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Autobiographical memories for negative and positive events in war contexts

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ABSTRACT

The aim of the present study was to examine the phenomenological qualities of self-reported negative and positive memories. The study was conducted in the Gaza Strip, Palestine, and a total of 134 autobiographical memories about negative and positive events were analyzed using a version of the Phenomenological Questionnaire for Autobiographical Memory (Manzanero & López, 2007). Participants were university students, 80 percent were women and 20 percent were men. Results showed that negative memories are more confused, more complex, and decay more over time than positive ones. In contrast, no differences were found between positive and negative memories on sensory information, spatial location, vividness, definition, accessibility, fragmentation, recall perspective, doubts about the accuracy of the memory, and how much participants recovered and talked about the event. High Dimensional Visualization (HDV) graph revealed that there were individual differences between negative and positive memories but no consistent differences across participants.

Los recuerdos autobiográficos de los sucesos negativos y positivos en contextos bélicos

Palabras clave:
Memoria traumática
Emoción
Testimonio ocular
Guerra

RESUMEN

El objetivo del presente estudio fue evaluar mediante auto-informe las características fenomenológicas de los recuerdos negativos y positivos. El estudio se llevó a cabo en la Franja de Gaza, Palestina, y se analizaron un total de 134 recuerdos autobiográficos sobre eventos negativos y positivos utilizando una versión del Cuestionario de Características Fenomenológicas de Recuerdos Autobiográficos (Manzanero y López, 2007). Los participantes eran estudiantes universitarios, 80 por ciento mujeres y 20 por ciento hombres. Los resultados mostraron que los recuerdos negativos fueron más confusos, más complejos y más deteriorados que los positivos. Por el contrario, no se encontraron diferencias entre los recuerdos positivos y negativos en información sensorial, localización espacial, viveza, definición, accesibilidad, fragmentación, perspectiva de recuperación, dudas sobre la exactitud de la memoria y cantidad de veces que los participantes recuperaron y hablaron sobre el evento. El gráfico de Visualización Híper-Dimensional (HDV) muestra que existen diferencias individuales entre los recuerdos negativos y positivos, pero no hay diferencias consistentes entre los participantes

In a review of traumatic memories, Brewin (2007) proposed that the controversies relating to this type of memories could be summarized into four main contentious issues. First, whether these memories are different from other types of autobiographical memories. Second, whether traumatic memories are more or less

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accurate from memories for non-traumatic events. Third, whether these memories can be forgotten and remembered later in life and, finally, whether there are special mechanisms responsible for this forgetting, perhaps repression mechanisms. These controversies can be further divided into two main issues (Manzanero & Recio, 2012). The first one relates to the extent to which negative autobiographical memories are indeed different from other types of autobiographical memory in terms of either their characteristics or accuracy. The second relates to the accessibility of this kind of autobiographical memory.

In terms of accessibility, Porter and Birt (2001) found that memories for negative events are remembered more frequently than other autobiographical memories. In the few cases in which these episodes were forgotten (4.6%) this was due to a deliberate attempt not to recall the memory rather than having forgotten the memory, a finding that supports the suggestion that in those cases where memories for negative events are forgotten it is mainly due to *suppression* rather than *repression* (Ost, 2009; McNally, 2003). However, other research shows that some suppressed memories are not actually suppressed but they are the result of a meta-memory failure that leads participants to forget that they had recovered the autobiographical information previously (Woodworth et al., 2009) or because participants tend to forget prior recoveries of the event which produces the illusion of having had amnesic episodes (Geraerts, McNally, Jelicic, Merckelbach, & Raymaekers, 2008). In any case, it seems that memories of negative events are more affected by retrieval-induced forgetting than by the memories of positive events (Harris, Sharman, Barnier, & Moulds, 2010) and are easily implanted or distorted (Paz-Alonso & Goodman, 2008). Indeed, several studies show memories for negative events are more accessible than others and due to the frequency of recovery they are more susceptible to distortion, and therefore less accurate (Ost, Vrij, Costall, & Bull, 2002; Rubin, Boals, & Berntsen, 2008; Talarico & Rubin, 2003, 2007). Assessing whether negative memories are less accurate however is not as straightforward as it may seem. Research shows for instance that negative memories are characterized by higher accuracy for central details but less accuracy for peripheral details (Christianson, 1992; Schmidt, 2004).

Studies have used a range of questionnaires to examine phenomenological characteristics of emotional memories such as the Memory Characteristics Questionnaire (Johnson, Foley, Suengas, & Raye, 1988) or the Emotional Experiences Questionnaire (EEQ; Porter & Birt, 2001). These questionnaires allow the exploration of specific features of the memories such as vividness, fragmentation, doubts, amount of details, sensory information, etc. One of the first studies looking at phenomenological characteristics of memories for negative events (Tromp, Koss, Figueredo, & Tharan, 1995) concluded that these memories, compared to other types of memories, were less clear and vivid, less well remembered, more thought and talked about and had less visual detail. Byrne, Hyman, and Scott (2001) in contrast found that memories for negative events were only different in that they tend to be reported as having less sensory information.

Sotgiu and Mormont (2008) suggest that the presence of mixed evidence may relate to the different methodologies employed in each study. First, studies differ in the type of questionnaires used. Second, they differ in the samples employed, which go from psychology undergraduate students who have experienced few negative events to clinical populations with post-traumatic stress disorder (PTSD). Third, studies vary in the time elapsed since the event took place. It is therefore difficult to make direct comparisons between studies in order to explain contradictory findings.

One of the most important factors associated to memory is the stress that may be associated with the event. This is indicated by all those studies warning of its influence on memory (Kim & Diamond, 2002; McEwen, 2000). However, its effect on the memories of negative events is complex (Berliner, Hyman, Thomas, & Fitzgerald, 2003; Peace, Porter, & Brinke, 2007; Wagenaar & Groeneweg, 1990). Stressful traumatic experiences could produce the sensation of intense, vivid, and persistent memories. At the same time, stress produces a significant impairment of attention and memory processes. However, the experience of stress (and the development of PTSD) is not only a function of the characteristics of the event lived but how each person perceives and reacts to negative stimulus (Saigh, Yasik, Mitchell, & Abright, 2011), which in turn is based on different factors (King, King, Foy, Keane, & Fairbank, 1999; Nemeroff et al., 2006), such as resilience, which favor the ability to deploy coping strategies necessary for the person to respond to the negative stimulus without seriously disrupting their balance and therefore minimizing the effect on memory or attention. Studies have shown, for example, that child soldiers show different degrees of resilience, which was an indicator of absence of posttraumatic stress disorder, depression, and clinically significant emotional and behavioral problems (Klasen et al., 2010). Similarly, emotion regulation could play a role in emotional responses (Punamäki, Peltonen, Diab, & Qouta, 2014), which in turn would be the basis of differences between positive and negative memories.

In the present study we aimed to test one sample of university undergraduate students from the Gaza Strip in Palestine who are regularly subjected to negative experiences because they live in a prolonged war context and have, therefore, high levels of stress. The aim was to explore whether the phenomenological characteristics of the memories for negative and positive events differed. It was difficult to establish specific hypotheses *a priori* because, as mentioned above, most of the studies on traumatic or negative memories analyze unique events that take place in hardly comparable contexts.

Method

Participants

Participants were 114 students of the University of Al-Aqsa and the University of Al-Azhar in the Gaza Strip (Palestine). The research project was interrupted by the Israeli attacks on Gaza between December 2008 and January 2009, which partly destroyed the universities. For this reason 47 participants could not complete the study. To avoid biasing the results, only the data collected before December 2008 was included in the study. The final sample comprised 67 university students, 54 women (ages 17-36, mean age 22.32, $SD = 4.30$) and 13 men (ages 18-36, mean age 24.38, $SD = 5.23$).

Procedure

Following the procedure described by Johnson et al. (1988), participants were first asked to write a description of two personal past events, one negative and one positive, that happened at a similar time in their life. They were told negative events included traumatic, unpleasant events and positive events happy, pleasant memories that would have had important implications for them. For negative events they were told they could be events such as deaths, accidents, or aggressions. For positive events, weddings, births, or an important achievement could be considered. It was important that participants did not withhold information of the event for fear of embarrassment or judgment. Participants were therefore told explicitly that they would not have to hand these descriptions and that they served only as prompts to their memory. Once they completed the description of the event, participants filled in the questionnaire.

Table 1
Type of Events Reported for Positive and Negative Memories (as spectator/as active participant)

Negative Event		Positive Event	
Death	21 (1/20)	Birth	33 (4/29)
Aggression	11 (8/3)	Leisure	17 (1/16)
Separation	1 (1/0)	Wedding	9 (2/7)
Accident	26 (14/11)[a]	Work	1 (0/1)
War attacks	1 (0/1)	Other	7 (1/6)
Other	7 (3/4)		

[a] One participant did not answer type of implication.

Materials

In order to analyze the phenomenological characteristics of the memories, the Phenomenological Questionnaire for Autobiographical Memory (Manzanero & López, 2007) was used. This questionnaire is based on the Trauma Memory Quality Questionnaire by Meiser-Stedman, Smith, Yule, and Dalgleish (2007) and the Memory Characteristics Questionnaire developed by Johnson et al. (1988) (See Appendix 1 for an English translated version). This questionnaire comprises two sections. The first section contained eight questions asking information about the event, such as the duration, when and where the event took place, implications for the person, how significant it was for the participant, how strong their feelings were, whether feelings were positive or negative, and what was the role of the participant (spectator or active participant). The second section contained 28 questions about phenomenological characteristics of the memory, including sensory and temporal information, vividness, feelings and remembered thoughts, how detailed the memory was, etc.

The original questionnaire was translated from Spanish to Arabic by the fourth author. A pilot study conducted with 20 Palestinian participants to evaluate this translation revealed that all participants had difficulties understanding the bi-dimensional scales and therefore the questions and answer scales were revised. These revised version contained first, a 5-point rather than a 7-point scale and second, the same scale was used for all questions, with 1 being *totally disagree* and 5 *totally agree* rather than each question containing two different dimensions. As an example, to assess the familiarity of the place where the event took place in the original questionnaire the question was: "Was the general setting. . .?" and the answer 1 *unfamili*ar to 7 *familiar*. This question was changed to: "The place where the event took place was familiar" and the answer 1 *totally disagree* to 5 *totally agree*.

In addition to the changes to the format of the questionnaire, six questions were added to explore potential differences in negative and positive memories regarding temporal and spatial context and the presence of decay, fragmentation of recall, difficulty remembering important details, and amnesic episodes. Finally, the four questions regarding doubts, remembered thoughts, whether participants had told others about the event, and field/observer perspective were converted from a two-choice answer in the original questionnaire to a 5-point scale answer in the Arabic translation.

Results

All 67 participants completed two questionnaires (one for a positive memory and one for a negative memory), thus a total of 134 questionnaires were analyzed. For a breakdown of the type of events recalled see Table 1. Positive and negative events did not differ in terms of event duration, familiarity of the setting, when the event took place, nor in the significance it had for the participant (all $p > .05$). Both negative and positive events had taken place on average approximately 3 to 4 years before the testing (negative: $M = 4.51$, $SD = 5.01$; positive: $M = 3.37$, $SD = 3.76$; $t(66) = 1.39$, $p < .17$, $r = .127$). There was a significant difference in the proportion of positive and negative events reported in which the participants were either spectators or active participants, $\chi^2(1) = 14.39$, $p < .005$. As can be seen in Table 1, in 40.9% of the negative events, participants reported being active participants and in 59.1% of the cases they were spectators of the event. In contrast, in the majority of the positive events (88.1%) participants reported being an active participant with only an 11.9% of cases in which they were spectators. All analyses conducted on phenomenological characteristics were performed separately for the groups that reported being spectators or active participants. No significant differences were found and therefore analyses reported here include all participants.

There were significant differences in terms of emotional valence and the implications that the event had on the participants. Negative events were defined as having negative emotional valence (negative: $M = 1.41$, $SD = 0.63$; positive: $M = 4.64$, $SD = 0.54$; $t(66) = 31.06$, $p < .001$, $r = .940$). In addition, differences were found regarding the importance of the event, negative: $M = 3.37$, $SD = 1.70$; positive: $M = 4.70$, $SD = 0.67$; $t(66) = 5.87$, $p < .001$, $r = .458$, with data suggesting that positive events had greater importance than negative events and greater consequences, negative: $M = 3.94$, SD = 1.25; positive: $M = 4.37$, $SD = .69$; $t(66) = 2.45$, $p < .05$, $r = .208$. No differences were found for emotional intensity, negative: $M = 3.56$, $SD = 1.43$; positive: $M = 3.82$, $SD = 1.39$; $t(66) = 1.14$, $p < .258$, $r = .092$.

Some of the phenomenological dimensions considered in the study were evaluated in more than one question of the questionnaire used. For this reason, a category for Sensory Information was created by calculating the mean for answers to questions relating to color, smell, taste, visual, touch, and sound (questions 9 to 14). Questions 25 and 26 relating to previous and later associated events were also averaged into a category of Associated Events. Questions 15 and 16 both related to Vividness so an average was calculated for the two questions. Finally, questions 23 and 24 related to how accessible the memory was, so an average score was calculated to give information about Accessibility. Also the average was calculated for responses to questions asking whether the participant had talked (Q41) and thought (Q38) about the event and had relived the event (Q40). This composite score was termed Multiple Recovery. The remaining questions were considered individually as evaluating specific phenomenological dimensions. As multiple comparisons were conducted, the significance level was adjusted with a Bonferroni adjustment to .003. As shown, negative and positive memories did not differ in any of the variables except for complexity, confusion, and decay, with negative memories being more complex and more confused and decayed than positive ones.

In relation to recovery difficulties, the results of this study showed no significant effects of type of memory on amnesic episodes and accessibility. Only three negative memories (but also two positive memories) stated fully agreeing to the statement asking about the presence of amnesic episodes and 7 participants (5 for positives) agreed with this statement. The amnesic episodes reported, however, were not associated to difficulties accessing the memories. Of the three negative memories that reported total agreement with this statement, two (who witnessed a death) also reported total agreement with the statement regarding how easy it was to access the memory, and the remaining participant (who suffered an accident) stated that s/he could not remember the event easily but recovered the memory frequently (5 of 5). In the latter case it may be possible that the amnesic episode was a direct result of injures related to the accident.

Intuitive differences between negative and positive memories: High dimensional visualization

Informal reports from participants and clinical researchers suggest that there are distinct phenomenological experiences

associated to autobiographical memories for negative events (Porter & Birt, 2001) and that positive and negative memories are experienced very differently. The difference in phenomenological experience is even suggested to impact on the feeling of accuracy. For instance, Talarico and Rubin (2007) suggest that flashbulb memories for negative events are not more accurate, but *feel* more accurate. It is therefore difficult to explain the lack of differences found in the present study. In the next section we provide a tentative explanation not only for the inconsistencies found but also for those found in previous studies. Specifically, this study explores differences of memory characteristics for positive and negative events in each individual by using High Dimension Visualization (HDV), which allows the visual representation of all the variables simultaneously multiple variables to visualize the differences between the two types of statements (Manzanero, Alemany, Recio, Vallet, & Aróztegui, 2015; Manzanero, El-Astal, & Aróztegui, 2009). HDV facilitate graphic representations when having more than three variables by reducing dimensionality through multidimensional scaling to 3D (Buja et al., 2008; Steyvers, 2002). Sammon error compares the differences between the original distances between points, in the original hyperspace, and the distance of the new representing points in the 3D space. In addition, a cluster analysis was conducted to classify participants into two groups.

These analyses addressed two questions: 1) do positive and negative memories differ in terms of phenomenological characteristics? and 2) if they differ, is there a consistent pattern of this difference? When all the variables were considered in the HDV graph, it is not difficult to differentiate between the two types of memories (see Figure 1). In general, positive memories were grouped at the top of the chart and negative at the bottom. The answer to the first question is that positive and negative memories are indeed different. Moreover, the graphic representation linking negative and positive memories for each participant shows a clear difference between the two types of memories, although in different directions for each individual. This would explain why although the memory for the events is experienced differently by each individual, the differences cannot be detected at group level. There is an individual pattern of variation. So, as an answer to the second question, the HDV graphical representation suggests that there is a consistent pattern of difference but the patterns are not shared across individuals Table 2.

Sammon's error was quite high and suggests that 14% of the information was lost in the transformation from the original data to the high dimensional points. So, conclusions should be considered tentative.

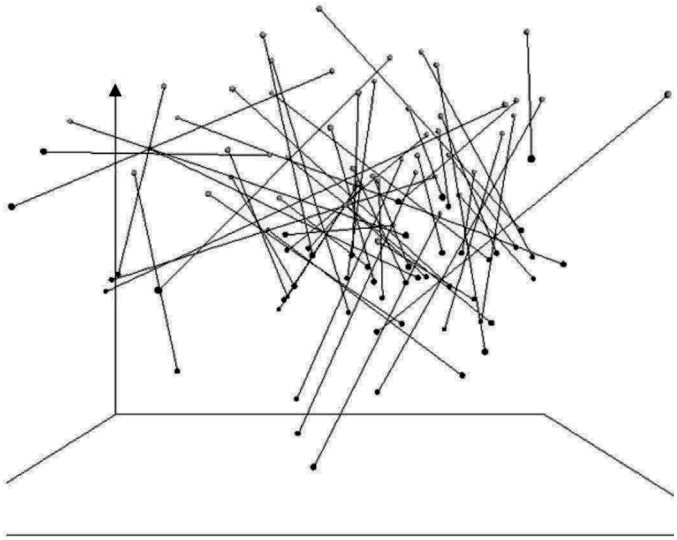

Figure 1. Within-participant Distance between Negative (dark dots) and Positive (light dots) Memories using a HDV Graph including All Variables. Sammon's error = .14.

A K-means cluster analysis was conducted to classify the two types of memories based on all the phenomenological characteristics considered. This analysis grouped 73 cases as cluster A and 61 as cluster B. When cluster A is considered equal to negative memories and B equal to positive memories, the negative memories were correctly classified in 52 cases (77.6% of total negative memories), while positive memories were correctly classified in 46 cases (68.7% of total positive memories).

Discussion

The within-subject pairwise comparisons showed that when individual phenomenological features were considered there were few differences between memories for positive and negative events (only confusion, complexity, and decay). One possible explanation for this result may relate to the high frequency of traumatic events experienced by this sample. It was expected that Palestinian participants would have higher degrees of trauma associated to the memories. In contrast, emotional valence, the degree of consequences, and the importance of the events for participants were not as high as predicted. In fact, Palestinian participants attributed less

Table 2
Means, Standard Deviation and *t* Values for Each Dependent Variable

	Negative	Positive	*t*(66)	*p*	Effect-size *r*
Vividness	4.16 (1.01)	4.38 (0.62)	0.87	.39	.130
Sensory information	2.97 (1.01)	3.06 (0.94)	0.65	.52	.046
Details	3.59 (1.55)	3.88 (1.52)	0.98	.33	.094
Confusion[a]	4.35 (1.06)	2.55 (1.45)	8.61	.001	.578
Complexity[a]	3.85 (1.31)	1.92 (1.03)	9.08	.001	.636
Remembered Thoughts	3.82 (1.39)	3.73 (1.21)	0.45	.49	.034
Accessibility	3.83 (1.08)	3.94 (0.86)	0.70	.05	.072
Amnesic episodes	2.07 (1.30)	1.85 (1.10)	1.78	.243	.090
Verbalisation	3.31 (1.55)	2.92 (1.42)	1.84	.07	.130
Associations	3.63 (1.18)	3.76 (1.07)	0.71	.48	.058
Decay[a]	2.83 (1.49)	2.07 (1.14)	3.49	.001	.275
Forgotten details	2.04 (1.18)	2.09 (1.13)	0.27	.79	.022
Doubts	2.12 (1.41)	1.90 (1.10)	1.25	.21	.087
Fragmentation	2.60 (1.53)	2.46 (1.33)	0.59	.56	.049
Temporal context	4.15 (1.05)	4.17 (0.88)	0.14	.89	.010
Spatial context	4.19 (1.25)	4.58 (1.53)	1.74	.09	.138
Multiple recovery	3.45 (1.16)	3.40 (0.94)	0.35	.73	.024
Perspective (Observer/Field)	3.10 (1.50)	2.88 (1.26)	1.22	.25	.079

[a] Significant at $p < .0003$ (Bonferroni adjustment for pairwaise comparisons).

importance to negative events (3.37) than to positive ones (4.70). This can be explained in terms of the circumstances surrounding the events experienced such as feedback about negativeness (Takarangi & Strange, 2010). As discussed in the introduction, the expected differences between negative and positive memories are mainly explained by its meaning, its importance to the person, and the associated emotions. Meaning and importance should make them more distinctive. The two factors had higher values in negative memories than in positive memories. No differences were observed with respect to the intensity of the emotions associated with the two types of memories. Perhaps the latter is responsible for not having found more differences between negative and positive memories.

In any case, the above arguments are not entirely correct. When the characteristic global patterns of the two different types of memory are considered, then we can see a clear difference between negative and positive memories. This difference can be seen in the HDV graph and cluster analysis, which takes into account the full set of features simultaneously. Also these clear differences are observed if we consider each participant separately. As shown in the HDV graph, the problem to establish patterns characteristic of each type of memory is that even in a virtual hyperspace positive memories are located at the top and the others at the bottom; these patterns vary in other directions even if there is substantial distance between them. Individual and cultural differences in temperament (Oakland, Callueng, Rizwan, & Aftab, 2012), resilience, or other variables could be responsible for these results, this is, resulting in an individual way of coding emotional experiences in memory. We share the ability to distinguish between positive and negative experiences. We differ in the way we experience and code emotional events in memory. Prolonged exposure of participants to negative situations could be responsible for an increase in their values of resilience. In any case, individual differences appear to be very important in this respect, as was seen in the HDV graph. More research on the influence resilience, prolonged exposure to negative situations, and other factors have on the characteristics of the memories would be necessary.

Conflict of Interest

The authors of this article declare no conflict of interest.

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Appendix 1. Translation to English of modified version of the *Phenomenological Questionnaire for Autobiographical Memory* (original in Arabic language)

Please, consider the following characteristics regarding the autobiographical memory you described earlier and circle the most appropriate answer.

1 = *totally disagree* 2 = *disagree* 3 = *neutral* 4 = *agree* 5 = *totally agree*

1. Age: 2. Sex:

Type of event

3. The event was:

An accident A Terrorist attack A death A relationship break up

Other (please state):

4. In this event I was:

Witness ☐

Participant ☐

5. How long was the event?

Seconds minutes hours months

years

6. Was the general setting familiar?

1 2 3 4 5

7. This event did have serious implications:

1 2 3 4 5

8. Feelings at the time were positive:

1 2 3 4 5

9. Feelings at the time were intense:

1 2 3 4 5

10. The event was very important to me:

1 2 3 4 5

11. At the time of the event I was _____ year old.

Memory characteristics

12. My memory for this event is clear:

1 2 3 4 5

13. My memory for this event is in color:

1 2 3 4 5

14. My memory for this event involves visual detail:

1 2 3 4 5

15. My memory for this event involves sound:

1 2 3 4 5

16. My memory for this event involves smell:

1 2 3 4 5

17. My memory for this event involves touch:

1 2 3 4 5

18. My memory for this event involves taste:

1 2 3 4 5

19. My memory for this event is vivid:

1 2 3 4 5

20. My memory for this event is detailed:
1 2 3 4 5
21. My memory for this event is fragmented:
1 2 3 4 5
22. The story line is confused:
1 2 3 4 5
23. The story line is complex:
1 2 3 4 5
24. My memory for the location where the event took place is clear/distinct:
1 2 3 4 5
25. My memory for the time when the event took place is clear/distinct:
1 2 3 4 5
26. I remember how I felt at the time when the event took place:
1 2 3 4 5
27. When I remember the event now, my feel is intense:
1 2 3 4 5
28. I remember clearly what I thought at the time:
1 2 3 4 5
29. My memory for this event is impaired:
1 2 3 4 5
30. Overall, I remember this event easily:
1 2 3 4 5
31. Some details or scenes of this event come into my memory automatically:
1 2 3 4 5
32. Some times, I have suffered amnesic episodes related with this event:
1 2 3 4 5
33. I cannot talk about what happened very easily:
1 2 3 4 5
34. I feel that I cannot remember important elements from this event:
1 2 3 4 5
35. I remember events relating to this memory that took place, in advance of the event:
1 2 3 4 5
36. I remember events relating to this memory that took place, after the event:
1 2 3 4 5
77. I have doubts about the accuracy of my memory for this event:
1 2 3 4 5
38. I have thought about this event since it happened,:
1 2 3 4 5
39. My memory of the event are like a film where I can see myself as an actor/actress:
1 2 3 4 5
40. I re-experience this event frequently
1 2 3 4 5
41. Since it happened, I have talked about this event frequently:
1 2 3 4 5

Note. For the positive event questionnaire, question number 3 was: weddings, births, meetings, important achievement, professional successful or other.

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