

ARSA 2012



Proceedings in Advanced Research in Scientific Areas

The 1st Virtual International Conference



December 3rd – 7th, 2012

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Published by: EDIS - Publishing Institution of the University of Žilina



Univerzitná 1
01026 Žilina
Slovak Republic

Editors: Ing. Michal Mokryš, Ing. Anton Lieskovský, Ph.D.

ISBN: 978-80-554-0606-0

ISSN: 1338-9831

Pages: 2173

Printed in: 650 copies

Publication year: 2012

Other: All published papers undergone single blind peer review.

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Preface

It is my honor to introduce the new proceedings of the ARSA 2012, which is considered as prestigious, innovative and progressive conference. This year the following main areas have been chosen:


- Business Management
- Marketing
- Economy and Business Economics
- Public service, Law
- Financing and Accounting
- Psychology, Sociology and Pedagogy, Social Science
- Medicine
- Veterinary medicine
- Art, Religion, History, Philosophy
- Linguistics
- Ecology
- Natural science (mathematics, chemistry, biology, physics)
- Electronics, Electrical Systems, Electrical Engineering
- Industrial and Civil Engineering
- Informatics
- Information Technology

The main motivation of this year's conference edition was „to give the opportunity for a wide range of scientific groups“.

We prepared 16 virtual conference rooms, where many discussions have been realized during the conference. From the total amount of 525 received papers the program scientific committee has chosen 440 for the presentation in ARSA virtual Conference. The conference ran continuously during the December 3rd - 7th 2012 at **www.arsa-conf.com**.

Finally we would like to say thanks to all participants of this conference. The special thanks belong to authors for their high trust. We also thank all members of the Scientifics Committee for their work during the reviewing process. Our special thanks are due to conference web-administrators, they did excellent work.

In the name of the Organizing committee



Ing. Štefan Baďura, Ph.D.

ARSA Team Member

Žilina, December 23th, 2012.

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Methodological Issues in Involuntary Autobiographical Memory Research

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Abstract— This paper is devoted to autobiographical memories that come to mind without preceding attempt to retrieve in non-clinical group. Involuntary memories are distinguished from intrusive memories. The research domain of involuntary memories is presented in terms of main methodological strategies and general results. The author also raises the most important questions, challenges and methodological solutions for future research.

Keywords: autobiographical memory, involuntary memories, involuntary retrieval

I. WHAT ARE INVOLUNTARY AUTOBIOGRAPHICAL MEMORIES (IAM)?

The subject of this paper are involuntary autobiographical memories. Their main characteristic is that they pop up in mind spontaneously, unintentionally and are related to the events from personal past in a non-clinical group [1, 2, 3, 4, 5, 6]. In contrast to voluntary autobiographical memories (VAM) they are not retrieved on purpose. It is crucial to underline that involuntary autobiographical memories are distinguished from intrusive memories [e.g.: 7, 8]. The latter suggest a clinical perspective and are almost immediately associated by researchers with the particular type of memories appearing in PTSD (posttraumatic stress disorder) [6]. Described as recurrent and unwanted, they are one of the characteristic features of PTSD (criterion B: repeating, re-experiencing the traumatic event, 9). The clinical perspective contributed to the dissemination of the erroneous belief that involuntary memories are rare in healthy population, because of their limited and dysfunctional nature that constitutes an exception to the proper functioning of memory [4]. Intrusive memories, treated as a special case of involuntary autobiographical memories, are not the subject of this article.

II. MAIN FINDINGS IN INVOLUNTARY AUTOBIOGRAPHICAL MEMORY RESEARCH

Involuntary autobiographical memories are assumed to be a universal phenomenon [1, 10, 3, 4, 11]. Almost everyone in the healthy population (without any problems with autobiographical memory) will also experience involuntary memories. Typical frequency estimates are two to five spontaneous memories per day [1, 3]. According to Barzykowski [27] only 2% of participants report that they never experience IAM, while 76% experience IAM one or two

times per day. The results suggest that involuntary memories are no different from voluntary autobiographical memories [for review: 4]. According to Berntsen [4] there is no separate memory-based system (i.e., for involuntary memories) – but only one episodic memory system. They are similar in many characteristics, such as: (a) frequency of occurrence [1, 2, 10, 12, 11, 13], (b) emotional nature – they relate mostly to the events rated as intense, more positive than negative [2, 6], (c) distribution of memories in a lifetime – the effect of standard forgetting function, reminiscence bump [2, 6, 14, 15], (d) they are related to current concerns [10, 16, 17].

The results suggest [2, 6] that involuntary memories differ from voluntary autobiographical memories in some aspects. They differ with regard to mechanisms of retrieval. Voluntary recall is a strategic, goal-directed process. In other words, it requires cognitive effort to maintain the process of memory retrieval. In contrast, involuntary recalls appears to be effortless in nature [14]. Moreover, IAM are most frequently accompanied by diffused state of attention [e.g.: 2, 18], whereas VAM are the results of deliberate recall. IAM comparing to VAM are [2, 6]: (a) less general and schematic (they refer to specific events from the past), (b) less frequently retrieved and repeated, (c) more positive and less remote (they refer to current concerns and personal-goals), (d) accompanied by physiological reaction and having an effect on actual mood and well-being of the individual.

III. METHODS OF IAM EXAMINATION

There are three main research strategies used in the field of involuntary memories research : (a) survey methods [e.g. 19, 12; 17], (b) structuralized diary studies [e.g. 1, 2, 6, 16; 17], (c) experimental and laboratory methods (e.g.14, 20, 21, 22). None of them is superior to the other and each can be used to address specific scientific question.

The first method, the survey methods, allow us to ask research questions concerning: frequency of occurring in everyday life, memories' properties, distribution of memories across the lifespan. Furthermore, questionnaires allow us to collect objective data from as many subjects as possible [12, 22, 11, 23]. This method is especially recommended if: (a) manipulation of an dependent variable would be unethical (e.g. the examination of a frequency of intrusive memories), (b) the main field of interest is the relationship between large amount of various variables (e.g. the relationship between personality

and quality of recalled memories). Probably the largest disadvantage of this method is the fact that it is based on retrospection of the subjects and therefore can be vulnerable to memory distortions (i.e. retrospection bias). The results [3] suggests that, if involuntary memories will not be recorded immediately after occurring, they can be forgotten quickly. Nonetheless, in some cases it could be advantageous, particularly in research oriented toward accuracy (veridicality) in IAM [24].

The second method, the structuralized diaries are is currently the main research strategy used in IAM field. The subjects have to record involuntary memories immediately when they occur. By providing such collected reports it is possible to examine the sole (i.e. without retrospection bias) properties of IAM (e.g. frequency of occurrence). It is possible to describe the natural context of occurrence, in particular: characteristics of triggers, activities, thoughts and cues. Until recently it was the only method, which was not based on retrospection of subjects. The largest disadvantages of this method are the lack of: (a) systematic manipulation (and hence cause and effect reasoning is infeasible), (b) control of thoroughness of the subjects. The first disadvantage does not appear to be an issue in research oriented toward: (a) characteristics of context of natural occurrence, (b) functional aspects of IAM, (c) genuine properties of IAM. The second disadvantage can be overcome, for example, by inducing proper motivation to fill in diaries systematically.

In case of structuralized diaries we can distinguish an envelope method (19, 17). Participants receive a sealed envelope and they are instructed to open it when any involuntary memory occurs. At that time they fill in the involuntary memories survey, which includes questions about this one particular memory. This method is very similar to structuralized diaries except that participants record only one memory, thus it can be more convenient and effortless for them in comparison with previously described method.

The last method, the experimental-laboratory method seems to be the avenue for the future research prospects. There are a few major reasons for this assumption. Previous methods have strong limitations concerning possible research questions, that can be examined. The lack of systematic manipulation is one of their strongest disadvantages. There are two groups of experimental-laboratory methods [3], which can overcome this problem. In the first one, encoding phase is under strict control. For example, in stressful paradigm [22, 7] in encoding phase, participants are shown an emotional (not neutral) material. After such exposure involuntary memories with references to this content are recorded (e.g. using diary method) and are the subject of scientific examination. However, the content is not autobiographical in nature. In the second group, a researcher is focused on the retrieval phase more than on encoding. For example, Mace [25] studied involuntary memories occurring during voluntary recalls – participants had to report any memories that came to mind spontaneously. Ball [20] used free semantic association task, which was tape-recorded and played-back to the participant after his or her performance. They were instructed to report, if they remembered any involuntary memories, which came to their minds during previous task performance. Strong disadvantage of this strategy

is the retrospective bias. The first strategy [25] can be criticized for giving participants the suggestion about the proper subject of the research. Thus, memories could be voluntary and deliberately retrieved. This issue can be overcome by instructing participants to report any content of their mind during the task performance.

IV. METHODOLOGICAL ISSUES IN INVOLUNTARY AUTOBIOGRAPHICAL MEMORY RESEARCH

Three major methodological issues can be defined in properly designed involuntary autobiographical memory experiment: (a) the extent to which results can be generalized (external validity issue), (b) control of the involuntary nature of remembering (suggestion bias), (c) online recording of involuntary memories.

Referring to the first issue, there is the need to design experimental procedure, which pertains to natural context of IAM occurrence. According to Berntsen [2] only 33% IAM occur during concentration on the task. Mace [26] estimates that only 7% to 13% of IAM are induced by own thoughts. Barzykowski [28] estimates that 40% (at most) of all involuntary memories recorded in structuralized diaries are triggered by verbal-type cues (heard, read, spoken words). 64% of all IAM came to mind while participants are not concentrated on ongoing task performance. In this line, experimental design should be based on diffused (at least not very demanding) states of attention, because results show that this is the most common state in which involuntary autobiographical memories occur [e.g. 2, 3, 18, 19, 15, 27, 28].

On the basis on these results Simone Schlagman and Lia Kvavilashvili [14, 15] designed their own experimental procedure, which is a promising avenue for future research. In their method participants are engaged in monotonous and dull vigilance task. They are instructed to identify the particular pattern of lines. Apart from the patterns, there are word phrases displayed, which the subjects are told to ignore. They are asked to report any involuntary memories that come to their mind during the task performance. At that time, they are completing one page of autobiographical memory questionnaire, which involves: (a) describing the content of memories, (b) indicating what was each memory triggered by, (c) rating the intensity of concentrating on the task on the scale. After answering this questions, they return to the main task. At the end of this procedure, participants answer remaining questions for each memory they reported. The procedure developed by Simone Schlagman and Lia Kvavilashvili [14] give promising prospects for future research because: (a) retrieval phase of involuntary memories can be examined under well controlled conditions (b) it makes it possible to systematically manipulate the wide variety of independent variables in different phases of information processing (e.g.: encoding: emotional affect; retrieval: type of triggers, cognition load), (c) design bases on the occurrence of involuntary memories that are very similar to the natural context, (d) it makes it possible to raise completely new kind of scientific questions (especially those concerning cognitive mechanisms), what would be unfeasible within previously discussed methods, (e) it can be modified easily, (f)

what is the most important, involuntary memories phenomenon can be described in a cause-effect relationship.

This method gives an opportunity to examine cognitive mechanisms which are involved in recalling such memories. So far, it is the only way to examine involuntary memories online (i.e. at the time of occurrence) in conditions that are as natural as possible in the laboratory. This method is probably the only one that will allow answering the questions about: (a) anticipation of IAM occurrence, (b) control of IAM occurrence, (c) individual differences in IAM, (d) mnemonic and cognitive mechanisms of IAM. The experimental examination of involuntary memories is a necessity.

In the experimental design developed by Simone Schlagman and Lia Kvavilashvili [14] there are a few methodological issues that can be discussed. These are: (a) retrospection bias and (b) suggestion bias. As it was described earlier, participants are completing two pages of involuntary autobiographical memories. The first page (concerning the questions about: content of memories, characteristics of time of retrieval) is filled out immediately after memories popped up in the mind. However, the characteristics of involuntary memories which are compared with characteristics of voluntary memories, are on the second page – filled out after the task performance. It leads to the contamination of results by the retrospection bias. However it can be changed easily. Participants can be instructed to immediately answer a few questions concerning only the phenomenological characteristics (e.g.: vividness, emotional valence of memory and so on), because these properties can be susceptible to forgetfulness. After the task performance subjects can answer questions which are referring to the properties that are less sensitive to change over time (e.g.: the estimation of the time of event occurrence). This procedure can provide the examination of the true characteristics of involuntary memories.

The second methodological issue is the suggestion bias. Participants are instructed to stop the program every time an involuntary memory pops in their mind. There is a risk that they will try to recall something voluntary. In a proper procedure [14] participants do not know which trigger will be displayed on the monitor screen. Thus, they cannot initiate involuntary memories corresponding to the cue in advance. However, this does not guarantee that recorded memories are still involuntary. Barzykowski [27] has compared the properties of memories recorded in two experimental conditions: with and without suggestion. He used modified procedure developed by Schlagman and Kvavilashvili [14]. Participants in one group were instructed to record any content which popped in their mind, thus they did not know, what the experiment was about and what expectations have the experimenter had. They answered questions concerning phenomenological properties (such as: vividness, emotional valence, intensity of emotions, uniqueness, distinctiveness, subjective filling of influence their mood and physiological sensations) as soon as the IAM occurred. After the task performance participants answered questions which did not refer to time dependable properties (e.g.: importance, frequency of occurrence and so on).

In addition, Barzykowski measured one particular dependent variable, which had not been under systematic consideration in previously discussed procedures: purposefulness of memory or content which were recorded by subjects. Participants rate on 7-point scale (1-not at all trying; 7-fully trying), how much they were trying to bring this memory/content to their mind. Ratings from 1 to 3 indicated involuntariness, and ratings from 5-7 voluntariness. Rating 4 (the middle of the scale) was inconclusive and was not used to assess type of records. It has to be underlined that the estimation of purposefulness should be introduced to every procedure oriented towards involuntary memories. However this does not solve the problem of suggesting (see further), but it can be the first step to prevent the contamination of data by including voluntary memories. Without the control of involuntariness, the subject of the experiment (voluntary vs. involuntary memories) is not easily determined.

The first results (27) show, that in the suggested group: (a) there was a higher number of recorded memories observed, (b) there was a bigger number of voluntary memories observed, (c) 14 percent of all recorded memories were voluntary in nature (comparing to 7 percent in non-suggested group), (d) the average percentage of voluntary memories for a person is 5,5 percent (compared to 0,4 percent in non-suggested group), (d) recorded memories (in comparison to non-suggested group) differ in the estimation of: time of events (more distant) and uniqueness (are more unique). The most important difference, implies that suggestion somehow changes memories recorded by participants. It was reflected in suggested group by the fading effect [27, 28] – memory of the event is more positive than the original event. Barzykowski [27, 28] observed this effect only for voluntary memories and for involuntary memories recorded in suggested group. There was consistently no fading effect for involuntary memories in: non-suggested group, structuralized diaries group and envelope group (using the envelop method previously described). The results are consistent with previous research [31] and suggest that involuntary memories represent an important exception to this characteristic properties of autobiographical memories phenomenon.

There is the need for further research to estimate the relationship between giving suggestions (concerning the object of the an experiment) to participants and properties of memories. However, the existing results suggest that in spite of instructing participants to record only spontaneously retrieved memories – they record also voluntary memories. Furthermore, the difference between these two groups can be more indirect than the number of memories the participants provide. It pertains also to properties of memories.

This issue pertains also to the structuralized diary. If further studies provide strong evidence that suggesting affects participant recordings irrespectively of being instructed not to deliberately evoke memories - it will be necessary to use non-suggesting structuralized diary. It is already an interesting prospect for future research to compare the involuntary memories obtained in a non-suggesting procedure in an experimental design and outside the laboratory (i.e. structuralized diary studies) with voluntary memories.

Probably the most important challenge for researchers is to develop experimental design. Such method should: (a) have high external and ecological validity, (b) enable to control and manipulate the wide range of variables, (c) make clear distinction between voluntary and involuntary memories. The last one is the most challenging and can be described by the following question: how to instruct participants to record something involuntary without suggesting the object of the research?

Until now, the focus of memory researchers was primarily on the objective processes. As it turns out, remembering is not always a performance-oriented process. Supplementing the existing knowledge with involuntary memories and mechanisms which underlie them is an important step towards obtaining a comprehensive insight into the nature and functioning of memory processes. Involuntary memories are samples and at the same time an indicator of continuous and unconscious mental activity and its significant impact on the mood and well-being of an individual.

The universality of everyday involuntary memories draws attention to the fact that at least as interesting and having its own characteristics as involuntary information encoding is the involuntary process of eliciting information from memory. Rapidly growing interest in the latter is also expressed by the intensity of research on prospective memory in which the intention is extracted from memory at the right time without any preceding attempt to recall it [29, 30]. What is more, research on involuntary autobiographical memories may have important implications for the understanding of intrusive memories in PTSD and related disorders. This is one of the most interesting prospects for future research.

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