Revista Interamericana de Psicología/Interamerican Journal of Psychology - 2010, Vol. 44, Num. 3, pp. 467-474

Phenomenal Qualities of Autobiographical Memories in an Event-Cuing Paradigm

Gustavo Gauer[1]
William Barbosa Gomes
Federal University of Rio Grande do Sul, Porto Alegre, Brazil

Abstract

Phenomenal qualities of recollection and reflexive properties of freely recalled momentous personal events were investigated in 2 experiments. Brazilian undergraduates recalled and rated specific autobiographical episodes through the Autobiographical Memory Questionnaire. In Experiment 1, momentous events were compared to childhood and adolescence scenes. Experiment 2 used an event-cuing paradigm to form 3 pairs of cuing and respective cued events: momentous, earliest recollection, and an event from the subject's birthday last year. No significant differences were found within clusters, but all variables differed between momentous and earliest clusters, whereas only vivid event variables (importance, emotion, rehearsal, unusualness, and consequences) distinguished momentous events from last birthday. Momentous events were characterized in terms of reflexively attributed vivid memory properties, rather than of phenomenal qualities of recollection. Results are discussed in their implications for the relationship between phenomenal qualities of recollection and judgments of autobiographical events and patterns of association in event clusters.

Keywords: Autobiographical memory; Life experiences; Phenomenology; Imagery; Judgment.

Qualidades Fenomenais de Memórias Autobiográficas: Eventos como Pistas

Resumo

Investigou-se qualidades fenomenais e propriedades reflexivas de eventos marcantes recordados por estudantes universitários. O instrumento utilizado foi o Questionário de Memória Autobiográfica. No Experimento 1, eventos marcantes foram comparados a cenas de infância e adolescência. No Experimento 2 os participantes recordaram 3 pares de eventos: marcante, primeira lembrança infantil, evento ocorrido no último aniversário, e eventos respectivamente relacionados. Não houve diferenças significativas entre eventos-pista e eventos relacionados. Na comparação entre os pares, todos os itens do questionário diferenciaram eventos marcantes das primeiras lembranças infantis, mas apenas propriedades reflexivas (importância, intensidade emocional, ensaio, raridade, e consequências) distinguiram eventos marcantes de lembranças do último aniversário. O que diferencia eventos percebidos como pessoalmente marcantes são propriedades de memórias vívidas, atribuídas de forma reflexiva. Os resultados são discutidos em suas implicações para a relação entre qualidades fenomenais e julgamentos reflexivos de relevância de eventos pessoais, e padrões de associação de eventos autobiográficos.

Palavras-chave: Memória autobiográfica; Eventos de vida; Fenomenologia; Imaginação; Julgamento.

Not all personally experienced occurrences leave enduring and consistent traces in our memory. Only some events produce long-lasting, vividly recalled memories (McGaugh, 2003). Those vivid memories tend to be personally important, frequently rehearsed, and easily recalled (Rubin & Kozin, 1984). They have been shown to form associative links with other memories, producing clusters in the organization of autobiographical memory (Brown & Schopflocher, 1998a; Singer & Salovey, 1993). The functions of such vivid memories may have to do with enhancing learning from single instance experiences, especially emotional or stressful ones (McGaugh, 2003). Effective access to information about such events might be relevant for the economy of the personality, and serve directive functions – they influence current behavior and help the subject to solve current problems (Pillemer, 2003). For instance, recall of momentous events can help the individual solve present problems when situations are similar those experienced in the past. Moreover, memories individuals pinpoint as benchmarks in the timelines of their lives help them organize their life records and allow individuals to represent who they are (Elnick, Margrett, Fitzgerald, & Labouvie-Vief, 1999). For example, subjects would include only some of their memories in the book

[1] Address: Universidade Federal do Rio Grande do Sul, Instituto de Psicologia, Departamento de Psicologia do Desenvolvimento e da Personalidade, Rua Ramiro Barcelos, 2600, sala 123, Santa Cecília, Porto Alegre, RS, Brazil, CEP 90035-003. *E-mail*: gusgauer@gmail.com

of their lives, and even fewer of them would deserve a full chapter in the opus.

In order to account for the psychology of vivid memories we have of momentous events, one should consider them both in their aspects that are common to other autobiographical phenomena, and in the unique features that distinguish them as a separate class. We view the ability to recollect momentous events and other autobiographical memories as the composite products of various cognitive processes (Greenberg & Rubin, 2003). Autobiographical memory is a particular form of gaining knowledge of past events, and incorporates processes such as consciousness (phenomenal sense of recollection), memory (declarative, episodic recall), and reasoning (judgment processes, both heuristic and systematic) (Gauer & Gomes, 2007). Evidence has been presented that heuristic judgments of reality and source of memories rely on qualities such as vividness of imagery, reinstatement of emotions from the original event, and fluency of recall (Johnson, Hashtroudi, & Lindsay, 1993). However, the relationship between phenomenal qualities and systematic, or reflexive judgments of memories and events, that is, judgments based on more extended reasoning , have not yet been probed.

Personal relevance is here examined as a property attributed to personal events by means of reflexive or metacognitive judgment processes (Rubin & Siegler, 2004). Those judgment processes are considered to be similar to what has been called systematic judgments, as they are opposed to heuristic ones. For example, importance judgments have shown to be closely related to other properties, such as emotional intensity and consequentiality (McGaugh, 2003). In that sense, momentous events are essentially judged as such, and those judgments would not necessarily be impacted in the same way as source-monitoring judgments are influenced by phenomenal qualities. However, still there might be significant correlations, and those can prove useful in understanding momentous event memories.

The fact that some unique events are remembered vividly, after long delays, and usually accompanied by high emotionality, is well documented (see McGaugh, 2003, for a review). Many current models and frameworks in the literature on recollection and reminiscence have described functions and characteristics of important personal memories. Those memories have been defined as benchmark memories (Elnick et al., 1999), vivid memories (Rubin & Kozin, 1984), personal flashbulb memories (Thomsen & Berntsen, 2003), self-defining memories (Singer & Salovey, 1993), or momentous events (Pillemer, 2003). However, few models have addressed the relationship between phenomenal aspects of recollection, such as vividness of imagery and emotions at recall, and the attribution of properties to events through judgments, personal relevance among them.

Recollection of momentous episodes elicits memories that are to be seen in the present study as personal versions of flashbulb memories (Brown & Kulik, 1977/2000), that is, memories vivid and rich in contextual details regarding the subject's circumstances during the original event (Thomsen & Berntsen, 2003). However, momentous event memories encompass more than phenomenally vivid episodic recall of specific episodes. Rubin and Kozin (1984) highlighted the role of personal importance in the making of such vivid memories. Furthermore, pinpointing one event as important before a myriad of personal events one potentially has the memory of necessarily involves judgment processes, heuristic and systematic (Johnson et al., 1993; Mitchell & Johnson, 2009). It can also be argued that momentousness is related to principles of organization of events in autobiographical memory in that it grants certain events with particular relevance in individuals' life stories (Elnick et al., 1999)

Besides the phenomenal features of recollection and the judgment processes that characterize them, momentous event memories play a distinct role in the organization of autobiographical memory. They have been shown to form clusters, in the sense that they are associated to other specific events in narrative-like form (Brown, 2005; Brown & Schopflocher, 1998b). In a related conceptualization, association with similar events has been described as a key feature of self-defining memories (Singer & Salovey, 1993). Nevertheless, it has not been as yet inquired if momentous events will form clusters in a different pattern than other personal memories would.

Brewer (1986) compared flashbulb memories and personal memories, concluding that they are not two separate forms of memory, for most personal memories would score high on flashbulb characteristics. Vivid memories, or flashbulb memories, consist of the well documented and thoroughly debated phenomenon of having highly vivid, long lasting memories of the circumstances of receiving important news and experiencing important events (McGaugh, 2003). The importance of such events may be related to their collective relevance (Brown & Kulik, 1977/2000), or personal significance (Rubin & Kozin, 1984). The vivid memory phenomenon was operationalized by Thomsen and Berntsen (2003) into a group of seven characteristics, derived from Brown and Kulik's work: (a) vividness and (b) presence of details in the memory; (c) personal importance, (d) unusualness, (e) emotionality, and (f) perceived consequences of the event; and (g) amount rehearsal of the event memory in thought and conversation.

Flashbulb characteristics include several properties the subject attributes to the event or memory: importance; rehearsal (thought and talked); emotions; personal consequences; and unusualness (Thomsen & Berntsen,

2003). McGaugh (2003) accounted for long-lasting vivid memories in a framework that integrates flashbulb variables and posits emotional intensity as the key feature in consolidating such memories. The main sets of data on which that framework rests include the following evidences: unusual events that generate emotional or stress responses are better remembered; they generate stronger, more vivid, longer-lasting memories; consequentiality is highly correlated with personal significance; and there is little evidence that rehearsal is a critical factor for making lingering flashbulb memories, but it is so for personal consequences and emotional intensity as event attributes.

The experiments here reported primarily addressed the general question of how and to what amount momentous event memories differ from other personal event memories in subjective ratings of recollective experience qualities. Secondarily, we asked whether ratings of momentous events cue related events in a way different from other events, thus showing specific aspects as to how they form event clusters, and if the clusters they form with related events are to some extent coherent as to those phenomenal ratings, that is, if the cued memories are more similar in phenomenal ratings to their cues than to the other cued memories elicited by other events.

The experiments were designed in order to investigate which variables (i.e., subjective ratings of memories and of events) distinguish momentous events from other types of events having the basic hypothesis around the flashbulb group of items and its relation to task constraints like time, place, and context. Freely recalled momentous events from any time of the subjects' lives are the least constrained task we presented subjects with. However, such a task is supposed to prompt the individual for metacognitive judgment processes (Gauer & Gomes, 2008), both in choosing one event that is important before the myriads of personal events of his personal history, and in having to use some criteria for making that judgment, such as emotional impact or personal consequences he currently attributes to the event. Experiment 1 compared momentous events to other, more or less recent, probably less personally significant personal events, in a number of subjective ratings of phenomenal qualities, component processes, and reported properties of events. The main hypothesis is that the properties that will most regularly distinguish momentous events across experiments are the flashbulb characteristics. Experiment 2 used a simplified event-cuing paradigm (Brown & Schopflocher, 1998a, 1998b). The rationale is based on the self-defining memories literature argument that defining features of such personally important memories is that they link themselves to other, similar memories. We thus ask if that similarity encompasses phenomenal qualities and flashbulb ratings. Put another way, the question might be if a momentous event cluster (i.e., the pair of momentous event and its related event) will still differ from other events when clustered with other, associated events.

Experiment 1: Childhood, Adolescence, and Momentous Event Memories

We asked subjects for three personal memories: one of a momentous event from any time of their lives, one from a scene of their childhood, and one from a scene of their adolescence. The hypothesis that motivated those tasks is that first, whereas childhood events would engage the individual in a source monitoring effort that uses imagery information to rate recollection attributes, momentous events would trigger flashbulb judgments. On the other hand, momentous events would present more vivid images since they are usually more recent. Adolescence events, in this early adult sample, would be closer in time to momentous events, and not as remote as childhood events. Thus, they were expected to present more vividness of imagery than childhood events, but still rating lower than momentous events in flashbulb characteristics. The earliest recollection task should motivate reality monitoring judgments more challenging than those prompted by the childhood scenes task, with less vivid imagery and higher uncertainty regarding recollection features. The birthday event task, on the other hand, was expected to cue more recent, easily recollected, but less personally important events.

Method

Participants

Forty-nine Brazilian undergraduate students took part in the experiment. All participants were enrolled in psychology introductory courses at a private university situated in the Greater Porto Alegre area. Thirty-four of the participants were women (69.4%). Mean age was 23.7 (SD = 7.5), ranging from 17 to 48.

Materials and Procedure

We used a version of the Autobiographical Memory Questionnaire ([AMQ], Rubin, Schrauf, & Greenberg, 2003) consisting of 19 items. It has been translated and adapted by Gauer and Gomes (2008). Eighteen items had the form of statements regarding phenomenal characteristics, component processes and reported properties of events, followed by seven-point scales. The last two items referred to time of event and memory specificity. For the momentous event task, the date item asked the subject to date the event as accurately as he could; for the childhood and adolescence scenes tasks, the subjects' age at the event was asked. The specificity item asked the subject to indicate if the memory referred

to: (a) an event that happened once in a particular time and place, (b) a merge of similar events, or (c) events that happened through a period longer than one day. The AMQ items used by Rubin et al. (2003) were translated to Portuguese by the first author, and back-translated by a bilingual research assistant. Few inconsistencies comparing to the English original version were found, and those were discussed and resolved by both researchers.

In their classroom, subjects were invited to take part voluntarily in a study about the memory we have of personal events from our lives. Those who agreed to participate received a booklet and signed the informed consent form on the cover. They were instructed on what are specific autobiographical events and on how to respond to the scales on the AMQ. The booklet asked them to recall three autobiographical events: a momentous event from any time of their lives, a scene from their childhood, and a scene from their adolescence. For each event, they should provide a short one-line header and fill out the subsequent AMQ items. Half of the participants received a booklet with instructions to recall events in the above order, and for the other half the two last instructions (scenes from childhood and adolescence respectively) were presented in the reverse order. Mean scores for each AMQ scale were compared between the three tasks (momentous, childhood, adolescence) through *ANOVA* followed by post-hoc comparisons through the *Tukey HSD* test. A significance level of $p < .05$ was considered in all analyses.

Results and Discussion

Three AMQ items showed significant differences at the .01 level: important ($F = 7.46$), emotionally intense ($F = 5.02$), and talked ($F = 5.02$). The first two means were higher for the momentous event, while the mean for talked was higher in the adolescence event. Three other means were significantly different at the .05 level: coherent ($F = 3.55$), remember ($F = 3.83$), and thought ($F = 3.57$). Coherent and remember were higher for the momentous event, while thought was higher for the adolescence event. Throughout the questionnaire, the lowest means were those of the childhood scene, except for unusual, although there is no significant difference between means at that item.

A *Cross-tabulation* between event specificity (once, merge, extended) and task (momentous, childhood, adolescence) did not yield a significant chi-square value, nor did it between specificity and subjects' sex. Table 1 shows means and standard errors on the AMQ variables

Table 1
ANOVA and Post-Hoc Tests with Mean Scores and Standard Errors on AMQ Items by Task

	Momentous		*Childhood*		*Adolescence*	
Variable	*Mean (SE)*	*Post-hoc*	*Mean (SE)*	*Post-hoc*	*Mean (SE)*	*F (2.139)*
Relive	5.47 (.24)		4.77 (.25)	*	5.65 (.20)	3.969*
Hear	5.27 (.23)	*	4.39 (.26)	*	5.31 (.22)	4.495*
See	6.29 (.14)		5.66 (.19)		6.00 (.20)	2.932
Talking	5.27 (.27)	*	4.30 (.29)		5.00 (.26)	3.340*
Spatial	5.61 (.22)		4.93 (.29)	*	5.71 (.22)	3.015
Emotions	5.40 (.29)		4.93 (.31)	*	5.92 (.22)	3.299*
Setting	6.79 (.07)	*	6.27 (.18)		6.45 (.17)	3.052*
Remember	6.24 (.16)		6.11 (.20)		6.35 (.16)	0.434
In words	5.33 (.29)		4.55 (.28)		5.12 (.27)	2.004
Back in time	5.45 (.29)		4.80 (.28)		5.57 (.24)	2.303
Story	5.21 (.29)		4.77 (.30)	*	5.86 (.24)	3.892*
Happened	6.78 (.08)	**	6.19 (.17)		6.62 (.14)	5.176**
Important	6.37 (.19)	**	5.00 (.29)	**	6.06 (.24)	8.837**
Thought	5.63 (.23)	**	4.59 (.26)		5.58 (.21)	6.193**
Talked	4.86 (.29)	*	3.91 (.30)	**	5.27 (.25)	5.988**
Emotional event	6.12 (.20)	**	5.09 (.28)	**	6.10 (.19)	6.852**
Consequences	5.90 (.22)	*	5.27 (.27)		6.12 (.22)	3.385**
Unusual	4.65 (.24)		4.66 (.33)		4.81 (.30)	0.097
Says about me	4.82 (.31)		4.18 (.33)		4.65 (.31)	1.048

Note. Overall *F* test significant differences in bold; pairwise post-hoc tests between tasks by Tukey's HSD adjustment; *=significant at the .05 level **=significant at the .01 level.

and respective *ANOVA* results by task, as well as the significance of pairwise post-hoc comparisons. Significant differences in the overall *ANOVA* test were found for the variables relive, hear, talking, emotions, setting, and story at the .05 level, and for happened, important, thought, talked, emotional event, and consequences at the .01 level. Those variables were further analyzed through pairwise, post-hoc comparisons using *Tukey HSD*. No significant differences were found in post-hoc tests between momentous events and scenes from adolescence.

Significant differences between momentous and childhood events in the variables hear, talking, setting, talked and consequences at the .05 level, and in variables happened, important, thought, and emotional event at the .01 level. Significant differences were found in the comparison between adolescence and childhood scene events at the variables relive, hear, spatial, emotions, story ($p < .05$), important, talked and emotional event ($p < .01$). The overall ANOVA results showed that some AMQ items concerning phenomenality and cognitive processes differentiated between the three tasks. However, the most substantial differences, significant at the .01 level, were predominantly reflexive properties. Moreover, the post-hoc analyses showed that all but one of the reflexive properties variables distinguished between momentous events and childhood scenes, whereas fewer of them did that in the comparison of adolescence to childhood scenes. Those results indicate a key role for reflexive properties of events as characteristics of momentous event memories.

Experiment 2: Momentous Event Memories as Cues for Recall

Brown and Schopflocher (1998a, 1998b) operationalized the principle by which memories of specific events are associated to each other as event clusters. Such clusters are independent from, but modifiable by narrative processing (as in telling the memory to others). An event cluster is a "memory structure that organizes information about a set of causally and thematically related events". Events in a cluster would be like episodes in a story: causally related, temporally proximate, and similar in content. Memorable personal events are embedded (Neisser, 1986) in event clusters. Brown and Schopflocher's original event cuing paradigm comprises five tasks. In the task, event-generation, the subject creates a set of personal events (cuing events) from word-cues or from choosing significant personal events. The event-cuing task prompts subjects to recall one personal event (cued event) from each cuing event. The third, relation-coding task, asks the participant to answer (yes or no) if the events in a given pair involved the same people, same activity, same location, if one event caused the other, if one was a part of the other, if both events were part of the same broader story, or other kind of relation. The fourth task consists of estimating a date for each event, and in the last task the subject rates the importance of each event. In this study, we used a simplified event-cuing design in which one autobiographical memory would be the cue for the subject to recall a second one, related to it in any fashion.

It was expected that momentous events will differ from other events in the properties subjects attribute to them, and not necessarily in the phenomenal characteristics and component processes related to the presently produced memory itself. We also expected that memories of momentous events will be comparable to what have been called self-defining memories (McLean & Thorne, 2003; Singer & Salovey, 1993). One of the features of self-defining memories is that they are linked to other memories (Singer & Salovey, 1993). Brown and Schopflocher (1998a) posit that autobiographical memories are organized in clusters and thus that one memory will cue another of the same cluster if the first one is important.

Three research questions guided this experiment: (a) How do cuing and cued events differ in ratings of phenomenal qualities and reported properties? (b) Do the possible effects of cuing vary when we compare types of cuing events? and (c) Do events related to momentous ones show lower ratings than their cuing events?

Method

Participants

Forty-two undergraduate students, of whom 31 (73.8%) were women, whith a mean age of 20.2 (SD = 2.9), took part in the study. All participants were psychology majors at the Federal University of Rio Grande do Sul in Porto Alegre, RS, Brazil.

Materials and Procedure

In their own classroom, participants were invited to take part as volunteers in a research project on human memory. All of the students invited agreed to participate, and signed an informed consent form. Each participant was given a booklet that asked him to recall and give a short header to six autobiographical events: one momentous event from his life; one event related in any way to the momentous one; his earliest childhood recollection; one event related in any way to it; any event happened at his birthday last year; and one event related in any way to it. The pairs formed by one event and its related counterpart were analyzed as three clusters: momentous, earliest and birthday. Mean scores for each scale were compared between the six types of events separately; between the three clusters by collapsing data from each pair of cuing and cued events; and between

cuing and cued events by collapsing the respective events from the clusters. In a second phase of analysis we subtracted the scores of the cued events from the cuing events in the respective clusters. Those differences were then compared between clusters and the results showed whether momentous events would cue related events with significantly lower scores in most variables, as would be expected.

The booklet for this study was similar to the one used in Experiment 1, now asking for six events. However, in this booklet, the date item for all six tasks asked subjects to provide the most precise date they could attribute to that event, or the middle of the period in case the event extended for more than one day. The AMQ items for this study comprised most of the variables from the first one, but some items are specific to each study. The order of the six events was the same for all participants: momentous and related event, earliest childhood recollection and related event, and event from birthday last year and related event.

Results and Discussion

Mean age of the memories (period between the estimated date of the event and the time date were collected) was 293.9 days (*SD*=108.2). The age of the momentous events showed a high variability, with a standard deviation of 1138.8 days for a mean of 747.1 days. Crosstabulation between specificity and clusters showed a chi-square value of 19.62, significant at the $p < .01$ level. All the scales presented higher means for the momentous cluster. The comparison of means shows significant differences between the momentous and the birthday clusters mainly in the scales referent to reported properties of events – important ($F = 45.14$), thought ($F = 50.82$), talked ($F = 29.03$), emotionally intense ($F = 42.98$), conse-quences ($F = 72.74$), unusual ($F = 22.23$), unexpected ($F = 6.95$), common ($F = 20.58$) and changed importance ($F = 5.79$). Note that six of those properties are charac-teristics of the phenomenology-based operationalization of personal flashbulb memories (Thomsen & Berntsen, 2003): important, thought or talked, emotionally intense, consequences, and unusual. The only cognitive compo-nent process of autobiographical memory that showed significant difference in the scale was re-experiencing the emotions of the original event ($F = 4.87$).

Table 2 shows the means and standard errors of the six separate tasks on AMQ items referring to phenomenal qualities, emotion and reflexive judgments. Means for cuing events did not differ significantly from cued events in all three clusters in any of the variables, so the overall *ANOVA* results on Table 2 are from comparing means between the three event clusters – momentous, earliest, and birthday – computed cuing and cued events, and significance of post-hoc pairwise comparisons (*Dunnett's T*) between momentous events and the other two clusters. The overall ANOVA between the three clusters yielded significant results in all AMQ variables at the .05 or .01 levels. Post-hoc analyses found significant differences between the momentous event and birthday clusters showed significant differences in the variables important, thought, talked, emotional event, consequences, and unusual.

One further post-hoc analysis was done between the cuing momentous event and all others types of events

Table 2
ANOVA and Post-Hoc Analyses by Cluster, with Mean Scores and Standard Errors on AMQ Items, by Task

	Earliest recollection			*Momentous event*			*Birthday last year*		
	Cuing	*Cued*		*Cuing*	*Cued*		*Cuing*	*Cued*	
Variable	*Mean (SE)*	*Mean (SE)*	*Post-hoc*	*Mean (SE)*	*Mean (SE)*	*Post-hoc*	*Mean (SE)*	*Mean (SE)*	*F (2,236)*
Relive	3.38 (.26)	3.69 (.29)	*	4.85 (.26)	5.05 (.30)		4.38 (.32)	5.07 (.28)	13.936*
Back in time	3.30 (.31)	3.77 (.33)	*	4.90 (.27)	4.68 (.28)		4.48 (.31)	4.72 (.30)	10.142*
Remember	4.65 (.31)	4.31 (.34)	*	6.25 (.21)	5.90 (.29)		5.41 (.34)	6.13 (.22)	16.832*
Happened	4.43 (.24)	4.69 (.25)	*	6.35 (.13)	5.82 (.24)		5.97 (.23)	5.98 (.20)	30.422*
Emotions	2.63 (.29)	3.28 (.32)	*	4.75 (.25)	4.82 (.29)		3.97 (.34)	4.30 (.27)	20.036*
Important	3.45 (.29)	3.74 (.35)	*	6.25 (.20)	5.17 (.28)	*	3.55 (.28)	4.08 (.30)	32.190*
Thought	3.68 (.26)	3.95 (.27)	*	6.03 (.23)	5.28 (.26)	*	3.40 (.27)	3.93 (.31)	33.878*
Talked	3.13 (.27)	3.08 (.28)	*	5.50 (.28)	4.58 (.30)	*	3.00 (.28)	3.88 (.32)	24.872*
Emotional event	3.43 (.32)	3.95 (.37)	*	6.42 (.19)	5.43 (.28)	*	3.90 (.31)	4.15 (.32)	31.241*
Consequences	3.35 (.34)	3.64 (.32)	*	6.32 (.23)	5.88 (.25)	*	2.90 (.29)	4.15 (.36)	47.526*
Unusual	2.88 (.33)	3.10 (.33)	*	5.50 (.25)	4.45 (.36)	*	2.95 (.34)	3.95 (.28)	20.660*

Note: Overall *ANOVA* by cluster, means collapsed between cuing and cued events; pairwise post-hoc comparisons using *Dunnett's T*, with momentous event as control category; * significant at the $p < .01$ level.

separately. The cuing momentous events differed significantly, at the .05 level, in all AMQ items, from both events in the earliest cluster, but when compared to cuing and cued events in the birthday cluster, significant differences at the .05 level were found only at the personal flashbulb variables: important, thought, talked, consequences, emotional event, and unusual. Although there was no significant difference between cuing and cued events in any of the tasks, nor across tasks, there was a noticeable pattern that discerned the kinds of tasks. Figure 1 shows the result of subtracting the scores on cued events from the scores on the cuing events for the three tasks, for the reflexive judgments variables. It shows a somewhat clear pattern, all differences in the momentous event task being positive, birthday differences negative, and earliest recollection differences close to zero, some positive, some negative. In that graphic representation, positive values indicate that scores of the cuing event in the task were higher that those of the cued event, negative values meaning the opposite. Therefore, momentous events typically cued related events that were rated as less important, less rehearsed, less emotional, less unusual, and less consequential. On the other hand, in the birthday task, in which the cuing event could be of variable personal importance, subjects generally recollected a related event of higher rating on those variables.

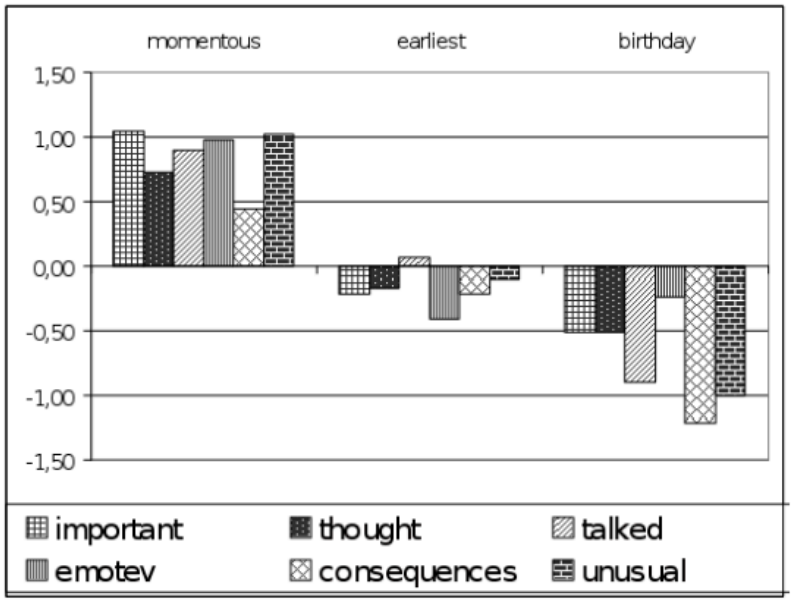

Figure 1. Mean differences in flashbulb properties scores between cuing and cued events within event clusters.

Although the cuing-cued subtractions did not present significant differences, we highlight the stability across variables within the groups of processes. Ultimately, it would be fair to expect that, if one computed the individual variables scores into three indexes corresponding to the dimensions of the component processes framework – recollection, cognitive processes, and reported properties – comparing the sums of those subtractions as separate dimensions would yield statistically significant differences.

General Discussion

Results showed that (a) throughout the experiments, marked differences from momentous events to other types of personal events, especially in respect to properties of reflexive judgments, not that much for phenomenal qualities; and (b) in the clustering experiment, a specific pattern of clustering to momentous events in comparison to earliest childhood recollections and memories for event happened at birthday last year.

Not only momentous event memories differ significantly from other types of event-memories in their respective phenomenal qualities as rated by the subject, but they also present a different pattern of clustering. They tend to be in the center of clusters. That holds both when momentous events are the cuing stimulus, followed by less relevant cued memories, and when less distinctive memories are the cue, in which case they tend to cue a more distinctive memory, expectedly of an event characterized as momentous.

Momentous events are often interpreted as a separate kind of autobiographical memory representation. However, the same might be claimed of any other type of personal event. One must compare personal to public events, for instance, and special types of relevant personal events,

such as activities and news. Furthermore, our results support the strategy of investigating autobiographical memories in their phenomenal qualities as recollective experiences and in the properties subjects attribute to events. From the pattern of results discussed above and from other studies, it is fair to assert that what has differentiated momentous events are mostly the properties attributed to the events. Noticing that the properties we have addressed are those of flash-bulb memories. Nonetheless, if momentous events are personal flashbulbs, they do not necessarily present higher imagery and phenomenal senses of belief and recollection as would be expected in confidence-based operationalization of flashbulbs (Thomsen & Berntsen, 2003).

In this study we attempted to investigate what has been taken as one particular kind of autobiographical memory, although with different operationalizations, that is, momentous event memories. However, that view implies a taxonomy of memories in which momentous events would form a distinct class from, say, vivid events, daytime events, events at the cafeteria, and so forth. That sort of classification might not be possible or desirable as a means for explaining autobiographical memory, since the amount of particular kinds of events would be overwhelming, as would be the number of criteria for classification. We argue that momentous event memories form a separate category mainly when they respond to specific tasks, forming a taxonomy on the empirical level, momentousness being a variable specified by a series of attributes any memory might be presented with to, or be granted with by, the remembering individual. According to this view, at the empirical level, discerning different kinds of events is process more closely related to judgment processes than to the more immediate, phenomenal and cognitive components of autobiographical remembering. Furthermore, recollective experience can in that way be taken as a unitary general phenomenon of which a number of qualitative and quantitative variants can be established, including their assignment to post hoc categories.

Two main limitations to the interpretability of results of the present studies can be advanced. First, it must be Experiment 1 presented subjects with very unconstrained tasks. More control over factors such as time and life domain may be welcome in future studies Second, the clustering experiment did not control for type of connection between cuing and cued events. As a possible influence on the process of event-cuing, future studies might add to the paradigm some form of control over type of association, be it in the form of a questionnaire item, or of an orientation in the own task to cue events by a specific rule of association.

References

Brewer, W. F. (1986). What is autobiographical memory? In D. C. Rubin (Ed.), *Autobiographical memory* (pp. 25-49). Cambridge, MA: Cambridge University Press.

Brown, N. R. (2005). On the prevalence of event clusters in autobiographical memory. *Social Cognition, 23*(1), 35-69.

Brown, N. R., & Schopflocher, D. (1998a). Event clusters: An organization of personal events in autobiographical memory. *Psychological Science, 9*(6), 470-475.

Brown, N. R., & Schopflocher, D. (1998b). Event cuing, event clusters, and the temporal distribution of autobiographical memories. *Applied Cognitive Psychology, 12,* 305-319.

Brown, R., & Kulik, J. (2000). Flashbulb memories. In U. Neisser & I. E. Hyman (Eds.), *Memory observed: Remembering in natural contexts* (pp. 50-65). New York: Worth Publishers. (Original work published 1977)

Elnick, A. B., Margrett, J. A., Fitzgerald, J. M., & Labouvie-Vief, G. (1999). Benchmark memories in adulthood: Central domains and predictors of their frequency. *Journal of Adult Development, 6*(1), 45-59.

Gauer, G., & Gomes, W. B. (2007). Memória autobiográfica. In A. A. Oliveira (Ed.), *Memória: Cognição e comportamento* (pp. 139-164). São Paulo, SP: Casa do Psicólogo.

Gauer, G., & Gomes, W. B. (2008). Recordação de eventos pessoais: Memória autobiográfica, consciência e julgamento. *Psicologia: Teoria e Pesquisa, 24*(4), 507-514.

Greenberg, D. L., & Rubin, D. C. (2003). The Neuropsychology of autobiographical memory. *Cortex, 39*, 687-728.

Johnson, M. K., Hashtroudi, S., & Linsay, D. S. (1993). Source monitoring. *Psychological Bulletin, 114*(1), 3-28.

McGaugh, J. L. (2003). *Memory and emotion: The making of lasting memories*. London: Weidenfield & Nicolson.

McLean, K. C., & Thorne, A. (2003). Adolescents' self-defining memories about relationships. *Developmental Psychology, 39,* 635-645.

Mitchell, K. J., & Johnson, M. K. (2009). Source monitoring 15 years later: What have we learned from fMRI about the neural mechanisms of source memory?. *Psychological Bulletin, 135*(4), 638-677.

Neisser, U. (1986). Nested structure in autobiographical memory. In D. C. Rubin (Ed.),. *Autobiographical memory* (pp. 71-81). New York: Cambridge University Press.

Pillemer, D. B. (2003). Directive functions of autobiographical memory: The guiding power of the specific episode. *Memory, 11*(2), 193-202.

Rubin, D. C., & Kozin, M. (1984). Vivid memories. *Cognition, 16*(1), 81-95.

Rubin, D. C., Schrauf, R. W., & Greenberg, D. L. (2003). Belief and recollection of autobiographical memories. *Memory & Cognition, 31*(6), 887-901.

Rubin, D. C., & Siegler, I. C. (2004). Facets of personality and the phenomenology of autobiographical memory. *Applied Cognitive Psychology, 18*, 913-930.

Singer, J. A., & Salovey, P. (1993). *The remembered self: Emotion and memory in personality*. New York: Free Press.

Thomsen, D. K., & Berntsen, D. (2003). Snapshots from therapy: Exploring operationalisations and ways of studying flashbulb memories for private events. *Memory, 11*(6), 559-570.

Received 15/12/2009
Accepted 04/02/2010

Gustavo Gauer. Federal University of Rio Grande do Sul, Porto Alegre, Brazil.
William Barbosa Gomes. Federal University of Rio Grande do Sul, Porto Alegre, Brazil.