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The language of memory:
the impact of narrating on
autobiographical memory fluency

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*[...] Keep Ithaca always in your mind.
Arriving there is what you are destined for.
But do not hurry the journey at all.
Better if it lasts for years,
so you are old by the time you reach the island,
wealthy with all you have gained on the way,
not expecting Ithaca to make you rich.*

*Ithaca gave you the marvelous journey.
Without her you would not have set out.
She has nothing left to give you now. [...]*

(Constantine P. Cavafy, Ithaca)

Abstract

The present dissertation aims to explore the role of narrating on autobiographical memory fluency, considering both past life events of everyday life and those related to the illness experience of cancer. Despite their mutual connection, autobiographical memory and autobiographical narrative are not the same thing: narrative provides new semantic, pragmatic and communicative features for memory through a “narrativization” process (Bruner, 1990). People need to re-elaborate their past memories through narrative in order to find new meanings and new emotional involvement, especially in the case of impacting experiences such as illness. For this reason, the present dissertation starts with the proposal of the implementation of the narrativization model in doctor-patient communication and medical practice.

Then, three empirical studies are presented: the first aimed to explore the link between autobiographical memory and autobiographical narrative in a sample of university students, assessing whether the emotions present in memories are maintained or transformed when memories are narrated. Results underlined that participants expressed more emotions and a greater number of complex emotions in narrative than in memories.

The second study aimed to assess how the length of autobiographical narrative affects autobiographical memory fluency and its emotional tone in a sample of university students. Results showed that short narratives improved autobiographical memory fluency, while long narratives supported the conservation of memories and their emotional re-elaboration in terms of richness and complexity. Text analysis showed that cognitive terms were used more in long narratives.

The third study considered the role of oncological patients’ positive and negative narratives of illness on autobiographical memory fluency and its emotional involvement. Results underlined that narrating memories of illness increased memory fluency and emotional richness of narrated memories. Negative narrative decreased negative emotional tone and increased the complex one. Furthermore, linguistic analysis showed that negative narratives were more coherent and full of connections than positive ones.

In conclusion, narrating provides emotional richness and complexity of memories and changes in memory fluency. The narrativization model can be implemented in medical practice in order to facilitate the illness re-elaboration in doctor-patient communication.

Keywords:

Autobiographical memory;

Autobiographical narrative;

Memory fluency;

Gist;

Long narrative;

Emotions;

Narratives of illness;

Positive narrative;

Negative narrative;

Narrative Based Medicine;

Doctor-patient communication.

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Preface

This dissertation wants to be a journey. Exactly as the journey I did during these three years of Doctorate. When I started my Ph.D., I was really interested in studying narratives of illness focusing on the patients' point of view on the experience of suffering of a serious and chronic disease as cancer. From a first analysis of scientific literature, I realized that narrating an own experience is an elaborated act of externalizing a past memory of life. Thus, illness is also an autobiographical memory which requests to be elaborated by telling others what is happening in our lives. In 1976, Ulric Neisser argued that studies on memory usually deal with abstract cognitive processes which don't refer to the problem of real people in the real life (Neisser, 1976). In his point of view, the study of cognitive processes had to be related to how they influence individuals' life. Nevertheless, evidence of the role of narrative in elaborating a past life memory is still not so copious. About narrative and memory, for example, we know that narrative gives a structure to autobiographical memories, enriching the past event with a temporal and a causal sequence. We know that through narrating a memory, people can reflect on its meaning, considering other points of view and other emotional engagements, for example sometimes a negative event can acquire positive meanings. Nevertheless, we also know that autobiographical memory and autobiographical narrative are not the same: despite the several studies that concern the cognitive processes involved in both, their relationship is still unclear, especially when academics face real life context as the disease experience.

Firstly, we have no evidence yet on the role of narrating a past event on memory fluency, which can be defined as the the subject's ability to retrieve different types of personal memories (Rathbone & Moulin, 2014). In this sense, we could argue that narrating a specific memory improves memory fluency or, on the contrary, inhibits it, especially in the case of unsuitable events like illness. We can also make suppositions on the role of narrative on the emotional engagement of memory fluency. Thus, narrating a negative event could improve the availability of negative memories of life or, on the contrary, inhibit their recall.

The influence of the narrative on autobiographical memory, that I will call "narrativization" - paraphrasing Jerome Bruner (1991) - is the focus of the journey that scientists have to face when they take into account the narrative of some peculiar chapters of our lives, such as having to go through a disease.

This is the reason why I have organized my dissertation in four landmarks.

The first part of our journey will be a proposal of a theoretical model based on the application of the narrativization process in medical practice: especially in this context, in fact, the importance of listening to narratives on illness and how elaborating them in doctor-patient communication is crucial. Psycho-oncological literature, indeed, defines the disease experience as a breakdown in the life span (Axia, 2002). A useful way to repair this breakdown could be narrating it, considering new meanings and connecting it with the past and the future life. Thus, starting from the recent knowledge on doctor-patient communication, the first chapter will embrace the use of narrative of illness in medical practice in the light of the autobiographical narrative and memory theories of cognitive psychology. Actually, the use of narrative in medical practice is not new: about three decades ago (Kleinmann, 1988) a group of physicians started stressing the importance of listening to stories of illness as a tool for the care professions. Contemporary cognitive psychologists have started studying narrative (Bruner, 1986), but connections between these two fields are still few.

Since scientific evidences on the connection of these fields are scarce, the next two chapters offer a contribution and constitute a first empirical result useful for the application of the narrativization model in real life contexts. Since the final aim of this dissertation was to investigate oncological patients' narratives of illness, it would be pretentious to explore the role of narrative on memories of illness without having explored these cognitive processes in normative samples. Thus, the second and the third chapters will explore the topic of the dissertation trying to give a scientific contribution to the relationship between memory fluency and autobiographical narrative in samples of university students.

Firstly, in the second chapter, the emotional involvement of a memory when it is recalled and when it is narrated will be considered in order to assess if the narrativization process determines a change in autobiographical memory's emotional tone. This study, although explorative, is an important starting point for the empirical part of the journey.

Secondly, in line with the recent theories on the social development of autobiographical memory, I will present in the third chapter an experimental study on the role of the length of narrative in improving changes in autobiographical memory fluency and in emotional engagement. Starting from the hypothesis that narrative has a role on memory fluency and on emotions, how do short versus long narratives influence them?

Finally, the fourth chapter will present a research implementing the narrativization model through the study of the influence of positive and negative narratives on the memory fluency and on the emotional tone of autobiographical memories related to the illness experience. This is the result of many mornings spent in the oncology Day Hospital wards, talking with patients and collecting their memories and narratives on illness. It was not easy to face a dramatic disease and to explore it through the words of the patients I met. After having collected scientific evidences on the narrativization of autobiographical memory, through this last study I have tried to understand what happens to a memory related to the disease experience when patients have the opportunity to narrate it positively or negatively. In other words, I have focused on the role of narration in improving the availability of memories and their emotional tone, considering the hospital environment and the memory of a life breakdown. This is the last landmark of the journey. Results of this last study will try to give a contribution to the explanation of the narrativization model presented in the first part of the dissertation and, particularly, to its implementation in the real life of people suffering from an as serious disease such as cancer.

In this dissertation, every chapter has to be considered as an independent landmark, with its own introduction and conclusion. Nevertheless, they are also strictly connected by the same theoretical assumption and the explanation of one landmark leads to the explanation of the others.

Chapter One

Improving doctor-patient communication through the narrativization of autobiographical memories of illness¹

1.1 How and why communicate in medical practice

In the first part of the twentieth century, respected physicians as Stefano Stefani (1913), William Osler (1921) and Michael Balint (1957) introduced the importance of relationship in medical practice. The same Stefani in 1913, in an article entitled "mental attitude of a doctor in the presence of their patient" (Stefani, 1913), wrote that "the mental image of health must become, for the doctor, more familiar than the morbid state, which, on the contrary, most of the time absorbs all the attention" (Stefani, 1913, p. 303). This will be possible, in the view of the author, only by adopting a mental attitude providing a holistic attention to the patient.

It is surprising that, despite these previous contributions, the question of doctor-patient communication, although widely treated in healthcare and scientific literature, remains debated: on one side the progresses of Evidence Based Medicine drive medicine towards objective and standardised care protocols, on the other the Narrative Based Medicine approach, underlining the importance of narrative, stressed as well the importance of doctor – patient communication in the therapeutic relationship (Charon and Wyer, 2008). Though different, these two paradigms started to be interconnected and more integrated showing therefore how they can coexist filling a mutual gap.

This chapter's aim is twofold: firstly, to discuss some basic issues concerning doctor-patient-communication in the light of recent theories on autobiographical memory: this kind of memory, according to Nelson and Fivush definition (Nelson and Fivush, 2004), is meant as a declarative, explicit memory for specific points in the past, recalled from the unique perspective of the Self in relation to others. Consequently, in the last part of the chapter we propose our personal view on how recent narrative and autobiographical memory models can provide useful and convincing tools to face this debate.

¹ A similar version of the present chapter has been recently published (Smorti & Fioretti, 2014).

In the last thirty years, since both NBM approach (Kleinman, 1988) and Narrative Psychology (Bruner, 1986) started to claim their theories, especially in western countries the attention to communication between doctor and patient has gradually increased as attested by publications, research, training and seminars. By typing in the portal Scopus the keywords patient - physician - communication and limiting the resources to the last thirty years more than 29,200 scientific titles are provided, 18,108 of which have been published within the last ten years. These findings illustrate that the theme of communication has become increasingly central in medical practice, both for the influence that it exerts on the process of care and for the difficulties inherent in the process of communicating. Indeed, The World Health Organization as well, considering the concept of health, refers to a state of wellbeing, both physical and psychological (<http://www.who.int/>). This definition calls into question broader aspects of those closely related to the care of the body, highlighting the relationship between patient and health care professionals and with it, primarily, the problem of an efficient communication. The therapeutic alliance, which is essential for the success of therapy, is centred on the possibility of a relationship between doctor and patient that takes place through an open and sincere dialogue (Greenhalgh, 1999; Charon, 2011).

Some of the main areas of research that emerge from the scientific literature of the last thirty years are focused on the asymmetry of the patient-doctor relationship (Albuquerque and Roffé, 2008), the connection between efficient communication and adherence to the treatments (Stewart *et al.*, 2000), the relationship between the type of communication and degree of patient satisfaction (Sitzia and Wood, 1997) and communicative style of physicians (Emanuel and Emanuel, 1992). However just a few studies have deepened this topic in light of the theoretical knowledge about autobiographical narrative and autobiographical memory (Williams, 2008). Actually this is a topic of an extraordinary importance both for the meaning itself of narrative medicine approach and because memory and narrative processes are deeply involved in patient-doctor communication.

1.2 The issue of Narrative Based Medicine

The heart of communication between a doctor and a patient is the story of life: the life, past, present and future, of the patient. Patients give an autobiographical narrative of

their lives and, specifically, in relation to the disease, doctors choose the parts to use for their clinical purposes.

Rita Charon, one of the pioneers of Narrative Based Medicine (Charon 2000a; 2000b; 2006) has considered listening to the stories of ill patients not only as a human and empathetic approach to the patient, but also as a rich source of information useful for the diagnosis, identification of the treatment, the symptoms and the therapeutic strategies.

According to her approach to medical practice, the health professionals must not only consider the case's history by collecting information about the disease in its pragmatic content, but also open up to the illness and understand all the parts that make up this illness narrative: the people who experience it (their subjective experience), the goals that motivate them (like what they want to deal with, the care, and what are the therapeutic goals they want to achieve with their doctor), the tools they want to use (clinical, but also practical and related to everyday life before the illness), and the background situation in which the disease was diagnosed (family support and relationships, problems at work, eating habits etc. etc.).

In this domain, listening to the illness's story constitutes a more complete and useful medical practice for the purpose of an effective communication between doctor and patient. This listening is based on the belief that narration is the way in which patients experience their illness and that, through the storytelling, they can work together with professionals to build the significance of the experience of being ill and of its therapeutic pathway (Elwyn and Gwyn, 1999).

The medical professional training, however, often focuses more on exploring the history of the disease than that of the illness: the natural instinct to produce and listen to stories can be lost during the university years in favour of the learned experience to build medical reports (Kleinman, 1988). These reports, which are potentially rich in information on the patient's life, appear fragmented and lack meaning because they are abstracted from their broader life context. The symptoms of disease, separated from narrative of the habits of daily life, are an incomplete material on which to produce a sometimes incorrect diagnosis (Greenhealgh and Hurwitz, 1999).

In Greenhealgh's point of view (1999), this is due to the current Evidence Based Approach according to which Medicine, as a science, is based on an objective and reproducible clinical method. The lack of interest in the subjective dimension of the disease that distinguishes this approach, causes interview protocols to exclude the

exploration of the broader contexts of the patient's life (which could illuminate the subjective meaning of the patient's account), and to impoverish doctor-patient communication so that the possibility for the patients to produce their illness narrative is precluded.

Is it possible to retrieve the patients' subjective point of view and to give meaning to their story in order to understand their illness and not just their disease?

Some attempts to expand the information collected during patient-physician communication have included the creation of diaries complementary to the patient's medical records (Di Gangi *et al.*, 2012). In this case, the news on the psychological state of the clients, their needs and, in the case of paediatrics, the parental observations and reports on their children are harvested, usually by nurses, to then be used by health professionals. This "complementary medical record", despite collecting some information on illness rather than disease, is, however, once again placed in a separate position compared to the history of the disease: on the one hand, it incorporates the patients' and their families' perspectives during the clinical path, on the other, however, it leaves them in the background: complementary, indeed, to the rest of the story. On the contrary, physicians need a method to integrate biomedical information with the patient's life history, in order to realize both the clinical management of the disease and the care of illness (Helman, 1981).

When a physician practices medicine with narrative competences, she/he can quickly and correctly interpret what their patient is trying to communicate (Charon, 2006), understanding not only the patient's ability to narrate illness, but also the disease itself. This is the reason why in recent years Narrative Medicine teaching programs have emerged encouraging students and health professionals to write about their patients with non-technical language, seeking the story of illness. The basic assumption of this re-education training is to re-apply in work practice the innate narrative structures of thought and language. The presumption of this method is that if one of the two partners of the dyad (doctor or patient) is not capable of focusing on illness narrative, many of the demands both doctors and patients attribute to the therapeutic relationship may remain unfulfilled.

However, if the Narrative Based Medicine approach can represent an efficient theoretical model to understand and improve doctor-patient communication, it needs an attentive and more deepen investigation on its scientific foundations. Narrative based medicine approach entails, among others, psychological concepts as that of personal

story and narrative, autobiographical memory, cognitive and social processes entailed in narrating. What we will propose in the last part of the present chapter is a sort of connection of Narrative Based Medicine practices with psychological knowledge on narrative processes. But now let's consider the main knowledge in doctor-patient communication.

1.3 Recent theories on doctor-patient communication

In the context of the recent theories about the doctor-patient communication, Emanuel and Emanuel (1992) have outlined four possible models of a doctor's communicative style toward their patients. These styles mainly describe how the doctor gives information. The Authors identified an information model, characterized by an expert and authoritative doctor who provides relevant information based on the facts and by a patient who, in the light of what they have learned from communication, chooses the treatment he or she considers most suitable to their life style and to their personal requirements; an interpretive model, in which the physician acts as a counsellor and tries to understand and interpret what is primarily important for the patient, informing and assisting them in the implementation of the medical treatment chosen; a deliberative model, in which the physician delivers information, but also becomes a mentor, helping the patient to understand the various therapeutic options, identifying the moral aspects suited to their beliefs, and finally a paternalistic model: the doctor gives the patient selected information and encourages them by promoting the choice the doctor considers best for the patient. These four models attribute different roles to the physician and the patient in communication, provide different degrees of participation and autonomy by both partners and lead to different effects of the therapeutic relationship.

To work on and overcome the problems of doctor-patient communication, protocols and guidelines have been also developed to help healthcare staff to provide an efficient communication with their patients (Baile *et al.*, 2000).

Programs dedicated to teach key communication skills have also been implemented because results of communication trainings show that very few doctors receive formal training in communication and the clinical experience is not adequate to compensate the lack of ability. (Fallowfield *et al.*, 1998; Fallowfield *et al.*, 2002). Looking at more recent data on communication styles of doctors, scientific evidences show that they have changed since the introduction of guidelines and protocols for the therapeutic relationship (Butalid *et al.*, 2014). Observational studies have demonstrated that

communication in consultations is actually more focused on psychosocial information, rather than just on the physical problems, although physicians use to show less empathy (Butalid *et al.*, 2014). These studies demonstrated that, despite the considerable amount of research on the importance of communication in the therapeutic relationship and the efforts to implement effective protocols of communication, doctors and patients have views of their interactions so divergent as to appear two different realities (Stewart, 1995; Pilnick & Dingwall, 2011).

What patients require from their doctor seems to be: clear and simple information about the disease and treatments, participation in treatment decisions and an effective emotional support. When a doctor shows interest and participation in their patients' illness history, patients are more satisfied and makes less comments and requests for clarification (Dulmen *et al.*, 1997).

Leckie and colleagues (2006), investigating patients' preferences regarding the communication styles of their doctors, claim that when they have a technical attitude, using scientific terms exclusively, not providing spontaneous information but only responses to patients' questions, being too focused on their professional role, create distrust in their patients and decrease their level of satisfaction in the therapeutic relationship. It is important to add that for patients the need for emotional warmth is essential, but secondary to the need for clarity and openness to dialogue (Easter and Beach, 2004; Leckie *et al.*, 2006; Hojat *et al.*, 2011) which seems to be much desired by patients, using a simple and direct language, answering to any questions for clarification and providing an efficient emotional communication.

On the contrary, studies on the beliefs and the desires of medical staff showed that doctors usually are satisfied about the relationship with their patients when they feel able to practise their professional competence and when they perceive the success and effectiveness of treatments they have implemented. Satisfaction correlates negatively with loss of control in communicating with their patient, lack of progress in the treatment and with perception that the patients do not trust their work and are emotionally distant from them (Ort *et al.*, 1964). Newell et al. (1998) reported that professionals generally appreciate patients who are able to express clearly their physical symptoms, leaving in the background psychosocial problems related to the disease (Haidet and Paterniti, 2003).

This evidence underlines the fact that often doctors and patients expect different things from each other during the therapy. Like any type of human interaction, the doctor-

patient relationship is considered an interpersonal process in which each component transmits and receives verbal or non-verbal feedbacks to and from the other (Kenny, 2010).

In the light of these data, the best way to set doctor-patient communication would appear to be the sharing of information, making joint decisions not only based on the clinical implications of the treatment but also on the emotional involvement of both partners. The procedure of the Share Decision Making (SDM) for instance proposes that treatment decisions related to the health of the patient should be taken after sharing the views of both the health professional and the patient (Clayman, 2012). In this perspective, each therapeutic action is centred on what the individual patient's wants, expressed by herself/himself and is included in a co-management of the process. This patient-centred view aims to integrate the biological dimension of traditional medicine with a perspective in which the sufferer is the protagonist. The illness experience of each patient is relevant and cannot be reduced to mere biological components because it involves all variables connected to the patient's life, including the psychological and social one.

This model seems desirable for both the patient and the physician. Patients may find relief in resolving major decisions affecting their health through a co-participation to the clinical decision-making, sharing information about disease and its treatment options (Pilnick and Dingwall, 2001). However all this also means bringing within the therapeutic relationship the emotional burden of fears, doubts and hopes about the outcome of the disease and its consequences. A doctor may find relief in sharing the decision about the treatment together with the patient, but this direct interaction may create anxiety too. This might push him/her, as it often occurs, to use psycho-lexical stratagems as that of talking *about* patients rather than *with* the patient (Mintz, 1992). The dissatisfaction for the patient-doctor relationship models was at the base of our narrative proposal that an effective doctor-patient communication should spring from a careful consideration of the results in the field of cognitive and social-cognitive research on autobiographical narrative.

One of the basic assumptions sustaining the necessity of a narrative basic medicine approach (Kleinman, 1988; Charon, 2006) is that the communicative divergences and misunderstandings in doctor-patient communication depend on the fact that patients and doctors tell two different stories, which can be defined as histories of illness (the patient's one, mainly centred on the personal experience of the disease) and histories of

disease (the physician's one, centred on an objective data report collected in the anamnesis).

Studies on medical error have outlined how doctors collect information from their patients showing that many complaints against health professionals are related to episodes of misunderstandings or misinterpretations due to a miscommunication (Vincent, 1998). The main problem seems to be, in fact, the difference between physician's and patient's narratives: both have their own goals in telling and listening to narratives, as well as different vocabulary and linguistic knowledge about it (Boyd, 2000). In fact, doctors have to collect an anamnesis of the story (and the word “anamnesis” means “recall”), so they have to collect a memory of the illness and to re-elaborate it through narration. This occurs in different and diverse occasions, as during the *debriefing*, when doctors have to inform their colleagues in the handover in the hospital ward, in conferences, in training courses and in discussion of cases and mainly, of course, when they re-tell the patient's story to themselves, to the patient itself and his/her relatives. The fact that “disease” may represent the doctor's perspective while “illness” the patient's one leads to, according to many studies, contrasting perspectives on the therapeutic relationship (Stewart, 1995; Makoul *et al.*, 2007; Kenny *et al.*, 2010; Moore *et al.*, 2010).

The reference to this narrative proposal suggests a deeper discussion on the role of narrating on autobiographical memory.

1.4 The impact of narrating on autobiographical memory

Stories are our natural way to organize many different types of information (McAdams, 2001): particularly, personal or autobiographical stories allow us to order the sometimes chaotic events of our lives. The desire for order and consistency can lead us to build our lives in a narrative form (Cohler, 1982). The autobiographical narrative draws on autobiographical memory, which through the narrative is outsourced in a very particular way: narrative could be a sort of elaborative rehearsal (Tulving & Craik, 2000), in which information about the narrated event is “meaningfully related to other information [...]”. The general finding is that the greater the elaboration of one's encoding is, the better the subsequent memory” (Tulving & Craik, 2000, p. 96). Furthermore, the use of language, the narrative format and the setting not only rehearsal

the memory but also produce a story radically transformed by what it was before (Smorti, 2011).

As a result, the autobiographical narrative is a way through which memories are transformed, procuring a sort of narrativization of experience, very important in a situation in which one wants to interpret, understand and consider one's experience (Bruner 1990, 1991). Indeed, as he wrote, "people narrativize their experience of the world and of their own role in it" (Bruner, 1990, p. 115). These transformations, which may be beneficial to the mental well-being of the patient, have been demonstrated in numerous studies (Pennebaker *et al.*, 1988; 1990; 1997; 2001), and occur because the personal story is shared and reconstructed to an interlocutor through the narrative, moving from an internal to an externalized language enriched by the narrative structure (Bruner, 1990). In this process, narrative gives some of its characteristics to memory, as for example a greater use of language, a temporal and causal organization, the emergence of emotions and intentionality, as well as a re-elaboration of the emotional process related to the past event.

Therefore, one of the conditions that come into play and affect the way in which this transformation takes place from memory to autobiographical narrative is the sort of relationship between storyteller and listener.

The narrative act is always facing someone and therefore is dependent on the type of relationship between a listener and a storyteller. The partner, in fact, the one who listens to the story, contributes to its reorganization by providing insights and points of view. In doing so, she/he becomes part of the process of elaboration of the narrator's personal history. The relationship between narrator and listener, therefore, allows the occurrence of a "new" story that differs from what the narrator may have told others, because it is modified by new interactive situations. Theories about the social construction of autobiographical memories argued that memory has a constructive and contextual nature. Conway (Conway and Pleydell-Pearce, 2000) deals with the construction that autobiographical memory derives from the interplay of the self-system (individual beliefs and goals) and the autobiographical knowledge (records about past experiences); goals in everyday life determine which memories are recollected and reconstructed and why. Pasupathi takes into consideration the social construction of the personal past starting from the assumption that much learning and development begins in recounting past events in conversation (Pasupathi, 2001). According to this Author two principles govern conversational recounting: consistency and co-construction.

Consistency deals with the way in which speakers and listeners jointly produce memories retold in their conversation: retelling autobiographical memories is a way to increase knowledge about them in terms of interpretative content (Pasupathi, 2001). The main studies in the field of autobiographical memory argue that such memories are often rehearsed, both mentally and conversationally. This procedure involves the application and the construction of a scheme of the event. Such schemes can improve the comprehension of many details or exclude other inconsistent information.

Co-construction deals with the fact that recalling a past event can produce small and progressive changes in the nature of an autobiographical knowledge.

Co-construction is strongly dependent on three elements: the speaker, the listener and the speaker-listener interaction. Although a good number of studies have deepened the role of the narrator (McAdams *et al.*, 1997; Fivush, 1998), of the interlocutor (Pasupathi *et al.*, 1998; McAdams *et al.*, 2001; Pasupathi and Hoyt, 2009), and of their interaction (Pasupathi, 2001), what has not been adequately addressed is the kind of changes which affect autobiographical memory. Pasupathi (2001), however, pointed out the importance of previous knowledge about the topic of conversation, the non-verbal behaviour between the partners of interaction, the disinterest or disapproval about what is told as well as the motivation to tell. In a study on non-autobiographical memories, asking couples of individuals to recall memories about films seen together, the author demonstrated that collaborative coproduction of memories implies richer and more detailed narratives than those persons recall individually (Pasupathi, 2001). Thus, the meanings people give to the events of their life are not individually processed through the narrative alone, because they result from the joint and co-constructed activity of partners involved in the conversation. In this sense, different narrative styles elicited in narrator could lead to different elaboration processes of autobiographical memory.

1.5 Building together stories of illness: a proposal for doctor-patient communication

Evidence underlined in past paragraphs has shown the patient's request for an attentive and empathic doctor; similarly these studies highlight the important role that doctors play in listening to their patients' stories about illness. To develop effective doctor's communication skills it is not just important to improve the way in which information are given to patient, but also the way to listen to them. Indeed, patients retell their illness histories many times to relatives and friends but only during their meeting with

the doctor do they give a new narrative structure to their own autobiographical story, facing an interlocutor who gave them a different point of view.

By reviewing knowledge about social interaction's impact in the development of autobiographical memory, however, some authors have also suggested the role of the closeness and similarity of the listener to the narrator. For instance: individuals who recall past events together with a friend tend to remember more information than when they have a recall task with a stranger (Alea and Bluck, 2010). The relationship between narrator and listener influences not only the kind of story that is told, but also the listening act itself.

Bluck et al. (2013) have experimented on this topic with the Autobiographical Memory Sharing (AMS) method. They studied the social function of autobiographical memory by stimulating empathy between the narrator and the interlocutor, focusing on the variables that may affect this ability. Participants, selected on the basis of having experienced or not traumatic events in the past, were requested to read autobiographical narratives about traumatic memories. Level of empathy before and after the reading of the stories was measured. The results show that in the group of readers who had traumatic experiences the level of empathy increased after reading the story (compared to those who had not experienced trauma). According to Pillemer (1992) and Bluck and colleagues (2013), sharing autobiographical memories, such as those related to the disease that arise in patient-physician communication, greatly increase the listener empathy towards the narrator of traumatic events.

The Autobiographical Memory Sharing (AMS) approach assumes that the listener (the physician) can search for their own autobiographical memories choosing the episodes that are similar to what has been recounted by the narrator (the patient) and extracting the elements useful to the understanding (Lockhart, 1989). Physicians collect every day a large number of stories about illness, experiencing a job that involves a substantial burden of suffering. Especially if they deal with deadly diseases, they could experience high levels of stress for managing with the emotional burden of their job (Sandrin, 2004).

Considering what we have written so far, it would seem then that doctors are the ideal partner for the practice of AMS: by listening to the stories of the patient and comparing them with the accumulated experience in working life, they can increase the intimacy of communication, developing empathy for their client and then giving correct information necessary for the creation of a therapeutic alliance. In this process of joint

reconstruction of disease, the doctor may incorporate the history of the patient in a medical lexicon (Donnelly, 1997), learning, at the same time, to master the subjective and emotional experience. This type of bio-psycho-social approach, not new to research in this field (Engel, 1977), embraces in a single - built with "four hands" - story the various aspects of illness and disease and may allow both the doctor and patient to meet the needs of partner in the therapeutic relationship.

1.6 Conclusions

This chapter aimed to discuss the need for a solid and careful connection among medical patient-centred practices and theoretical constructs of narrative theories.

We have therefore highlighted two key points within the debate on doctor-patient communication.

The first is the opportunity to move from a “patient centred model” to a “patient-physician centred model”, that considers at the centre of medical practice both actors of the therapeutic relationship and the result of their interaction: the history of the disease. Starting from the current studies on doctor-patient communication and on the yet unresolved problems in this domain, as well as the differences between patient's and physician's stances within their relationship, we have explored the role of narrative of illness as a tool in the creation of a personalized care. The goal of the Narrative Based Medicine approach, in this sense, is not only that of incorporating the patient's perspective in the work of the physician, but to shape, through narrative, a common perspective, which is created in equal measure from both, respectful of the social roles that take part in the relationship. In this sense, we tried also to deepen this field in the light of social and cognitive theories about narrative and autobiographical memory, focusing on the great importance that this knowledge can bring to the doctor's correct openness to patient's stories. Although the doctor-patient communication has been central in social and health-care debate for several decades, it is now certain that the medicine should take advantage of the evidence derived from the narratives of the illness (Greenhealgh, 1999), through an integration of the Evidence and the Narrative Based Medicine approaches.

According to the studies on autobiographical narrative and its influence on life event memories, we think that basing medical practice on the joint construction of the history of illness could be the correct approach to redefine what illness means in the patient's life and what it means in the work experience of the physician. Communication training

in medical practice could embrace modules on narrative theories as a practical proposal to provide narrative skills and the correct way to use them in the daily activity of caring. The second point we have emphasized concerns our proposal for a model of doctor-patient communication.

The need to narrate and to be listened, in the health field, medical care and hospitalization, as well as in all situations of suffering, is strong and irrepressible. In this way the patient's experiences (memory) assume a new meaning when they are communicated, following a process that we can define “narrativization” (Bruner, 1991). Through the narrativization model, also in medical practice, the story of illness can be elaborated passing from a personal and internal language to a language for the “others”. Methods like The Autobiographical Memory Sharing (AMS) procedure, thus, rather than considered examples of good relationship between doctor and patient, must be considered as a complete form of relationship very useful to the teaching programs in medical communication: the profound knowledge of the history of life and its joint development can lead to a therapeutic approach that considers all the variables useful for clinical practice.

In the light of this proposal and given the importance to clarify the cognitive models at the basis of the narrativization process, before considering the role of narrative in contexts of suffering, the next two chapters will explore the narrativization process through two different studies. In the first the role of autobiographical narrative on the accessibility of past memories and on their emotional involvement will be assessed. In the second it will be considered the role of the length of autobiographical narrative. In the last chapter we will consider an application in contexts of disease, considering the relationship between narrative and memories in patients suffering from cancer. In this sense, we will also focus on different types of narratives: long versus short stories, as well as negative versus positive stories. Our main aim is, indeed, to demonstrate that the narrativization process is strictly dependent to the way in which people tell their story.

Chapter two:

How the emotional content of memories changes in narrative

2.1 Introduction

Autobiographical memory and autobiographical narrative are the central part of the individual's sense of self (Ross, 1989). They provide a contribution to personal identity, give a sense of coherence to our lives (Conway, 1997; Conway & Holmes, 2004; McAdams, 2001, 2006; McAdams *et al.*, 2006), and create the building blocks of a life story (Habermas & Bluck, 2000; McLean, Pasupathi, & Pals, 2007). Nevertheless, autobiographical memory and autobiographical narrative are not the same. They are distinct concepts which refer to distinct processes having important reciprocal influences. As we will show in the next paragraphs, few studies have explored this topic and knowledge about it is still unclear. The aim of the present study is to assess how emotion content associated with personal memories changes when these memories are narrated and become autobiographical narratives. Since personal memory is individually located, while narrative is by definition sustained by a communicative act, the first step to do is to show how autobiographical memory is socially interconnected and how it shares common social roots with narrative.

2.1.1 The social roots of autobiographical memory

Though personal memory is individually located, it is socially constructed. If we consider the role played by cultures, we become aware of how cultures, among other things, define what is normative in each developmental period, such as infancy, childhood, adolescence, adulthood, and what is not. Individual life stories, with their personal meaning and coherence (Berntsen & Rubin, 2004; Rubin & Berntsen, 2003), therefore receive a normative structure from culture. But the social intertwining of memory and culture is particularly evident in social development. Many authors suggest that the development of autobiographical memory is socially determined (Conway & Holmes, 2004; Fivush & Baker-Ward, 2005; Fivush & Nelson, 2004; Fivush, 2011): the

interactions and relationships with parents in childhood and with peers in adolescence (Peterson, Bonechi, Smorti & Tani, 2010) seem to promote changes in autobiographical memory.

The development of autobiographical memory takes place in childhood through a process characterized by social cooperation among adults and children (Fivush & Nelson, 2004). Studies in this field are numerous and focused on conversations between parents and children in the first years of linguistic development (ages of four, five and six). In their very first years of life, children develop memories about past events through the repetition of daily routines provided by their parents (Nelson & Fivush, 2004), who help their children to store these by attributing a specific time and location to every event (Tulving, 2002).

Autobiographical memory starts to develop at the age of three-four, when children start to put their memories in a verbal way, giving them a story structure based on Burke's pentad of agent, action, scene, goal and instrument (Burke, 1945). It is through "cooperative discussions" with their parents that children internalize the narrative structure of shared conversations, using it to guide their own recollection of significant precedent experiences (Nelson & Fivush, 2004). These so-called "memory talks" between child and parents are considered crucial for the developmental process of the autobiographical memory (Ferrari, Fasig, & Welch-Ross, 1997). Studies in this domain, in fact, have pointed out that the different interactive and communicative modalities of caregivers imply differences in the content of their children's narrative (Nelson & Fivush, 2004; Sales, Fivush, & Peterson, 2003).

Other studies have explored the development of autobiographical memory in later ages, highlighting the role of peers and school. When growing up, children or adolescents employ narrative schemas learned from their familiar environment in other important contexts such as school through their relationship with peers. In this case, too, feedback received from interlocutors during the narrative of own life events plays a decisive role in the construction of autobiographical memory, in its interpretation and in the process of sense giving (Pasupathi & Hoyt, 2009).

From what we have shown so far, it is apparent that autobiographical memory and autobiographical narrative are deeply interconnected, and that they share a common social root and context of development. It is necessary now to consider their differences and reciprocal influences.

2.1.2 Autobiographical memories and autobiographical narratives

Autobiographical memory is traditionally conceptualized as a type of episodic as well as semantic memory for specific personally experienced events related to the self (Pillemer, 1998; Conway & Pleydell-Pearce, 2000). Reminiscing about what occurred in the past is a natural phenomenon (Webster & McCall, 1999), and has the function of reflecting in order to better understand events or experiences and, in turn, to understand the Self (Fivush & Baker-Ward 2005; Fivush & Nelson, 2004). Moreover, autobiographical memory not only depends on an awareness of self in the past, but on sharing these past events with others, so as to negotiate and interpret them in a different way and develop intimacy with others (Alea & Bluck, 2003; Pasupathi, 2001). Thus, the primary function of autobiographical memory is to develop a life history in time. This can occur and develop by telling others a story through narrating past events (Pasupathi & Hoyt, 2009). Bruner (1986; 1990; 1991; 2004) claims that autobiographical memory has a narrative organization: there is not just a Self telling stories, rather a Self shaped by the stories it tells others.

Autobiographical memory and autobiographical narrative are not the same thing: narrative is not simply an externalized form of autobiographical memory, because of its different, richer linguistic format which provides new semantic, pragmatic and communicative features for memory. Since the seminal Bartlett's work on war of ghosts (Bartlett, 1932) focusing on the act of retelling, telling memories has been considered a quite different matter from simple reminiscing (Marsh, 2007)

Language gives autobiographical memories an organizational structure. Autobiographical narrative transforms autobiographical memory and organizes event memories into a comprehensible, chronological and causal sequence of individual events (Bruner, 1991; Fivush, 2011). Bruner uses the word “narrativization” to indicate a particular transformation of an event (and therefore of a memory) into a narrative form that follows ten narrative characteristics, such as diachronicity, specificity, normativity and so on (Bruner, 1990). Individuals create narratives of specific events or experiences, and these events are linked together through time and serve to define the self (Habermas & Bluck, 2000; McAdams, 2001). This integration of personal events into one’s life stories provides a sense of narrative continuity, through the connection between past events and present selves (McAdams, 2001). Specifically, narratives provide a coherent integration of the changes and developments occurring over the course of one’s life

(Conway & Pleydell-Pearce, 2000; Conway, Singer, & Tagini, 2004). Hence, it follows that narrating memories, also by way of linguistic devices, supports the narrator's identity. Moreover, narratives are specifically appropriate devices to take into consideration problems, incongruences and violations of normality and to seek to solve them (Bruner, 1991). One of these incongruences is the violation of expectation, which can be expressed in the narrative by the sense of surprise for an unexpected event. By narrating an autobiographical event, people make a significant change by moving from the internal representation of life events (Conway, 2005) or, in other words, from a "language for the Self", to a "language for the others" (Vygotsky, 1965, En. ed.). Through this process of externalization, the person experiences the emotions felt at the moment of their codification again (Rubin & Berntsen, 2003), modifying and interpreting them into a tale according to the present point of view.

Emotions play a crucial role in autobiographical memory: particularly, experiences which are not lived with a significant emotional engagement generally do not activate an adequate level of specific attention: as a result, they are registered as "not important", and thus are quite easily forgotten (Christianson, 1992). On the contrary, events experienced with medium - high emotional involvement are registered as "important", thus having a good probability of being remembered. Nevertheless, positive and negative emotions may lose their intensity through narrative (McLean et al., 2007): the opportunity to narrate an experience and to give it a meaning has, indeed, a "restoring" effect on its recollection (McAdams et al., 2001). Indeed, a number of studies have shown that while disclosure of negative events to others might have negative short-term effects, in the long term, such disclosure generally reduces the negative feelings that typically accompany the recall of such events (Conway, 1997; Neiderhoffer & Pennebaker, 2002). By narrating an event, and so producing a story, a person refines some details to the benefit of others which become more significant; the need for coherence and continuity which characterizes the narrative of an autobiographical memory helps to rebuild the missing parts and to repair the initial fragmentation (Conway, 1997). Just at this point, the event can be forgotten or obtain a different emotional tone: for example, the stress associated with emotions related to memories can wane or disappear (Pennebaker & Seagel, 1999). Other results, on the contrary, highlight the impact of positive and negative emotions in narrating: in retelling an episode, positive emotions are stronger while negative ones are prone to vanish (Pasupathi & Wainryb, 2010).

Some studies have highlighted that by narrating a personal experience, Self-conception and the perception of narrated events radically change. In addition, this modification itself is influenced by the way in which narrators tell stories and interlocutors listen to them (McGregor & Holmes, 1999; McLean & Pratt, 2006; Pasupathi, Alderman, & Shaw, 2007; Thoman, Sansone, & Pasupathi, 2007; Pasupathi, 2001; Tversky & Marsh (2000). Other scholars have studied how diversity in storytelling setting and goals may play an important role in the extent to which an individual recalls autobiographical memories (Skowronski & Walker, 2004). Telling a personal memory using a lifetime period (such as "when I was finishing high school"), or general event knowledge (such as "I went to the prom"), or event-specific knowledge ("I fell down while I was dancing with Mary") provides the contextual background for the event-specific knowledge, placing a memory in a proper perspective (Conway, 1997).

Although specific studies on the influences of personal narrative on memories are few, there exists a considerable body of research suggesting how the act of narrating memories can change the content of memories substantially, both because narrating is a communicative act, and owing to the massive use of language, which is employed much less in personal memories, even though they are expressed through an internal language. Language and "language to someone" give organization to memories and render them explicit by making covert aspects emerge.

The interconnection between autobiographical memory and autobiographical narrative shows that narratives are the language of memories (Tani, Smorti, & Peterson, in press) and they transform memories, giving them more complexity and richness. As far as we know, specific research focusing on the transformation of memories into narratives is scarce, and this is precisely one of the reasons at the basis of the present research and of the first aim of this work.

In the interconnection between memories and narratives gender may have an important role. The gender variable has been shown to be important in autobiographical memory. For example, women's event memories are longer and richer in detail (Pohl, Bender, & Lachmann, 2005), and are more likely to include emotional and interpersonal information (Bauer, Stennes, & Haight, 2003; Fivush et al., 2003). To explain these gender differences in autobiographical memory, a number of researchers have emphasized socialization differences between genders. For example, parents are more elaborative when engaging in autobiographical memory-sharing with daughters than sons; they are also more likely to embed remembered events within an emotional and

interpersonal context (Adams, Kuebli, Boyle, & Fivush, 1995; Buckner & Fivush, 2000; Fivush et al., 2003). This can suggest that females, along their growth, learn to have more elaborate internal representations of their relationships and then develop better autobiographical memories of them.

Given the relevance of gender differences we can expect females and males to be different in using memories, both with regard to the quantity and quality of emotions involved.

2.2 The current research

Given the scarcity of studies conducted so far on this topic, the aim of this study is still explorative and it intends to deepen the relationship between autobiographical narrative and autobiographical memory by exploring the change in the emotional content of memories when they are narrated. Our claim is not that the simple act of narrating produces changes in autobiographical memory. When people have to narrate their memories, they have to begin to organise their memories in a narrative perspective. So, it is difficult to separate the influence of thinking or reminiscing memories in a narrative perspective from the act of narrating, and so putting materially in words own thoughts and memories. We have studied emotion content by using emotion words and asking participants to use them to label memories before they are narrated and when they are transformed into narratives. Emotion words may play an important role in personal narratives (for a study of emotion words in narrative about friends, see Tani, Smorti, & Peterson, in press). Emotions words capture the primary emotions experienced by narrated characters and they also define the narrative's emotional tone as positive or negative. A number of studies have shown that the emotion words used in narrative are indicators of the emotional tone of the experiences: for example, emotional experiences in romantic relationships (Slatcher & Pennebaker, 2006), mother-child experiences (Fivush, Sales, & Bohanek, 2008) and positive versus negative experiences (Bohanek, Fivush, & Walker, 2005). Thus, it is possible that the use of emotion words, or more specifically their emotional tone, may be influenced by the fact of using the language less (as in memories) or more (as in narratives). Moreover, since a narrative is a specific device that serves to analyse incongruence beyond other goals, the use of emotion words will be more complex when memories are transformed into narratives. Furthermore, assuming a narrative structure, a memory acquires those proprieties which

are related to the story, as for instance the violation of expectation.

The purpose of the present study is twofold. The first is to verify the hypothesis (richness hypothesis) that, in comparison with memories, narratives of memories are richer in terms of attributed emotions (that is, a greater number and richer variety of emotions are used). Moreover, since narrative permits the examination of incongruence, problems and details of memories that are synthetically represented in the consciousness, a second goal was to verify if narrated memories in comparison with not-yet-narrated ones are more complex (complexity hypothesis, that the emotions are put together in order to form complex emotional states with positive and negative emotions or emotions connected to the violation of expectancy).

Because the gender variable has been shown to be important in autobiographical memory this study intends to assess the gender variation in the use of emotions related to autobiographical memory and narrative.

2.3 Method

2.3.1 Participants

A convenience sample of 72 university students from the University of Florence (35 males and 37 females) were recruited for this study. Students were 18 to 25 years old ($M = 20.9$ years; $SD = 1.4$); the males' mean age was 20.4 years ($SD = 1.45$), and females' mean age was 19.4 years ($SD = .98$). The majority of these participants came from the centre of Italy (82.8%), with the remainder from southern (2.6%) or northern (8.67%) Italy. All the participants came from families of a middle or high socioeconomic level, with more than 65% of their parents having a high school diploma or university degree. As well, 54.5% of the participants had at least one sibling and 79% lived at home with their parents.

2.3.2 Instrument

Memory Fluency Test (MFT). The participants were engaged in a timed Memory Fluency Task described and employed in previous research (Peterson, Bonechi, Smorti, & Tani, 2010). To explore autobiographical memories and autobiographical narrative, as well as their interaction, we developed a questionnaire focused on the accessibility of life events and the emotion assigned to them. Prior research in our laboratory on memories and quality of relationships used a Memory Fluency Task (Tani et al., 2010).

Since such a task requires individuals to provide as many memories about targeted events as they can in a limited amount of time, MFT assesses how readily accessible the memories are. Methodologically we considered those memories that are most readily accessible important for the construction of a coherent sense of self and most likely to be integrated into a person's life story (Bohanek, Marin, Fivush, & Duke, 2006). According to Conway and his colleagues (e.g., Conway & Holmes, 2004; Conway & Pleydell-Pearce, 2000), the memories that are readily accessible are those that are meaningful not only at the time of retrieval but also at the time the events occurred. They further argue that the most accessible memories from a particular period of one's life are best measured by providing subjects with a limited amount of retrieval time. That is, it is the first few memories that are most significant, and an optimal way to elicit them is through a time-limited recall task. Thus, in the present study, we explored individuals' memories through use of this type of task. In particular, participants were asked to recall memories that involved experiences which occurred in high school or university. This age range was chosen because people tend to recall more personal and collective events from the period of late adolescence and early adulthood than from other periods of life (Conway, 1997).

During this session, participants were encouraged to recall as many memories as they could and write down only a sentence or two about each memory. They were given three minutes to do this task (timed by the researcher). After the recollection, the participants were asked to specify the time and the context in which every event happened, in order to facilitate the recollection and accuracy of the tool (Tulving, 2002). Then, they were requested to choose one of them and to select the emotions connected to the recalled event from an eleven-item list: they could select one or more emotions, also of a different emotional tone (positive and negative), that were appropriate to describe the recalled event. According to the main theories about emotions (Ekman, 1999) and on the basis of the spontaneous use of emotions shown in similar samples of participants in previous fluency test sessions (Tani et al., 2010; Peterson et al., 2010), we selected eleven fundamental emotions: one positive (happiness), two neutral (surprise and pride) and eight negative (anger, fear, envy, shame, sadness, disgust, guilt and jealousy).

Autobiographical narrative. A narrative task was used in partial intersection with the MFT. After the Memory Fluency Test participants were requested to write in detail the memory that had been previously labelled in terms of emotions. A blank sheet of paper

was provided to the participants in order to encourage them to freely narrate their memories on the event. Once this task ended, they had to classify their narrative in terms of emotions. They were requested to think of the narrative, to reread it if necessary, and to select, from the eleven-item list, those emotions connected to what they had written. In this case they could again select one or more emotions, also of a different emotional tone (positive and negative). They were given 15 minutes to do this narrative task (timed by the researcher).

2.3.3 Procedure

Participants were recruited while they were in class during university courses. They were told about the goals of this research project on autobiographical memory. Data collection was organized collectively during the class session. The aims of the study were explained in brief to the students, leaving them the opportunity to freely agree to take part or not participate and leave the classroom. A researcher conducted the collection while managing the time needed for the recall task and taking care that the participants had the privacy and tranquillity to complete the task. Once participants understood the nature of the tasks, the Memory Fluency Test session took place followed by the narrative task. In total, the data collection lasted about 40 minutes. The research was conducted in accordance with the American Psychological Association guidelines for the ethical treatment of human participants. Prior permission was obtained from the University Dean and President as well as each course professor. The participants provided their individual consent and could withdraw at any time.

2.3.4 Data Coding

The number of memories was tabulated. Given it was a time-limited task, the memories consisted of a brief sentence or two (e.g., “the day I went on a bicycle trip with my friends” or “when I was not invited to my best friend’s birthday party”).

To test the “richness hypothesis” we counted the number of emotions used by the participants to label their memory and their narrative. Moreover we considered whether one or more than one emotion was used to classify memories or narrative.

To test the complexity hypothesis emotions in memories as well as narratives were considered in two different ways. Firstly, using a molecular way of classification, the

researchers considered every single emotion, selected by the participants to describe their memory and narrative, in terms of presence or absence of sadness, happiness, etc. In particular, the the presence of the emotion “surprise”, that express the sense of violation of expectation, has been considered. Secondly, using a molar way of classification, the researchers codified the emotional tone of the memory as simple positive, simple negative, simple neutral or complex. A simple positive emotional tone was attributed when participants used “happiness” alone or with neutral emotions such as surprise or pride to label their memories or narrative. A simple negative emotional tone was attributed when participants used one or more of these emotions to label their memories or narrative: “anger”, “fear”, “envy”, “shame”, “sadness”, “disgust”, “guilt”, or “jealousy”. A simple negative tone was also considered if participants used a negative emotion with a neutral one (surprise or proud). A simple neutral tone of emotion was considered if participants used surprise and/or pride without other emotions. A complex emotional tone was attributed when participants used one or more negative emotion together with happiness (neutral emotions might be included as well). All these categories were numerous except the neutral tone. Surprise and pride only occurred alone in a few cases.

2.4 Results

To label their memories participants used a total of 167 emotions ($M= 2.29$, $SD= 1.78$) Females used more emotions than males (respectively: $M = 2.5$, $SD =1.77$ and $M = 2.00$, $SD =1.75$) though not in a significant way ($F(1,70)= 1.88$, $p = ns$). No differences among males and females emerged using comparing their use of one emotion to label their memory ($X^2= .34$, $p = ns$). As to emotional tone, males and females used simple positive, simple negative and complex tone to the same extent (simple positive: males 48%, females 45%, Mann-Whitney's $U= 658$, $p=ns$; simple negative: males 31%, females 37%, Mann-Whitney's $U = 598.5$, $p =ns$; complex: males 20% , females 16% , Mann-Whitney's $U = 644.5$, $p = ns$)

Since no significant difference was found among males and females further analysis will consider the whole sample without gender comparisons.

Table 1 shows the emotions attributed to memories (those memories chosen to be narrated) and to narratives (the same memories once narrated).

	Memory to narrate		Narrated Memory		Wilcoxon's <i>z</i>	<i>p</i>
	<i>N</i>	%	<i>N</i>	%		
EMOTIONS						
Fear	21	0.28	23	0.31	-0.57	ns
Guilt	6	0.08	7	0.09	-0.44	ns
Anger	15	0.20	19	0.26	-1.41	ns
Disgust	8	0.10	9	0.12	-0.57	ns
Happiness	47	0.64	53	0.72	-1.73	ns
Envy	3	0.04	3	0.04	0.00	ns
Jealousy	3	0.04	3	0.04	0.00	ns
Shame	9	0.12	14	0.19	-1.66	ns
Sadness	15	0.20	17	0.23	-0.70	ns
Proud	17	0.23	20	0.27	-0.83	ns
Surprise	23	0.31	40	0.54	-3.54	.001
Tot Em	167		208			

Table 1 Emotions used by the participants to label memory chosen to narrate and narrated memory

Note: number of memories to narrated and narrated memories = number of participants ($N=72$)

A non-parametric Wilcoxon test for dependent samples was calculated to evaluate the differences between the memories chosen and memories narrated. As it can be seen, participants did not use different emotions to label their narrative in respect to when they had labelled their memory. In memory task they used mainly happiness, surprise, fear, sadness and proud, in narrative task they used happiness, surprise, proud and anger mainly. However two important features must be noted in the table. The first is that in the number of emotions increased from memory task to narrative task (167 emotions vs. 208). The second is that surprise is the one emotion that increases significantly (Wilcoxon's $z = -.54$, $p < .001$). 23 participants used it to label their memory while, when they had to label their narrative, 40 participants used it. Surprise is associated with

negative emotion in memory in 2 cases (9%) out of 22 cases, while in narrative is present 8 times (20%) out of 40, but it was mainly associated with happiness both in memory and in narrative. Particularly this association increases from 23% in memory to 42% in narrative (McNemar test: $p < .01$).

The example of a 20-year-old male participant is significant: after the narrative about the day when he started his most important relationship with a girl, he added the emotion of surprise to that of happiness, which was already present in the Memory Fluency Test. Also in this case the narrative structure of the story enabled the surprise to appear: *“We spent a really beautiful and fun day with some other friends, we made a human chain and she was close to me, holding my hand. The way she held my hand, however, was so strange, very warm. At the end of that day she kissed me without saying a word...”* (subject 2-67).

Table 2 shows complexity and richness of emotions in memory and in narrative tasks.

	Memory to narrate		Narrated Memory		Wilcoxon	
	<i>N</i>	%	<i>N</i>	%	<i>Z</i>	<i>p</i>
COMPLEXITY						
Simple positive	34	0.47	31	0.43	-0.57	ns
Simple negative	26	0.36	18	0.25	-1.5	ns
Complex	12	0.18	23	0.32	-2.35	0.01
RICHNESS						
One emotion	37	0.50	14	0.19	-4.1	0.001
Number of emotions mean (SD)	2.29 (1.78)		2.88 (1.69)		-2.78*	0.01

*paired t test

Table 2: Emotions' complexity and richness used by the participants to label the memory chosen and narrated memory

Note: number of memories to narrated and narrated memories = number of participants ($N=72$)

In memories, the tone of emotions was more significantly simple positive and simple negative than complex. Once memories were narrated, the tone of emotions was again more significantly positive. However, a significant difference emerged upon comparing the tone of emotions from memories to narratives. The simple positive tone and negative tone of emotions decreased, while the complex tone of emotions increased significantly (simple positive tone in memory vs. simple positive in narrative $z = -0.57$, $p = ns$; simple negative tone in memory vs. simple negative in narrative: $z = 1.5$, $p = ns$; complex tone in memory vs. complex tone in narrative $z = -2.35$, $p = .01$). Overall, the complex tone of emotions went from 12 to 23 cases.

There are a lot of examples of an increase in complex emotional tone after the narrative task. One boy, for example, selected the “trip to Berlin” memory for narration. Before the narrative it was a positive memory: only the emotion of *happiness* had been allocated to it. After the narrative, the student selected *happiness* as well, but also the negative emotion *anger*, changing the memory into an emotionally complex one. This is due to the topic of the narrative that emerged during the tale: when it had been written, the happy trip to Berlin also made way for negative experiences such as, for example, the bad condition of the hotel and the journey: “*We travelled by bus and it was a really long way, almost 15 hours! We stopped one night in Munich but the hotel wasn’t very comfortable; the city was beautiful but the welcome less so!*” (subject 2-77). A girl who participated in the study, for example, wrote about a dangerous accident that happened to a friend during the second year of high school, allocating the emotions of sadness and fear to the memory, while after the narrative the emotion of happiness appeared. Indeed, as in a happy ending story genre the girl wrote that “*the ambulance got there quickly and they took him to hospital where, fortunately, they looked after him. After a month with a plaster cast everything went back to normal*”(subject 2-14). In this example, the typical narrative structure of a story (McAdams, 2001) helps the participant to give rise to new complex emotions, adding happiness for the good ending of the story to the negative emotions due to the bad accident.

As for Richness hypothesis one emotion responses decreased significantly when participants labelled a narrative, in comparison to when they had labelled a memory ($z = -4.1$ $p < .001$). Indeed one emotion was used from 51% of participant in the memory task and only from 19% of them in the narrative task. A t test was used to assess changes in the number of emotions. Narrated memories were labelled with a greater number of emotions than memories ($M = 2.29$, $SD = 1.78$ and $M = 2.88$, $SD = 1.69$, respectively).

2.5 Discussion

This paper aimed to study two different steps in memory retrieval: when they are retrieved in a Memory Fluency Test and then classified in terms of emotions connected to the remembered event and when they are narrated and then classified – as “narrativized” memories - in terms of emotions.

Therefore, the basic aim of this study was to analyse memories’ changes, in terms of the emotions labelled before and after the narration. An important tradition of research on memory and narrative has suggested that when they are narrated memories do not maintain the same characteristics as when are simply retrieved without any other language aid. So the main hypothesis was that narrated memories were expected to be richer than the not-yet-narrated ones in terms of the emotions attributed. Moreover, since narratives are specifically aimed at examining the incongruences, problems and details that are synthetically represented in the consciousness in memories, a second hypothesis was that in comparison with not narrated memories, narrated ones were expected to be more complex. Finally, since literature on gender differences had suggested that females appear to be different from males both in some aspects of autobiographical memory and in the way of expressing emotions, we wanted to observe gender differences.

As to the first and the second hypotheses, our expectations were confirmed. Once told, more emotions were attributed to narrated memories in comparison with the number of emotions attributed to memories to narrate and multiple emotions were attributed to narrative much more than to memory (richness hypothesis). Moreover the narrated memories were more significantly complex than memories to narrate (complexity hypothesis). Since the complex tone of emotions includes both positive and negative emotions, the increase in complexity demonstrates that positive and negative emotions join together more through narrating than when a memory is simply retrieved. It is important to stress that the simple increase in the number of emotions (richness hypothesis) is not the direct cause of the increase of complex narratives. In fact the increase in the number of emotions might affect those memories that had already been classified with multiple emotions (for instance, a memory described with two emotions might be described with three or four emotions in the narrative) without transforming memories classified with a single emotion into narratives classified with multiple emotions. Indeed, what occurred was not a simple increase in the number of emotions

but also the fact that memories classified with a single emotion were, once narrated, classified with multiple emotions. 37 memories to narrate were classified with a single emotion while, when they had been narrated, a single emotion system was only used in 14 cases.

Since participants used 167 emotions to label their memories while in narratives used 208 emotions, almost all the emotions increased from memory to narratives. However the one emotions that increased significantly was surprise. Surprise expresses the presence of an unexpected event and this is one of the particularities of narrative, that is, taking into consideration and giving a meaning to what is unexpected (Bruner, 1991). So it seems that, through narrating, memories really are transformed into a narrative form and acquire narrative devices. The connection between happiness and surprise goes in this direction, showing that when happiness is in a narrative it acquires an important specification, that of being unexpected: happiness in itself is not a good story.

Though females made use of more emotions in comparison to males, the analysis of gender differences didn't show any significant difference. Overall neither in richness nor in complexity variables any significant differences emerged. Previous studies that compared the number of retrieved memories found that females retrieve a greater number of memories than males in females (Tani et al., 2010; Pasupathi, 2001). However, from a previous research using a Memory Fluency Test (Tani et al., 2010, Tani et al. in press) females did not express a greater number of negative memories or positive memories in comparison with males. In our research we didn't measure the number of memory, because our aim was that of studying one memory to narrate. So our result does not contradict those of the previous authors. It can be assumed that, in our research, when participants have to select a special memory no difference appears in the emotional tone because this memory represents a particularly significant experience. In other words, when males and females describe an important or special experience the tone of the emotions is the same, but this does not occur when they have to retrieve memories because of the greater fluency capacity of females in comparison with males.

The general results of this inquiry are in line with the studies on autobiographical narrative (see for instance: McAdams, 2001, 2006; McAdams et al., 2006) supporting the assumption that narrative plays a great role in improving changes in autobiographical memory, promoting both richness (number of emotions) and

complexity (more complex types of emotions). As previous studies have demonstrated, telling a story about a past episode is a way to re-experience it (Rubin, 2003) and add new emotions. These results are consistent with the “restoring” effect of narrative (Pasupathi & Wainryb, 2010), as the next studies will show clearly. In their studies on autobiographical open interviews, McAdams et al. (2001; 2006) argue that leaving space and time to re-organize events and select the main topics of the past life is an important tool for making a better autobiographical construction of the past.

Chapter three

Does autobiographical narrative influence autobiographical memory fluency?

The role of story length

3.1 STUDY1

3.2 Introduction

Autobiographical memory and autobiographical narrative are two deeply interconnected processes that provide an important contribution to building the individual's sense of self (Ross, 1989). However, despite their mutual connections and influence, autobiographical memory and autobiographical narrative are not the same thing but are distinct concepts referring to different cognitive processes. One of the most important trends in recent decades in studies assessing the interaction between these two processes is the concentration on how autobiographical memories are socially constructed (Conway & Holmes, 2004; Fivush & Baker-Ward, 2005; Fivush & Nelson, 2004; Fivush, 2011), since interactions and relationships with parents from childhood, and with peers in adolescence (Peterson, Bonechi, Smorti & Tani, 2010), seem to promote changes in autobiographical memory. Autobiographical memory starts to develop at the age of three to four, when children start to put their memories in a verbal way, giving them a story structure based on Burke's pentad of agent, action, scene, goal and instrument (Burke, 1945). It is through 'cooperative discussion' with their parents that children internalize the narrative structure of shared conversations, using it to guide their own recollection of significant precedent experiences (Nelson & Fivush, 2004). In fact, caregivers' different interactive and communicative modalities imply differences in the content of their children's narrative and hence a different way of encoding and retrieving events and of constructing autobiographical memories (Nelson & Fivush, 2004; Sales, Fivush, & Peterson, 2003).

While, in social conversation contexts, several studies have investigated the impact of narrative on autobiographical memory recall, there are still few studies that have

explored the role of different narrative types in improving the fluency of autobiographical memory. This is the main aim of this paper.

3.2.1 Autobiographical memory fluency and autobiographical narratives

Autobiographical memory is defined as a type of episodic as well as semantic memory for specific life events related to the self in relation with others (Pillemer, 1998; Conway & Pleydell-Pearce, 2000). Reminiscing about what occurred in the past is a natural phenomenon (Webster & McCall, 1999), and gives the opportunity of bettering understand events or experiences and, consequently, the Self (Fivush & Baker-Ward, 2005; Fivush & Nelson, 2004).

Assessing autobiographical memory often implies exploration of the natural retrieval of memories as a consequence of feedback such as a positive or negative word. Many tests have been implemented to explore the recall of autobiographical memory fluency (Dritschel, Williams, Baddelay & Ninmo-Smith, 1992; Williams, 2000; Rathbone & Moulin, 2014), which can be considered a measure of the ease of autobiographical memory generation (Rathbone & Moulin, 2014): ‘the subject’s ability to retrieve different types of personal memories is assessed with typical fluency tasks asking for as many memories as possible in a given time period, such as two minutes’ (Rathbone & Moulin, 2014, p. 2). According to Conway and his colleagues (Conway & Pleydell-Pearce, 2000; Conway, 2005), recalling an autobiographical memory influences those aspects of the Self which are more associated with the remembered event: ‘events that intensively engage the working self will be strongly associated with central working self-goals and so give rise to memories that, because of their close association with current goals, remain highly available’ (Conway & Pleydell-Pearce, 2000, p. 280).

However, autobiographical memory not only depends on an awareness of self in the past, but on sharing these past events with others, so as to negotiate and interpret them in a different way and develop intimacy with others (Alea & Bluck, 2003; Pasupathi, 2001). This can occur and develop by telling others a story through narrating past events (Pasupathi & Hoyt, 2009).

By narrating an event, and so producing a story, a person refines some details to the benefit of others which become more significant; the need for coherence and continuity which characterizes the narrative of an autobiographical memory helps to rebuild the missing parts and to repair the initial fragmentation (Conway, 1997). At this point, the event can be forgotten or obtain a different emotional tone: for example, the stress

associated with emotions related to memories can wane or disappear (Pennebaker & Seagel, 1999).

Nevertheless, as we have written, people can produce different stories in different contexts. In the next paragraph, we will consider the different cognitive processes implied in the production of small and big stories.

3.2.2 *'Small stories' and 'big stories'*

The narrative of a past life event could be considered a 'small story' or a 'big story' (Bamberg, 2006). By small story we mean the 'kind of stories we tell in everyday settings' (Bamberg, 2006, p.63), often related to everyday, not very interesting or particularly tellable occurrences. This kind of story usually comes from an interaction in which the listener asks for a brief report of the event. In this sense, the recalled event is not usually recognized as an interesting story, so it is quickly forgotten. In this sense, a small story is somewhat similar to the gist of a memory (Reyna & Brainerd, 1995). Traditionally, we refer to 'gist' with regard to the substance of a memory, a sort of brief label of the remembered episode. It is the meaning of the memory, providing general information: hence, it is imprecise and does not contain exact details (Reyna & Brainerd, 1995).

On the contrary, big stories (Bamberg, 2006), or verbatim (Reyna & Brainerd, 1995; Brainerd & Reyna, 2004) are narratives with exact wording, using more details and enabling coherence and to connect the event with others present in the autobiographical memory. In this kind of story, speakers are asked to recall an event with a particular opportunity for reflection. The interaction that leads to longer stories requires someone to ask the speaker for details, clarifications and explanations: in other words, the narrator perceives that the story is interesting and that someone cares about it. The verbatim generally implies the recollection of secure memories, virtually exempt from mistakes (Brainerd & Reyna, 2002). On the contrary, the gist is recalled through semantic clues (useful for preserving the meaning of the memory) which sometimes could be false. Thus, considering the adaptive coherence of autobiographical memories theorized by Conway's Self-Memory system (Conway, 2005), we can argue that the gist pursues coherence with the Self, while the verbatim follows the correspondence with reality (Brainerd & Reyna, 2002).

Nevertheless, remembering specific and detailed events or general ones implies different cognitive processes and different cognitive labor for the narrators. Holland,

Addis and Kensinger (2011) identified two phases in autobiographical memory recall: the first begins by specifying a cue (for example, recalling an event associated with the word 'school'), with a consequent memory search process and evaluation of the search results. The second phase deals with elaboration of the event: the selected event is collocated in a specific time and the details appear (Conway, 2005; Holland et al., 2011). Considering these phases, the gist of an autobiographical memory is recollected in the first phase of memory recall, while the specific details required for a long narrative also need the second phase to be recalled (Holland et al, 2011). Neuroscience studies have also suggested that there are two cognitive areas involved in the gist and long narrative recollection process of past life events. Particularly, the detailed narrative of events engages the prefrontal and medial temporal lobe regions, while the gist activates extensive right-lateralized prefrontal cortex activity (Holland et al., 2011). At the same time, studies on amygdala damage have shown that selective medial temporal damage sparing the amygdala impairs the emotional memory for gist but not for details of complex stimuli (Adolphs, Tranel & Buchanan, 2005).

It appears clear that narrating a past event in detail requires more time and more cognitive retrieval than narrating the gist of an event and only focalizing on the general information about the episode. But what are the possible influences on memories of making a short or a long narrative of a memory?

As far as we know, no evidence exists about the relationship between the type of narrative (long or short) and its influence on autobiographical memory. However, we can argue that a short narrative implies a form of gist, in which the general meaning of the autobiographical memory is pointed out without the opportunity to recall other details or to give it a new sense. In contrast, a long narrative implies a deeper cognitive mechanism involving a re-organization of the memory, the selection of those details that are more interesting and important, and the addition of personal considerations.

A comparison of the effects that long and short narrative can have on autobiographical memories and emotions in particular seems to be a useful study. It can cast light not only on the role of language on memories but can also provide important information on the practical use of narrative in everyday life as well as in professional contexts.

3.3 The current research

This research is interested in assessing the influence of the length of autobiographical narrative on autobiographical memory fluency. Although there are few specific studies

on this topic, there exists a considerable body of research suggesting that the act of narrating can substantially change the content of memories, both because narrating is a communicative act, and because of the extensive use of language (which is employed much less in personal memories, even though they may be expressed through an internal language). Language and 'language to someone' gives organization to memories and renders them explicit by making covert aspects emerge. In fact some studies (Pennebaker & Seagal, 1999) have suggested that by narrating a personal experience, Self-conception and the perception of narrated events changes radically. In addition, this modification itself is influenced by the way in which narrators tell stories (Pasupathi, 2001). Using more or less language to tell memories can influence memory fluency. If narrating a past event in detail requires more time and more cognitive retrieval than narrating the gist of an event, memories should change accordingly. If a long narrative permits the recollection of more details and use of a sharper story format than a gist narrative, the memories could change accordingly too.

Starting from these assumptions, the general goal of this study was to explore the relationship between autobiographical narrative and autobiographical memory, and in particular to assess the extent to which narrative of different lengths can affect memory fluency.

In the present study, memory fluency is defined as the quantity of diverse memories that can be recalled in a given amount of time. The memories recalled in a Memory Fluency Task are those more readily recallable in that particular moment. Hence, the amount of memories that are recalled indicates the number of diverse memories that are available or, in other words, the level of memory fluency (Dritschel, Williams, Baddeley, & Nimmo-Smith, 1992; Rathbone & Moulin, 2014). Given the defined amount of time provided and the limited memory capacity, the memories that are recalled are the ones that are more available. So this study will assess the extent to which narrating a memory, sorted from a list of memories recalled in a memory fluency task, can interfere in a subsequent memory fluency task. Our assumption is that narrating a memory entails work of elaboration that can affect memory fluency in two ways. On one hand, the narrative process entails labor that, as such, can hamper memory fluency. This is well known from many study trends, for instance, on the effect of distress resulting from a cancer diagnosis. Their main results suggest that cognitive and physical fatigue affects the retrieval of past life events and the reflection on them (Nilsson-Ihrfelt, Fjallskog, Liss, Jakobsson, Blomqvist, & Andersson, 2004, Giffard, Viard, & Dayan, 2013). On

the other hand, the narrative process activates an elaboration process that makes individuals expand their memories more and so concentrate on them. This could reduce the level of more general memory fluency, meant as the amount of new and diverse memories retrieved in a given space of time.

We are aware, however, that another hypothesis exists. A narrative task could activate new associations and so new memories. Early studies indicate that when a word or concept is activated in the memory, and then spoken, it will activate other words or concepts which are associatively related or semantically similar to it (Dritschel et al., 1992). Therefore, while a long narrative is expected to enable deeper elaboration of a given memory and hence facilitate a better narrated memory availability with respect to a short one, the studies conducted so far do not definitely exclude that a longer narrative could also have the effect of promoting new memory fluency.

In the present study we requested participants to compile a Memory Fluency Task (MFT). Afterwards the participants were divided into three groups. Two experimental groups had to choose two memories and narrate them in detail: one group had to write two long narratives on them (LN) and the other had to write two short ones (SN). Moreover, a control group (CG) had no narrative task to complete.

Finally, another memory fluency task was proposed to the two groups.

We aimed to assess:

- 1) changes in overall memory fluency. Given that a long narrative, being rich in details and giving a major opportunity to associate new memories, can improve memory fluency more than a short narrative and that, in contrast, a big story entails a greater cognitive task that can hamper memory fluency, we did not have a definite hypothesis as to which of the two groups would have a better memory fluency outcome in the second MFT;

- 2) Changes in the memory fluency of narrated memories and non-narrated memories. We supposed that narrated memories would be recalled more in the MFT2 than unnarrated memories because narrating memories had a rehearsal effect, in line with our theoretical hypotheses. However, we also supposed that participants from the LN group would recall more narrated memories in MFT2 than the SN group, because the participants had the opportunity to write more and explore the memory in more detail. Summarizing, our hypothesis was that memory fluency were higher in narrated memories than in unnarrated ones, and in LN group more than in SN one;

3) Differences between long and short narrative texts in terms of cognitive words and causal connection. This aim is closely related to the second goal and can cast light on the results from the first aim because it provides information on the amount of cognitive work entailed in the narrative task. We supposed that those categories of words which are related to the cognitive labor involved in the narrative process would be significantly higher in the LN than in the SN group. In other words, we supposed that a long narrative would be richer in cognitive terms that can express the narrator's reflexivity.

3.4 Method

3.4.1 Participants

The participants were freshman students in an university of central Italy (N = 152, M = 76, F = 76) aged $M = 22,5$ ($SD = 3.07$), generally coming from central Italy (82%) cities.

Participants were randomly allocated to two experimental groups. (Long Narrative LN = 53; Short Narrative SN = 54) and to a Control Group (CG = 45). The three groups were comparable as to age and gender (LN: age $M = 22.5$ ($SD = 2.39$); M = 24, F = 29; SN group : age $M = 22.4$ ($SD = 3.27$), M = 31, F = 23; CG: age $M = 22.7$ ($SD = 3.58$), M = 21. F = 24). Preliminary analysis showed that groups were homogeneous by age ($F(2,149) = .136$, $p = ns$), gender distribution ($F(2,149) = .921$, $p = ns$) and the number of memories recalled in the first Memory Fluency Test ($F(2,149) = .857$, $p = ns$).

3.4.2 Instrument

All participants completed a questionnaire focused on the accessibility of past life events. The Memory Fluency Task (Peterson et al., 2010; Tani et al., 2010) had been implemented by our laboratory in previous research on memories and quality of relationships. By requiring individuals to provide as many memories as they can in a limited amount of time, the MFT assesses how accessible the memories are. According to Conway and his colleagues (e.g., Conway & Holmes, 2004; Conway & Pleydell-Pearce, 2000), the memories that are readily accessible are those that are meaningful not only at the time of retrieval but also at the time the events occurred. In particular, the participants were asked to recall memories that involved experiences which occurred in high school or university. This age range was chosen because people tend to recall more

personal and collective events from the period of late adolescence and early adulthood than from other periods of life (Conway, 1997).

After the first memory fluency task, the two experimental groups (LN and SN) were involved in the autobiographical narrative task. In order to assess the impact of narrative on memory fluency, the participants wrote two narratives. They had to select a memory listed in the MFT and write it following two different instructions: write the memory on one page (for the long narrative participants) and in five lines (for the short narrative participants). Afterwards, the participants were requested to choose another memory and repeat the same task. The control group took part to academic activities. Finally, the three groups completed a memory fluency task again. At the end of the entire task, the participants had to compare the two memory tasks and tick those memories that were recalled in the first and in the second memory fluency tasks.

3.4.3 Procedure

The data were collected together in class during the university courses. The three groups of participants completed their tasks separately. The aims of the study were explained in brief to the students, leaving them the opportunity to freely agree to take part, or not, and leave the classroom. A researcher collected the data while managing the time needed for the recollection task and taking care that the participants had the privacy and tranquillity needed to complete the task. The research was conducted in accordance with the American Psychological Association guidelines for the ethical treatment of human participants. Prior permission was obtained from the School Dean and President as well as from each course professor. The participants provided their individual consent and could withdraw at any time. Once participants had understood the nature of the tasks, the Memory Fluency Test session took place.

The participants were asked to remember as many memories as they could involving events from their high school years. They were given a sheet of paper with separate lines labelled for memory 1, memory 2, memory 3, etc.. The participants were asked to recall as many memories as they could and write a short sentence or two as a summary of each memory on the different lines. They were given three minutes to do this task (timed by the researcher). Afterwards, the participants were asked to go back through their list of memories and, for each one, specify how old they were when the event occurred (in years and months), and where it took place. Once the memory fluency task had been completed, the narrative task started just for the two experimental groups. The

researchers asked the long narrative group participants to ‘please now select one of the memories you have listed and try to narrate it on the lines below’ (the whole page). The experimenter asked the short narrative group participants to ‘please now select one of the memories you have listed and try to narrate it on the lines below’ (five lines). Since previous studies (Tani, Smorti, Peterson, in press) showed that the participants completed a page of narrative in about 15 minutes, this was the time given to the long narrative group to complete their task, while the short narrative group were given 7 minutes. Once all the participants had completed their narrative task, the participants were again requested to choose another memory and to write it according to the short or the long narrative group assignments. Once participants had also completed this second narrative task, they were requested to complete another MFT. The control group completed twice the MFT, following a test-retest design, waiting about 40 minutes between the first and the second data collection.

3.4.4 Data coding

In order to accomplish the first aim we measured memory fluency using a quantitative and qualitative method. As a quantitative indicator we used: a. the number of memories in the first and the second MFT; as qualitative indexes we used: b. the number of memories recalled in the first MFT that were also recalled in the second MFT (repeated memories); c. the number of memories recalled in the first MFT that were not recalled in the second MFT (lost memories); d. the number of memories in the second MFT that had not been recalled in the first MFT (new memories); e. the number of different memories recalled. This index was the sum of the first and the second MFT by counting the memories that were different: that is, repeated memories, lost memories and new memories. In order to accomplish the second aim we used a score varying from 0 to 2. The lowest, 0, indicated that after narrating the two memories (recalled in the first MFT), the participant recalled memories in the second MFT that did not include these two memories; 1 indicated that after narrating the two memories the participant recalled memories in the second MFT that included only one of the narrated memories; 2 indicated that after narrating the two memories the participant recalled memories in the second MFT that included both narrated memories. We calculated the percentage of the narrated recalled memories in the second MFT out of the number of narrated memories (2) and the number of unnarrated recalled memories out of the number of unnarrated memories.

In order to accomplish the third aim, all the narratives were transcribed and analysed using the Language Inquiry and Word Count procedure (LIWC, Pennebaker, Francis, & Booth, 2001) for a lexical analysis of the text in order to quantify the linguistic dimensions of these narratives. The LIWC program processes text files one word at a time, matching the base form of the words to an extensive dictionary of over 2,290 word stems, and provides the percentage of words in several linguistic, emotional and cognitive categories, regardless of any information on the content of the events that are reported. A frequency count is provided of the total instances of target words from each category, and this count is then divided by the total number of words in the text to check for individual differences in verbosity. Thus, the scores reflect a percentage of word matches in each category. The LIWC dictionary has been demonstrated to be reliable and exhaustive in its counts, categorizing approximately 85% of specific words used in a wide corpus of narratives and has been utilized by several narrative researchers (e.g., Fivush, Edwards, & Mennuti-Washburn, 2003; Pennebaker et al., 2001; Smith, Anderson-Hanley, Langrock, & Compas, 2005). In the present study, we used an Italian version of this dictionary that was elaborated and used on an Italian sample by Smorti, Pananti and Rizzo (2010). Given the hypotheses of this study, the following categories were examined: a) Overall word count. This is a frequency count of the number of words; b) Cognitive processes. This is a LIWC category including cognitive (ought, know, cause), insight (think, know, consider), discrepancy (should, would, could), tentative (maybe, perhaps, guess), and certainty mechanisms (always, never); c) Cohesion/syntactical connections. These included causal (because, therefore), temporal (then, afterwards), and adversative (however, but) connections.

3.5 Results

First of all, we assessed whether gender differences exist in memory fluency that could confound data differences among the three groups. A multivariate analysis of variance was run, inserting memory fluency in MFT1 and MFT2, and group and gender as factors. Neither group ($Pillai = .038$, $F(4,292) = 1.41$, $p = ns$), nor gender ($Pillai = .033$, $F(2,149) = 2.43$, $p=ns$), nor group x gender ($Pillai = .047$, $F(4,292) = 1.74$, $p = ns$) resulted significant. Given the non-significant effect of gender we ran all the subsequent analyses by collapsing the sample and only considering the three groups.

With respect to the first goal, we compared the quantitative and qualitative aspects of the memory fluency of the three groups across the two MFTs before and after the narrative task.

Table 1 presents the description of memories retrieved by the participants from the three groups in the first and second MFTs as the quantitative fluency indicator. As qualitative indicators, the descriptions of memories that were recalled in both the first and second MFTs (repeated memories), those that were not recalled in the second MFT (lost memories), and those that were only recalled the second time (new memories) are reported as well.

	SN		LN		CG	
	MFT1	MFT2	MFT1	MFT2	MFT1	MFT2
	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>
	(<i>SD</i>)	(<i>SD</i>)	(<i>SD</i>)	(<i>SD</i>)	(<i>SD</i>)	(<i>SD</i>)
Number of repeated memories (b)	1.57 (2.26)	1.57 (2.26)	2.96 (2.92)	2.96 (2.92)	2.91 (2.99)	2.91 (2.99)
Number of lost memories (c)	5.55 (2.66)		4.32 (2.97)		4.84 (3.16)	
Number of new memories (d)		6.01 (2.31)		4.04 (2.26)		4.28 (3.14)
Total number of memories (a)	7.12 (2.88)	7.55 (2.85)	7.28 (2.04)	7.01 (2.69)	7.75 (2.28)	7.22 (2.28)
Total number of diverse memories (1) (MF1+MF2) (b+c+d)	13.12 (4.27)		11.32 (3.35)		12.02 (4.11)	

Table 1: Quantitative and qualitative fluency indicators in MFT1 and MFT2 across the two groups

(1) The number of repeated memories was counted once.

Although the participants who composed a short narrative increased the number of memories from the first to the second MFT (MFT1 mean = 7.12; MFT2 mean = 7.55), those who wrote a long narrative remained stable (MFT1 mean = 7.28; MFT2 mean = 7

) and the Control Group decreased the number of memories (MFT1 mean = 7.75 ; MFT2 mean = 7.22), a repeated ANOVA measure showed no significant differences as to the task ($Pillai = .003, F(2,149) = .48, p = ns$) or to the task x group interaction ($Pillai = .031, F(2,149) = 2.37, p = ns$). The three groups were not significantly different ($F(2, 149) = .29, p = ns$). Univariate analysis of variance showed that, moreover, there was no difference between the three groups in either the first ($F(2,149) = .85, p = ns$) or the second MFT ($F(2,149) = .89, p = ns$).

As far as the qualitative indicators were concerned, in the LN group, out of 7.28 memories recalled in the first MFT, 2.96 (40.65%) were also recalled in the second MFT. In the CG, out of 7.75 memories recalled in the first MFT, 2.91 (37.5%) memories were recalled also in the second MFT. In the SN group, out of 7.75 memories recalled in the first MFT, 1.57 (22.06%) were also recalled in the second MFT. As for lost memories, in the SN group 5.55 memories (77.94% of memories recalled in the first MFT) were lost in the second MFT, while this only occurred for 4.32 memories (59.35%) recalled by the LN group and for 62.45% of CG memories. Considering the number of new memories recalled in the second MFT, in this case the SN group recalled 6.01 (79.5%) new memories out of the 7.55 memories recalled in the second MFT, while the LN group recalled 4.04 (57.72%) new memories out of the 7 memories recalled in the second MFT and CG group recalled 59.7% of new memories out of 7.22 memories. The three groups also appeared different in the number of different memories, namely the sum of the above variables, with the SN group recalling more ($M= 13.12$) different memories than the LN group ($M= 11.32$) and Control Group ($M= 12.02$). In order to statistically compare the three groups, a multivariate analysis of variance was run.

Overall, the group differences were significant ($Pillai = .134, F(2,149) = 3.54, p < .001, \eta^2 p = .071$). In particular, they were significantly different as to the repeated memories ($F(2,149) = 4.35, p < .01, \eta^2 p = .059$), the new memories ($F(2,149) = 9.07, p < .01, \eta^2 p = .121$) and not significantly different as to lost memories ($F(2,149) = 2.39, p = ns$), as well as significantly different as to the diverse memories ($F(2,149) = 5.91, p < .01, \eta^2 p = .084$). Scheffé Post-Hoc test showed that LN ($p < .05$) and CG ($p < .05$) participants recalled more repeated memories than SN ones, while SN constructed more new memories than LN ($p < .01$) and CG ($p < .01$) ones. SN participants constructed more diverse memories than LN ones ($p < .05$).

The second goal of this study dealt with the fluency of the narrated memories in the second MFT. As outlined in the method section, from the first MFT every participant selected two memories and narrated them in detail in line with their experimental condition (short or long narrative). Thus, this type of analysis regarded only LN e SN participants, because the CG ones didn't write narratives. In order to assess whether narrating long or short narratives only increased the memory fluency of those memories that were narrated or of those that were not narrated too, we distinguished these two types of memories and compared their memory fluency.

The LN more than the SN participants recalled at least one narrated memory in the second MFT (34 vs. 20 respectively) with a significant difference ($\chi^2= 10.223, p < .001$).

Table 2 shows the number of narrated memories recalled in the second MFT by the two groups and the memory fluency of those memories that were narrated and those that were not. In order to compare the two types of memories, and given the different amount of narrated and non-narrated memories (in LN the non-narrated memories numbered 5.28 [7.28- 2 = 5.28], and in SN 5.12 [7.12-2 = 5.12], and there were 2 narrated memories for both groups), we calculated the percentage of memory fluency. The rate of recalled narrated memories was calculated out of 2 for both groups, and that of non-narrated memories out of 5.12 and 5.28 for the LN and SN participants respectively.

	SN		LN	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
	%	%	%	%
Number of narrated memories recalled in MFT2 (1)	.59	.83	1.15	.91
	29.5%	41.7%	46.4%	46.4%
Number of non-narrated memories recalled in MFT2 (2)	.98	1.59	1.81	2.22
	14.5%	23.5%	33.7%	36.9%
Total number of repeated memories	1.57	2.26	2.96	2.92

Table 2: Rate of repeated memories in narrated and non-narrated memories

(1) Percentage calculated out of number of narrated memories (= 2)

(2) Percentage calculated out of number of non-narrated memories in MFT1 (SN = 5.12; LN = 5.28)

In both groups the rate of recalled memories that were narrated (Means: SN = 29.5 %, LN = 46.4%) was higher than the rate of recalled memories that were not narrated (Means SN 14.5% , LN = 33.7%). Moreover, in comparison to the SN group, the LN group participants recalled significantly more both narrated (Means 46.4 % vs. 29.5%) and non-narrated memories (Means 33.7 % vs. 14.5 %).

A multivariate analysis of variance showed that these differences were significant ($Pillai = .106$, $F(1,105) = 6.127$, $p <.01$, $\eta^2p=.089$) and that LN participants recalled more narrated ($F(1,105) = 10.12$, $p <.01$, $\eta^2p=.089$) and non-narrated memories ($F(1,105) = 10.62$, $p <.01$, $\eta^2p=.045$) than SN ones. A repeated measures analysis of variance showed that the number of recalled narrated memories was higher than non-recalled ones ($Pillai= .27$, $F(1,105)= 39.47$, $p<.001$, $\eta^2p=.110$), and that this rate is higher in LN participants than in SN ones ($F(1,105) = 2.91$, $p <. 01$, $\eta^2p=.066$).

The third goal of our research was to assess the extent to which the two types of narratives were different in terms of cognitive processes and cohesion. The results of the linguistic analysis are shown in table 3.

	LN		SN		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
No. of Words	321.4	118.2	84.38	20.69	.001
COG. MECH	6.37	1.91	4.69	2.85	.01
Insight	1.83	1.00	1.24	1.42	.01
Discrepancy	1.20	1.07	0.82	0.95	ns
Tentative	1.54	0.98	0.23	1.78	.001
Certainty	0.86	0.63	0.93	1.31	ns
Temp. Connection	0.90	0.60	0.46	0.31	.001
Advers. Connection	0.22	0.31	0.66	0.96	.01

Table 3: Descriptives of length of the narrative cognitive words and connectives and p significance in comparison of the LN and SN groups

Firstly, we assessed the participants' word counts to verify the difference due to the short and long narrative conditions. The SN group wrote an average of 84.38 words in the narrative task, while the number of words in LN narratives was 321.48 with a significant difference between the two groups ($F(1,105) = 203.15, p < .001$).

The LN group participants used cognitive processes significantly more ($F(1,105) = 10.26; p < .01$) than the SN group (Means 6.43 vs. 4.69 respectively). In particular, in their narratives, LN participants used more insight ($F(1,105) = 4.96; p < .05$) and tentative terms ($F(1,105) = 74.33, p < .001$). Moreover, the longer narratives were richer in temporal connections ($F(1,105) = 10.77, p < .01$). In contrast, the SN group participants used significantly more causal ($F(1,105) = 4.80, p < .05$) and adversative ($F(1,105) = 7.6, p < .01$) connections than the LN group. As for the other categories, 'certainty' ($F(1,105) = .83, p = ns$) and 'discrepancy' ($F(1,105) = 3.36, p = ns$) were not used to a different extent by the two group participants. See table 4 for a summary of the results.

An example of the different use of cognitive mechanisms in the two groups is shown in the following examples.

Participant 1-59's short narrative reads: *'My teacher obviously did not like me. So I asked her why and she confirmed this to me frankly, adding a flurry of insults into the bargain'*. This girl, having just five lines to describe the selected memory *'The art teacher detested me'*, used two sentences: in the first one, she narrated the episode using a sort of introduction, very similar to the title of the selected memory. In the second sentence, she added information about the time she asked the teacher for an explanation, making no personal reflections as to the disagreeable event. In the narrative, some details also lost their importance: for example, the art teacher becomes a generic teacher.

On the other hand, subject 2-3 from the LN group describes the memory *'My best friend Alice'* by giving the autobiographical narrative the structure of a complete story, underlining the protagonist, the place, the time and what happened in detail: *'It was the first day of school. I entered the classroom, said hello to my classmates and spoke to some of them. I realized that there was a girl all by herself: she was standing right next the wall, looking around, sometimes she went out of the classroom for a few minutes, then she came back in again. I could see that she was very nervous, uncomfortable. I didn't know there was someone new in the class! I decided to introduce myself and tried to make her feel more comfortable. I found out that she had been kept down a year in*

the science school so she had decided to change over to the classics school. So, when she went out of the classroom, she went to meet her old classmates (because we were in the same building). Her name was Alice, she was happy that someone had spoken to her, but I don't remember if she told me that or if I just noticed that she looked less nervous. I invited her to sit with me at the same desk, I told her something about the teachers, we talked a bit. The lesson started. We spent the next four years at the same desk and we still are friends now. I went up to her because I was very sorry to see a girl who was embarrassed and by herself in the classroom and I wanted to make her feel more comfortable. I could never have imagined she would become my best friend!"

In this case, the long narrative gives the possibility to describe the event and focus on the subject's memories, thoughts, discoveries and reflections. In the tale we can find a lot of terms related to introspective and cognitive mechanisms: 'I found out', 'I could never have imagined', 'I realized', 'I decided', 'I don't remember'. In the case of the long narrative experimental condition, the narrative task implicates greater cognitive labor, inciting the narrators to make an important reflection on the autobiographical event.

3.6 Discussion

Our study had three aims. The first was to assess changes in overall memory fluency in groups of university students that had to write long vs. short narratives between two MFTs. Regarding this aim we did not have a definite hypothesis because writing a long narrative could both represent a heavier work burden (and thus hamper memory fluency) and stimulate new associations (and therefore facilitate memory fluency). The second explored changes in the memory fluency of narrated and non-narrated memories. In this case, we supposed that narrated memories would be more available in the MFT2 than memories that were not narrated because narrating memories had a rehearsal effect, but also that the LN group participants would recall more narrated memories in MFT2 than the SN group, because the participants had the opportunity to write more and explore the memory more in detail. Finally, we aimed to study the differences between long and short narrative texts in terms of cognitive words and causal connections. We supposed that those categories of words which are related to the cognitive labor involved in the narrative process would be significantly higher in the LN than the SN group.

The results showed that the SN participants recalled the same number of memories as the LN and the CG in the two MFTs. However, a more qualitative analysis of the MFTs showed that the internal fluency composition was different. The SN group participants recalled more diverse memories than the LN ones. This means that they repeated the same memories less. In fact, the SN participants 'lost' more memories and constructed more new memories than the LN and the CG groups.

Regarding the second aim, in both groups, in proportion, narrated memories were retrieved more than the non-narrated ones in the second MFT. However, this rate was higher in the LN group. In other words, although narrating a memory facilitates its retrieval and affects the memory fluency of the narrated memories, narrating a memory through a long narrative not only increases the availability of narrated memories but also that of non-narrated memories.

With regard to the third aim, in their narratives the LN group participants made use of a higher number of words referring to reflection and cognition than the SN group. The LN participants made more use of temporal connections, while the SN ones made more use of causal and adversative ones. In other words, making a short or a long narrative does not mean simply using more or less words, but constructing a type of different narrative, a narrative of a different genre, as studies on big or small narratives have demonstrated. So, our results show that the style of narrative, long or short, produces different modifications in memory fluency, as we have seen, in many different ways. These data support the opinion of those authors (Bamberg, 2006; Holland, Addis and Kensinger, 2011) that sustain the hypothesis of two phases in autobiographical memory recollection: the first begins by specifying a cue, with a consequent memory search process and evaluation of the search results. The second phase deals with the event elaboration: the selected event is collocated in a specific time and the details appear. Considering these phases, the gist of an autobiographical memory is recalled in the first phase of memory recollection, while the specific details required for a long narrative also need the second phase to be recalled. We can therefore argue that in our investigation long narratives entail two levels of elaboration while short narrative only envisages one. Making only the first level of elaboration can facilitate the availability of diverse memories because the act of narrating does not concentrate the fluency on narrated memories. This can explain why memory fluency is higher (in terms of new and diverse memories) among the SN group. In contrast, those who wrote a LN repeated the same memories more. That is, in this group the same memories were

available in the second MFT as had been available the first time. This can be due to the higher level of elaboration required by big narrative. This trend occurred also in the Control Group: having no interferences due to the narrative task, participants of this group were prone to repeat the same memories: their memory fluency in terms of diverse memories had got an inhibition in the second MFT.

However, this more intense work does not affect the amount of recalled memories. In fact, the three groups were not statistically different as to the number of memories. If narrating a long narrative simply had a fatiguing effect on the memories, the second MFT would have shown significant differences among the three groups.

Thus, another hypothesis can be proposed. Narrating a long narrative affects memory fluency at two levels. At a first general level, it permits a stronger availability of those memories recalled the first time, which, therefore, are likely to be recalled the second time too. That is, it determines a higher availability of those memories that are recalled the first time simply because it does not facilitate the availability of new memories. We may notice that the three groups make seven memories in the first and the second MFTs and that seven is the 'magic number' (Miller, 1956). In other words, the participants in the three groups achieve the same performance in terms of the number of memories retrieved in 3 minutes, also following the different narrative conditions (long narrative and short narrative). But in those 3 minutes they recall different types of memories: more new and diverse in the short narrative group, in respect to the long narrative and control group participants.

At a second level, telling a long narrative facilitates the availability of those memories that have been narrated. In fact, long narrated memories are more likely to be recalled in the second MFT when they have been narrated in LN rather than SN form. However, the Long Narrative group participants also recalled the non-narrated memories more than the Short Narrative group. This datum confirms the existence of two types of effects coming from writing long narratives of a memory: the effect of laboring, which hampers the construction of new memories and facilitates the availability of the same memories, and that of elaborating, which facilitates retrieval of the narrated memories.

The results of the third aim help to provide a better interpretation of the first and second aims. By giving the opportunity to spend more time exploring the past event and reflecting on its meaning, long narrative has an effect on the availability of narrated memories. The cognitive mechanisms activated in the long narratives help participants to come back to the same memories chosen for narration. On the contrary, a short

narrative entails less cognitive labor and the narrated events are not likely to be recalled again in the second MFT. In the long narratives, narrators do not just tell the story of the event, but also activate cognitive and introspective mechanisms, highlighting deep reflection on the memory.

In the story of participant 2-3, the episode is described in detail and the narrator has given all the information to understand what happened: the place (in the classroom), the time (the first day of school), the protagonists (her and her best friend), how the situation occurred (Alice was alone, she went to talk to her and so on).

The case of the short narrative is different: the results from the linguistic analysis show that this type of narrative is poorer in terms of temporal connections and cognitive and introspective mechanisms: in this case the reflective power of narrative on memory is not enabled. With no room to describe the selected life event, the participants have to choose those information that is most meaningful to provide a general idea of what they mean. In this sense, the characteristics of short narrative are very similar to the gist. But like with gist, short narrative has the task of summing up a diachronic process in a few words while pursuing coherence with the Self (Brainerd & Reyna, 2002), so it needs to use linguistic devices that link the events such as causal and adversative connections. This is demonstrated by the short narrative of participant 1-59 shown in the previous paragraph, which starts very similarly to the gist of the memory listed in the first Memory Fluency Test ('the art teacher detested me', in MFT becoming 'my teacher obviously did not like me' in the narrative). Then, in the short narrative, participants often supply other information to the reader to give a sort of explanation of the title of the gist. In effect, the results of the linguistic analysis show that the short narrative group's tales have a good percentage of causal connections, significantly greater than those of long narrative group. So, participant 1-59 tried to explain about the time she asked her teacher about their lack of understanding and the teacher gave her a damning answer.

We know from scientific literature that narrative provides autobiographical memory with a language 'for the others', at the same time making it possible to experience the event again, re-elaborate it and give it a new meaning (Bruner, 1990; 1991; Habermas & Bluck, 2000; McAdams, 2001). In this sense, the general results of this study are in line with the studies in the field: autobiographical narrative plays a crucial role in improving autobiographical memory (Bruner, 1986; 1990; 1991; 2004; Habermas &

Bluck, 2000; McAdams, 2001). Narrative is the language of memory (Tani et al., in press; Smorti, submitted) and this means it makes changes to it.

3.6.1 Limitations

This inquiry has some limits. Firstly, the data collection was conducted in a relatively small time. Between the MFT test and retest, the data collection for both groups lasted about 40 minutes. What happens to memory fluency if the retest is conducted at a later moment in time? Do narrated memories remain in the second MFT if the time frame between the first and the second data collection is longer? Is the role of short and long narrative the same on memory fluency? Does the great cognitive labor involved in long narrative reduce its effect of conserving fluency after a longer time frame?

A second limit relates to the data collection procedure. We asked SN participants to narrate the selected memory using just five lines. In this case, the short narrative was forced by the small amount of available space. It could be interesting to test the difference between short and long narrative styles while not restricting the space available to participants. In some cases, narrators prefer not to write a long narrative, summarizing the autobiographical memory in just a few words. In any case, a summary is not the same as a short narrative.

3.7 STUDY 2

3.8 The present study

The previous study supported evidence that narrating influences memory fluency and that narrating a long versus a short narrative has a substantial impact on recalling narrated and unnarrated memories. The topic of the present study was to assess whether narrated memories can have a significant influence also on the emotional tone of the memory.

In particular, The present study aimed to explore the role of short and long narratives on emotions related to autobiographical memories. As far as we know, scientific knowledge on the topic is very modest. Copious numbers of studies have considered the role of narrative in changing the content of autobiographical memory. Narrative, being a “language to someone who listens to our story”, gives a structure to memories and helps to re-explore the event and the emotional involvement related to it. Some studies have

found the role of narrative to have a deep impact in tempering emotions of memories: in the case of traumatic memories, we have seen that a narrative task can decrease negative emotions, leaving room for more positive ones (Pennebaker & Seagel, 1999). In addition, we argue that this modification itself is influenced by the way in which narrators tell stories: we hypothesize that using more or less language to narrate our memories can influence the emotional experience of an autobiographical memory. If narrating a past event in detail requires more time and more cognitive retrieval than narrating the gist of an event, the emotions attached to those memories should also change.

Starting from these reflections, the general goal of this study was to explore the relationship between emotions, autobiographical narrative and autobiographical memory, with particular regard to the extent to which different lengths of narrative influence the emotional engagement with a memory of our past life. Specifically, we aim to explore:

- 1) Differences in the number of emotions and in the emotional tones allocated to the memories narrated in a first and second Memory Fluency Task (MFT), in order to assess if the long narrative (LN) or short narrative (SN) condition can produce changes in the emotional processing of those autobiographical memories. We hypothesize that the LN will improve the number of emotions of narrated memories in the second MFT with respect to the first (the richness hypothesis), implying also a bigger co-presence of positive and negative emotions (the complexity hypothesis).
- 2) As to whether and to what extent the emotional tone of memories is influenced by the emotional tone of narratives, we hypothesize that in the Long Narrative group, because of the higher cognitive and introspective processes involved in the task shown in study 1, the correlation between emotional tones in narrative and in the second MFT will be stronger than that between the first and second MFT. In other words, we hypothesize that narrating a memory at length will have a bigger role in the emotional recall of an autobiographical memory.

3.9 Methods

3.9.1 Participants

Participants were a sample of university students from a central Italian city (N= 107, F=52; M=55), randomly allocated to two groups (Long Narrative LN= 53; Short

Narrative SN=54). Because only 54 subjects overall narrated memories also recalled in the second MFT (34 from the LN group and 20 from the SN group), the sample of this study is composed of just those participants who recalled memories from the second MFT which had also been narrated. The two groups were homogeneous for age (LN= M 22,05 ($SD=1,41$); SN= M 23,5 ($SD=1,40$); $t=-1.86(52)$, $p=ns$) and sex (LN= 20 females, 12 males; SN= 12 females, 8 males, $X^2= .007$, $p=ns$).

3.9.2 Instrument

To explore autobiographical memories and autobiographical narrative, as well as their interaction, all participants completed a questionnaire focused on the accessibility of past life events and on the emotional tone of them. The Memory Fluency Task (Peterson et al., 2010) used in previous studies on memories and quality of relationships was implemented by our laboratory. Requiring individuals to provide as many memories as they can in a limited amount of time, a MFT assesses how accessible the memories are and what emotional tone they have. In particular, participants were asked to recall memories that involved experiences which occurred during their high school years. This time period was chosen because, in line with the Reminiscence Bump theory (Conway, 1997), people tend to recall more personal and collective events from the period of late adolescence and early adulthood than from other periods of life.

During this session, participants were encouraged to recall as many memories as they could and write down a sentence or two about each memory (a kind of title for the memory) in three minutes. Then, they had to select one or more emotions and allocate them to each memory listed. For this task, we selected 12 emotions: 4 positive (happiness, satisfaction, relief and tranquility), 5 negative (fear, guilt, anger, shame and sadness) and 3 neutral (affected, surprise and pride).

Every participant completed the MFT twice in a test-retest design.

The two groups were also involved in two autobiographical narrative tasks between the first and second MFT. Researchers asked for two narratives to amplify the cognitive process involved in narrating a memory. The LN group had to select a memory listed in the first MFT and narrate it without any length limits; researchers asked participants, “now please select one of the memories you have listed and try to narrate it, writing all that you remember about it. You can use the whole page”. The SN group had just five lines to describe the memory: “now please select one of the memories you have listed and try to narrate it using the five lines you find below”. Both groups repeated the

narrative task twice, each time allocating to each narrative one or more emotions from the same lists presented in both MFTs. At the end of the narrative task, all participants again completed the MFT and, lastly, marked those memories which were also present in the first MFT.

3.9.3 Procedures

Data was collected in class during university courses. The aims of the study were explained in brief to the students, leaving them the opportunity to take part freely or not, and to leave the classroom. A researcher conducted the data collection while managing the time needed for the recall task and taking care that the participants had the privacy and quiet to complete the task. Once participants understood the nature of the tasks, the first Memory Fluency Task session took place, followed by the narrative task and then the second MFT. In total, the data collection lasted about 40 minutes. The research was conducted in accordance with the American Psychological Association guidelines for the ethical treatment of human participants. Prior permission was obtained from the School Dean as well as each course's professor. The participants provided their individual consent and could withdraw at any time.

3.9.4 Data coding

The analysis only used data from those participants who had chosen at least one memory that was also recalled in the second MFT; in total, 34 participants from the LN group and 20 participants from the SN group. To code the emotional tone attributed to memories narrated and recalled the second time, we used a three-category system of classification, distinguishing : a) a simple negative tone. A simple negative tone was attributed to a memory or narrative when participants used only negative emotions to describe the memory (fear and/or guilt and/or anger and/or shame and/or sadness) or negative and neutral emotions (for instance, fear and surprise); b) a simple positive tone was attributed when participants used only positive emotions to describe the memory (such as happiness and/or satisfaction and/or relief and /or tranquility) or positive and neutral emotions (such as happiness and pride; c) a complex tone was attributed when both positive and negative emotions were present (for instance happiness and fear). Each emotional tone had a score of 0 to 2: 0 if the emotion was not present in either narrative tasks, 1 if it was allocated to one narrated memory, and 2 if it was present in

both. Indeed, the first and second narratives have been considered together in data analysis, regarding the two accounts as part of the same narrative task.

We also considered the emotions to be multiplex in the case in which more than one emotion was allocated to a memory selected for a narrative. In this case, multiplex emotions were assessed with a score of between 1 and 2, when 1 was in the case of participants allocating just one emotion to the memory narrated and 2 was when they selected more than one emotion.

The variables of the present research were: 1 the number of emotions, 2 number of response with one or more emotions (multiplex emotions), 3 tone of emotions. This was classified as simple negative, simple positive and complex tones.

3.10 Results

The first goal of the study deals with the emotional tone of memories selected to be narrated when they were listed in the first or in the second MFT. Results of multivariate ANOVA showed that there isn't a significant change in the number of emotions allocated to memories narrated in the first and in the second MFT ($Pillai=.014$, $F(1,52)=.748$, $p=ns$). Nevertheless, a significant opposite trend in the SN and LN groups has been found: while the LN group was prone to increase the number of emotions (first MFT mean = 4,5, second MFT mean= 5,5), the SN decreased emotions (first MFT= 5,6, second MFT= 5,1) with a significant interaction effect task*group ($Pillai=0.118$, $F(1,52)=6.92$, $p<.01$, $\eta^2p=.733$).

Results were confirmed by the data on multiple emotions. Considering the number of memories in the first and in the second MFT with only one emotion or more than one emotion allocated, results show that the LN group (first MFT= 1,55, second MFT= 1,91, $Z= -4.24$, $p<.001$) was significantly more likely than the SN group (first MFT=1,90, second MFT=1,75, $Z= 1.37$, $p=ns$) to increase the multiplex emotions. Table 1 summarizes the results of the Wilcoxon non-parametric test.

Looking at the emotional tone of memories narrated in the first and in the second MFT, again the Wilcoxon non-parametric test shows a significant difference between the LN and the SN groups. In the Long Narrative group, simple positive emotions (first MFT=0,79, second MFT=0,67, $Z= -1.26$, $p=ns$) remained stable, negative emotions (first MFT=0,77, second MFT=0,50, $Z=-2.49$, $p<.01$) decreased significantly, while a complex emotional tone increased significantly (first MFT=0,44, second MFT=0,83, $Z= 2.69$, $p<.001$). In the Short Narrative group, simple negative emotions remained stable

(first MFT=0,55, second MFT=0,60, $Z=-.44$, $p=ns$) while simple positive emotions (first MFT=1,10, second MFT=0,85, $Z=-1.89$, $p<.05$) and complex emotions (first MFT=0,35, second MFT=0,55, $Z=-1.20$, $p=ns$) increased, although for the latter, there was no significant difference between the first and second fluency task. Table 1 shows the results of the Wilcoxon non-parametric test.

	SN			LN		
	MFT1	MFT2	<i>p</i>	MFT1	MFT2	<i>p</i>
N emotions	5,65	5,1	NS	4,5	5,58	ns
Mult. emotions	1,90	1,75	NS	1,55	1,91	.000
Simple negative	0,55	0,60	NS	0,76	0,50	.01
Simple positive	1,10	0,85	.05	0,79	0,67	NS
Complex	0,35	0,55	NS	0,44	0,82	.001

Table 1: measures of emotions in the first and in the second MFT across the two groups.

The second goal was deal with exploring whether the emotional tone of a memory in the second MFT were related to the emotional tone of that narrated memory more than that of the same memory listed in the first MFT.

Overall results show that in both the LN and SN groups, the second MFT was related both with the first MFT and the narrative task (see table 2). Results of non-parametric correlations of single negative, single positive and complex emotional tones of narrated memories show that in the LN group, the negative ($K =.591$, $p <.01$), positive ($K =.621$, $p <.001$) and complex ($K =.569$, $p <.01$) tones of the memory in the second MFT were correlated with the same emotional tones in narrative. Considering the correlation between the emotional tones of memories narrated when they are listed in both the first and second MFT, results underlined that both simple negative ($K =.552$, $p <.01$) and simple positive ($K =.547$, $p <.001$) tones are correlated, while there is not a significant correlation for the complex tone ($K =.255$, $p =ns$).

The same trend is highlighted by results of correlations in the SN group. In this case, the simple negative tone of the memory narrated and listed in the second MFT is correlated with the same tone in the narrative ($K =.675$, $p <.01$) and in the first MFT ($K =.492$, $p <.05$); the simple positive tone is correlated with the same tone in the narrative (K

=.529, $p < .05$) and in the first MFT ($K = .508$, $p < .01$); while the complex tone is significantly correlated only with the same emotional tone in the narrative task ($K = .510$, $p < .05$) and not in the first MFT ($K = .234$, $p = ns$). See table 2 for complete results. Summarizing, there is a strong connection of the emotional tone of a memory when it has been recalled in the first MFT, when it has been narrated in a Long or Short condition and when it has again been recalled in the second MFT.

SHORT NARRATIVES										
		Neg1F	NegN	Neg2F	Pos1F	PosN	Pos2F	Com1F	ComN	Com2F
L O N G N A R R A T I V E S	Negative1F	-----	.800***	.410	-.416***	-.256*	-.033	-.460***	-.356**	-.171
	NegativeN	.696***	-----	.504*	-.443***	-.287*	-.203	-.273*	-.501***	-.129
	Negative2F	.643***	.624***	-----	.000	-.030	.200	-.339	-.455*	-.643**
	Positive1F	-.459***	-.293*	-.278	-----	.635***	.137	-.520***	-.196	-.183
	PositiveN	-.311**	-.214	-.078	.592***	-----	.274	-.345**	-.573***	-.273
	Positive2F	-.089	.096	-.112	.149	.337*	-----	-.078	-.023	-.643**
	Complex1F	-.536***	-.410**	-.316	-.389**	-.180	.025	-----	.545***	.345
	ComplexN	-.221	-.526***	-.376**	-.257*	-.622***	-.292	.451***	-----	.421
	Complex2F	-.210	-.266*	-.647***	-.024	-.211	-.519**	.099	.425**	-----

Table 2: non-parametric correlations with Kendall's Tau-b test of emotional tones in the first MFT (1F), in the narrative task (N) and in the second MFT (2F).

Note: * for $p < .05$; ** for $p < .01$; *** for $p < .001$

Nevertheless, data of non-parametric correlations also showed an effective relationship between the emotional tones of memories when they were listed in the first MFT and when they were narrated.

In order to assess the effective correlations between the second MFT and the first, and between the second MFT and the narrative, we made non-parametric partial correlations (see tables 3 and 4) controlling for the relationship that the MFT1 and the Narrative have on each other. In this case, results of Tau-b of the Kendall test underlined that in the Long Narrative group the emotional tones in the Narrative were significantly correlated to the second MFT (negative: $K = .234, p < .05$; positive: $K = .325, p < .01$; complex: $K = .399, p < .001$), while in the Short Narrative group, no significant correlations were found (negative: $K = .300, p = ns$; positive: $K = .312, p = ns$; complex: $K = .262, p = ns$). Thus, by controlling the correlations, a significant effect of the long narrative condition emerged.

Long narrative	Partial Kendall's Tau-b		
	MFT2		
	Neg	Pos	Com
Negative MFT1 (a)	.116		
Negative N (b)	.314*		
Positive MFT1 (a)		-.069	
Positive N (b)		.325**	
Complex MFT1 (a)			-.198
Complex N (b)			.399***

Table 3: non parametric partial correlations of emotional tones in the first MFT (1F) and in Narrative (N) with the same emotional tones in the second MFT (MFT2).

(a) controlled for emotional tone in Narrative

(b) controlled for emotional tone in the first MFT

Note: * for $p < .05$; ** for $p < .01$; *** for $p < .001$

Short narrative	Partial Kendall's Tau-b		
	MFT2		
	Neg	Pos	Com
Negative MFT1 (a)	-.147		
Negative N (b)	.300		
Positive MFT1 (a)		-.180	
Positive N (b)		.312	
Complex MFT1 (a)			.052
Complex N (b)			.262

Table 4: non parametric partial correlations of emotional tones in the first MFT (1F) and in Narrative (N) with the same emotional tones in the second MFT (MFT2).

(c) controlled for emotional tone in Narrative

(d) controlled for emotional tone in the first MFT

Note: * for $p < .05$; ** for $p < .01$; *** for $p < .001$

3.11 Discussion

This paper aimed to study the role of autobiographical narrative in the emotional engagement of autobiographical memory, by considering two types of narrative: when participants can narrate in detail and without length limits, and when they have to give a short narrative of a past life episode. Therefore, the basic aim of the study was to explore changes in allocation of emotions to autobiographical memories with consideration of the significant differences due to the narrative task (short or long).

As we said in the introductory paragraph, narration gives a language structure to an autobiographical memory, and through this process the person can re-elaborate personal past events and give them a new meaning (Bruner, 1990; 1991; Habermas & Bluck, 2000; McAdams, 2001). For this reason, our starting hypothesis was that a long narrative, giving more space to elaborate the autobiographical memory, would change the emotions allocated to an autobiographical memory.

For the number of emotions and the emotional tones allocated to the memories from the first to the second MFT, we speculated that the Long Narrative group, writing in more detail and considering different ways to describe the past event, would change the

emotions related to memories, increasing the total number of emotions (richness hypothesis) and the co-presence of positive and negative emotions (complexity hypothesis).

For the richness hypothesis, our expectations have been confirmed. The Long Narrative group had a greater emotional engagement in the memories after the narrative task than the SN group did. Results of changes in emotional tones have also confirmed our speculations: to write in detail about a memory increased the number of emotions allocated to the narrated memories listed from the first to the second MFT. This datum is confirmed by the fact that the Long Narrative group also increased the number of memories with more than one emotion allocated (multiplex emotions).

With regard to the complexity hypothesis, our expectations were confirmed there as well. Participants who wrote a Longer Narrative had a higher number of complex tone of emotions in the second MFT than in the first MFT, with positive and negative emotions more likely to be co-present in the same memory. In contrast, in the Short Narrative group, there were no significant changes in the emotional tone. One example of this trend comes from a participant of the LN group who listed the memory “*The last day of high school*” in the first MFT, allocating the positive emotions of “happiness” and the neutral “pride” to it. After having described it, the boy again listed the memory in the second MFT, allocating the same emotions “happiness” and “pride” to it, but also adding the negative emotion “sadness”, transforming the memory from a single positive to a complex one. Reading the narrative, this complexity becomes clear: “*I remember the last day of high school. From the first moment I arrived that morning I felt that it was a singular day. I could not decipher my emotions, but I perfectly remember that something was stabbing in my stomach. To enter my classroom for the last time made me sad. It was strange, because I had been impatiently waiting for that day for a long time! [...]*”. It’s evident that through the act of narration, the boy had had the opportunity to consider some details of the memory which he had not thought of at the moment of the memory retrieval, which then evoked the emotion of sadness at entering his classroom for the last time.

The role of long and short narratives is clear when looking at the results, which include the partial correlations between the emotional tones of memories in the second MFT and in the narrative task. To confirm the effect of long and short narratives, we decided to explore if in the Long Narrative group, the emotional tone of the narrated memories was related to the emotional tone of the same memory when they were again recalled in

the second fluency task. To make the results clearer, we also controlled for the correlation between the first Memory Fluency Task and the second: because participants allocated emotions to the same memory three times (first MFT, narrative and second MFT) the real effect of the long narrative task is significant just as in the case where the correlation between the narrative and second MFT would be stronger than that between the first and second MFT.

Basically, the results of the correlations show that both in the Long and Short Narrative groups, the emotional tones of memories in the second MFT correlate with those allocated to the narrative and with those of the memories listed in the first MFT. In other words, there is an emotional label for an autobiographical memory which persists when it is recalled in the first fluency task, when it is narrated shortly or at length, and again when it is listed in the second fluency task. Nevertheless, our interest was to assess if when a narrated memory is retrieved again in the second MFT, it has a stronger correlation with the first recall task or with the narrative task. Controlling the reciprocal relation between the first MFT and the narrative task, results underline that the impact of narrative on the emotional tone of autobiographical memory is stronger when participants have the opportunity to narrate their past life event in detail. Indeed, no partial correlations emerged in the Short Narrative group between the emotional tone in narrative and in the second MFT, while in all emotional tones there is a significant partial correlation in the LN group.

The narrative task has a more important role for the emotional label of a memory when participants can explore it in detail without length limits. Thus, considering again the memory “The last day of high school” listed by an LN participant, the simple positive tone in the first MFT changes in narrative (becoming complex) and also in the second MFT. Indeed, when the boy recalled the same memory in the second MFT, labeling it as “The Last day of school”, he allocated complex emotions (“happiness”, “sadness” and “surprise”) to it as he did for the memory narrated.

In conclusion, there are several differences in the way in which short and long narratives improve changes in the emotional involvement of autobiographical memory. The emotional content of an autobiographical memory can change through narrative, becoming more complex for example, especially when the narrator can re-elaborate it in a long narrative.

This study represents a first contribution to a problem that has not been investigated before. Previous studies on short and long narratives have shown that they have

different cognitive and linguistic properties. Studies on gist have shown that there are two levels of recall in gist and verbatim of autobiographical memory. However, the effect of short or long narrative on memory and on emotions allocated to memories in particular has not been studied before. In this sense, our results can make a contribution to the field of studies on autobiographical memory, and also provide new evidence for the practical use of narrative in the management of professional areas affected by a high emotional engagement, for example the health staff who care for patients with serious diseases.

3.11.1 Limitations

This study has some limits. Firstly, the fact that just 54 participants of 107 recalled the same memories narrated in the second MFT obligated us to limit our analysis to a modest sample. Furthermore, the two groups (LN and SN), although homogeneous for age and sex, recalled in MFT2 a significantly different number of memories narrated (34 vs. 20 memories). Certainly, this datum is a result by itself: Long Narrative conditions improve the availability of autobiographical memories; nevertheless, starting from this datum we had two groups with two different numbers of memories. Another limit of our study is that we didn't consider the emotions at a molecular level: in future studies it would be interesting to test which single emotion increases from memory to narrative and then again to memory. Indeed, in the first study of this dissertation we found that some emotions, such as for example "surprise" and "happiness", are more prone to increase than others after the narrative of an autobiographical memory. Our future direction will also be to better explore the relation between complex emotions and narrative and memory: this is, in our opinion, an important field of study which could also be implemented in intervention studies, for example in the elaboration of traumatic autobiographical memories through narrative.

Chapter four:

Narrating positive versus negative memories of illness.

4.1 Introduction

As we presented in the preface, the final aim of the present dissertation was that of studying the impact of narrating on memory fluency in contexts of suffering. We also planned to carry out different introductory works on normative samples. From these studies we received confirm of our presupposition on the influence of narrative on autobiographical memory fluency.

The present study addresses the effect of narrating on memory fluency and illness. The ability to retrieve specific autobiographical memories is greatly influenced by serious health conditions, such as cancer (Nilsson-Ihrfelt, Fjallskog, Liss, Jakobsson, Blomqvist & Andersson, 2004). Indeed, with this condition, memory fluency of autobiographical events relating to the period of illness is reduced (Giffard, Viard & Dayan, 2013). At the same time, when a person is facing a serious disease and the idea of the future is threatening, the memory of past events plays a crucial role because of the human tendency to organize and understand the present through the elaboration of the past. Thus, the study of memory and narrative processes in cancer patients is useful for several reasons: it can elucidate the connection between theories of memory and real life context, as claimed by Neisser (1976) forty years ago; it can develop a better knowledge of these processes in context of diseases that threaten life; and finally, it can help to construct conceptual instruments useful for implementing interventions on autobiographical memory and reasoning with these patients.

These are some of the reasons why we asked oncological patients to tell us about their positive and negative memories of life. Other reasons will be explained after we have clarified the theoretical model of autobiographical memory and narrative at the base of the present study.

4.1.1 Autobiographical memory and autobiographical narrative

As we have underlined in the previous chapter, autobiographical memory is a type of episodic and semantic memory for specific events in our lives related to the self in connection to others (Pillemer, 1998; Conway & Pleydell-Pearce, 2000; Fivush & Nelson 2004). Recalling memories about what occurred in our lives is a natural cognitive process which provides the opportunity to re-elaborate our past and consequently, the Self (Fivush & Baker-Ward, 2005; Fivush & Nelson, 2004).

According to the Self-memory system model (Conway & Pleydell-Pearce, 2000; Conway, 2005), to recall an autobiographical memory is a cognitive process strictly related to the Self: “events that intensively engage the working self will be strongly associated with central working self-goals and so give rise to memories that, because of their close association with current goals, remain highly available” (Conway & Pleydell-Pearce, 2000, p. 280).

The role of accessibility and availability of memories in the self memory system makes central the issue of fluency and its measurement (Dritschel, Williams, Baddelay & Ninmo-Smith, 1992; Williams, 2000; Rathbone & Moulin, 2014;). Autobiographical memory fluency can be defined as the ease of autobiographical memory recollection (Rathbone & Moulin, 2014), or in other words, the subject’s ability to retrieve as many different memories as possible in a given time period (Rathbone & Moulin, 2014, p. 2). Though autobiographical memory, rooted in social contexts as it is, does not imply any communicative act, autobiographical narrative is a recounting of past experiences by the Self, telling his/her story to others or to himself/herself (Bruner, 1990).

Therefore, despite their strong relationship, autobiographical narrative does not entail the same cognitive processes as autobiographical memory: we cannot consider narrative as the externalized form of autobiographical memory because of its different, richer linguistic format which provides new semantic, pragmatic and communicative features for memory. In other words, narrative gives a structure to our memories (Bruner, 1990; Smorti, 2011), through a process in which the memory we are narrating acquires some properties typical of the “language for others” (Vygostkji, 1965), such as, for example, a chronological and causal sequence (Bruner, 1990; Fivush, 2011).

Several research fields have deepened our understanding of how autobiographical memory is constructed and modified by narrative. Fivush and Nelson (2004a; 2004b) have pointed out the role of parent-child conversation and narratives in the development of autobiographical memories in children; Pasupathi (2001) and colleagues (McLean,

Pasupathi & Pals, 2007) have explored the role of narrator-listener relationships in modifying memories of past life events. Moreover, autobiographical narrative and its connection to autobiographical memory is substantially influenced by their relational context, because memories that are narrated receive comments, and non-verbal reactions from interlocutors that help the narrator to negotiate and interpret his/her past life events in a different way (Alea & Bluck, 2003; Pasupathi, 2001). Pennekaber (1997), thereby underlining the role of narrative in elaborating traumatic past experiences. So, different and independent streams of research share the same point: autobiographical memory is largely influenced by narratives and by the conditions in which narratives are produced. The present study stems from this tradition of research and intends to go further, demonstrating how narrative can affect memory fluency; a topic that, as far as we know, has not been addressed so far.

4.1.2 The role of emotions in autobiographical memory and in autobiographical narrative

Because both autobiographical memory and autobiographical narrative regard remnants of the narrator's past life experiences, emotions are tightly embedded in both autobiographical processes. In particular, the emotional engagement of a memory is a crucial factor in the process of retrieval. Christianson (1992) argued that past experiences which are not lived with a significant emotional engagement generally do not activate an adequate level of specific attention. Thus, they are registered as "not important" and easily forgotten. On the contrary, events with a medium to high emotional involvement have a higher probability of being remembered.

It is also possible that positive and negative emotions can lose their intensity through narrative (McLean et al., 2007): however, narrative can also have a "restoring" effect on its recollection in memory (McAdams *et al.*, 2006), giving more meaning to a past life experience.

There are several differences between memories of positive and negative events in life. Generally, negative events are less lasting, less detailed and less accurate (Byrne, Hyman & Scott, 2001). Considering the Flashbulb Memory theory (Brown and Kulik, 1977), this is probably due to the fact that for certain types of events such as negative or traumatic experiences, the mind may reduce arousal activation, leading to more probability of forgetting information. Studies on comparisons between negative versus positive autobiographical memories showed that overall negative experiences are less

clearly recalled than positive ones, which contain more sensorial details and emotional engagement ratings (Byrne et al., 2001).

Nevertheless, the availability of positive and negative events is not the same across a life span: Rubin and Berntsen (2003) reported that the incidence of positive events, but not negative, rises steeply during adolescence, peaking around the 20s. Other studies highlighted that the temporal distribution of positive and negative events differs because from early to late adolescence there are some significant life transitions (high school, college selection and acceptance, first affective relationships, physical development) which are prone to be considered as culturally positive (Collins, Pillmer, Ivcevic & Gooze, 2007).

However, Tani, Bonechi, Petterson,& Smorti (2010) found that for parents' memory, negative memories were more frequent than positive ones during late adolescence. In later periods of life, such as adulthood and old age, people tend to recall more personal landmark events (Collins et al., 2007).

Final conclusions from studies on narratives of positive and negative events are still in progress: firstly, because these studies have also found that stressful events may be remembered as well as those that are not stressful (Peterson & Rideaut 1998); secondly, because results depend on the intensity of emotions (negative vs. traumatic) and on their repetition (once or repeated). Fivush, Hazard, McDermott Sales, Sarfati, and Brown (2003), and later Fivush and Mc Dermot Sales (2006), argued that remembering negative and stressful experiences have an adaptive function and that these memories can be maintained as well as the positive ones. In fact, they found that in childhood and early adolescence, the memory of negative experiences was more internally focused and more coherent than narratives about positive experiences. O'Kearney, Speyer and Kenardy (2006), studying memories of accidents and post-traumatic disorders, didn't find narratives with poor organisation in early adolescents, such as those found by other authors. In contrast, these narratives were more cohesive, and rich with connection as "because" and "therefore", considered to be a necessity of elaborating that type of experience. Also, McAdams (2008) and Pals (2006) argued that narrating a negative memory requires a higher re-elaboration process in which the event has to be resolved. To conclude, this field of studies is still a work in progress. Firstly because, from a theoretical point of view, there is not enough scientific evidence on the assumption that negative memories are worse or better remembered than positive ones; secondly,

because some studies have pointed out a better cohesion of negative narratives and others have underlined a worse coherence with respect to positive narratives.

4.1.3 Autobiographical memories/narratives and cancer

Facing a breakdown of autobiography, as that is what a cancer diagnosis does, implies the need to re-elaborate life experience, thereby re-establishing continuity between life before and after the disease (Axia, 2004).

Studies in the field of psycho-oncology have underlined the fact that cancer brings an autobiographical breakdown in the lives of patients (Axia, 2004) which leads them to recognise and divide their life into two separate parts: before and after the diagnosis (Chesler, 1993). Any breakdown in the continuity of life involves a distortion of memory (Giffard et al., 2013). So, it is not surprising that there are studies which have looked at autobiographical memory in patients treated for cancer (Nilsson-Ihrfelt et al., 2004, Giffard et al., 2013) in order to better understand the processes entailed. The main results of these studies suggest that the breakdown in life brought about by cancer affects the availability to recall past events and to reflect on them. Most of these distortions have been observed in cancer patients affected by stress-related psychiatric disorders such as depression or Post-Traumatic Stress Disorder (Giffard et al., 2013), caused by being informed of the diagnosis and by the process of the disease itself. In these cases, autobiographical memory fluency is often characterized by the tendency to recall general rather than specific memories. Evidence of this is also supported by functional neuro-imaging studies that describe a reduced hippocampal volume in depressed and PTSD cancer patients (Maller, Gaskalakis & Fitzgerald, 2007). Compared to control groups, as observed through Magnetic Resonance Imaging, these patients have a reduction of those areas which are related to autobiographical memory (Giffard et al., 2013). However, this reduced autobiographical memory fluency that has been reported in cancer patients still remains even in the presence of psychiatric disorders (Giffard et al., 2013).

Generally, the cancer disease moderates the recall of autobiographical memories: patients have significantly less access to episodic memories than healthy controls, as well as to temporal details of memories (Nilsson-Ihrfelt et al., 2004). Results underline that the difficulty of retrieving specific memories is not just related to the period of illness, but extends through the whole life period (Giffard et al., 2013). Bergouignan and

colleagues (2011) tried to explain this result by arguing that aggressive treatments such as chemotherapy or surgical interventions can influence the retrieval of memories of past life events. Effectively, studies on neuro-imaging in cancer patients not suffering from psychopathologies showed a hippocampal atrophy in patients with remitted breast cancer, characterized by a smaller posterior hippocampus (Bergouignan, Lefranc, Chupin, Morel, Spano & Fossati, 2011). This shows that it is the condition of being a cancer patient (and all that is entailed by this condition) and not the fact of suffering from other psychopathologies (related or unrelated to this condition) that affects autobiographical memory as much as it does.

Considering which type of autobiographical memories patients have more difficulty retrieving, results from studies with an Autobiographical Memory Test (Nilsson-Ihrfelt et al., 2004; Bergouignan et al., 2011) suggest that negative and stressful events are less prone to being recalled than positive ones. Both controls and patients, indeed, showed significantly higher episodic autobiographical memory retrieval scores for positive rather than negative memories of past life events. Williams and colleagues (2007) explained this tendency as a way of regulating affect, thereby contributing to protecting the self against specific stressful memories by decreasing the likelihood of episodic recollection. At the same time, many authors reported a higher probability of finding alexithymia in cancer patients, which is characterized by a reduced ability to identify and describe their own feelings and emotions (De Vries, Forni, Voellinger & Stiefel, 2012).

4.1.4 Gender differences

As far as we know, no scientific evidence exists on gender differences in memory fluency of people suffering from cancer. So only inferences on gender differences can be made. From studies on written narratives, we know that women usually write more than men about their experience of illness (Salander & Hamberg, 2005). There is also evidence on gender differences for the topic of narrative. When participating in support groups, for example, women seem to be more open to sharing their emotions than men, while men prefer to share information about their illness (Salander & Hamberg, 2005). Moreover, studies on patients' quality of life have shown that women narrate their psychological problems more than men (Salander & Hamberg, 2005): “the expressive emotional descriptions written by women compared to men were longer, contained more metaphors, and overall communicated their experience more vividly” (Salander &

Hamberg, 2005, p. 690). Moreover, regarding the emotional engagement of memories, there is strong evidence in scientific literature about gender difference. Generally, women's autobiographical memories are longer and richer in details (Pohl, Bender, & Lachmann, 2005), as well as richer in emotional and interpersonal information (Bauer, Stennes, & Haight, 2003; Fivush, Berlin, Sales, Mennuti-Washburn & Cassidy, 2003). Women have also been found to retrieve more memories in a memory fluency task (Conway, 1997): in particular, women seem to be more prone to recall memories with a negative emotional engagement for past life events when these memories regard peers, (Tani, Bonechi, Petterson, & Smorti, 2010). To conclude, women and men have different propensities in the recall of autobiographical memories and in the way in which they narrate them. While women generally have higher fluency and ability to refer to high emotional memories, males are more prone to refer to information in memories, reducing considerations of emotional engagement.

4.2 The current research

The present study aims to explore the role of positive and negative narratives of illness and their effect on autobiographical memory fluency during a delicate and painful period of life, such as when patients have cancer. Because scientific evidence has underlined a reduced autobiographical memory fluency in cancer patients, our assumption was that giving a narrative structure to a memory could help patients to re-elaborate it and improve access to the memories of illness. Since, as we have stated, autobiographical narrative substantially influences the way in which our past events are remembered, (because narrative provides structure to a memory), we aimed to verify if narrating illness experiences impact the recall of them and, particularly, their accessibility and their complexity. Moreover, we have considered that in autobiographical memories in general and in stressful experiences in particular (such as having cancer), emotions play an important role in personal narratives; through narrative, patients capture the primary emotions experienced and define the narrative's emotional tone as positive or negative. Studies on the memories of negative and positive events are not conclusive. Nevertheless, this issue seems to be central to studying cancer patients, for the importance itself that remembering negative events helps to elaborate them while remembering positive events helps to get relief from suffering (having no pleasure, and not considering one's life worthwhile.)

Therefore, we have studied memories of illness, considering them with respect to their emotional engagement: we refer to positive memories when people recall an event and allocate one or more positive emotions to it, while negative memories were considered to be those that were connected to one or more negative emotions. We thought that by asking the narrator for positive or negative narratives of illness, the emotional definition of patients' disease experience would change.

The present study aimed to assess:

1. Memory fluency in oncological patients before and after having narrated negative and positive events, related to the illness experience. If narrative provides a structured memory that is more elaborate than the memory itself, we hypothesized that after being narrated, a memory becomes generally more accessible, richer and more complex in terms of emotional allocation. However, in this context, we also aimed to explore whether positive or negative narratives of illness have different emotional effects on memory fluency and on the emotional engagement of memories. Thus, for this aim we implemented two levels of analysis, as we made for the study presented in chapter three: firstly we have considered all memories recalled by participants and their emotional tones, secondly we have focused on the comparison between memories narrated and unnarrated in those participants who recall again in the second MFT the memories selected for the narrative task. This twofold analysis was useful in order to consider differences in the elaboration of autobiographical memories available when they are narrated or not. On the basis of the literature, we supposed that patients recall a lower number of negative past events with respect to the positive ones. Considering the narrative effect on memory fluency, despite the absence of previous studies in this specific field (the influence of narrative on memory fluency) and some contrary evidence to our hypothesis, we are prone to suppose, on the basis of Fivush and McAdams's works, that the task of narrating negative stories brings more changes in the availability of autobiographical memory and in its emotional tone. Particularly, we supposed that in narrated negative memories, the narrativization process would have a stronger effect on the recall task, compared to those non-narrated.
2. To assess gender differences in memory availability: considering the different aptitude of males and females narrating stories of illness, we hypothesized that females would recall more diverse memories than males, amplifying their fluency of memories of illness; we hypothesized also that females would more probably increase their

emotional involvement in memory than males. Nevertheless, we hypothesized a growth in the emotions also in males, due to the re-elaboration of memory given by narrative.

3. Because we aimed to evaluate the influence of different types of narratives (positive versus negative) on memory and to better understand the reason for this influence, we also aimed to assess the linguistic proprieties of narratives in the two conditions. Even though we have no definite hypothesis, we thought that negative narratives were significantly longer and more coherent than positive ones because of the necessity to elaborate the negative event.

4.3 Method

4.3.1 Participants

63 patients (32 females and 31 males), with an average age of 64,03 ($SD=14,38$) were recruited for the present study. All participants were in the active phase of the disease and were contacted during their daily therapy in the Day Hospital Ward of two hospitals in Florence. The majority of the participants (64%) had cancer of the reproductive apparatus (breast or uterus in the female sample, bladder or testicles in the male sample). Other participants had metastacized tumours on the reproductive apparatus which had started from other organs (36%). Not all participants had certificates for psychological disorders due to their illness experience (such as, for example, the PTSD diagnosis). None of them had previously asked for support from the psycho-oncological services.

Patients were equally and randomly divided into two groups: the first ($N=33$, Females=15, Males= 18) had to narrate a memory listed beforehand with a positive emotional tone (PN), the second ($N=30$, Females=17, Males=13) had to narrate a negative memory (NN). To assess the homogeneity of the sample, t of Student and χ^2 tests were implemented in order to evaluate differences in gender and age. Overall, no significant differences between the two groups were found for gender (PN $M= 1,54$, NN $M=1,43$, $X^2= .790$, $p =ns$) or age (PN $M=65,18$, NN $M=62,76$, $t(61)= .662$, $p =ns$)

4.3.2 Instrument

The Memory Fluency Task. To explore the autobiographical memory retrieval in cancer patients, the participants engaged in a timed Memory Fluency Task described and employed in previous research (Peterson, Bonechi, Smorti, & Tani, 2010).

This questionnaire is focused on the accessibility of autobiographical life events and the emotions assigned to them. The theoretical assumption is that since such a task requires individuals to recall as many memories as they can about a particular period in their life in a limited amount of time, the MFT assesses how readily accessible the memories are. Indeed, as we discussed in chapter three, according to Conway and his colleagues (e.g., Conway & Holmes, 2004; Conway & Pleydell-Pearce, 2000), the most accessible memories are those that are meaningful not only at the time of the retrieval task, but also at the time the events occurred. Following this theory, the first few memories listed are those that are the most significant from the participants' point of view. Because our main interest was to explore autobiographical memory in connection with cancer, participants were asked to recall memories that involved experiences which occurred from the discovery of the disease to the present.

During this session, participants were asked to recall as many memories as they could and write down a sentence or two about each memory (a kind of title for that memory). A researcher timed the task, allowing three minutes for the memory recall. After this part, the researchers asked participants to specify the time and context in which every event happened in order to facilitate the recollection and accuracy of the tool (Tulving, 2002). Then, for every memory they had listed, researchers asked patients to allocate emotions connected to the specific event recalled from a twelve-item list: they could select one or more emotions, and also different emotional tones (positive, negative or neutral). According to the main theories about emotions (Ekman, 1999) and on the basis of previous studies (Tani, Bonechi, Peterson & Smorti, 2010; Peterson et al., 2010), we selected twelve fundamental emotions: four positive (happiness, relief, satisfaction and tranquillity), three neutral (surprise, affected and pride) and five negative (anger, fear, shame, sadness, guilt). The Memory Fluency Task was repeated two times, before and after the narrative task.

Autobiographical narrative. A narrative task was used between the two MFTs. After the first Memory Fluency Task, participants were requested to choose a significant memory episode from their recalled memories, and to tell it in detail to the researcher. Researchers randomly selected participants for two task conditions: for the first, they

asked participants to choose a memory listed in the MFT which they perceived as positive, for the second they were asked to select a negative memory of illness. Participants selected memories, classifying them as positive or negative according to one of these conditions: if they expressed in the first MFT positive/negative emotions about the selected memory and/or if the event had positive/negative consequences in the life of the individual. Thus, an example of a memory selected as positive was “when I managed to go out with my friend for Women's Day despite my anemia”, while a memory chosen as negative was, “when I read the word “cancer” on my examination document for the first time”. Every participant recalled both negative and positive experiences in the first MFT, simplifying the randomization process of PN and NN groups.

No time limit was given to participants, and they orally narrated their memory to a responsive and attentive listener. In previous studies we had asked participants to write down their memories: in that case, the age and tiredness of some participants due to the therapies lead us to decide to do an oral task in this case.

Researchers transcribed the narratives during data collection, reading together with participants the narratives collected. After the narrative task, participants had to classify their narrative in terms of emotions. They were requested to think of their narrative and to select, from the same twelve-item list of the two Memory Fluency Tests, those emotions connected to what they had narrated. In this case, they could again select one or more emotions.

4.3.3 Procedure

Participants were recruited while they were waiting for their daily therapies in the Day Hospital wards. The ethical committees of the hospital and of the University of Florence approved the study, which was conducted in accordance to the American Psychological Association guidelines for the ethical treatment of human participants.

Data collection was organized individually in rooms provided by the hospital. The aims of the study were explained in brief to the patients in the waiting room of the DH wards, allowing them the opportunity to freely agree to provide their individual consent. In only three cases, patients decided not to participate in the study. There was a strong collaboration with the health staff, who put forward patients in good clinical condition, in order not to disturb those who were not in good condition because of strong therapy outcomes. Researchers conducted the collection, managing the time for the task and

taking care that the participants had the privacy and tranquillity to complete it. In total, the data collection lasted about 40 minutes for every participant. In a few cases, narrative collection was interrupted for some minutes: some patients needed a break because of high emotional involvement in the task. Researchers provided for giving all the necessary time before starting again to collect narratives of illness. After data collection, researchers explained again the aims of the study, reflected with patients on their narrated stories and thanked them for their participation.

4.3.4 Data Coding

After transcribing the patient's interview verbatim we considered the two lists of memories and the emotions allocated to them. Given that it was a time-limited task, the memories consisted of only a brief sentence or two (e.g., “the day of the diagnosis communication” or “when I told my husband that I had a cancer”). First we assessed the change in memories with regard to measures of fluency: the number of memories listed in the first and in the second MFT, and the number of diverse memories (thus, the sum of memories present in the first MFT that were also in the second, memories acquired in the second MFT and memories maintained). In this way we used three different measures of fluency. The number of memories that expresses the number of memories independently of the fact that these are repeated in the two MFT is an indicator that it is a pretty rough measure influenced also by the speed of the accessibility of memories (how many memories a person can remember and write in 3 minutes). The number of diverse memories, that is the number of different memories, expresses the wideness of experiences or the number of different events memories refer to. Finally a third indicator was used, represented by the fluency consistency that expresses the number of memories that are repeated from the first to the second MFT. The greater this measure is the more it indicates the extent to which memories of the two MFTs are concentrated on the same events.

We have also considered the emotional engagement of memories and narratives. Emotions were considered in their molar meaning: the researchers codified the prevalent emotional tone (simple positive, simple negative, simple neuter or complex) of the memory and the narrative. A simple positive emotional tone was attributed when participants used positive emotions such as “happiness”, “relief”, “tranquillity” or “satisfaction” alone or with neutral emotions such as surprise to label their memories or narrative. A simple negative emotional tone was attributed when participants used one

or more of the following emotions to label their memories or narrative: “anger”, “fear”, “shame”, “sadness”, “guilt”. A simple negative tone was also considered to be so if participants used a negative emotion with a neutral one. A simple neutral tone of emotion was considered if participants used “surprise”, “affected” and/or “pride” without other emotions. A complex emotional tone was attributed when participants used one or more negative emotions together with one or more positive emotions (neutral emotions might be included as well). In such case each emotional tone received a 0-1 score: 0 when it was not present, and 1 when it was present. Thus, every memory and narrative could be classified in one of four exclusive categories: simple positive, simple negative, simple neutral, or complex. This coding was applied to all the memories, distinguishing the memory that was narrated from the others and checking if each memory was recalled also in the second MFT or not. In this way it was possible to develop a more specific analysis for those memories present in both the MFT assessing the differences between the memory that was narrated from the others.

For the linguistic analysis of narrative, the Linguistic Inquiry Word Count (Pennebaker, Francis & Both, 2001) was implemented. This software provides a percentage for the presence of categories of words in the collected narrative. Because we were interested in testing differences in the elaboration processes of positive and negative narratives, we considered the total word count and the presence of verbal time (present, past and future tenses), emotional involvement (positive and negative feelings) and cohesion of the tale (total connections, temporal and adversative connections).

Summing up, the dependent measures of our study were: 1) measures of fluency. These consisted of the number of memories listed in the first and in the second MFT, the number of diverse memories listed in both MFTs, the fluency consistency of memories (memories maintained in the second MFT), the percentage of memories narrated and non-narrated recalled in the second MFT; 2) measures of emotions. These consisted of: the mean number of emotions per memory listed in the first and in the second MFT, the percentage of simple positive, simple negative, simple neutral or complex tone of the memory and the narrative; 3) The linguistic LIWC categories of words : word count, positive and negative feelings, past tense, present simple or simple future, total connections, adversative, temporal and causal conjunctions.

4.4 Results

4.4.1 Memory fluency

Memory Fluency of the two groups across the two MFTs was checked. The two groups did not appear to be significantly different (PN $M=6,63$, NN $M=6,60$, $t(61)=.045$, $p=ns$).

Results of repeated measures ANOVA showed that generally in the second MFT participants recalled a lower total number of memories ($Pillai=.265$, $F(1,61)=21.24$, $p=.000$, η^2 , $p=.223$) that passed from a mean of 6.61 to 4.8. No differences for group ($Pillai=.005$; $F(1,61)=.278$, $p=ns$) or gender ($Pillai=.003$; $F(1,61)=2.01$, $p=ns$) was observed: both in the positive and in the negative groups, males and females had diminished numbers of memories in the second MFT with respect to the first one.

As to the other fluency measures (number of diverse memories and fluency consistency) a multivariate ANOVA showed a significant gender difference ($Pillai=.094$; $F(1,61)=2.99$; $p<.05$, $\eta^2p=.098$). Particularly in the case of diverse memories, females remembered a higher number of diverse memories than males in both groups ($F(1,61)=4.70$, $p<.05$, $\eta^2p=0.74$) without any group difference ($Pillai=.004$, $F(1,61)=.125$, $p=ns$). For the fluency consistency, males conserved more memories than females, but no group effect ($F(1,61)=.186$, $p=ns$) was found. Table n. 1 summarises descriptive statistics of memory fluency indicators across gender, groups and trials. Generally, narrating positive versus negative experiences of illness did not impact the autobiographical memory fluency. On the contrary, gender seemed to influence the wideness of memory fluency.

	Positive Narrative						Negative Narrative					
	Females		Males		Total F+M		Females		Males		Total F+M	
	MFT1 M (SD)	MFT2 M (SD)	MFT1 M (SD)	MFT2 M (SD)	MFT1 M (SD)	MFT2 M (SD)	MFT1 M (SD)	MFT2 M (SD)	MFT1 M (SD)	MFT2 M (SD)	MFT1 M (SD)	MFT2 M (SD)
Total	7.2	4.8	6.1	4.6	6.6	4.7	7.4	5.2	5.5	4.6	6.6	4.9
Number memories	(3.2)	(2.8)	(3.6)	(2.5)	(3.4)	(2.6)	(3)	(2.7)	(2.4)	(2.6)	(4.9)	(2.6)
Number diverse memories	9.8 (4.9)		8.6 (4.8)		9.1 (4.8)		10.8 (4.5)		7 (3)		9.2 (4.3)	
Fluency consistency	2.3 (2.1)		2 (1.9)		2.1 (2)		1.7 (1.9)		3 (1)		2.3 (2.1)	

Table 1: descriptive statistics of total number of memories, diverse memories and the fluency consistency in Memory Fluency Tasks 1 and 2.

	Positive Narrative						Negative Narrative					
	Females		Males		Total F+M		Females		Males		Total F+M	
	MFT1	MFT2	MFT1	MFT2	MFT1	MFT2	MFT1	MFT2	MFT1	MFT2	MFT1	MFT2
N of emotions	2 (1.1)	2.2 (1.3)	1.7 (.8)	1.8 (.7)	1.8 (1)	2 (1)	2.3 (1.1)	2.1 (1.2)	2.1 (1.3)	2.3 (1.5)	2.2 (1.1)	2.2 (1.3)
%Simple negative tone	42.8	28.9	37.9	41.1	40.1	35.5	45.4	34.1	34.6	23	40.7	29.3
%Simple positive tone	39.3	48.4	49.9	49.8	44.5	49.3	39.1	49.1	45.6	38.6	41.9	44.5
%Simple neuter tone	10	11.8	8.2	6.	8.9	9	4.4	4.6	3.7	3.6	4	4.1
%Complex tone	7.9	10.5	5	2.5	6.3	6.1	11.1	12.2	16.1	34.8	13.3	21.9

Table 2: mean emotional richness and percentage of emotional tones of memories listed in Memory Fluency Tasks 1 and 2 considering both groups and genders.

Considering the emotional engagement, preliminary analysis showed no difference between the two groups for the percentage of simple positive ($F(1,61)=.157, p=ns$), simple negative ($F(1,61)=.007, p=ns$), simple neutral ($F(1,61)=3.17, p=ns$) and complex ($F(1,61)=2.57, p=ns$) emotional tones of memories listed in the first MFT. Results showed that no task x group ($Pillai = .012, F(1,61)=.74, p = ns$) or task x gender ($Pillai = .012, F(1,61)=.99, p = ns$) effects emerged as to the number of emotions per each memory. However a significant interaction effect task x group x gender emerged ($Pillai = .06, F(1,61)=4.07, p <.05, \eta^2, p = .065$). This difference was due to the fact that females increased their emotional engagement in PN group (MFT1 =2 vs. MFT2 = 2.2) and decreased in NN group (MFT1 =2.3 vs. MFT2 = 2.1). An opposite trend was found in males who increased emotional engagement especially in negative narrative condition (MFT1 =2.1 vs. MFT2 = 2.3).

Regarding the emotional tone of memories, overall simple negative tone significantly decreased ($Pillai=.275, F(1,61)=22.409, p<.001, \eta^2, p = .102$) from the first to the second MFT without significant effect of group and group x gender interaction. Indeed, both females and males across the two groups generally attributed less negative feelings in memories listed after the narrative task (MFT1 = 40.4% MFT2 = 32.5%). Simple positive tone, didn't change significantly between first and second MFT in both groups ($Pillai=.013, F(1,61)=.750, p=ns$), although females were prone to attribute more positive emotions to their memories in the second MFT while males followed the opposite trend. Also in this case no significant main or interaction effect of gender and group have been found. The simple neutral tone also did not change in the second MFT ($Pillai=.000, F(1,61)=.004, p=ns$): both females and males of PN and NN maintained the same percentage of neutral memories. The complex tone underlined a main effect of the task ($Pillai = .06, F(1,61) = 4.04; p <.05, \eta^2p = .064$) and an interaction effect task x group ($Pillai = .06, F(1,61)=4.03, p<.05, \eta^2p = .064$) and an interaction effect task *group* gender ($Pillai=.08, F(1,61)=5.49, p<.05, \eta^2p = .085$). In the positive group, the complex tone remained stable (6.3 % to 6.1%) while in the negative group the complex tone increased (13.3% to 21.9%) In particular, in the negative group males significantly increased the use of the complex tone (13.1% to 34.8%).

4.4.2 Narrated vs unnarrated memories

Because we had hypothesised, on the bases of the previous studies, that narrating a memory influences its fluency and related emotions, we compared fluency consistency

and numbers of emotions and emotional tone of those memories that were selected to be narrated in comparison to memories that had not been selected to be narrated.

In the PN group, 19 (9 females and 10 males) out of 33 participants (57.6%) recalled the memory that had been narrated in the second MFT, while the same occurred in 16 (7 females and 9 males) out of 30 participants (53.3%) in the NN group. This difference was not statistically significant either for groups ($X^2=.115$, $p=ns$) or for gender comparison ($X^2=.046$, $p=ns$).

In the second MFT generally, participants maintained a percentage of 55.5% narrated memories versus 32.7% unnarrated memories. This difference is significant for the total sample ($Z=-3.47$, $p<.001$) as well as for the two separate groups: the Negative Narrative group maintained 57.5% of narrated memories versus 37.9% of non-narrated ones ($Z=-2.73$, $p<.01$), while the Positive Narrative group conserved 53.3% of narrated memories versus 33.7% of unnarrated ones ($Z=-2.20$, $p<.05$).

Before comparing narrated versus non-narrated memories for emotional tones, we made a preliminary analysis of gender differences for richness of emotions in narrated memories for which we didn't find significant data. Results of t test and non-parametric Wilcoxon test revealed no significant differences between females and males as to the number of emotions ($t(33)=.67$, $p=ns$), or for simple negative ($Z=-.26$, $P=ns$), simple positive ($Z=-.18$, $p=ns$) and complex ($Z=.12$, $p=ns$) tone of emotions. The same trend was observed for unnarrated memories: no differences emerged for the number of emotions ($t(33)=-.15$, $p=ns$) or for simple negative: $t(33)=-.17$, $p=ns$; simple positive: $t(33)=-.65$, $p=ns$; and complex: $t(33)=-.009$, $p=ns$ tone of emotions. Thus, given the numerical scarcity of the four groups and non significant preliminary results, we implemented data analysis considering the two positive/negative narrative conditions, focusing on the just 35 cases in which memories narrated were available in the second MFT. Comparison of emotional richness and tone of narrated and non-narrated memories was implemented as well, in order to assess the effect of narrating on memories recalled (see table number 3 for descriptive statistics and figures 1 and 2 for their visual representation).

	Positive narrative		Negative Narrative			
	MFT1	MFT2	MFT1	MFT2		
Non narrated M						
N emotions	1.82	1.86	2.59	2.81		
%Negative tone	48.7	46.4	44.8	37.4		
%Positive tone	39.2	46.6	34.6	39.8		
%Neuter tone	5.5	5	2.1	5		
%Complex tone	6.4	1.9	17	17.5		
Narrated M						
	MFT1	N	MFT2	MFT1	N	MFT2
N emotions	2.10	3.36	2.68	2.68	3.46	2.87
%Negative tone	10.5	15.7	21	75	25	43.7
%Positive tone	89.4	78.6	73.6	12.5	25	12.5
%Neuter tone	.01	.02	.02	.01	0	.02
%Complex tone	0	5.2	5.2	12.5	50	43.7

Table 3: descriptive statistics of richness and emotional tones of narrated memories and non- narrated memories

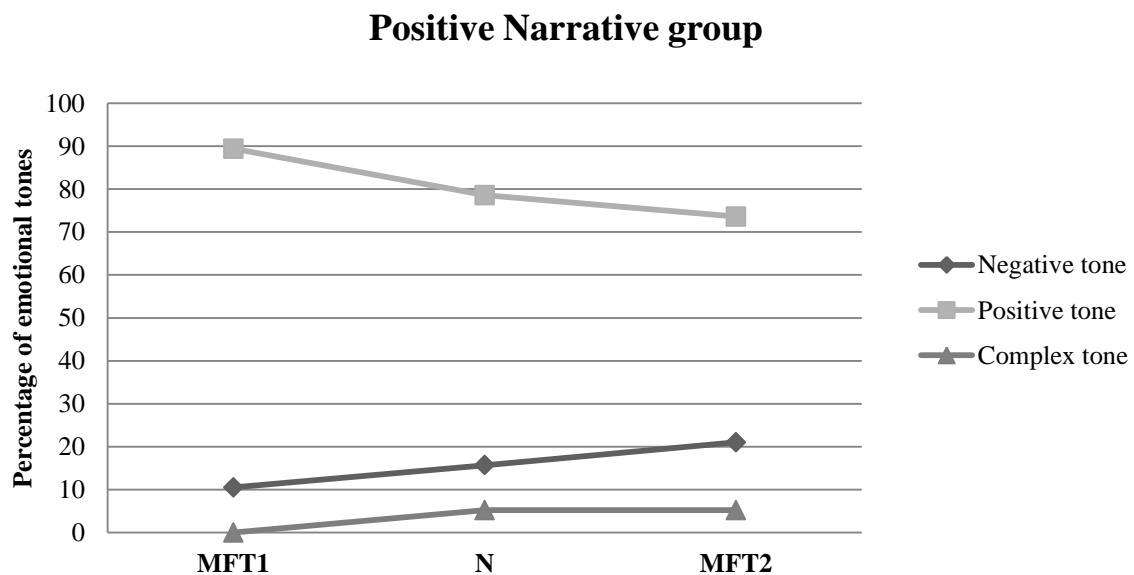


Figure 1: percentage of emotional tones of memories when they are listed in the first MFT, when they are narrated and when they are recalled again in the second MFT

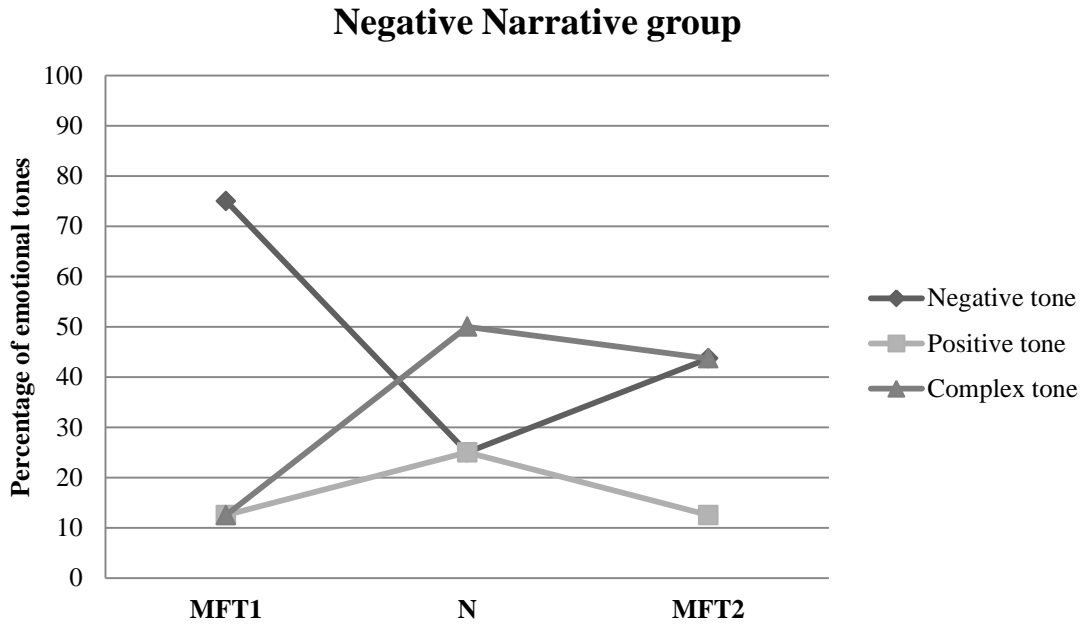


Figure 2: percentage of emotional tones of memories when they are listed in the first MFT, when they are narrated and when they are recalled again in the second MFT.

Looking at the number of emotions in the first and in the second MFT, results of the ANOVA repeated measures for non-narrated memories underlined no significant task effect ($Pillai=.034$, $F(1,33)=1.04$, $p=ns$), task*group interaction effect ($Pillai=.015$, $F(1,33)=.465$, $p=ns$). On the contrary, data of narrated memories highlighted that both in the PN and NN groups, (MFT1= 2.10, MFT2=2.68 and MFT1= 2.68, MFT2=2.87 respectively) , the number of emotions increased significantly ($Pillai=.156$, $F(1,61)=5.745$, $p=.02$, η^2 , $p=.156$), without a significant task*group ($Pillai=.041$, $F(1,33)=1.31$, $p=ns$, η^2 , $p=.22$) effect. In other words, for both groups, memories that had been narrated had more emotions in the second memory fluency task, than memories that were not selected for the narrative task.

To assess the emotional tones of memories when they were listed in the first and in the second MFT, a repeated measures ANOVA for non-narrated memories and a non-parametric Wilcoxon test for narrated memories were used.

Looking at the non-narrated memories, results underlined that both in the PN and the NN groups, in the second MFT the decrease in negative tone of the memories was not significant ($Pillai=.039$, $F(1,33)=1.22$, $p=ns$), and without any task*group effect ($Pillai=.012$, $F(1,33)=.33$, $p=ns$). No significant changes emerged either for a positive

tone ($Pillai=.04$, $F(1,33)=1.38$, $p=ns$), for a neutral tone ($Pillai=.01$, $F(1,33)=.32$, $p=ns$) or for a complex tone ($Pillai=.01$, $F(1,33)=.40$, $p=ns$) in either of the PN or NN groups. As to narrated memories in the Positive Narrative group between the first and the second MFT, no significant differences were found in the emotional tones of the memories: simple negative (MFT1 %=10.5, MFT2 %=21, $Z=-1.41$, $p=ns$), simple positive (MFT1 %=89.4, MFT2 %=73.6, $Z=-1.73$, $p=ns$), and complex (MFT1 %=.01, MFT2 %=5.2, $Z=-1.00$, $p=ns$) tones of emotions did not significantly increase or decrease in MFT2. In contrast, participants of the NN group significantly decreased simple negative emotional tones (MFT1 %=75, MFT2 %=43.7, $Z=-2.23$, $p<.05$), and at the same time significantly increased the complex tone of memories narrated in the second MFT (MFT1 %=12.5, MFT2 %=43.7, $Z=-2.23$, $p<.05$). No significant data emerged for the simple positive tone, which continued stable (MFT1 %=12.5, MFT2 %=12.5, $Z=.00$, $p=ns$) or for the neutral one, which was generally absent.

In the case of narrated memories we could also assess the emotional allocation to the narrative task in both groups. Results have shown that participants narrating positive events followed in narrative the same trend of emotional allocation in the second MFT: with respect to the first MFT, participants increased the negative tone (MFT1 %=10.5, N %=15.7, $Z=-1.00$, $p=ns$) and complex tone (MFT1 %=0, N %=5.2, $Z=-1.00$, $p=ns$) while decreasing the positive tone (MFT1 %=89.4, N %=78.6, $Z=-1.41$, $p=ns$), although not significantly. On the other hand, for participants narrating negative events, the narrative task had a significant role on emotional engagement: with respect to the first MFT, with the simple negative emotional tone in narrative decreasing significantly (MFT1 %=75, N %=25, $Z=-2.82$, $p<.01$), while the complex one increased (MFT1 %=12.5, N %=50, $Z=-2.12$, $p<.05$). No significant changes emerged for the simple positive (MFT1 %=12.5, MFT2 %=25, $Z=-1.00$, $p=ns$).

An example of a memory that acquires complexity after the narrative task came from participant #30 of the Negative Narrative group, a 73-year-old man. When he listed the memory, "*Blood on the beach two years ago*" in the first MFT, he allocated the negative emotion of fear and the neutral one of feeling affected. Then through narrative, the man re-constructed the temporal sequence of the event ("*I was at the beach 2 years ago and I urinated blood for 4 days in the morning and night. I spoke to my daughter-in-law and she called the doctor [...], then I came back home and did all the examinations [...], then they found cancer and I was very shocked, so that they removed it [...]. After 15 days I met the doctor again and he emphasized my better condition, saying that now I*

just had to do lavages once a month for a year”), adding details on the consequences of that day on the beach when he saw himself urinating blood. In the narrative task, as well as in the second MFT, the memory becomes complex, with the neutral emotion of surprise also added and the positive one of relief. In this way, the memory has both positive and negative emotions, thereby becoming complex. In this case, the narrative gave the opportunity to provide a structure for the memory typical of the tale: the insertion in the event of a temporal sequence with a past, present and future, as well as the violation of expectation (surprise), adding to the fear feeling also the happy end of the story (relief) due to his last meeting with the doctor.

4.4.3 Linguistic analysis of narratives

Another aim of our study was to deal with the linguistic analysis of positive and negative narratives in order to consider differences in the elaboration of the memories during illness in the two groups.

Table 4 shows descriptions of LIWC categories chosen for the analysis of narratives.

Liwc categories	PN	NN	ANOVA
	M(DS)	M(DS)	p
Total word count	79.81(40.1)	107.63(43.86)	<.05
Emotional feelings			
Positive feelings	2.9(2.24)	1.1(1.2)	<.01
Negative feelings	1.5(1.3)	2.7(2.6)	ns
Verbal tenses			
Present simple	9.8(3.6)	7.6(3.2)	=.06
Past tense	2.7(2.9)	6.3(2.4)	<.001
Future	0.1 (0.1)	0.8 (0.4)	ns
Cohesion			
Total connections	2.3(3.1)	3.5(1.7)	=.06
Temporal connections	1.5(1.9)	2.7(2.1)	<.001
Causal connections	.27(.65)	.50(.20)	ns
Adversarial connections	.55(.89)	.79(1)	ns

Table 4: Descriptive statistics of linguistic analysis with LIWC software.

Results of univariate ANOVA showed that participants of the Negative Narrative group overall narrated more of their illness experience than the PN group (Word count NN= 107.63, PP= 79.81, $F(1,33)= 4.02, p<.05$). Considering the linguistic properties, positive narratives were richer with positive feelings ($M\% NN= 1.1, PP= 2.9, F(1,33)= 8.24, p<.01$), while negative narratives focused more on negative emotions ($M\% NN= 2.7, PP= 1.5$), although without a significant difference. Looking at the verb tenses of narratives, data from linguistic analysis showed that members of the Positive Narrative group used the present tense more ($M\% NN= 7.6, PP= 9.8$), although not significantly ($F(1,33)=3.46, p=.07$), while negative narratives were significantly more likely to refer to the past ($M\% NN= 6.3, PP= 2.7, F(1,33)=15.17, p<.001$). Considering the cohesion of the tales, narratives on negative experiences of illness were significantly richer in terms of temporal connection ($M\% NN= 2.7, PP= 1.5, , p<.001$). An almost significant difference was found for the total connection category ($M\% NN= 3.5, PP= 2.3, Z=-1.79, p=.06$). Both causal ($M\% NN= .50, PP= .27, F(1,33)=1.69, p=ns$) and adversative conjunctions ($M\% NN= .55, PP= .79, F(1,33)=.273, p=ns$) are higher in the NN group, although not significantly.

In the last section we introduced the negative narrative of participant #30 of the NN group, who narrated his story of illness from the first symptoms to the actual condition. The plot of the story was focused on a temporal sequence of what had happened: he introduced the first perception of his illness (“*I was at the beach 2 years ago and I urinated blood for 4 days*”), the complication (“*I did the examinations, then they found cancer*”) and the resolution of the story (“*the doctor emphasized my better condition, saying that now I just had to do lavages once a month for a year*”). Temporal and general connections such as “then” and “so that” gave cohesion to the story, re-elaborating the past story, and also considering the consequences to the present.

In contrast, positive narratives dealt with a general reflection on the narrative experience. Participant #16, a 54-year-old female, gave an example by narrating her memory, “*Back to my natural optimism*”. She said: “*I have a serious and chronic disease; I only have a bit more time. If these are my last moments, I want them to be mine and not the disease’s. I want to be the sunny and optimistic person of always: I want my daughters to remember me like this*”. In this case, the autobiographical memory was not related to an experience of illness being the plot of a story, but introduced a reflection about the present condition and the expectations about her remaining life time.

4.5 Discussion

The first aim of this study was to assess the memory fluency of patients before and after a task of narrating one positive or negative memory of illness. We hypothesized that after being narrated, a memory becomes generally more accessible, richer and more complex in terms of emotional allocation. Moreover, in this context we also aimed to explore whether positive or negative narratives of illness have different emotional effects on memory fluency and on the emotional engagement of memories. Our first analysis was focused on the whole sample of memories. First of all, it's curious that, despite scientific evidence to the contrary in literature, our sample of oncological patients did not show an inhibition in memory retrieval: indeed, our results show that in the first Memory Fluency Task, the availability of autobiographical events is very close to "the magic number of 7, plus or minus 2" (Miller, 1956), reported for normative samples. Furthermore, we did not find any inhibition in the recall of negative events either: in the first Memory Fluency Task, both the participants of the PN and NN groups recalled respectively 40.1% and 40.7% of negative memories versus 44.5% and 41.9% of positive ones. With regard to our aims, results underlined that, considering narrated and not narrated memories all together, both the PN and NN groups had decreased memory fluency to the same extent in terms of number of memories, and the two groups were not significantly different for the other two measures of fluency either: number of diverse memories and number of maintained memories from the first to the second MFT. The two groups allocated a similar number of emotions to memories but were different in the use of the tone of emotions because the negative group participants increased more than the positive group ones the use of the complex tone of emotion when they had to qualify their memories. Our second analysis was that of comparing memories selected for being narrated and memories non-narrated in both groups. This second analysis was focused on those participants who in the second MFT recalled the memories selected for the narrative task. In the two groups, roughly the same number of participants spontaneously recalled in the second MFT the memory that they had already narrated (19 participants of the PN group and 16 of the NN group). Generally, both groups' participants spontaneously recalled a significantly higher percentage of narrated memories in the second MFT with respect to the non-narrated ones.

Interesting differences emerged in the comparison between the first and the second MFTs in the way the two groups recalled the narrated and not-narrated memories. In fact, in non-narrated memories, both groups' participants in the second MFT attributed

roughly the same number of emotions to memories attributed in the first MFT and used the same type of tone of emotions. In other words, our results did not show either a task effect (MFT1-MFT2) or a group effect (PP vs NN). All the differences emerged when narrated memories were analysed. The Negative Narrative group participants significantly increased the complex tone of emotions and decreased the simple negative tone. Effectively, the influence of emotional allocation to narratives is crucial: in the NN group, both changes in negative and complex tones are due to the emotional involvement in the narrative task.

Another aim of our study was to assess gender differences in autobiographical fluency and emotional engagement of memories. Considering memory fluency, we hypothesized that females were more likely to recall diverse memories than males, who at the same time were more consistent. Results confirmed our starting hypothesis: the number of diverse memories in the first and in the second MFTs was higher for females, while males were prone to maintaining more of the same memories. In line with the scientific evidence in the field (Conway, 1997), females change the quality of fluency, losing more memories and acquiring more new memories with respect to men. In other words, the narrative task in women has an opening effect on memory fluency. Some memories listed previously disappear, leaving space available for new memories. As for emotional engagement, we hypothesized that females were more prone to increasing emotional richness because of their natural tendency to refer more to their feelings in recalling autobiographical memories (Conway, 1997). Results didn't completely confirm our hypotheses: as we have noted, females increased the number of emotions in the group narrating positive experiences, while males followed the same trend in the group narrating negative memories. We interpreted these data by considering that women are naturally more prone to expressing and narrating their emotions. It's conceivable that men benefit more from the opportunity of narrating their illness, especially when they face a negative experience, and thus they generally don't decrease their emotional engagement. Moreover, males in the NN group were more prone to increasing the co-presence of positive and negative emotions (a complex tone of emotions). Again, we interpret these results by considering that, because males are less prone than women to showing negative feelings, the narrative task of a negative event has a stronger effect in them.

Finally, as we had noticed, no gender differences emerged as to narrated memories. This suggests to us that narrating a memory of illness has a similar effect on both males and females.

The third aim dealt with the assessment of linguistic differences between negative and positive narratives of illness. In this case, we hypothesized that negative narrative were more cohesive than positive ones because of the participants' need to create coherence out of negative memories. Results of linguistic analysis have confirmed our expectations: negative narratives are longer and more related to the past, and are significantly more organized through more total and temporal connections.

In summary, narrating memories of illness (both positive and negative) improves memory fluency of these memories. Participants are more likely to again recall in the second MFT those memories that had been recalled in the first MFT and then had been narrated, and to them they attributed a greater number of emotions. However, narrating a negative event makes memories more emotionally complex and less negative.

These results confirm our expectations about narrative's effect on memory fluency: the fact that emotions allocated to narrated memories significantly increased in both groups in the second MFT proves our assumption that narrative has a restoring effect on memory. If in general memories the emotional involvement basically decreases, in the case of memories selected for the narrative task this trend is opposite. This is not actually surprising because narrating a memory constitutes a rehearsal (Tulving, & Craik, 2000), and therefore it reinforces the maintenance of memory.

However, narrating also has a narrativization effect. This means that the emotions are more numerous in a narrative than in a memory, but also that narrating a memory can influence the further recall of the memory itself. Furthermore, narrating a negative vs. a positive memory entails different narrative procedures: participants who narrated a negative past event related to illness are prone to significantly decrease simple negative tone in the memory listed in second MFT, at the same time increasing the complex one. This datum is opposite in the case of the PN group, which tended to decrease positive emotions, although not significantly increasing the simple negative ones. Therefore positive and negative narratives do seem to have the restoring effect that often has been reported in scientific literature (McAdams et al., 2006). But narrating a negative event contributes to re-elaborating our past and considering also positive points of view, which tends to allow the complexity of memories to emerge. This evidence is clear in

the example of NN participant #30 on the time in which he saw blood while urinating as the first symptom of his cancer disease: through narrating his experience, he also considered some details, as the interview with the oncologist who relieved him noted, also adding a positive emotion (relief) to the memory and recalling it in the second MFT.

In effect, linguistic analysis showed that positive and negative narratives have a different narrative structure: paraphrasing Fivush and colleagues (2003, p.17), “an emotionally negative event creates some problem that begs for resolution, leading to a more story-like structure. Positive events in contrast can be a simple listing of interesting things [...]”. While negative narratives require an explanation, leading to the elaboration of the memory into a coherent story with a personal meaning, positive ones may not require that and, in our results, deal more with a sort of present, general reflection on the illness experience. The negative narrative of man #30 gives us a good example of our interpretation: he elaborated the whole story of illness, starting from the diagnosis communication and connecting it with the last meeting with his doctor and with expectations for the future. Indeed, the negative narrative was longer, addressed more to the past, and more cohesive in terms of temporal connections. All these characteristics indicate that negative narratives entail a larger work of elaboration.

Our research is in line with McAdams’s work about the role of narrating negative events: “reasoning about negative events ideally involves a two-step process. In the first step, the narrator explores what the negative experience feels or felt like, how it came to be, what it may lead to [...]; in the second step, the narrator articulates and commits the self to a positive resolution of the event” (Pals, 2006; McAdams, 2008, p. 254).

4.5.1 Limitations

First, we only assessed memories of illness in patients who were actually facing that experience. On the one hand, this could be an advantage because of the greater accuracy of memories recalled, but on the other we could also argue that the high emotional engagement in the actual state of illness could distort the retrieval of positive and negative events. In the future, we aim to explore autobiographical memories in patients involved in other phases of the disease, such as remission.

Secondly, we haven't considered a control group in order to verify what happens with patients' memory fluency when they have not had the opportunity to elaborate their experience through narrative.

Thirdly, we haven't considered the age of the participants. Indeed, there is a large age gap with both the male and female patients. This is quite normal because diseases such as cancer can affect people in different periods of life. Nevertheless, as we know from scientific literature, memory fluency for positive and negative events of life is different from one period to another. In future, we aim to better explore age differences, considering memory fluency in different time periods (for example, early and middle adulthood), in order to remove the "tiredness" effect due to advancing age.

Finally, we cannot say that the narrative influence on memory fluency has an enduring effect: we have only implemented the Memory Fluency Task in a time frame of about 40 minutes. In the future, we will consider a follow up task to verify changes in memory fluency over time.

Conclusions

*[...] Perchè cantando il duol si disacerba [...]*²

(Francesco Petrarca, *Il Canzoniere*)

In this conclusion I take stock of the scientific evidence derived from the studies and how they can be useful for the study of narrative and autobiographical memory in contexts of disease.

My ambition was to present this dissertation as the tour of four independent landmarks, although strictly connected to one another: starting from the proposal of a theoretical model useful to understand and explain the meaning of the presented studies, I aimed at concluding with a sort of validation of it through the results of studies implemented. This was how I had planned it in my mind, in which each part is strictly connected and depends on the other.

The first part was the introduction of the narrativization model. In this chapter, I have proposed a model for the implementation of narrative in medical practice based on cognitive psychology theories on autobiographical memory and narrative.

Since this is still an unexplored land, the second chapter was an explorative study which aimed at giving a scientific contribution to the role of narrative on the emotional tone of memories. Results have demonstrated that the narrative gives richness and complexity to the emotional tone of autobiographical memory: in other words, narrating a memory transforms it.

Moving from these assumptions, in the third chapter I have tried to go one step further, considering the role of the narrativization process on memory fluency and on its emotional engagement. Because scientific literature suggests that there are different narrative styles socially constructed, I have explored the role of short and long narrative on memory fluency. Results have underlined that there are different cognitive processes related to the length of the story and that this difference influences the ability to recall memories and to emotionally elaborate them. Particularly, long narratives produce a

² *[...] Since grief is rendered less bitter by being sung [...]*

bigger rehearsal and thus a better availability (fluency) of narrated memories, not just when they are narrated, but also when they are simply recalled in a Memory Fluency Task, following a sort of glow effect. On the contrary, a short narrative does not favour a similar availability of the memory and does not strengthen its memory fluency, but leads to the availability of new and diverse memories,. Nevertheless, the emotional elaboration emerged in the explorative study is confirmed in long narrative condition: when it is “narrativized” in a long tale, a memory becomes richer and more complex. Furthermore, the complexity that has emerged in the narrative is maintained also when a memory is recalled again in a second MFT. Linguistic analysis of short and long narratives confirms that narrating in length a memory requests more work in terms of what we called cognitive mechanisms, introspection and temporal connection: in other words, it involves a bigger cognitive labor which, in my interpretation, could improve the conservation of narrated events and inhibit the availability of new memories.

The fourth part is close to the first, but is elaborated through the evidence given in the second and third parts. I aimed to assess the role of positive and negative narratives of illness on memory fluency and the emotional tone of autobiographical memory. In this case, participants were oncological patients in the active phase of disease: they completed twice the MFT and narrated their memories of illness while they were attending therapy in two Day Hospital wards in Tuscany. Results underlined that positive or negative narratives of illness do not influence the memory fluency: in all participants the availability of memories related to the illness experience decreases after the narrative task, although females are more prone to recall diverse memories than males in the second MFT. Significant differences due to the group emerge considering the emotional involvement of memories narrated: in this case, narrating a negative event of illness improves the emotional complexity of memory, without a glow effect on unnarrated memories. Linguistic analysis shows that effectively positive and negative narratives are different: the first aims to be a present reflection on the illness experience, while the second is more coherent and focused on the past experience and its elaboration.

Summarizing, three are the main reflections I have gathered in my journey.

The first is that to “narrativize” a memory is a way to emotionally elaborate it. This is a topic I have found in all three studies. Through the “narrativization of experience” (Bruner, 1986, 1990), new emotions emerge and, in the case of long and negative narratives, positive and negative emotions are allocated to the same memory. This is an

evidence that the narrative structure gives new meanings to the autobiographical memory. The case of the emotion “surprise” is a good example: in all three studies participants experienced the sense of surprise after having narrated a memory of their past life more than when they had to recall it. As I have considered in the second chapter, surprise is strictly related to the violation of expectation typical of the story structure (Bruner, 1990). Narrativization implies the consideration of new points of view, as the happy ending of the story or unexpected complications. The oncological patient, through the narrative of his negative memory of the first symptoms of the disease, transforms his bad event into a complex one, feeling relief and surprise.

My second reflection is that the narrativization process can have a sort of glow effect of the availability of autobiographical memory. In the case of memory fluency, there is not just an effect on memories narrated, but also an effect on all memories recalled in a Memory Fluency Task. Furthermore, this effect is due to the length of the story. This is an interesting result: narrative does not just influence a memory, but can contribute to the availability of new diverse memory (in the case of short narrative), or to the availability of the narrated memory (in the case of long narrative).

The relationship between memory fluency and narrative is not proved in the case of memories of illness: in line with scientific literature in the field, facing a serious disease affects the availability to recall past memories. Nevertheless, in the case of oncological patients, narrated memories are more available than unnarrated ones. Despite the memory fluency inhibition reported by scientific literature, when patients have the opportunity to narrate their illness experience, they more easily maintain it in memory. This is the proof of our assumption that narrative can be considered an elaborative rehearsal, useful to improve the fluency of memories.

My third reflection is that the results of this dissertation suggest that the model of narrativization can be a useful contribution to the medical practice. In doctor-patient communication, the need for understanding and sharing narratives of illness is strong. Because communication in medicine is the discussion of the patients’ memory about their experience of illness, narrativization seems to be a good way to elaborate them in the relationship with the physician, considering a new complex and rich emotional involvement. Narrative, as an elaborative rehearsal (Tulving & Craik, 2000), improves the encoding of memory of illness and their sharing in the doctor-patient communication.

Considering the narrativization model in medical practice, it is not just a good way to help patients in the re-elaboration of their lives into the illness; the physician could also acquire new information on the disease, useful to implement the best therapies. Furthermore, our results underline that narrating negative events does not mean an increase of negative feelings of memories but, on the contrary, it decreases them through a re-elaboration in a more complex emotional tone.

This work has underlined that narrating a memory can improve reflexivity and awareness processes, and that narrating can constitute an effective tool to implement in hospital contexts.

I'm aware that this dissertation has some limits and that some important questions remain unanswered. Every study I have presented has its specific limitations due to the research implementation. Considering the general work, this dissertation does not take into account the role of the listener of the story in the narrativization process. Scientific literature, indeed, argues that memories of our past life are socially developed and then co-constructed in the relationship between a narrator and a listener. Given the scarce evidences on the relationship between narrative and autobiographical memory fluency, I have decided to implement three studies based just on the narrator cognitive processes involved in narrativization. The studies on memories of illness have tried to consider the listener's role: patients narrated orally their stories to researchers who randomly changed the request of narrating positive or negative events. Nevertheless, the listeners' characteristics have not been studied. This aspect is very important especially in the medical practice, where the communicative skills of physicians are a good instrument to elicit patients' narrative.

In future studies my research group aims to explore the characteristics of co-construction in medical practice on the narrativization process of memories of illness. We will explore if there are characteristics of narrator and listener which improve the availability of autobiographical memory, as well as its emotional elaboration. In the case of physicians, for example, we can suppose that a good empathy and good knowledge on communication skills would improve accessibility to memories related to the disease.

A second limitation is due to the nature of the narrative task. The narrative task we employed was not simply a task where participants had to narrate. We didn't use a request of automatic or expressive writing as those used by Pannebaker (1997). In these tasks a person has to write uninterruptedly without lifting the pen from the paper. In this

way all the time spent to write overlaps the time spent to recall. In this span of time they had time to reflect, to memorise and to write. They could interrupt, reflect, correct what they had written and then to go on. In this way the comparison among memory and memory narrated is, said more precisely, a comparison among a particular memory and the same memory recalled (reflected, analysed and so on) and narrated. Further research is necessary in order to manage this problem. One way to address it could be through using automatisms. In this way the time of recalling overlaps with the time of narrating. However, also in this case, studying the narrating process means also studying something that includes both memory and narrative. So we have a Memory Fluency Task, where the time to recall and reflect is limited and the language can be used just to extract a label from that particular experience, and a narrative task where the language can be used copiously and therefore verbal reflection may be very extended. In this span of time recalling and writing a narrative occur to different extent. Our research demonstrated that, providing time (about 15 minutes), a mean (writing) and a goal (narrating), a particular memory become richer and more complex.

A third limitation of this dissertation is due to the sample size. Since one of the goals of this work was to compare the fluency of narrated and unnarrated memories, small samples forced us to consider just few cases assessing this comparison. In the second and in the third studies, for example, narrated memories conserved in the second MFT were 54 and 35. A future goal could be to amplify the sample in order to further implement data analysis, especially testing for mediating and moderating effects.

Another general limitation of this dissertation is the age of participants. If participants involved in the studies presented in chapters two and three are university students, oncological patients are middle adults or, in some cases, elderly people. Thus, we asked the students to recall memories of their adolescence (in line with the reminiscence bump theory), while patients have focused on memories of their adulthood. In this way, we have controlled the time spent from the occurred event to the recall of it: every participant recalled memories that did not occur more than 5 years before the retrieval task. Nevertheless, we know from scientific literature that every stage of the life has got different memory fluency abilities. In future studies, I aim to investigate the relationship between narrative and memory fluency in healthy adults and, on the other hand, in young oncological patients.

Furthermore, another limit of the study comes from the type of tumors of the oncological patients participating to the third study. Most of them were suffering from

reproductive apparatus cancer. This is a very serious cancer, not just because of its social and psychological consequences (for example, mastectomy in women or sexual impotence in men), but also due to the intensity of the therapies. It could be interesting, in future studies, to consider other types of cancer which the most of time do not affect the regular patients' life organization. Cancer is a chronic disease, but there are many patients who survive for a long time elaborating the illness experience as a component of a large part of their lives.

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