

Running head: PROJECTING ONESELF INTO THE PAST AND INTO THE FUTURE

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Phenomenal Characteristics Associated with Projecting Oneself Back into the Past and  
Forward into the Future: Influence of Valence and Temporal Distance

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## Abstract

As humans, we frequently engage in mental time travel, reliving past experiences and imagining possible future events. This study examined whether similar factors affect the subjective experience associated with remembering the past and imagining the future. Participants mentally “re-experienced” or “pre-experienced” positive and negative events that differed in their temporal distance from the present (close versus distant), and then rated the phenomenal characteristics (i.e., sensorial, contextual, and emotional details) associated with their representations. For both past and future, representations of positive events were associated with a greater feeling of re-experiencing (or pre-experiencing) than representations of negative events. In addition, representations of temporally close events (both past and future) contained more sensorial and contextual details, and generated a stronger feeling of re-experiencing (or pre-experiencing) than representations of temporally distant events. It is suggested that the way we both remember our past and imagine our future is constrained by our current goals.

## Phenomenal Characteristics Associated with Projecting Oneself Back into the Past and Forward into the Future: Influence of Valence and Temporal Distance

One of the most fascinating achievements of the human mind is its ability to engage in mental time travel in order to mentally relive past experiences (Suddendorf & Busby, 2003; Tulving, 2002; Wheeler, Stuss, & Tulving, 1997). When mentally traveling back to the past, we may remember an event in considerable detail, for instance by “seeing” in our mind the location where this past experience took place as well as the persons and objects that were present, by remembering the unfolding of the event as well as what we felt or thought when experiencing it, and so forth. Such detailed sensorial and contextual (spatio-temporal) information is an essential aspect of memory because it provides the rememberer with a subjective “sense of self” in the past (Klein, 2001) and enables him or her to distinguish memories of events that have been personally experienced in the past from other kinds of representations such as dreams, imagined events, or beliefs (Johnson, Hashtroudi, & Lindsay, 1993). According to Tulving’s most recent characterization of episodic memory (Tulving, 2002; Wheeler et al., 1997), the hallmark of episodic retrieval is what he terms “autonoetic” (self-knowing) consciousness, which is “the kind of consciousness that mediates an individual’s awareness of his or her existence and identity in subjective time extending from the personal past through the present to the personal future” (Tulving, 1985, p. 1). Autonoetic consciousness is thought to allow not only the subjective experience associated with re-experiencing a past experience but also the ability to project oneself forward in time to mentally “pre-experience” an event (Wheeler et al., 1997). However, although many researchers have showed increased interest in the subjective experience of remembering, by investigating either states of awareness (e.g., Gardiner, 1988; Tulving, 1985) or phenomenal characteristics (e.g., Johnson, Foley, Suengas, & Raye, 1988) associated with memory, few studies have examined what Atance and O’Neill (2001) call “episodic future thinking,” which is “the ability to project the self forward in time to pre-experience an event” (p. 537).

As argued by previous researchers, the cognitive processes involved in remembering the past and imagining the future are closely related, and memory is probably one of the resources that support insight into the future (Atance & O’Neill, 2001; Okuda et al., 2003;

Wheeler et al., 1997). The past may indeed constrain the generation of possible and likely futures, by supplying expectancies and determining what is plausible (Johnson & Sherman, 1990). Consistent with these propositions, it has been found that amnesic patients who are unable to recall their personal past typically have difficulties in imagining possible future experiences (Klein, Loftus, & Kihlstrom, 2002; Tulving, 1985). A recent study using positron emission tomography (PET) further indicates that common cerebral bases underlie thinking of the future and past (Okuda et al., 2003). In addition, Williams et al. (1996, Experiment 1) reported that suicidal patients had difficulties both in retrieving specific autobiographical memories and in generating specific images of their future, and that the specificity levels for the past and the future were correlated. Furthermore, inducing non-clinical participants to retrieve generic rather than specific memories reduced the specificity of their images of the future (Williams et al., 1996, Experiments 2 and 3). Based on these findings, the authors argued that the same processes are used for autobiographical memory recall and for anticipating the future. Specifically, the association between memory retrieval and future imaging arises because the intermediate descriptions that are used to search autobiographical memory (i.e., general descriptions of events that are used to access more specific knowledge; see also Conway & Pleydell-Pearce, 2000) are also used to generate images of possible future experiences.

In the present study, we were interested in examining the subjective experience associated with projecting oneself back into the past and forward into the future, and in investigating whether this subjective experience is influenced by similar factors in both cases. Previous studies have shown that the amount of phenomenal characteristics (i.e., sensorial, contextual, emotional and cognitive information) associated with memory is influenced by several variables. For instance, memories for recent events typically contain more sensorial and contextual details than memories for more remote events (Johnson et al., 1988). Remembering is also affected by the purposes, goals, or motives (hopes, fears, needs, desires, and so forth) of the individual (Conway & Pleydell-Pearce, 2000; Johnson & Sherman, 1990) and these generally tend to cause memories of positive experiences to contain more sensorial and contextual details than memories of negative experiences (Byrne, Hyman, & Scott, 2001;

D'Argembeau, Comblain, & Van der Linden, 2003; Destun & Kuiper, 1999), probably because most people are motivated to create and maintain a positive self-concept (Baumeister, 1998; Taylor & Brown, 1988). If imagining the future is constrained by past experiences as well as by individual purposes, goals, and motives, then factors that influence the qualitative aspects of memory, such as the valence of an event, should also affect representations of possible future events. Some studies suggest that the positive or negative valence of information may indeed influence future-oriented thinking. MacLeod and Byrne (1996) found that control (non-anxious and non-depressed) participants tended to generate more positive than negative experiences in a measure of future thinking based on an adapted verbal fluency paradigm (see also MacLeod, Tata, Kentish, & Jacobsen, 1997). Furthermore, Weinstein (1980) reported that people consistently predicted that they would be more likely than their peers to experience positive events in the future (e.g., having a good job, owning their own home) and less likely to experience negative occurrences (e.g., being fired from a job, divorce). However, these studies were concerned with differences in the amount and predicted probability of imagined positive versus negative future events rather than differences in the subjective experience associated with mentally pre-experiencing these events. Examining whether the valence of an event similarly affects the subjective experiences of remembering the past and imagining the future was the first goal of the present study.

Our second purpose was to investigate whether temporal distance from the present influences the experiences of projecting oneself back into the past and forward into the future in a similar way. As we have noted, previous findings indicate that memories of recent experiences typically contain more sensorial and contextual details than memories of more remote experiences (Johnson et al., 1988). This is not surprising because, unless they are frequently reactivated, the phenomenal characteristics of memories tend to be forgotten over time (Suengas & Johnson, 1988). Although phenomenal characteristics of representations of future events obviously cannot be forgotten because these events have not yet occurred, temporal distance from the present might nonetheless affect the subjective experience associated with the imagination of future happenings. Indeed, Trope and Liberman (2003) have recently proposed that “the greater the temporal distance from a future event, the more

likely is the event to be represented abstractly in terms of a few general features that convey the perceived essence of the events rather than in terms of concrete and more incidental details of the event” (p. 405). People may therefore find it easier to project themselves into future events that loom nearer because they may already have clear representations of the kinds of events that will probably happen to them in the near future, and they may know the kinds of projects and decisions they intend to make. By contrast, the distant future may seem more obscure and uncertain, rendering it more difficult to represent in detail. This possibility was examined in this study by comparing the amount of phenomenal characteristics associated with representations of near and far future events. In addition, we assessed the visual perspective that was adopted in these representations. Nigro and Neisser (1983) observed that in some memories one adopts the visual perspective of an observer, seeing oneself from the “outside,” whereas in other memories one sees the scene from one’s own perspective. These authors further reported that, when remembering, people are more likely to adopt an observer perspective for older than for more recent memories (see also Robinson & Swanson, 1993). In our study, we examined whether the visual perspective adopted when imagining future events is also affected by their temporal distance.

Finally, we were also interested in assessing the time participants took to construct specific memories of past events and images of future events. The construction of specific autobiographical memories often requires effortful processes that consist in generating retrieval cues that are used to search autobiographical knowledge, and these processes may be controlled by the individual in order to construct memories that are relevant to current goals (Conway & Pleydell-Pearce, 2000). Similarly, the generation of possible future happenings is also influenced by self-relevant goals (Johnson & Sherman, 1990). Given that a fundamental motive shared by most individuals is to view themselves in a positive light (Baumeister, 1998), accessing knowledge of positive experiences should take less time than accessing knowledge relating to negative experiences. Newby-Clark and Ross (2003) recently presented evidence that is partly consistent with this proposition. They found that people take less time to generate positive than negative future events; however, the time needed to recall positive and negative past events did not differ. In the present study, we sought to replicate these

findings, and we also examined the possibility that the temporal distance of the events could modulate the influence of valence on the time needed to construct memories of past experiences. Distant past events typically have fewer implications than recent past events for current well-being (Suh, Diener, & Fujita, 1996), so people may view negative aspects of their remote past more dispassionately. Furthermore, there is evidence indicating that people tend to flatter recent and deprecate distant former selves in order to enhance their current self-regard (Wilson & Ross, 2001). Accordingly, we predicted that constructing memories of positive experiences would take less time than constructing memories of negative experiences, but only for the recent past.

In summary, we investigated the phenomenal characteristics of mental representations associated with projecting oneself back into the past and forward into the future. Participants were asked to bring to mind representations of past and future events that differed in their valence (positive versus negative) as well as in their temporal distance from the present (near: last or next year versus far: last or next 5–10 years), and the time required to bring a specific event to mind was measured. Participants mentally re-experienced or pre-experienced each event and then rated the amount of sensorial, contextual, and emotional detail associated with their representation. The visual perspective that was adopted in each representation was also assessed.

## Method

### *Participants*

Forty undergraduate students (21 women and 19 men) at the University of Liège participated in the study. Their average age was 22.3 years (ranging from 19 to 27 years).

### *Materials and Procedure*

All participants were tested individually in a soundproof room. An initial introduction explained that they would be asked to remember some events that they had personally experienced in the past and to imagine some events that might happen to them in the future, and also to answer some questions about these events. Participants were then given detailed written instructions that explained that the events they were to recall or imagine had to be

precise and specific (i.e., they had to take place in a specific place at a specific time and they had to last a few minutes or hours but not more than a day); some examples were provided to illustrate what would or would not be considered as a specific event. For future events, it was also mentioned that the events had to be things that might reasonably happen to the subjects in the future, given their plans and what they thought their future would be. The instructions further explained that the participants would be asked to try to remember (imagine) the events in as much detail as possible (i.e., remembering/imagining the setting and course of the events, the persons and objects that were/would be present and so forth) in order to mentally “re-experience” (or “pre-experience”) them.

After reading the instructions, participants sat at a viewing distance of approximately 60 cm from a computer screen and the general procedure for any one trial in the experiment was described: A pre-trial warning signal, the word “Ready,” would be presented on the screen for 1500 ms, followed by a blank screen for 1000 ms. A cue would then be displayed and the participant’s task was to remember or imagine an event, as quickly as possible, in response to that cue. Participants were asked to press the space bar as soon as they had a *specific* event in mind and this response time was recorded. Participants were then asked to write down a brief description of the event and, after that, to close their eyes and to try remembering/imagining the event as precisely as possible (i.e., remembering/imagining the setting and course of the events, the persons and objects that were/would be present, etc.) in order to mentally re-experience (or pre-experience) it. They were given 1 minute for this task. After that, they were given a written questionnaire in order to rate the representation of the event. The items were adapted from the MCQ created by Johnson et al. (1988), with the ratings being done on 7-point scales. Memories of past events and representations of future events were rated for visual details (1 = none, 7 = a lot), sounds (1 = none, 7 = a lot), smell/taste (1 = none, 7 = a lot), clarity of location (1 = not at all clear, 7 = very clear), clarity of the spatial arrangement of objects (1 = vague, 7 = clear and distinct), clarity of the spatial arrangement of people (1 = vague, 7 = clear and distinct), clarity of the time of day (1 = not at all clear, 7 = very clear), valence of the emotions involved in the event (1 = negative, 7 = positive), intensity of the emotions involved in the event (1 = not intense, 7 = very intense),

feelings of re-experiencing (or pre-experiencing) the event when remembering (or imagining) it (1 = not at all, 7 = a lot), importance of the event for the self-image (1 = not at all important, 7 = very important). Participants were also asked to report the visual perspective they took in their representation of the event by assigning it to one of three categories depending on whether they “saw” themselves in their representation (observer perspective, O), saw the scene from their own perspective (field perspective, F), or felt that neither point of view fitted (N). A detailed paragraph instructed them on the distinction between the observer and field perspectives (see Nigro & Neisser, 1983).

Participants were finally asked to date past events and also to rate their feelings of the events’ subjective temporal distance. The latter was assessed because previous studies have shown that people may feel more or less close to a past event, regardless of its actual temporal distance (Ross & Wilson, 2002). Briefly, participants were told that past experiences may feel quite close or quite far away, regardless of how long ago they actually occurred, and they were asked to rate how far away the event felt to them (1 = very close, 7 = very far away). For future events, they were only asked to give an estimation of the time when they thought the event might happen to them.

Two training trials were given in order to familiarize participants with the procedure. On the first training trial, they had to bring to mind a memory of a specific past experience that the word “television” reminded them of. On the second training trial, their task was to imagine a specific future experience that the word “car” made them think of. For both trials, they thought about the event for one minute with their eyes closed and then rated their representation of the event. The experimenter made sure that participants clearly understood the procedure and rating scales before the experimental trials began.

Each participant was then asked to recall four past events and to imagine four events that might possibly happen to them in the future. These events differed in their valence and in their temporal distance from the present: for past events, participants had to recall two events (one positive, one negative) that had happened in the recent past (i.e., within the last year, but at least one month ago) and two events (one positive, one negative) that had happened in the more distant past (i.e., events that were 5 to 10 years old); similarly, they had to imagine two

events (one positive, one negative) that might possibly happen to them in the near future (i.e., in the next year, after a minimum of one month) and two events (one positive, one negative) that might happen to them in the more distant future (i.e., in 5 to 10 years). Positive and negative events were defined as events about which the participants had felt (or would feel) positive or negative emotions, respectively.

Participants were told that the procedure was similar to the one used for the training trials: They would see the word “Ready” on the screen and then a short phrase describing the type of event that they had to bring to mind (e.g., “A negative event that happened in the last 12 months,” “A positive event that might happen in 5–10 years”). Their task was to try to remember/imagine an event that corresponded to the valence and temporal distance that were mentioned, as quickly as possible, and to press the space bar as soon as they had a *specific* event in mind. As was the case during the training trials, they then had to briefly describe the event, to remember/imagine it as clearly as possible for one minute with their eyes closed, and to rate their representation on the 7-point scales. Half of the participants recalled the four past events before imagining the four future events, whereas the other participants did the tasks in the opposite order. Furthermore, the order of presentation of positive versus negative events and of the temporally close versus distant events was also counterbalanced across participants. Finally, participants completed the Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979) at the end of the experiment. Two participants who had high BDI scores (> 20) were replaced by two new participants because it has been shown that depression can affect autobiographical memory retrieval (Williams, 1996) and the anticipation of future events (MacLeod & Byrne, 1996; MacLeod et al., 1997).

## Results

### *Content of the events*

To give an idea of the content of the events that were recalled and imagined in the present study, we classified the descriptions of events into broad categories. Old positive memories (i.e., of events that happened between 5–10 years ago) involved episodes at parties (31%), episodes during leisure activities (28%), romantic episodes (18%), and episodes of

success at school (15%); 8% of the events reported could not be classified in these categories. Old negative memories involved accidents, severe illnesses, or deaths of relatives (39%); arguments with relatives or close friends (21%); the end of a romantic relationship (14%); accidents, illnesses, or aggression involving the participants themselves (13%); and episodes of failure at school (13%). Recent positive memories (i.e., of events that happened within the last year) involved episodes at parties (34%), episodes of success at school (22%), romantic episodes (20%), and episodes during leisure activities (15%); 9% of the events could not be classified in these categories. Recent negative memories involved accidents, severe illnesses, or deaths of relatives (22%); episodes of failure at school (19%); accidents or illnesses involving the participants themselves (17%); the end of a romantic relationship (17%); and arguments with relatives or close friends (17%); 7% of the events could not be classified in these categories. Positive events that might happen in the near future (i.e., in the next year) were such things as episodes of success at school or at work (55%), episodes during leisure activities (13%), romantic episodes (10%), parties (10%), and the birth of a child (5%); 7% of the events could not be classified in these categories. Negative events that might happen in the near future were such things as episodes of failure at school (50%), the end of a romantic relationship (13%), accidents or deaths of relatives (13%), accidents involving the participants themselves (10%), and arguments with relatives or close friends (8%); 6% of the events could not be classified in these categories. Positive events that might happen in the distant future (i.e., in the next 5–10 years) were such things as weddings (36%), the birth of a child or episodes involving a child (23%), episodes of successes at work (21%), and buying a house (13%); 7% of the events could not be classified in these categories. Finally, negative events that might happen in the distant future were such things as accidents, severe illnesses or deaths of relatives (69%); accidents or severe illnesses involving the participants themselves (15%); episodes of failure at work (10%); and relationship problems (6%).

### *Response times*

The mean times (in ms) participants took to bring a specific event to mind are presented in Table 1 as a function of event type (past, future), temporal distance (near,

distant), and event valence (positive, negative). The response times were submitted to a 2 (event type) X 2 (temporal distance) X 2 (event valence) analysis of variance (ANOVA). The ANOVA indicated a main effect of temporal distance,  $F(1, 39) = 5.95, p < .05$ , a main effect of valence,  $F(1, 39) = 7.14, p < .05$ , and an event type by temporal distance by valence interaction,  $F(1, 39) = 8.89, p < .005$ . To further investigate this three-way interaction, 2 (temporal distance) X 2 (valence) ANOVAs were performed on past and future events separately. For past events, there was a temporal distance by valence interaction,  $F(1, 39) = 5.40, p < .05$ , and planned comparisons showed that participants took more time to recall negative than positive events, but only when they were recalling recent events,  $F(1, 39) = 4.28, p < .05$ , and  $F < 1$ , for recent and remote events, respectively. For future events, there was a main effect of valence,  $F(1, 39) = 9.58, p < .005$ , indicating that participants took more time to imagine negative than positive events. There were no other significant main effects or interactions.

-Table 1 about here-

#### *Ratings for phenomenal characteristics*

Before conducting the analyses, the ratings for visual details, sounds, and smell/taste were averaged into a general sensorial details measure (see e.g., Suengas & Johnson, 1988). Similarly, items regarding clarity of location, clarity of spatial arrangement of objects, and clarity of spatial arrangement of people were grouped into a clarity of location index. The mean ratings and standard deviations are presented in Table 2 as a function of event type (past, future), temporal distance (near, distant), and event valence (positive, negative). These ratings were analyzed using 2 (event type) X 2 (temporal distance) X 2 (event valence) ANOVAs for each phenomenal characteristic. For sensorial details, there was a main effect of event type,  $F(1, 39) = 13.82, p < .001$ , indicating that representations of past events contained more sensorial details than representations of future events. The main effect of temporal distance was also significant,  $F(1, 39) = 19.85, p < .0001$ , with representations of distant events containing fewer sensorial details than representations of close events. Finally, the ANOVA indicated an effect of event valence,  $F(1, 39) = 17.59, p < .001$ , showing that

representations of positive events contained more sensorial details than representations of negative events.

-Table 2 about here-

With regard to clarity of location, there was a significant main effect of event type,  $F(1, 39) = 83, p < .0001$ , showing that the location of past events was more clearly represented than the location of future events, and a significant main effect of temporal distance,  $F(1, 39) = 20.88, p < .0001$ , showing that location was more clearly represented for recent events than for distant events. Main effects of event type and temporal distance were also observed for time of the day,  $F(1, 39) = 117.34, p < .0001$ , and  $F(1, 39) = 17.74, p < .001$ , respectively. Ratings for time of the day were also affected by event valence,  $F(1, 39) = 7.65, p < .01$ , with positive events receiving higher ratings than negative events.

The ANOVA on valence ratings indicated a main effect of temporal distance,  $F(1, 39) = 5.07, p < .05$ , which was qualified by an event type by temporal distance interaction,  $F(1, 39) = 4.53, p < .05$ . Planned comparisons indicated that the valence of distant events was more negative (or less positive) than the valence of close events in the case of past events,  $F(1, 39) = 8.08, p < .01$ , but not of future events,  $F < 1$ . Unsurprisingly, the main effect of event valence was also significant,  $F(1, 39) = 4037.11, p < .0001$ , but this effect was qualified by an event type by event valence interaction,  $F(1, 39) = 24.87, p < .0001$ . Planned comparisons showed that future positive events were rated as more positive than past positive events,  $F(1, 39) = 12.25, p < .01$ , and that future negative events were rated as more negative than past negative events,  $F(1, 39) = 10.36, p < .01$ . For intensity ratings, there were main effects of event type,  $F(1, 39) = 22.75, p < .0001$ , and event valence,  $F(1, 39) = 8.69, p < .01$ . The interaction between event type and event valence and the three-way interaction were also significant,  $F(1, 39) = 4.48, p < .05$ , and  $F(1, 39) = 8.16, p < .01$ , respectively. Planned comparisons revealed that past negative events were rated as more intense than past positive events, but only when these events were temporally distant,  $F(1, 39) = 29.19, p < .0001$ , and  $F < 1$ , for ancient and recent events, respectively. In the case of future events, positive and negative events did not differ in their rated intensity, whatever their temporal distance,  $F < 1$ , and  $F(1, 39) = 2.45, p = .13$ , for distant and close events, respectively.

The feeling of re-experiencing (or pre-experiencing) the events was affected by temporal distance,  $F(1, 39) = 19.10, p < .0001$ , and event valence,  $F(1, 39) = 6.85, p < .05$ , with higher ratings given to temporally close than to temporally distant events, and to positive than to negative events. Finally, the ANOVA on ratings of importance of the event for the self-image indicated main effects of event type,  $F(1, 39) = 14.65, p < .001$ , and event valence,  $F(1, 39) = 10.89, p < .01$ , and a three-way interaction,  $F(1, 39) = 4.89, p < .05$ . Planned comparisons showed that positive past events were rated as being more important for the self-image than negative past events, but only when they were temporally close,  $F(1, 39) = 9.39, p < .01$ , and  $F < 1$ , for close and distant events, respectively. In contrast, positive future events were rated as being more important for the self-image than negative future events for temporally distant events,  $F(1, 39) = 7.68, p < .01$ , but not for temporally close events,  $F(1, 39) = 1.77, p = .19$ .

#### *Objective and subjective temporal distance*

The dating of past events was submitted to a 2 (temporal distance) X 2 (valence) ANOVA. The only significant effect was of temporal distance,  $F(1, 39) = 1240.23, p < .0001$ , with distant events ( $M = 84.69$  months,  $SD = 13.93$ ) being older than recent events ( $M = 5.73$  months,  $SD = 2.27$ ). The ratings for feelings of the subjective temporal distance of the event were also analyzed by a 2 (temporal distance) X 2 (valence) ANOVA. Again, the only significant effect was of temporal distance,  $F(1, 39) = 71.61, p < .0001$ , with recent events feeling closer ( $M = 2.91, SD = 1.40$ ) than distant events ( $M = 4.89, SD = 1.44$ ). Finally, a 2 (temporal distance) X 2 (valence) ANOVA on the estimation of the time in which future events might happen indicated main effects of temporal distance,  $F(1, 39) = 745.30, p < .0001$ , and event valence,  $F(1, 39) = 8.81, p < .01$ , which were qualified by a temporal distance by event valence interaction,  $F(1, 39) = 10.35, p < .01$ . Planned comparisons showed that negative future events were estimated to be more distant than positive future events when participants imagined events that might happen in the next 5–10 years ( $M = 93.68$  months,  $SD = 31.08$  and  $M = 75.40$  months,  $SD = 19.88$ , for negative and positive events, respectively),  $F(1, 39) = 9.64, p < .01$ , but not when they imagined events that might happen in the next year

( $M = 6.10$  months,  $SD = 3.07$  and  $M = 6.43$  months,  $SD = 3.12$ , for negative and positive events, respectively),  $F < 1$ .

### *Visual perspective*

In a previous study, we found that memories of positive and negative events did not differ in their reported perspectives, although both types of events were more often associated with a field (F) perspective and less often associated with an observer (O) perspective than neutral events (D'Argembeau et al., 2003). Similarly, positive and negative events had nearly the same proportions of F versus O perspectives in the present study, so we report the data on perspectives collapsed across event valence.

In order to analyze differences in visual perspective as a function of event type and temporal distance, we computed, for each participant, the proportions of F and O perspectives in each event category (i.e., distant past events, recent past events, distant future events, and close future events). Table 3 shows mean proportions of F and O perspectives as a function of event type (past, future) and temporal distance (near, distant). A 2 (event type) X 2 (temporal distance) X 2 (perspective: F vs. O) ANOVA on these proportions revealed a significant temporal distance by perspective interaction,  $F(1, 39) = 8.50, p < .01$ . Planned comparisons showed that representations of temporally distant events were associated with more O perspectives,  $F(1, 39) = 7.88, p < .01$ , and fewer F perspectives,  $F(1, 39) = 8.63, p < .01$ , than representations of temporally close events. The ANOVA did not reveal any other significant main effect or interaction, all  $ps > .18$ .

-Table 3 about here-

### Discussion

The purpose of this study was to examine the subjective experience associated with projecting oneself back into the past and forward into the future in order to re-experience or pre-experience past and future events. The time needed to bring a specific event to mind was measured and participants rated the phenomenal characteristics (i.e., sensorial, contextual, and

emotional details, visual perspective) associated with their representation. We were interested in examining whether the subjective experiences of remembering the past and imagining the future are affected by similar factors, such as the valence of the events and their temporal distance from the present.

The past and future events evoked by the participants were varied and formed a rather representative sample of the different kinds of events that characterize human life: episodes at school or work, parties or leisure activities, interactions with relatives or close friends, deaths, illnesses or accidents, romantic episodes, and so forth. With regard to their phenomenal qualities, we found that memories of past experiences were overall more detailed than representations of future events: they contained more sensorial details and their context (location, time of day) was more clearly represented. These findings are consistent with previous studies that showed that memories of real events contain more sensorial and contextual details than memories of imagined events (e.g., Arbuthnott, Geelen, & Kealy, 2002; Johnson et al., 1988; McGinnis & Roberts, 1996). These differences in phenomenal experience are essential because they play a pivotal role in helping people to discriminate memories of real events that have been experienced in the past from representations of imagined events, dreams, or beliefs (see Johnson et al., 1993; Mitchell & Johnson, 2000, for a description of the processes involved in attributing mental experiences).

Although representations of future events were less detailed than representations of past events, both kinds of representations were influenced by valence in a similar way: representations of positive events contained more sensorial details, were clearer concerning time information, and were associated with a greater feeling of re-experiencing (or pre-experiencing) than representations of negative events. These findings extend previous studies by showing that event valence affects not only phenomenal characteristics associated with remembering specific past events (see Byrne et al., 2001; D'Argembeau et al., 2003; Destun

& Kuiper, 1999), but also phenomenal characteristics associated with projecting oneself into the future in order to mentally pre-experience possible happenings. There is substantial evidence indicating that most people (with the exception of depressed people) tend to preferentially process information that conveys a positive view of themselves (Baumeister, 1998; Taylor & Brown, 1988). Such self-enhancement goals may favor the elaboration of positive rather than negative self-relevant information, thus making positive information to be better encoded into memory (Sedikides & Green, 2000). These differences in memory encoding may contribute to the differences we observed regarding phenomenal characteristics of memories for positive and negative events. In addition, people may control the retrieval of stored information during the process of constructing a specific memory (see Conway & Pleydell-Pearce, 2000), by favoring access to positive rather than negative information (D'Argembeau et al., 2003). Such a process may also contribute to the observed differences between phenomenal characteristics of memories for positive and negative events. Similarly, when generating possible future happenings, people may access positive information more easily, therefore enabling them to construct richer representations of their future when they are considering positive rather than negative experiences. In other words, we suggest that current self-enhancement goals may favor access to positive rather than negative self-relevant information, therefore enhancing the richness of representations for positive events, both when remembering the past and imagining the future. Such detailed representations of positive past and future events may be an important motivator for current behaviors, making people to work longer and harder on various tasks, and they may also be extremely important in keeping people happy and mentally healthy (Taylor & Brown, 1988).

The influence of temporal distance was also remarkably similar for past and future events: representations of temporally close events (both past and future) contained more sensorial details, were associated with a clearer representation of contextual information

(location, time of day), and generated a stronger feeling of re-experiencing (or pre-experiencing) than representations of temporally distant events. The influence of temporal distance on the richness of memories of past experiences replicates previous work (Johnson et al., 1988) and is probably a consequence of forgetting sensorial and contextual details over time (Suengas & Johnson, 1988). The present study also indicates that people construct more detailed representations when they think that imagined events may happen in the near rather than in the far future, which is consistent with the proposition that representations of distant future events are more abstract and decontextualized than representations of near future events (Trope & Liberman, 2003). In a previous study, Liberman, Sagristano, and Trope (2002, Study 2) showed that, when listing events that could happen in either a good or a bad day in either the near future or the distant future, participants reported more diverse experiences for the near future than for the distant future, suggesting that anticipated positive and negative experiences are more abstract and prototypical for the more distant future. In the same vein, the present findings indicate that projecting oneself in a specific positive or negative experience and trying to pre-experience it in as much detail as possible results in a richer representation when the event is expected to be experienced in the near future rather than in a more distant future. As we have already argued, this may indicate that people have rather clear representations of the kinds of events that will probably happen in the near future; they may have some specific goals and may have already begun adapting their behavior in order to achieve them. By contrast, the distant future may seem more obscure and uncertain, and people's goals for more distant future periods may be less well defined, making it harder to project themselves into events belonging to this distant temporal window.

A slightly different (though related) explanation is that people may find it more difficult to project themselves into temporally distant events (both past and future) because the self-concepts that are involved in these events are perceived as being somewhat different

from the present self-concept. Temporally close events typically involve self-concepts that are perceived as being similar to the present self-concept, whereas temporally distant events involve self-concepts that may seem different because people may feel they have changed (or will change; Ross & Wilson, 2000). People may find it easy to project themselves into events that involve temporally close self-concepts because these events may be perceived as highly connected to their current purposes, goals, and motives. By contrast, it may be difficult to project oneself into situations in which one had (or will have) different purposes, goals, and motives, and behaved (or will behave) differently than one does in the present. This might be particularly true for young adults like the population we examined in the present study because they are in a period of rapid change in which the self-concept is still in formation and many novel events are encountered; thus, future events are less foreseeable than they are later in life (Rubin, Rahhal, & Poon, 1998).

The fact that participants tended to adopt a different visual perspective when representing temporally close versus temporally distant events is also consistent with the hypothetical role of the perceived similarity between the present self-concept and past or future self-concepts. Indeed, we found that temporally distant events (both past and future) were more often represented with an O perspective (i.e., from a third-person perspective in which the individual perceives himself/herself as if he/she were observing another individual, rather than from a first-person perspective in which he/she is the subject of experience) than temporally close events (see Nigro & Neisser, 1983; Robinson & Swanson, 1993, for similar findings with regard to past events). This kind of third-person perspective may serve as a distancing mechanism, leading individuals to perceive that a past (or future) self-concept is different from the current self-concept. Indeed, Libby and Eibach (2002) observed that, when people think about behaviors that are incompatible with their current self-concept, they represent them more often from a third-person perspective than when they think about

compatible behaviors, and these authors argued that, when people have changed on a given dimension, they feel as though their past self-concept was another person and they actually see themselves in memory from the vantage point they would have when looking at another person. The influence of temporal distance that was observed in our study may therefore be the consequence of distant events being perceived as involving different self-concepts from the current one, leading them to be more often represented from a third-person perspective and to contain fewer sensorial and contextual details.

Finally, we found that the valence of the events affected the time participants took to construct representations of specific events. First, participants took more time to imagine negative future events than positive future events. This finding is consistent with the studies reported by Newby-Clark and Ross (2003), who argued that negative future scenarios come to mind relatively slowly because people tend to be highly optimistic about their future and typically devote less thought to negative than to positive future events. With regard to the past, we found that memories of negative experiences were constructed more slowly than memories of positive experiences, but only for the recent past. In contrast, Newby-Clark and Ross (2003) reported that negative past events were not generated more slowly than positive past events; however, it is not clear whether the past experiences generated in that study belonged to the recent or distant past. People may attach more importance to positive aspects of their recent past self-concepts than to those of their more distant past self-concepts (Wilson & Ross, 2001), making them more motivated to think of positive rather than negative recent events. In the present study, positive past experiences were indeed rated as being more important for the current self-view than negative past experiences, but only when these experiences were recent. Accordingly, this study suggests that constructing memories of positive past experiences takes less time than constructing memories of negative experiences, but only when these experiences are perceived to be of sufficient importance to current self-

views. The additional time needed to generate specific memories of negative versus positive recent experiences may be a consequence of control processes exerted by the individual, perhaps through the generation of retrieval models (see Conway & Pleydell-Pearce, 2000, for a detailed account of autobiographical memory construction), in order to preferentially access autobiographical knowledge that is consistent with self-enhancement goals. Studies assessing the contents of consciousness at particular points during the retrieval cycle (see Haque & Conway, 2001) for positive and negative recent memories should be conducted in future in order to shed some light on this issue.

In summary, our study indicates that the subjective experience associated with projecting oneself back into the past and forward into the future in order to re-experience or pre-experience an event is influenced by the valence of the event as well as its temporal distance from the present. These findings suggest that factors such as self-enhancement goals and the perceived similarity between the present self-concept and past or future self-concepts may not only constrain the way we remember our past, but also the way we imagine our future. This suggests that remembering the past and imagining the future are closely related, in that both may be influenced by an individual's current goals, motives, and purposes.

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Table 1

*Mean Response Times (in ms) and Standard Deviations as a Function of Event Type (Past, Future), Temporal Distance (Near, Distant), and Event Valence (Positive, Negative)*

	Past events		Future events	
	Near	Distant	Near	Distant
Positive	20,159 (13,918)	33,732 (22,920)	19,393 (16,553)	17,978 (11,167)
Negative	30,335 (29,479)	29,425 (24,526)	26,606 (23,162)	36,140 (39,379)

Table 2

*Means and Standard Deviations of Ratings for Phenomenal Characteristics as a Function of Event Type, Temporal Distance, and Event Valence*

	Past events				Future events			
	Near		Distant		Near		Distant	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Sensorial details	4.77 (1.04)	4.32 (1.13)	4.18 (1.16)	3.87 (1.16)	4.12 (1.37)	3.82 (1.28)	3.92 (1.48)	3.15 (1.30)
Location	6.17 (0.83)	6.13 (0.90)	5.43 (1.03)	5.56 (1.06)	4.43 (1.66)	4.50 (1.67)	4.22 (1.55)	3.73 (1.62)
Time	6.48 (0.82)	6.00 (1.43)	5.65 (1.55)	5.45 (1.60)	4.40 (2.04)	3.88 (2.11)	3.75 (1.97)	3.00 (1.85)
Valence	6.50 (0.82)	1.65 (0.80)	6.20 (0.76)	1.33 (0.57)	6.65 (0.74)	1.23 (0.53)	6.75 (0.49)	1.18 (0.50)
Intensity	5.75 (1.21)	5.88 (1.09)	5.05 (1.26)	6.23 (1.03)	6.05 (1.32)	6.43 (0.87)	6.43 (0.81)	6.48 (1.04)
(P)re-experience	4.80 (1.54)	4.57 (1.71)	4.45 (1.81)	3.95 (1.68)	4.93 (1.58)	4.68 (1.85)	4.35 (1.79)	3.98 (1.85)
Importance	5.05 (1.85)	3.80 (2.17)	3.93 (1.86)	3.83 (1.93)	5.35 (1.78)	4.80 (2.07)	5.35 (1.69)	4.38 (2.01)

Table 3

*Mean Proportions and Standard Deviations of Field and Observer Perspectives as a Function of Event Type and Temporal Distance*

Perspective	Past events		Future events	
	Near	Distant	Near	Distant
Field	.663 (.429)	.500 (.439)	.575 (.417)	.450 (.436)
Observer	.313 (.419)	.475 (.438)	.388 (.400)	.500 (.423)