MEMORIES OF THE BRONZE NIGHT

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1. Introduction

In the past decades of the history of Estonia, there have occurred few events which have profoundly affected and touched more or less the entire population of the country. One of these events was undoubtedly the loss of the motor vessel "Estonia" on September 28th 1994 on its way from Tallinn to Stockholm with 989 persons on board, of whom over 800 died[1]. More recently, the events which took place in April 2007 (named as the 'Bronze Night', BN) are comparable due to their far-reaching effect on the people of Estonia.

There have been numerous newspaper articles which have been written, as well as several studies[2] which have been published concerning the BN. In addition issues such as the effects of being an on-site on journalist[3], as well as fear as a political means of influence[4] have also been examined, to mention a few. The aftermath of relocating the Liberators' Monument and the cyberattacks[5] against governmental agencies and services, banks and media

[1] **Final report on the MV ESTONIA disaster of 28 September 1994**, The Accident. – Accident investigation board of Finland. <http://www.turvallisuustutkinta.fi/en/Etusivu/Tutkintaselostukset/Vesiliikenne/MVEstonia/Lataussivu>, (29.01.2013)

[2] For example, see the special edition of Baltic Horizons, 2008, no. 10.

[3] **Krjutškova, K**. 2009. Aprillirahutuste kajastamise võimalikud psüühilised reaktsioonid ja mõjud ajakirjanikele. [Journalists who reverbrated April disturbances – its reactions and influence for them]. Bachelor thesis: University of Tartu.

[4] **Miller, M**. 2009. Hirm kui poliitiline mõjutusvahend ja selle kasutamine Pronksiöö sündmuste näitel. [Fear as a political means of influence and its use shown on Bronze Night events]. Bachelor thesis: University of Tartu.

[5] **Czosseck, C.; Ottis, R.; Talihärm, A.-M**. 2011. Estonia After the 2007 Cyber Attacks: Legal, Strategic and Organisational Changes in Cyber Security**.** Proceedings of the 10th European Conference on Information Warfare and Security at the Tallinn University of Technology Tallinn, Estonia 7–8 July 2011, pp. 57–64. Reprinted in 2011 in the Journal of Cyber Warfare and Terrorism, Vol. 1, Issue 1; **Tikk, E.; Kaska, K.; Vihul, L.** 2010. International cyber incidents: Legal considerations. Tallinn: CCD COE Publications; **Evron, G**. 2008. Battling botnets and online mobs: Estonia's defense efforts during the internet war. – Georgetown Journal of International Affairs, Vol. 9, No. 1, pp. 121–126.

channels, impacted almost everyone, therefore, the consequences that this event has had on the people living in Estonia has been widely discussed[6].

The current paper seeks to examine the degree to which the memories concerning the BN are united, and also ascertain the emotional reactions of people when they first heard about it. First, issues concerning memory and the formation of flashbulb memories are discussed. Then, the results of the survey are introduced and discussed. The chronology of the BN has been well documented in other sources[7], and is therefore, not within the scope of this paper.

2. The formation of memories

When we participate in an event, information about the event is mostly encoded into the episodic memory. This however, can be altered when we interact with others or watch/read different types of media. The information can then become blurred and, we may instead use semantic information (e.g. knowledge) for the memory process, rather than trying to actually remember what happened[8]. Thus, it can be difficult to judge afterwards, to what extent the information is retrieved from the episodic memory and how much became intergrated later from the semantic memory.

Events such as the BN also tend to form strong reactions. One way to examine the memory and reactions of people related to some specific event is through the concept of flashbulb memories (FBM). FBM are detailed memories of the reception context[9]. In some circumstances people may well remember the context in which they first saw or heard the news, such as the exact time it happened, their detailed location, or what activities they were engaged in at the time[10]. Still, these memories are often inaccurate and vulnerable to distortions over time as so-called 'ordinary' memories[11]. However,

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6 For example, see several papers in Vikerkaar 2008, special issue no. 4–5.

7 **Alatalu, T**. 2008. The Bronze Soldier – A Chronology. When and how he became notorious? – Baltic Horizons, No. 10, pp. 10–48.

8 **Tulving, E**. 2002. Mälu [Memory]. Tartu Ülikooli Kirjastus.

9 **Brown, R.; Kulik, J.** 1977. Flashbulb memories. – Cognition, Vol. 5, No. 1, pp. 73–79.

10 **Luminet, O.; Curci, A**. 2009. The 9/11 attacks inside and outside the US: Testing four models of flashbulb memory formation accross groups and the specific effects of social identigy. – Memory, Vol. 17, No. 7, pp. 742–759.

11 **Talarico, J. M., Rubin, D. C**. 2003. Confidence, not consistency, characterizes flashbulb memories. – Psychological Science, Vol. 14, No. 5, pp. 455–461.

documenting accurate memories is complicated as there are often difficulties in obtaining initial reports immediately after the event.

Previous research in the area of flashbulb memories has covered events as varied as: the loss of the ferry Estonia[12], the nuclear accident in Japan[13], the death of Princess Diana[14], the Nerve Gas Attack in Tokyo[15], the Marmara earthquake in Turkey[16], the resignation of the British Prime Minister Margaret Thatcher[17], the death of Belgian King Baudouin[18], the death of French President Mitterrand[19], as well as several studies of the 9/11 terrorist attacks in the US[20].

There are four major models which explain the formation of flashbulb memories[21] and they take into consideration the cognitive, emotional, and

[12] **Christianson, S. A.; Engelberg, E**. 1999. Memory and Emotional Consistency: The MS Estonia Ferry Disaster. – Memory, Vol. 7, No. 4, pp. 471–482.

[13] **Otani, H.; Kusumi, T.; Kato, K.; Matsuda, K.; Kern, R. P.; Widner, R. *et al.*** 2005. Remembering a nuclear accident in Japan: Did it trigger flashbulb memories? – Memory, Vol. 13, No. 1, pp. 6–20.

[14] **Kvavilashvili, L.; Mirani, J.; Schlagman, S.; Kornbrot, D. E**. 2003. Comparing flashbulb memories of September 11 and the death of Princess Diana: Effects of time delays and nationality. – Applied Cognitive Psychology, Vol. 17, No. 9, pp. 1017–1031.

[15] **Hirose, K.; Kato, T.** 1997. Two Different mechanisms of formation of flashbulb memories. – Interdisciplinary Information Sciences, Vol. 3, No. 2, pp. 177–124.

[16] **Er, N**. 2003. A new flashbulb memory model applied to the Marmara earthquake. – Applied Cognitive Psychology, Vol. 17, No. 5, pp. 503–517.

[17] **Conway, M. A.; Anderson, S. J.; Larsen, S. F.; Donnelly, C. M.; McDaniel, M. A.; McClelland, A. G. R. *et al***. (1994). The formation of flashbulb memories. – Memory & Cognition, Vol. 22, No. 3, pp. 326–343.

[18] **Finkenauer, C.; Luminet, O.; Gisle, L.; El-Ahmadi, A.; Van der Linden, M.; Philippot, P**. 1998. Flashbulb memories and the underlying mechanisms of their formation: Toward an emotionalintegrative model. – Memory & Cognition, Vol. 26, No. 3, pp. 516–531.

[19] **Curci, A.; Luminet, O.; Finkenauer, C.; Gisle, L**. 2001. Flashbulb memories in social groups: A comparative test-retest study of the memory of French President Mitterand's death in a French and a Belgian group. – Memory, Vol. 9, No. 2, pp. 81–101; **Finkenauer *et al.*** 1998.

[20] **Luminet & Curci** 2009; **Kvavilashivili, L.; Mirani, J.; Schlagman, S.; Foley, K.; Kornbrot, D. E**. 2009. Consistency of flashbulb memories of September 11 over long delays: Implications for consolidation and wrong time slice hypotheses. – Journal of Memory and Language, Vol. 61, No. 4, pp. 556–572; **Hirst, W.; Phelps, E. A.; Buckner, R. L. *et al.*** 2009. Long-Term Memory for the Terrorist Attack of September 11: Flashbulb Memories, Event Memories, and the Factors That Influence Their Retention. – Journal of Experimental Psychology – General, Vol. 138, No. 2, pp. 161–176; **Curci, A.; Luminet, O**. 2006. Follow up of a cross national comparison on flashbulb and event memory for the September 11th attacks. – Memory, Vol. 14, No. 3, pp. 329–344.

[21] **Brown, Kulik** 1977; **Conway *et al.*** 1994; **Er** 2003; **Finkenauer *et al.*** 1998

social factors of FBMs[22]. The Following is a short overview of the different approaches.

Brown and Kulik[23] proposed a model of FBM formation which closely follows the neuropsychological Now-Print! theory posited by Livingston[24]. They proposed that to form a FBM about the original event it must be new or unexpected (eliciting surprise). If there is a sufficient level of surprise, the event is evaluated in terms of consequentiality or personal importance. They have also suggested that emotional arousal subsequently triggers rehearsal, and in addition higher consequentiality elicits more frequent arousal. However, their model has been criticised for not using a consistent approach (i.e. test-retest method) and for emphasizing novelty and surprise without measuring them.[25]

Conway et al.[26] suggested a model for FBM formation using the structural equation modelling (SEM) approach. Their model of FBM utilized two direct predictors: emotionality and rehearsal, and two indirect predictors: knowledge/interest and importance/sensequences[27]. In their model emotionality and rehearsal were found to be unrelated. They were the first to combine a test-retest definition of FBM together with the SEM approach; also their model differentiated between the direct effects of the predictors on FBM (affective reactions) and the indirect effects (importance through rehearsal affects FBM). However, their approach has been criticised due to the fact that their appraisal of novelty was not defined or operationalised, and did not distinguish emotional appraisals and emotional responses.[28]

The Model proposed by Finkenauer et al.[29] argued that the process by which FBMs are formed and maintained develops through two pathways. The first pathway is linked to a cognitive appraisal of the novelty to FBMs which is mediated by the effect of surprise (i.e. the direct effect of emotion) whereas the second pathway represents the indirect effect of emotion. They have proposed that an incident creates high levels of cognitive appraisal of personal importance and consequentiality which are followed by intense neg-

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22 See **Luminet & Curci** 2009 for a detailed overview.

23 **Brown & Kulik** 1977

24 **Livingston, R**. 1967. Reinforcement. – **Quarton**, G.; **Melenchunk**, T. & **Schmitt**, F. (Eds.). The neurosciences: A study program. New York: Rockfeller University Press.

25 **Luminet & Curci** 2009.

26 **Conway *et al***. 1994.

27 **Luminet & Curci** 2009.

28 *Ibid.*

29 **Finkenauer *et al.*** 1998.

ative feelings. Emotional feelings then trigger a rehearsal which strengthens the memory trace of the original event and eventually enhances FBMs. An important role is also played by affective attitudes which are thought to influence importance/consequentiality, emotional reactions, and rehearsal.[30] The strengths of this model are the distinction made between cognitive appraisals and feeling states, and also the distinction between surprise and other emotional feelings[31]. This allows for the closer linkage of certain appraisals (like novelty) with specific emotional feelings that are triggered (for a more detailed account of the ''novelty encoding'' hypothesis see Tulving & Kroll)[32]. The weakness of this model lies in that FBMs were operationalised by a single measure of memory for the reception context and not by the test-retest procedure that permits a measurement of consistency[33].

The fourth model: Er[34], investigated the formation of FBMs for individuals who had direct vs non-direct experienced of an event. The author suggested that the recollection of those with direct experience of an event is different from those who had no direct experience. For the direct experience group, the level of personal consequences/importance was directly related to the degree of elaboration of FBMs. For the non-direct experience group, the formation of FBM closely followed the model suggested by Finkenauer et al., except that surprise and novelty were considered a single dimension, and a direct link between emotional reactions and FBMs was predicted.[35] The Er study provided an initial framework for models of FBM formation for events in which the level of involvement differed for people who had experienced the event (direct vs indirect) firsthand. The strengths of this model are that the event selected (earthquake), had high ratings in terms of personal importance and consequentiality, affective reactions, and surprise, which are key variables for the formation of FBMs. It was also beneficial that a large comparison group was recruited. However, the data collection took place six months after the event and therefore the original memory that was investigated at that time had already been reconstructed through media exposure and social communication.[36]

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30 *Ibid.*

31 **Luminet & Curci** 2009.

32 **Tulving, E.; Kroll, N**. 1995. Novelty assessment in the brain and long-term memory encoding. – Psychonomic Bulletin and Review, Vol. 2, No. 3, pp. 387–390.

33 **Luminet & Curci** 2009.

34 **Er** 2003.

35 *Ibid*.

36 **Luminet & Curci** 2009.

Overall, the four models coincide in that the following variables need to be included in models of FBM formation: (1) the reaction of surprise when learning about the original event, (2) the appraisal of importance, or the consequentiality of the original event, (3) the intensity of emotional feeling or state, and (4) rehearsal[37]. All models are also in concordance in that FBMs are initialised by new (or unexpected) situations and that this mechanism has an evolutionary adaptive value[38]. It should be noted, however, that in all models rehearsal does affect FBM, although according to Finkenauer et al. the effect is mediated by the memory of an event[39].

2.1. The aim of current study

The current study examines whether there is evidence to suggest a unity of memories among Estonian-speaking people concerning the BN. Although the FBM paradigm was used to conduct the study, because a test-retest method was not used, it cannot be considered an examination into the formation of FBM, therefore the term 'unity' of memories is used instead. Talarico and Rubin have indicated that confidence is largely related to the formation of FBM[40]. Therefore, after each question in our survey we asked participants to provide confidence ratings. Finkeneauer et al. have stated that initial emotional reaction to an event triggers rehearsal of the event and therefore memories of the event are more accurate [41]. For example, Conway et al. found that the emotional reactions about the memories of 9/11 terrorist attacks were divided into two, and were labelled as anxiety and rage[42]. Thus, emotional reactions are also considered in the current study.

However, there are some limitations in this research which should be taken into account when interpreting the results. First, the consistency of memories was not measured in the study, therefore, there can be no definite conclusion of whether the memories of the BN were consistent or not. Second, as the study was carried on via internet using multiple-choice questions, we were not able to examine directly the details of a person's memory. Nevertheless, we asked the participants questions which were most relevant

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37 **Luminet & Curci** 2009.

38 e.g., **Brown, Kulik** 1977; **Conway, M. A**. 1995. Flashbulb memories. Brighton, Sussex: LEA.

39 **Finkenauer *et al***. 1998.

40 **Talarico, Rubin** 2003.

41 **Finkenauer *et al.*** 1998

42 **Conway, A.; Skitka, L.; Hemmerich, J.; Kershaw, T**. 2009. Flashbulb memory for 11 September 2001 – Applied Cognitive Psychology, Vol. 23, No. 5, pp. 605–623.

to the examination of FBM based on previous research[43]. Third, as the study was conducted approximately three years after the event, it remains uncertain whether all the information remembered by the participants was in fact autobiographical; it may be that some of the external (semantic) information became intergrated with the original memories.

3. The survey

A link to an online survey was sent to the employees of several universities and local governments in both the Estonian and Russian languages. There were 204 respondants to the survey, of whom 192 responded in Estonian and 12 in Russian. Therefore, unfortunately, as there was such a low response rate from the Russian-speaking participants, the responses between Estonian and Russian participants could not be compared and the latter were excluded from the analysis. Of the 192 participants 53 (28%) were males and 139 (72%) were females. The average age was M = 35 (SD = 10.8), range from 17 to 71. By education, two (1%) had finished primary-school, 70 (36.5%) had completed high-school, and 120 (62.5%) the university. By location, 100 (52%) lived in Tallinn, 58 (28%) in Tartu, and 34 (18%) elsewhere in Estonia. The data was collected in April-May 2010 which is approximately three years after the BN.

The participants were first asked questions related to the circumstances in which they had heard the news. The questions were framed in a multiple-choice format based on the research of Conway et al. [44]. Each question was followed by a confidence rating which was scored on a scale from one to five ("1" not at all to "5" extremely). Participants responded by 'clicking' the appropriate button, which initiated the next question. A list of 14 questions was asked which were designed to measure the participants' emotional reaction when they thought back to what they were feeling during the event. Participants could also add their comments after the eight initial questions, but these comments are not analysed in this paper.

First it examined how well the participants remembered the events concerning BN (see Table 1) and then followed up with an analysis of their emotional reactions. Using chi-square analysis an examination of whether the memories were united among the participants (i.e. whether most of the

[43] *Ibid.*

[44] **Conway *et al.*** 2009.

participants remembered facts about the event and where they were in a unite way) was carried out.

Statistically significant effects were present for all of the statements (<.001). Most of the the participants were at home (66%), as opposed to other places, when they heard about the event (seven participants reported that they were in the middle of it). Most of the participants (79%) first heard of the news on April 26th, compared to other dates. The main medium for hearing the news was via television (57%) rather than via internet, radio, or newspaper. When the participants heard about the event, they were mostly with their family (52%) rather than with their friends, colleagues or alone. Concerning activities, the participants were mostly engaged in leisure activities (57%) compared to working, watching news, or doing something else. Participants heard the news mostly from the mass media (57%) and passed the news on, immediately to the family members (44%) and friends (24%). The mean ratings of the confidence regarding their memories were high, from M = 4.07 (SD = 1.10) for the date of when they first heard about the event to M = 4.75 (SD = .61) for the location when they first heard about BN.

The mean ratings of the emotional reaction are reported in Table 2. The highest rated emotions were *confused* (M = 3.70 on a five-point scale), followed by *hatred* (M = 3.68) and *angry* (M = 3.67). As a data reduction technique, the emotional response data underwent exploratory factor analysis using principal factor extraction and promax rotation. Inspection of the scree plot and eigenvalues suggest a two-factor solution, which is referred to as 'anxiety' and 'aggressiveness' (factor loadings are presented in Table 2). The correlation between anxiety and aggressiveness was strong (r = .371), but sufficiently uncorrelated to negate treating these as discrete emotional reactions to BN.

Next we examined the correlations (Pearson) between age and two other factors (anxiety and aggressiveness) and found that there was a small positive correlation between age and anxiety ($r = .297$, $p < .01$) and between age and aggressiveness ($r = .278$, $p < .01$). Also gender differences were examined in relation to these two factors. There were gender differences for anxiety with an independent t-test, $t(192) = -8.65$, $p = .001$ demonstrating that females were more anxious (M = 3.23, SD = 1.31) than males (M = 2.55, SD = 1.20). For aggressiveness a significant difference did not emerge, although there was a an indication of it, $t(192) = 1.94$, $p = .052$ (males M = 2.98, SD = 1.41 vs females M = 2.80, SD = 1.38).

Table 1. Proportions of participants' answers to the questions about the Bronze Night with unity and confidence measures.

						Unity	Confidence
Where were you when you first heard about BN?	In the middle of it	At home	At work	At school	Elsewhere		M (SD)
	4% (7)	66.1% (127)	11% (21)	4% (8)	15% (29)	χ^2 (4) = 264.35, p < .001	4.75 (.61)
When did you first hear about BN?	Before April 26th	On 26th	On 27th	On 28th			
	6% (12)	79% (152)	14% (27)	1% (1)		χ^2 (3) = 307.54, p < .001	4.07 (1.10)
How did you first hear about BN?	Radio	Television	Internet	Newspaper	Other		
	6% (11)	57% (110)	12% (23)	1% (2)	24% (46)	χ^2 (4) = 195.24, p < .001	4.56 (.69)
What were you doing when you first heard about BN?	I was working	I was watching the news	I had leisure time	Other			
	12% (23)	28% (53)	57% (110)	3% (6)		χ^2 (3) = 130.38, p < .001	4.47 (.77)
Whom were you with when you first heard about BN?	Alone	With family	With friends	With colleagues	Other		
	16% (30)	52% (99)	20% (39)	10% (19)	2% (5)	χ^2 (4) = 136.33, p < .001	4.71 (.63)
Who were the first persons you informed about BN?	Family	Friends	Did not inform anyone	Other			
	44% (85)	24% (47)	30% (57)	2% (3)		χ^2 (3) = 72.42, p < .001	4.54 (.72)
Who first informed you of BN?	Family	Friends	Media	Other			
	15% (30)	21% (40)	57% (109)	7% (13)		χ^2 (3) = 111.13, p < .001	4.68 (.65)

Note. The number of participants is in brackets. Unity between answers was measured with chi-square analysis.

Table 2. The means and standard deviations of emotional reactions to Bronze Night with the results of the factor loadings from exploratory factor analysis.

		Component	
	M (SD)	anxiety	aggressiveness
Confused	3.70 (1.14)	.677	
Angry	3.67 (1.25)		.819
Sad	3.41 (1.19)	.614	
Frightened	3.14 (1.26)	.735	
Vulnerable	2.54 (1.17)	.680	
Strong	2.98 (1.04)		.407
Indifferent	1.44 (.73)		
Desire to fight back	1.72 (1.08)		.804
Hatred	3.68 (1.24)		.796
Helplessness	2.69 (1.34)		.785
Distracted	1.82 (.94)	.542	
Need to talk	3.40 (1.24)	.590	
Need to be with others	3.30 (1.29)	.728	
Outrage	2.37 (1.26)		.612

Note. Only factor loadings larger than .30 are presented in the table. Mean and standard deviation for ratings on a scale of 1 to 5 with 1 being 'not at all' and 5 being 'extremely'.

4. Discussion

In this study memories of the BN were examined. Two main findings emerged. First, there was a unity in the way that the participants remembered the BN. Second, emotional reactions towards the event were mixed.

The majority of the participants experienced the BN similarly, i.e. they were at home with their family, and heard the news from the media (mostly via TV) on April 26th. The confidence ratings to the memories of the BN were high[45]. These results indicate that we can assume that if the memories of the BN were further examined then the presence of FBM could be found. However, as only a few of the respondents actually participated in the events personally, it follows that the memories were by and large constructed by observing different media channels.

Age had a small positive correlation with anxiety and aggressiveness; females were more anxious than males. Of the emotional reactions that were

[45] see **Talarico, Rubin** 2003.

most commonly felt, confusion, hatred and anger were the most predominate. Factor analysis indicates that there were two main emotional reactions: anxiety and aggressiveness. Thus the BN could be considered to be a traumatic event for people.

In other studies it has been found that people can experience a traumatic event not only as a victim, but also as a witness to certain events[46]. Conway et al. found that the initial emotional reaction to the terrorist attacks was comprised of two factors: anxiety and rage[47]. These results are consistent with the research of Lerner et al. [48], in that namely, they found that the fear response to the 9/11 attacks, was related to to the perception of a risk in the future, whereas the anger response was related more to a feeling of optimism about future events in the United States. Thus, as Conway et al.[49] state, it is possible that the participants who experienced a stronger anxiety/fear response after the attacks also perceived a greater risk in the future which may have resulted in more rehearsal and better memory performance[50].

The limitations of the study should be acknowledged. First, the participants in this study were from the Estonian-speaking community. It would be interesting to compare whether their memories differ from those of the Russian-speaking community. However, as there were only a few responses to our invitation to participate in the study among the Russian-speaking community, a comparative analysis was unfortunately not possible. The sample of this study was a convenience sample and not representative of the population of Estonia, especially in terms of gender and education due to the fact that (i) females and (ii) more persons with higher education responded the survey. Thus, the interpretation of the results and making generalisations to the general population should be made with care.

Second, due to the limitations in the study design, we cannot say that the formation of flashbulb memories have occurred. Although there are signs that a FBM could have been formed among the participants. However, much time has passed since the event and therefore we cannot be sure how much of the information about the BN comes from their original autobiographical memory. Also, as the term BN has been in everyday use for some time since

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[46] **Feinstein, A. & Owen, J. & Blair, N.** 2002. A hazardous profession: War, journalists and psychopathology. – The American Journal of Psychiatry, Vol. 159, No. 9, pp. 1570–1575.

[47] **Conway *et al***. 2009.

[48] **Lerner, J. S.; Gonzalez, R. M.; Small, D. A.; Fischoff, B**. 2003. Effects of fear and anger on perceived risks of terrorism: A national field experiment. – Psychological Science, Vol. 14, No. 2, pp. 144–150.

[49] **Conway *et al***. 2009.

[50] **Conway** 1995; **Er** 2003; **Finkenauer *et al.*** 1998.

the events happened, there may be an evaluative component for some people, which can affect the respondents' perception.

Finally, another factor which could have an effect on the formation of memories is the role of personal experiences. We know only vaguely that most of the participants in the study were not involved directly in the event and therefore their memories may have been influenced also by the format of the media that they received their information from.

Acknowledgements

The author wishes to thank Siim Sepper for helping to collect the data.

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