some words (condition 1), pictures (condition 2) and smells (condition 3).In response to eachcue youwillbeexpectedto thinkof

a memory. This memory could be from last week, last month or last year. One more thing-the memory you recall should be from a specific event and not general in nature.For example, if you see the word "good" you will need to specifically link this word with a memory of a past event or occurrence.It is important for you to try to retrieve a different memory for each cue.Let us now use some cues for practice"''.

Scoreon BDIII were recorded before their memories were recorded.. The wordcuesand imagecueswerepresented usingacomputerized display through a projector. For the olfactory cues, the participants were simply asked to takea sniff from the 1ml essence bottles of the smells and then try to identify memories evoked by these smells. A panelof two psychologists(theresearcher and anotherpsychologist) rated the memories reported by the participants as being specific or overgeneral. Thesameprocedurewasusedfor all the three cues.The response time was recorded using DMDX AUTOMODE software.The responsetime wasrecorded oncethe participant started to report his or her memory in response to the cues and stopped when the response wasover.Here.are someexamplesof OGMs to the wordcue surprised. One participant with depression said "I am no longer surprised by anything in life', compared with a control participant who stated"I was surprised a few weeksback whenI heardabout my selection in PunjabPolice".

## RESULTS

Meandepression in the depressed group(M =36.33, SD= 15.38) was significantly higher than control group (M=10.55, SD= 6.54), t =

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6.54, p < .01. lnterrater agreement (koppa coefficient) between the two judgeswere positively significant, for OGMs the correlation was

0.70 (p < .01) and for SAMs 0.61 (p <.01) respectively. These values

indicatedamoderaterangeof agreement between the raters.Scores on depression, OGMs and reaction time showed a positive correlation with on another, SAMs showed a negative relationship with reaction time (seetable 1 fordetails).

Table **1**

**lnter-Cone1ation among Scores on Depression. Cue Types, Reaction Time,** Specific Autobiographical Memories and Ovcrgcncral Autobiographical Memories (N-36)

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| } | **Overgcnc:r'al AMs** |  |  | - | ·.21 | *.49•* |
| 4 | **Specific.AMs** |  |  |  | - | -.4N• |
| *5* | **Reaction Time** |  |  |  |  | - |

**Note. *•p<* .01, AMs=Autobiogrnphical Memories**

Depressed participants retrieved significantly (t = 3.22, p < .005) more OGMs for different cues(M = 3.38,SD= 1.14) than controls(M= 2.11, SD= 1.23). However, control group retrieved significantly (t =- 4.72,p <.001) moreSAMsfor cues(M= 3.83,SD= 1.09) incomparison

withdepressed participants(M= 2.22,SD=.09).In addition, we found that depressed participants took significantly (t = 8.47, p < .001)

longer response times(M = 13.94, SD= 4.03) in comparison with the controls(M=4.61,SD= 2.35) seeFigure la.

Separate analyses were carried out for all three cues; for words, depressed patients (M = 7.55, SD= 5.16) retrieved significantly (p <

.05) more OGMs than controls (M = 4.32, SD = 1.04). However controls (M = 4.50, SD= 1.64) recalled significantly (p < .05) more

SAMsthandepressed patients(M= 3.19,SD= 1.04), and controls(M= 6.66, SD = 1.86) were significantly at retrieving memories than depressed patients(M= 15.50, SD= 3.56) seeFigure 1b.

For pictures, depressed patients (M = 7.22, SD = 2.81) recalled significantly more OGMs than controls (M = 4.19, SD = 1.04). However controls(M = 7.33, SD= 2.96) retrieved significantly more SAMsthan depressedpatients(M= 3.99,SD= 1.44), and controls(M= 2.11, SD= .40) weresignificantly faster at retrieving these memories thandepressed patients (M = 7.22, SD= 1.72)seeFigure1c.

For odors, depressed patients (M = 9.50, SD = 5.16) recalled significantly more OGMs than controls (M = 4.55, *SD=* 1.04). But controls(M = 3.11, SD= 1.47) retrieved significantly more SAMsthan

depressed patients (M"'1.50, SD= 1.04) and controls (M= 5.00, SD= 4.21) were significantly faster at recalling these memories than depressed patients (M=9.54, SD=1.01) seeFigure 1d.

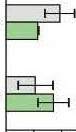
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Multiple regression analysisrevealed thatdepression wassignificant predictor of OGMs(B= .46,p < .01), R'fortheOGMs modelwas21%, though cue-types did not significantly predicted OGMs. Multiple



regression analysisalso showed that depression scores significantly predicted response time of participants (B= 4.97, p < .01),R' for the OGMs model was43%.

### DISCUSSION

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validity, largely due to a smallsamplesize. Thesmall sample limited our randomization abilities which did allow for balancing age,

The study was carried out to determine relationships among depression, OGMs and SAMs and to assess if retrieval of these memories was slower in depressed patients. Results revealed depressed patients retrieved more OGMs thanhealthy controls who retrieved more specific memories than depressed patients. Depressed patients responded slower in response to the words, picturesand odorcuesthancontrolswhenretrievingtheirmemories. Regression analysis suggested that the level of depression of participants significantly predi<ted retrieval of OGMs and response times.



Theresults of the studyarein accordance withthepreviousevidence that depression does have an impact on the retrieval of autobiographical memories and that OGMs wasstrongly associated with intrusive ideas, thoughts and memories about stressful and depression"·'•.

This finding, that depression has an impact on autobiographical memories is supported by the trauma hypothesis model. Williams and Broadbent (1986) offer an account of overgenerality in the memories of participants with other psychological disorders. Researchevidence hasshownthat that lower levelsof AM specificity and ahigher number of overgeneralmemories wereassociated with a higher possibility of being diagnosed with depression. In other words, OGMs were reported as being significant predictors of recurring depression".The reporting of OGMs and inability to recall specific memories might also be a coping mechanism used by depressed individuals, which might be due to the neurological changes observed in depression and due to impairments in executivefunctioning of individuals"".

The role of depression in influencing AM retrieval was seen in generally longer response times taken by depressed individuals in comparison to healthy controls. These findings indicate a general cognitive slowing in individuals with depression. It is also critical to notethat thiscognitive slowingmight be due to the tasks that make substantial demands on processing resources. Responding to these tasks is moredifficult when there are restrictionsin working memory capacity whichisoftenseenin depression.""

### CONCLUSION

The above findings indicate depression may be associated with general cognitive slowing in retrieving autobiographical memories among patients with depression as compared withhealthycontrols. However, the exact underlying brain mechanisms behind the reduction of OGMs is unclear which raises the need for further investigations.

### LIMITATIONS AND SUGGESTIONS

One limitation of the studywasmethodologicalin nature where we used l ml bottlesfor smells and the participants wereaskedto sniff at the smells. This procedure was not well controlled, many other studies have used special equipment for delivering controlled amounts of odor smells to assess differential impact of smells on memory functioning. Another limitation of the study is ecological

gender,SES, and other factors.

We need to conduct experimental studies in this area to address considerable gap in cognitive neuroscience literature and in countries like Pakistan. Clinical psychologists can assess OGMs in patients to link themto psychopathological disorders helping these professionalswith effectivetherapeutic outcomes.

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