 Chapter 1

GENERAL INTRODUCTION

1.1 Introduction

Autobiographical memory
For more than a century psychologists have studied memory but it is only since the seventies of the last century that research on autobiographical memory started to grow substantially (Skowronski, 2005). There has been and still is considerable discussion about the position, term and definition of autobiographical memory. In this thesis the term ‘autobiographical memory’ is broadly defined as a type of episodic memory for both retrospective (memories) and prospective information (expectations) related to the self (Birren & Schroots, 2006; Schroots, van Dijkum & Assink, 2004). Autobiographical memory (AM) is studied across multiple subdisciplines. For instance, neuropsychology is concerned with aspects of anatomy and biology that mediate AM (e.g., Conway & Fthenaki, 2000); developmental psychology focuses on the development of AM (e.g., Howe & Courage, 1997); personality psychology focuses, for instance, on relations between personality traits and features of the life story (McAdams et al., 2004), and cognitive psychology investigates the accessibility of memories over the lifespan (e.g., Rubin, Rahhal & Poon, 1998). All these disciplines, however, operate rather isolated from each other and there is not yet a theoretical framework which covers the diversity of AM research (Conway & Pleydell-Pearce, 2000). As a consequence, there are many theoretical ideas instead of one dominant theory of AM and the methods used to study AM are very diverse (Skowronski, 2005). Skowronski (2005) assumes that the theoretical and empirical diversity contributes to the survival and progress of this area of psychology. Other researchers, however, state that a consistent method of measuring and analyzing autobiographical memories is needed in order for science to advance (Kovach, 1995; Schroots & Assink, 2004).

In the present study AM is studied from a lifespan perspective. It was not until the 1980’s that lifespan psychology became subject of empirical study. For a long time, adulthood and old age were considered to be relatively stable periods without significant changes (Abeles, 1987). Only a few scientists were interested in what happened in midlife and old age (Birren & Schroots, 2001). For instance, Hall (1922) wrote a book on senescence (Birren & Schroots,
2001) and Bühler (1933) and Frenkel (1936) tried to reveal general developmental principles from the biographies of different individuals (McAdams, 1988). The work of Erikson (1950) gave an important impulse to the lifespan orientation in psychology (Settersten, 1999). Erikson developed a psychosocial theory of personality development across the whole lifespan consisting of eight stages in each of which a task has to be fulfilled or a crisis solved. But it was not until 1980 that the first review of lifespan developmental psychology was published by Baltes, Reese and Lipsitt. According to these authors, “Lifespan developmental psychology is concerned with the description, explanation, and modification (optimisation) of developmental processes in the human life course from conception to death” (p. 66). In 1982 Schroots introduced the term ‘ontogenetic psychology’. Ontogenetic psychology is concerned with the description and explanation of behavior throughout the life course from conception till death (Schroots, 1982). The term ‘lifespan’ is generally used by psychologists and is focused on ‘intra-psychic’ (or interior) phenomena and changes in these phenomena over the span of an individual’s life, while the term ‘life course’ is mostly used by sociologists who emphasize the link between social structures and human life (Settersten, 1999).

In order to study the development of all kinds of phenomena across the lifespan most frequently cross-sectional and longitudinal studies are conducted (Sugarman, 2001). In cross-sectional studies aspects of behavior are studied in different age groups at one moment in time and the results are compared to each other. Cross-sectional studies provide data and allow inferences only about inter-individual or between-person differences. It is unclear in cross-sectional research in how far age differences equal age changes as age groups in cross-sectional research can be different from one another in many aspects besides age (e.g., Schaie & Hofer, 2001; Schroots & Birren, 1988; Sugarman 2001). In order to answer questions concerning the development of all kinds of phenomena over the lifespan and to discover the mechanisms that explain the processes within individuals over the lifespan, it is necessary to conduct longitudinal research where the same individuals are studied at different points in time (Schaie & Hofer, 2001; Schroots & Birren, 1993). In principle, two repeated observations constitute a longitudinal study, but Schroots and Birren (1993) quote Deeg who considers a study to be longitudinal, “when the same persons are observed with respect to the same characteristics more often than two times and during a period long enough to enable the ascertainment of changes in these characteristics” (Deeg, 1989, p. 17). Baltes and Nesselroade (1979) gave five rationales for the utility of longitudinal study of behavioral development: (1) direct identification of intra-individual change, (2) identification of inter-individual variability in intra-individual change, (3) relationships among intra-individual
changes, (4) determinants of intra-individual change, and (5) inter-individual variability in determinants of intra-individual change. Hofer and Sliwinski (2006) state that these five rationales make it clear that it is necessary to measure and model change at two distinct levels of analysis: the intra-individual (or within-person) and the inter-individual (or between-person) level.

Until now little is known about changes concerning AM across the lifespan. There are a few studies in which respondents were asked to recall the same events at two different sessions (see Chapter 5) but, as far as known, there are no studies in which respondents are asked to report spontaneously events they recall from their past and expect for their future at different points in time. The present study aims to fill this gap. The study covers a period of five years in which the same respondents are measured three times. In this way it can be determined what remains stable and what changes with respect to different aspects of AM.

**Life-line Interview Method**

As there is not yet a comprehensive theory of AM to guide research in this area, an explorative, descriptive approach was used in this study. According to Van Zuuren (2002), an exhaustive description of the data forms the basis for gaining insight in a phenomenon and for discovering associations. In this way research contributes to the creation of hypotheses and the development of theory and is more inductive (i.e., hypotheses generating) than deductive (i.e., hypotheses testing). Qualitative research is very suitable for generating hypotheses and development of theories (Van Zuuren, 2002). Qualitative research is concentrated on the entire person and his environment, and starts from the subjective experience and the meaning given to this experience. Qualitative material can provide information that may not be accessible by other methods. “Sometimes qualitative material can best reveal innermost thoughts, frames of reference, reactions to situations, and cultural conventions. In fact, language often tells more about people than they want to disclose, or than they know about themselves, and it can bring to light things a researcher might not think to ask about” (Smith, 2000, p. 313). Drenth and Heller (2004) argue that the boundary between quantitative and qualitative is often permeable and they state that a combination of different methods often gives better results than a single method.

As mentioned before there are many different methods to gather autobiographical information. In the present study a special method, the Life-line Interview Method (LIM) was used. The LIM is a semi-structured interview and combines a quantitative and a qualitative approach. “The LIM has been developed purposively to study the subjective or self-
organization of past and future behavior over the course of life. With the term ‘subjective’ we mean the perception by the individual of his or her life, which implies some sort of retro- and prospective memory for life events, experiences, and/or expectations, as well as some sort of reflective and integrative capacity for these events” (Schroots, 2003, p. 193). In short, in a typical LIM session, a person is first asked to place perceptions of his/her life, past as well as future, visually in a temporal framework by drawing his/her life-line. Next, the respondent is asked to label each peak and each dip by chronological age and to tell what happened at a certain moment or during an indicated period. When all peaks and dips are labeled, the respondent is asked to tell something more about each event and in this way the life story is obtained. This procedure results in a life-line, which consists of a series of chronologically ordered life events, and a life story. In this thesis analysis of the data will be limited to the analysis of life events.

**Purpose**

In the present study 98 men and women of a young, middle and older age group were asked three times in a period of five years to recall memories from their past and to report expectations they have for their future by means of the Life-line Interview Method (LIM). Until now results of the first wave of this LIM-study have been published concerning the structure of the LIM|Life-line (Schroots & Assink, 1998), the number of events (Schroots, van Dijkum & Assink, 2004), the affect of events (Assink & Schroots, 2002), the content of events (Schroots & Assink, 2004; Schroots & Assink, 2005) and the number of words respondents use to tell the LIM|Life story (Schroots, Kunst & Assink, 2006). From these studies different patterns emerged concerning the structure of different aspects of AM. For instance, it turned out that respondents of different age groups reported the same number of events over the total lifespan, i.e., past and future.

The studies mentioned above have got a sequel; the LIM was administered a second and third time to the same group of respondents and thus has become a longitudinal study. The main purpose, then, of this longitudinal, explorative study, which is part of the research program *Life-course Dynamics* (Schroots, 2003) is twofold and can be summarized as follows: (1) to determine the stability and change across the lifespan of patterns which were found at the first wave, and (2) to provide a description of the stability and change of autobiographical memories and expectations over the lifespan. Autobiographical memories and expectations will be analyzed from the perspective of number, affect and content. Subsequently, the effect of age and gender on stability and change will be determined.
Overview

In the next paragraph, first, a short overview will be given of the history, position and organization of autobiographical memory (AM). Second, different methods which are used to collect autobiographical information will be mentioned. Special attention will be given to the Life-line Interview Method. In paragraph 1.3 attention will be paid to the study of life events in the past decades and to the dimensions by which life events are classified. Life events are the building blocks of the life story and the relation between the life story and AM will be discussed. In paragraph 1.4 a description is given of the design of this study, the respondents who participated in this study, the administration of the LIM and the way in which results were analyzed. In the following four chapters the empirical results of the study are presented. LIM-results will be analyzed from the perspective of number, affect and content of events. Chapter 2 presents results concerning the (change in) number of events respondents recall from their past and expect for the future and the distribution of these events over the lifespan. The question whether respondents recall and expect mainly positive or negative events is answered in Chapter 3. Because of the enormous amount of data concerning the content of events, this subject is divided over two chapters. Chapter 4 provides a description of the content of events for the first wave resulting in a description of the model life course for men and women of a young, middle and older age group. The results of the first wave make up the base line for Chapter 5 in which the stability and change in content of memories and expectations over a period of two and five years will be analyzed. Chapter 6 includes a presentation of the main findings of this study and a general discussion about methodological issues, the contribution of this study to the field of AM and life-course research, practical implications of the findings, and suggestions for future research.

1.2 Autobiographical Memory

History

Autobiographical memory is what is usually meant by the term memory in everyday usage (Rubin, 1995). The psychological study of memory started more than a century ago and is characterized by two different traditions (Baddeley, 1999). The tradition that dominated memory research for a long period was the experimental research on learning and memory which was started by Ebbinghaus (1885). Because he wanted to study memory as a pure
function of learning independent of content Ebbinghaus used nonsense words as stimuli. Under controlled laboratory conditions he studied the structure, organization and accuracy of memory (Pillemer, 2003). The other direction in memory research was started by Francis Galton. As soon as 1879, he conducted what is now often considered to be the first empirical study of autobiographical memory. Galton displayed a word to himself and then allowed the word to elicit some type of association, the so called ‘prompt word’ technique. As psychology developed as a natural science, the direction indicated by Ebbinghaus was followed during the next 100 years and Galton’s studies were not continued for the time being. In 1932, however, Bartlett criticized the Ebbinghaus approach to memory because the most central and characteristic features of human memory were excluded in these type of studies. Bartlett had his subjects learn and recall meaningful material under naturalistic conditions. But it is only since the seventies of the last century that there has been an upsurge in the interest of ‘everyday memory’. From that time on research on autobiographical memory has started to grow significantly and in 1986 the first book about autobiographical memory was edited (Rubin, 1986). Draaisma (2001) wrote a fascinating book about different aspects of autobiographical memory such as first memories, déjà-vu, near-death experiences, flashbulb memories and memory feats of idiot-savants, which became very popular among the general public.

**Definition**

In the past decades, there has been considerable discussion about the position, term and definition of autobiographical memory. Until the 1960s it was assumed that there was not more than one kind of memory. Broadbent (1958) made a distinction between long- and short term memory and by the early 1970s this distinction was widely accepted. In the case of the psychological study of memory, there is considerable agreement now that memory can broadly be divided into: (1) sensory memory; (2) short-term or working memory; and (3) long-term memory. Sensory memory refers to the role of storage in the processes involved in perception. The sense organs have a limited ability to store information about the world in a fairly unprocessed way for less than a second. Short-term or working memory refers to the temporary storage of material necessary for performing a range of complex tasks such as comprehension, reasoning, and long-term learning. Short-term memory allows us to retain information long enough to use it and lasts approximately between 15 and 30 seconds, unless people rehearse the material. Long-term memory refers to more durable encoding and storage
systems and can last a lifetime (Baddeley, 1999). Tulving (1972) divided long-term memory into episodic and semantic memory, the first referring to personally experienced events and the last to general facts, for instance, knowing how to write and read. Later, Tulving (1991) elaborated his memory theory and suggested five forms of memory: procedural, perceptual, short-term, semantic and episodic. According to Tulving (1984) episodic memory grew out of semantic memory and those two systems share many features. “Episodic memory is a recently evolved, late-developing, and early-deteriorating past-oriented memory system, more vulnerable than other memory systems to neuronal dysfunction, and probably unique to humans. Its operations require, but go beyond, the semantic memory system” (Tulving, 2002, p. 5). Episodic memory requires three elements: (1) a sense of subjective time which enables one to travel back in time in one’s own mind; (2) the ability to be aware of subjective time which is called ‘autonoetic awareness’; and (3) a ‘self’ that can travel in subjective time (Tulving, 2002). Tulving does not use the term ‘autobiographical memory’ and the question is whether episodic memory and autobiographical memory are different terms for the same memory system. According to Banaji and Crowder (1989) all episodic memory is autobiographical memory because episodic memory concerns personally experienced and therefore autobiographical information. But Brewer (1995) is convinced that ‘recollective memory’, a term he preferred instead of ‘autobiographical memory’, is a unique form of memory. He defined an individual’s autobiographical memory as “a recollection of a particular episode from an individual’s past” (1986, p. 34). Baddeley states that “autobiographical memory is concerned with the capacity of people to recollect their lives” (1992, p. 26). In contrast with these researchers, Rubin (1995, p. 1) believes “that definitions should not be set a priori, but should reflect the natural cleavages that researchers found in nature!” In general, it can be said that “the term autobiographical memory has generally been used to describe any sort of research in which individuals recall episodes from their own past; the focus in most research is on the recall of specific, individual memories of particular events” (Bluck & Habermas, 2001, p. 135).

A common aspect of most definitions of autobiographical memory is that it refers to the individual’s past. During the past years, however, there is an increasing interest in prospective memory, defined “as remembering at some point in the future that something has to be done, without any prompting in the form of explicit instructions to recall” (Maylor, Darby, Logie, Della Sala & Smith, 2002, p. 235). This contrasts with retrospective memory, which refers to remembering information from the past although prospective memory tasks need retrospective remembering. One has to remember that he/she should remember something
(Maylor et al., 2002). This definition, which emphasizes the memory function of ‘remembering to remember’, covers only partly prospective autobiographical memory functioning. As Tulving (2002) argues, episodic memory requires a mental travel in time and it has to be realized that it is not only possible to travel backwards in the past but also to travel forwards into the future. Human beings are not only aware of what has been but also of what may come. They are aware of their continued existence in time and reflect on, worry about, and make plans for their future. Thus, when retrospective autobiographical memory – briefly summarized - relates to the retrieval of memories, experiences or past events in the present, then prospective autobiographical memory is concerned with the retrieval of expectations, anticipations or future events, which likewise are based on present memory functioning. Consequently, in this LIM-study the term ‘autobiographical memory’ is broadly defined as a type of episodic memory for both retrospective and prospective information related to the individual (Schroots, van Dijkum & Assink, 2004).

Organization of autobiographical knowledge

Autobiographical memory emerges at about the end of the second year of age. Before that age personal memories are not available, a phenomenon which is called ‘childhood amnesia’. Children develop a sense of me at that time and begin to organize events that they experience as ‘things that happened to me’ (Howe & Courage, 1997). Conway and Pleydell-Pearce (2000) provided an integrative, hierarchical model - which still has to be tested empirically - of a self-memory system (SMS) that links an autobiographical knowledge base to personal goals. According to Conway and Pleydell-Pearce (2000), the autobiographical knowledge base contains information at three different hierarchical levels of specificity: lifetime periods, general events, and event-specific knowledge. Lifetime periods are the most general memories and cover relatively large segments of autobiographical time with identifiable beginnings and endings, like ‘When I studied psychology’. General events are more specific and at the same time more heterogeneous than lifetime periods. They encompass both repeated events and single events, like ‘Every morning I went to college by bicycle’. Event-specific knowledge contains event details unique to a single event, like ‘That morning, I had an accident’. Event-specific knowledge is embedded in a general event which in its turn is embedded in a lifetime period. According to Conway and Pleydell-Pearce (2000) one’s goals function as control processes in the SMS and modulate the construction of memories. Autobiographical memories are encoded and later retrieved in ways that serve the self’s goal agendas. As such, current goals influence the way autobiographical information is absorbed
and organized in the first place, and goals generate retrieval models to guide the search process later. The autobiographical knowledge base also helps to ground the personal goals. People formulate goals for the future that are reasonably in line with the information encoded as lifetime periods, general events, and event-specific knowledge.

**Methods**

Many different methods are used to obtain autobiographical data. As already mentioned Galton (1879), who conducted the first empirical study on autobiographical memory, used the so called ‘prompt word’ technique by displaying a word to himself and then allowed the word to elicit some type of association. Crovitz and Schiffman (1974) modified Galton’s word technique. They gave subjects a list of words and asked them to think of a specific memory they associated with that word. This ‘word-cue’ method has become with some variations one of the major methods used by psychologists to study autobiographical memory (for an overview see Conway & Haque, 1999; Fromholt et al., 2003; Rubin, Rahhal & Poon, 1998; Rubin, Schulkind & Rahhal, 1999). In other studies participants are asked to generate spontaneously (a certain number of specific) memories (d’Argembeau, Comblain & Van der Linden, 2003; Baum & Stewart, 1990; Berntsen & Rubin, 2002; Elnick, Margrett, Fitzgerald, & Labouvie-Vief, 1999; Fitzgerald, 1988, 1992, 1995; Holmes & Conway, 1999; Rubin, Schulkind & Rahhal, 1999; Sehulster, 1996). Questionnaires are also used to sample information about major life events. For instance, Glickman, Hubbard and Valciukas (1990) used the Life Events Questionnaire. Fingerman and Perlmutter (1995) used an abbreviated version of the Major Life Events Inventory (Phinney, Chiodo & Perlmutter, 1988), which consists of a list of 50 normative and non-normative life events. Normative events are events which occur at about the same time to all individuals in a given (sub)culture or to most members of a given cohort, while non-normative events do not occur in any normative manner for most individuals (Baltes, Reese & Lipsitt, 1980). Fingerman and Perlmutter (1995) also used an anticipated future events questionnaire. This questionnaire examined the most important events participants expected to experience in the next two years.

Another method to gain knowledge about the working of autobiographical memory is by means of diary studies, in which diarists record one or more autobiographical events each day for a certain period (Burt, Kemp & Conway, 2003). For instance, Wagenaar (1986) recorded one or more events daily for six years. He recorded who, what, where, and when information about the events, and rated the events for saliency, emotional involvement, and pleasantness. Recall was cued by different combinations of the recorded aspects.
Besides these methods which ask participants to generate (a specific number of) memories from their lives, autobiographical memory is also studied by means of the life story of the individual. Robinson and Taylor (1998) asked fourteen women with a mean age of 46 years first to tell about their life experiences and how they felt they fit together and second, to review their lives once more but to focus now on the disruptions, detours, surprises, choices, and turning points, both good and bad that may have occurred. Luborsky (1990; 1998) asked respondents to describe their lives. McAdams (1997) developed an extended life-story technique in which the participant is asked, among others, to divide his life into its main chapters, to provide a plot summary for each and to identify eight key scenes or episodes that stand out in the story as especially important or self-determining events. The complete interview takes about 2-3 hours to complete. Fromholt et al. (2003) asked subjects to “Tell about the events that have been important in your life”, in a 15-minute interview. Hermans (1992) used a method of self-investigation which enables a person to tell his or her life story to a psychologist in a way that results in an overview of valuations, including moral valuations, referring to the person’s past, present, and future. This process reveals the affective and motivational characteristics of the storyteller and leads to changes in (a retelling of) the narrative. Mackavey, Malley and Stewart (1991) used the autobiographies of 49 eminent psychologists to analyze the content in terms of autobiographically consequential experiences (ACE).

There are also alternative methods to obtain autobiographical information. Respondents were asked to draw their life line (Brugman, 2000; Hentschel, Sumbadze & Shubladze, 2000) or story line (Gergen & Gergen, 1987; Gergen, 1988) or life graph (Back & Bourque, 1970; Back, 1982; Bourque & Back, 1977; Grob, Krings and Bangerter, 2001) or to draw their life (Whitbourne & Dannefer, 1985-1986). Timelines (Rappaport, Enrich & Wilson, 1985) were used by deVries and Watt (1996) and Elnick et al. (1999), while Martin and Smyer (1990) used a sorting task in which participants were asked to select events that occurred to them and order the events according to the global importance they had in their lives.

Life-line Interview Method
As was mentioned before the Life-line Interview Method (LIM) was used in the present study to elicit autobiographical information in a systematic, standardized way. The LIM has been developed by Schroots (1984) on the basis of several studies of metaphors of aging and the individual life course. According to Collins Cobuild English Dictionary (1995) a metaphor is “an imaginative way of describing something by referring to something else which has the
qualities that you want to express”. For a long period metaphors had a bad reputation in science because the positivistic view of science required a clear, unambiguous, and objective description or characterization of reality. In recent years, however, it is argued that science is in an essential way metaphorical and characteristically employs metaphors; science is based on more or less implicit metaphors. This approach is based on the constructivist view of reality in science which holds that reality or the objective world is mentally constructed on the basis of the constraining influences of the individual’s knowledge and language. Theorists are guided by implicit metaphors in exploring and discovering new phenomena. For instance, the computer metaphor – the human being is a computer – has guided research in human memory for decades and has resulted in much progress in this field. When making explicit the implicit metaphor the assumptions which arise from it can be elaborated and examined concerning their appropriateness and consequences. The explicit metaphor can provide a deeper understanding of the existing theory but can also generate or create a whole body of theoretical problems and solutions. In short, metaphor is a means of entering the unknown through the gateway of the known (Liberally quoted from: Schroots, 1984; Schroots, 1991; Schroots & Birren, 2002; Schroots & ten Kate, 1989; Schroots, Birren, & Kenyon, 1991).

Frequently, individuals describe their lives as ‘making a journey’ which is symbolized by the ‘footpath’ metaphor. In this metaphor, both the temporal dimension and the affective dimension are expressed by traversing the mountains and valleys of life. When people use expressions as ‘I’m feeling up’ or ‘I’m really low these days’ to express positive and negative feelings, they make use of this footpath metaphor. The LIM is based on the ‘footpath’ metaphor, i.e., the graphical, two-dimensional representation of a footpath – with time on the horizontal dimension and affect on the vertical dimension – which symbolizes the course of human life with its ups and downs of important life events. The basic pattern of the LIM, as most metaphors of life, is the branching or bifurcation point. Such branching points may be defined as those changes in the life of the individual that direct the life path in a distinctive direction, and that are separated in time from each other by one or more affective or critical events or experiences (Birren & Deutchman, 1991). This bifurcation or branching behavior of the individual at the biological, psychological or social level of functioning is the core of the Branching Theory of Aging, an aspect theory of gerodynamics, which studies the dynamics of development and aging over the lifespan. Metaphorically speaking, bifurcation means that the fluctuating individual passes a critical point – the bifurcation, branching, choice, turning or transformation point – and can branch off into higher- and/or lower-order structures or processes. Higher- and lower-order structures can be translated in terms of mortality,
morbidity and quality of life. For example, traumatic life events and a healthy lifestyle may result in lower and higher order structures, respectively, and consequently in higher and lower probabilities of dying. Thus defined, the LIM|Life-line may be conceived of as a series of branching points from birth to death which forms the basic structure of the LIM|Life story (Liberally quoted from: Schroots 1988, 1995, 1996; Schroots & Birren, 1988; Schroots & Birren, 2002; Schroots & Yates, 1999).

The LIM has special characteristics which makes the method very suitable for gathering autobiographical information. First of all, most people are familiar with the graphical representation of time by a straight line and with hills and valley’s representing the ups and downs in life, and they do not need much thinking before drawing their life-line.

Second, the LIM claims to elicit autobiographical information at the affective level of the behavioral organization of the individual. Because of the hills and the dips in the life-line, the respondent automatically reveals the accompanying affect of the events, while the faults of more cognitively-oriented techniques like questionnaires, open interviews and (auto)biographies, which appeal primarily to the rational verbal capacities of the individual, are avoided. In actual practice most of the interviewed only after the drawing of the life-line fully realize what they are revealing and some of them want to ‘correct’ the original line in order to present themselves in a more positive way. For instance, a woman had drawn a very deep dip in her childhood. When she realized this, she wanted to make the dip less deep because “she did not want to look pitiful”. For some persons it is very painful to be confronted with the visualized truth of their life. They cannot ignore or deny the line they have drawn.

A third, special aspect of the LIM is its self-pacing quality. The life-line is drawn and the life story is told at the person’s own pace. The LIM allows each individual to set his or her own tempo, an advantage over standardized questionnaires especially for older people. In addition, the nondirective atmosphere of the interview enhances disclosure of an individual’s most sincere opinions, beliefs, and attitudes. The LIM is tailored to the unique qualities of individuals.

A final advantage of the LIM is the quality of self-structuring. The respondent and not the researcher, categorizes and structures the data in terms of number of events, age, and affect. The self-structuring quality makes it also possible to analyze the interview data in terms of patterned structures (branching points) which reflect the events, experiences, or happenings in the life of the individual. Organizing unstructured interview data into meaningful categories in such a way that they can be analyzed statistically tends to be a great problem. Thanks to the
design of the LIM the subject himself structures the data in terms of number of events, age at
which the event occurred or is expected to occur, and affect by which the event is
accompanied, which facilitates analyzing these data. This inherent structure has a validity of
its own since it represents the facts of an individual’s life as he or she sees it; it is the
subjective truth of his life (Liberally quoted from: Schroots, 1984; Schroots & Birren, 2002;
Schroots & ten Kate, 1989).

1.3 Life events

Overview
According to Sugarman (2001) life events are benchmarks in the human life cycle. They are
the milestones or transition points that give “shape and direction to the various aspects of a
concepts in the study of the life course. McAdams (1996) uses the term ‘nuclear episodes’ to
refer to particular scenes in the adult life story as high points, low points, beginning points,
ending points and turning points. Grob et al. (2001) use the word ‘life marker’ which they
define as an important event that affects the life significantly, or that has a formative influence
on life, or that turns life in a particular direction. Birren and Hedlund (1987) speak about
major branching points. Other terms are: bifurcation points, turning points, transitions or
transformations (Schroots & Birren, 2002) which are, as was mentioned before, defined as
those changes in the life of the individual that direct the life path in a distinctive direction, and
that are separated in time from each other by one or more affective or critical events or
experiences (Birren & Deutchman, 1991).

During the past decades many studies have been conducted with regard to life events,
especially on the role of ‘critical’ or ‘stressful’ events on the onset of illness or distress,
starting with Holmes and Rahe (1967) and their Social Readjustment Rating Scale. Although
this scale includes positive as well as negative events, the assigned fixed weightings to
different events ignore individual differences in their impact and meaning for different
respondents. Many researchers have tried to improve Holmes and Rahe’s scale by expanding
the scope of items, rewording existing items that are ambiguous, altering scaling procedures
or by focusing on everyday hassles instead of major life events, e.g., the Life Events
Inventory (Cochrane & Robertson, 1973), the Life Experiences Survey (Sarason, Johnson &
Siegel, 1978) and the Life Events Questionnaire (Chiriboga, 1984). In spite of these improvements, many problems remain associated with the use of questionnaires. First of all, the investigator determines which events are considered as important life events by selecting a set of life events out of all possible life events, with negative events being over-represented. Second, not all events are equally important for all respondents but weighting procedures of events are lacking or vary between studies. Third, the reliability of recall of events, especially over longer periods of time, is often problematic (Stettersten, 1999) and it is difficult to obtain life events in a systematic, temporal coherence. Fourth, only the past is investigated; expectations for the future are not included in these questionnaires. From the foregoing Settersten (1999) concludes that “We must better examine the degree to which the impact of life events varies as a function of the life stage of the individual and as a function of experiences in the lives of others to whom the individual is tied” (p. 146).

*Life story*

Life events are embedded in the total life story. As Bluck (2001) states, life events are the building blocks of life stories. DeVries and Watt (1996) note that the story of a life is given substance, size and shape by the events it embodies. According to Conway and Pleydell-Pearce (2000) nearly all researchers in the area of autobiographical memory research assume that there is an important and strong relation between the self and autobiographical memory. “Autobiographical memory is of fundamental significance for the self, for emotions, and for the experience of personhood, that is, for the experience of enduring as an individual, in a culture, over time” (p. 261). According to some theorists autobiographical memory is a part of the self (Conway & Tacchi, 1996; Howe & Courage, 1997; Robinson, 1986). The source of information about the self lies in autobiography, “the story of an individual’s life told or written by himself or herself that is based on the recall of memories, events, experiences, and relationships with other persons” (Birren & Schroots, 2006, p. 478). Although autobiographical memory and narratives are closely related to each other, memory researchers and narrative researchers have gone their separate ways for the most part using different theories and methods and having their own traditions (Robinson & Taylor, 1998).

The roots for the narrative approach lie in the 1930s. Then, personality psychology was born (Allport, 1937) which emphasized biography, myth, narrative, and the intensive exploration of the single case in the study of human lives (McAdams, 1988). Murray (1938) had his subjects tell a story in response to a picture cue. Charlotte Bühler (1933) and Else Frenkel (1936) collected and analyzed autobiographical accounts written by 400 European
men and women. They were more concerned with general principles in all lives than with the uniqueness of any single life and used these autobiographical data to generate hypotheses and theories (McAdams, 1988).

After the Second World War Erikson wrote psychobiographies about important historical persons, for instance Luther (1958) and Gandhi (1969) on the basis of the stage theory of life he had created (1950). Erikson considers development as a function of both individual and cultural factors. As the individual develops, he has to adapt to new demands society places on him. Erikson distinguishes eight stages in life and in each stage a psychosocial task is met. The first stage concerns ‘basic trust versus basic mistrust’ (ca. 0-1 yrs); during the first year of life the child learns whether he can trust or mistrust the predictability of the environment. In the second stage (ca. 1-6 yrs) the crisis concerns ‘autonomy versus shame and doubt’; the child has to attain self-control without loss of self-esteem and without feeling ashamed. In the third stage (ca. 6-10 yrs) the crisis ‘initiative versus guilt’ has to be solved; on one hand the child can develop a free sense of enterprise while on the other hand, with the development of conscience, the child can feel guilty about his thoughts and actions. In the fourth stage (ca. 10-14 yrs) the crisis ‘industry versus inferiority’ is central; when the child does not learn industry and does not become competent he can develop a sense of inadequacy and inferiority. The fifth stage (ca. 14-20 yrs) is ‘identity versus role confusion’; when the adolescent does not succeed to develop a sense of ego identity, he will be uncertain about who he is and what he will become. In young adulthood (ca. 20-35 yrs) the crisis ‘intimacy versus isolation’ has to be solved; when the individual has developed a separate identity he will be able to involve himself in intimate relationships instead of being isolated. In the seventh stage (ca. 35-65 yrs) the crisis is between ‘generativity versus stagnation’. Generativity refers to establishing and guiding the next generation. At last the person arrives at the final stage of ‘ego integrity versus despair and disgust’. When an individual succeeds to fulfill this task, he will accept his life for what it has been and will not look back with feelings of despair (Sugarman, 2001).

Integration in later life is facilitated by the process of life review. The concept of life review was introduced by Butler (1963) who saw reminiscence in the aged as part of a normal life review process to put one’s life in order by the realization of approaching death. Later, it was recognized that life review is not limited to old age but takes place in all stages of life. Reminiscence means literally the recall of memories without a specific purpose, while life review entails the recall, evaluation, and synthesis of positive and negative memories in a more systematic way (Webster & Haight, 1995). Reminiscence and life review are used for
different goals such as enhancing self-esteem, improving social skills, attaining social integration, acquiring ego-integrity (Scherder, Schroots & Kerkhof, 2002) and also as a therapeutic tool for treatment of depressions for elderly (Bohlmeijer, Smit & Cuijpers, 2003). In a meta-analysis of studies which used reminiscence or life review as a method of intervention for depressive symptoms on elderly, results indicated that both reminiscence and life review are effective treatments for (severe) depressive symptoms (Bohlmeijer et al., 2003). Serrano, Latorre, Gatz and Montanes (2004) also found that at post test older adults who had received life review treatment based on autobiographical retrieval practice reported fewer depressive symptoms, less hopelessness, improved life satisfaction, and retrieval of more specific events than a non-treatment control group. Watt and Cappeliez (1995) identified two types of reminiscence which are supposed to be effective in the treatment of depression of elderly; (1) integrative reminiscence which focuses on a constructive reappraisal of the past resulting in positive beliefs about the self and attributions about one’s role in negative events, and (2) instrumental reminiscence which focuses on memories of past problem-solving experiences and coping activities resulting, ideally, in the use of adaptive coping appraisals and strategies to cope more adequately with experiences of stress.

However, during the period in which psychology was dominated by behaviorism, the use of autobiographical data was of little scientific significance (McAdams, 2001). But since the mid-1980s, personality psychology has witnessed a strong upsurge of interest in personal narratives and life stories (Schroots & Birren, 2002). McAdams (1996; 2001) has delineated a conceptual framework that integrates the life story as an aspect of personality. McAdams makes a distinction between the I (self-as-knower) and the Me (self-as-known) features of personality; the I is viewed as the active subject who creates the self, while the Me is viewed as the object of knowledge, the self. The person can be described on three relatively independent, non-overlapping levels. The first level is the trait level; traits are described as those relatively nonconditional, decontextualized, generally linear, and implicitly comparative dimensions of personality which are rather stable over the lifespan. McCrae and Costa (1990) distinguished five personality traits, known as ‘the big five’: neuroticism, agreeableness, consciousness, extraversion, and openness. The second level of personality is called ‘personal concerns’ and relates to all kinds of constructs that are contextualized in time, place and role, for instance, personal strivings, defense mechanisms, goals, coping strategies and so on. The third level has to do with the meaning of life. Beyond traits and adaptations, many people seek an integrative frame for their own lives that gives them a sense that the various pieces of who they are come together into some kind of sensible whole. According to a number of
theorists, this kind of integration of the self into an identity is accomplished through the
construction and revision of a ‘life story’ (see McAdams, 1999). The third level of
personality, then, is the level of identity which is expressed in the life story. The life story
gives unity, meaning and purpose to a life. A life story can be defined as an internalized and
evolving narrative of the self that integrates the reconstructed past, perceived present and
anticipated future in order to provide a life with a sense of unity and purpose (McAdams,
1999). In sum, in the theoretical concept of McAdams (2001) the personality is viewed as a
unique pattern of traits, characteristic adaptations and stories. It has to be remarked that
identity and self are not the same. Children have a sense of ‘self’ but identity develops from
the late teenage years through the mid-20s when, according to Erikson (1950), the integration
of selfhood becomes a psychosocial problem for them. From that time on, individuals begin to
‘work on’ their identity. A life story is a psychosocial construction and not simply an
objective account of ‘what really happened’ in the past (Gergen, 1988; McAdams, 1996). Life
story data are viewed as temporary constructions of what seems most appropriate from the
perspective of the narrator at that time (Gergen, 1988; McAdams, 1996); a life story is only
one version of life and is subject to continuous changes.

During life many events occur but not all events individuals have experienced and which
they remember are included in the story of one’s life (Bluck & Habermas, 2000). Only
memories that are highly self-relevant when they are encoded, that have an emotional impact,
or that provide a motivational explanation for later development and/or maintain significance
at the time of retrieval are likely to be included in a life story (Conway & Holmes, 2004).
Bluck and Habermas (2000) consider only those memories truly autobiographical that are
linked to the self through emotional or motivational significance for one’s life. Another aspect
of autobiographical memories is that these memories are not merely incidents but are given
structure and meaning in the context of the whole life by their inclusion in a more flowing life
story (Kenyon & Randall, 1999).

Categorization

Classifying life events

In order to make life events data more manageable, they have to be classified into categories.
Life-event taxonomies classify life events according to different dimensions (Sugarman,
2001). Reese and Smyer (1983) identified 35 variables used to describe life events which can
be grouped into three main dimensions: (a) ‘event’ dimensions which describe objective
characteristics of the events themselves such as age relatedness, duration, type and
prevalence; (b) ‘perception’ dimensions which concern the subjective impression or evaluation of the events such as control, desirability and meaning; (c) ‘effect’ dimensions which refer to the outcomes or consequences of the events such as impact and direction of impact (Brim & Ryff, 1980). Several life-event taxonomies utilize only one dimension, for instance Holmes and Rahe’s (1967) Social Readjustment Rating Scale. Respondents are asked to indicate which of forty-three events, rank ordered according to their estimated stressfulness, they have experienced within (usually) the last 12 months. The sum of the stress ratings for these events is determined and it is assumed that the greater the amount of stress experienced by individuals, the higher the likelihood these individuals will suffer stress-related health problems. A three-dimensional taxonomy of life events was compiled by Brim and Ryff (1980) on the basis of the likelihood, i.e. the probability that an event will take place, age-relatedness, i.e. the correlation of the event with chronological age, and prevalence of events, i.e. whether the event is experienced by many or few people. For each dimension a distinction was made between a ‘high’ and a ‘low’ category. For instance, Marriage is an event that has a strong correlation with age, is experienced by many individuals and has a high probability of occurrence. A two-dimensional taxonomy comprising 4 event ‘types’ and 14 event ‘contexts’ was proposed by Reese and Smyer (1983) resulting in 56 cells. The 4 event types were social-cultural, personal-sociological, biological and physical-environmental. The event contexts were grouped into 5 categories: family, self, social relations, work and miscellaneous. An event such as Marriage is classified into the context ‘Love and marriage’ which belongs to the category ‘Family’ and to the event type ‘Personal-sociological’. Baltes, Reese and Lipsitt (1980) distinguished three types of events or influences over the lifespan: normative age-graded, normative history-graded and non-normative life events. Normative age-graded events occur at about the same time to all individuals in a given (sub)culture, for instance, going to school at age four in The Netherlands. Normative history-graded events occur to most members of a given cohort in similar ways, for instance, the Second World War. Non-normative events do not occur in any normative age-graded or history-graded manner for most individuals, for instance, having a severe accident. Studies in the field of autobiographical memory all use different category lists to classify events which makes it rather difficult to compare results (Schroots & Assink, 2004).

Classifying LIM-events
The data obtained by a LIM-interview are three-fold: a life-line, a series of temporally ordered
life events and a life story. Each of these three types of data can be analyzed at different levels of complexity and requires its own specific method of analysis. For instance, concerning the life-line a factor analysis can be conducted on different measures of the life-line (mean height of line, height of line at different points in life, slope of line at different points in life, number of peaks, and age at last peak) resulting in different typologies of the life-line (Schroots & Assink, 1998). The average life-line, based on the height of the line at different points in life can be determined for the past and future of different subgroups (Assink, 1996). Life events can be analyzed on the level of categories or subcategories (Schroots & Assink, 2005).

Concerning the life story, the number of words the respondent needs to tell the story of his life can be counted (Schroots, Kunst, & Assink, 2006) and affective sequences of transitions in life can be determined (Kunst, 2004). The present study is restricted to the analysis at the second level, the event level. Thanks to the special characteristics of the LIM, the subject himself structures the data which facilitates analyzing.

**LIM-category list**

A special category-list was constructed in order to classify LIM-events. According to Holsti (1968) categories should be uni-dimensional, exhaustive, mutually exclusive, and independent (i.e., an entry in one category does not affect an entry in another category). The LIM-category list, that was partly empirical based – i.e. coders identified categories on the basis of the material to be analyzed (Smith, 2000) – was constructed in the following way. First, all information concerning a specific event - a peak or dip on the life-line - was put together. In this way different units of text were created in chronological order; each unit included the age at which the event happened or was expected to happen, a short description of the event and an explanation of the event. To each identified unit a catchword was connected which describes in one or a few words, preferably in words used by the respondent, the most important theme in the unit. In a pilot study two independent coders identified these catchwords and solved disagreements by discussion. Next, the collection of catchwords was classified into categories by two coders. Groups of catchwords which had about the same meaning were combined into a category and received a covering name. In this way, nine categories were generated (Relations, School, Work, Health, Growth, Home, Birth, Death, Other) which – with the exception of the Other category – represent the most important life-themes and which are also in line with the work of Birren and Deutschman (1991), Sugarman (1986), deVries and Watt (1996), and Zautra, Affleck and Tennen (1994). Within each category, subcategories were developed on the basis of a combination of frequency by which
an event was reported and a systematic structure by which the category list was constructed. For instance, in some categories there is a Beginning (Begin Relations), a Course (Commitment), Problems (Problems Relations) and an End (End Relations). The subcategory ‘Others’ (Relations Others) was added to most categories, while a ‘Rest’ subcategory (Relations Rest) was added standard to all categories. In the final analysis, the coding list contains 40 subcategories divided over 9 categories. An advantage of this comprehensive category list is that (sub)categories can be taken together, for instance, in order to make comparisons with results of other studies more meaningful. Table 1.1 contains a list of the (sub)categories with some typical examples (Schroots & Birren, 2002; Schroots & Assink, 2005).

1.4 Method

Design
To study the dynamics of autobiographical memory across the life course a longitudinal research design was employed. The study started in 1995. About two years later the LIM was administered a second time and five years after the first wave a third time. Longitudinal as well as cross-sectional studies provide information about changes over the lifespan and both have their pros and contras. One of the major problems when interpreting results of cross-sectional and longitudinal studies is the Age-Period-Cohort (APC) effect. Each measurement taken on a subject at a particular time-point is influenced by three factors: (a) Age: time from date of birth to date of measurement, (b) Period: time or moment at which the measurement is taken (Twisk, 2003), and (c) Cohort: group of individuals that share similar environmental circumstances at equivalent temporal points in their life course (Schaie & Hofer, 2001). In both cross-sectional and longitudinal research designs only one variable can be controlled which means that the other two are inevitably confounded. The time parameters Age and Cohort are confounded in a design with cross-sectional data meaning that differences between age groups can be attributed to age as well as to cohort. The parameters Age and Period are confounded in a design with longitudinal data meaning that changes within age groups can be attributed to age as well as to time of measurement (Schaie & Hofer, 2001; Schroots & Birren, 1988; Twisk, 2003). Different designs were proposed to correct for these confounding effects (Baltes, 1968; Schaie, 1965; Schaie & Baltes, 1975). In actual
### Table 1.1 Coding list of (sub)categories with typical examples of LIM life events.

<table>
<thead>
<tr>
<th>(Sub)Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relations</strong></td>
<td>meeting partner, in love</td>
</tr>
<tr>
<td>Begin</td>
<td>marriage, family life</td>
</tr>
<tr>
<td>Commitment</td>
<td>divorce</td>
</tr>
<tr>
<td>End</td>
<td>relational problems</td>
</tr>
<tr>
<td>Problems</td>
<td>marriage problems children</td>
</tr>
<tr>
<td>Others</td>
<td>close friendship</td>
</tr>
<tr>
<td>Rest</td>
<td>student life, boarding school</td>
</tr>
<tr>
<td>School</td>
<td>school, college</td>
</tr>
<tr>
<td>Starting</td>
<td>graduating, diploma</td>
</tr>
<tr>
<td>Finishing</td>
<td>flunking, program problems</td>
</tr>
<tr>
<td>Problems</td>
<td>graduation (grand)child, partner</td>
</tr>
<tr>
<td>Others</td>
<td>student life, boarding school</td>
</tr>
<tr>
<td>Work</td>
<td>first job</td>
</tr>
<tr>
<td>Beginning</td>
<td>other job, promotion</td>
</tr>
<tr>
<td>Changing</td>
<td>retirement, family care</td>
</tr>
<tr>
<td>Stopping</td>
<td>layoff, bankruptcy</td>
</tr>
<tr>
<td>Problems</td>
<td>disability partner</td>
</tr>
<tr>
<td>Others</td>
<td>unemployment, job hopping</td>
</tr>
<tr>
<td>Health</td>
<td>illness, disease, surgery</td>
</tr>
<tr>
<td>Physical</td>
<td>depression, nervous breakdown</td>
</tr>
<tr>
<td>Mental</td>
<td>illness partner</td>
</tr>
<tr>
<td>Others</td>
<td>menopause, pregnancy</td>
</tr>
<tr>
<td>Rest</td>
<td>self-development, self-management</td>
</tr>
<tr>
<td>Growth</td>
<td>identity problems, midlife crisis</td>
</tr>
<tr>
<td>Individual</td>
<td>growth (problems) others</td>
</tr>
<tr>
<td>Problems</td>
<td>happy childhood</td>
</tr>
<tr>
<td>Others</td>
<td>self-development, self-management</td>
</tr>
<tr>
<td>Home</td>
<td>relocation</td>
</tr>
<tr>
<td>Moving</td>
<td>(go and) live on one’s own</td>
</tr>
<tr>
<td>Leaving</td>
<td>leaving home others</td>
</tr>
<tr>
<td>Others</td>
<td>second home</td>
</tr>
<tr>
<td>Birth</td>
<td>child(ren)</td>
</tr>
<tr>
<td>Child</td>
<td>grandchild(ren)</td>
</tr>
<tr>
<td>Grandchild</td>
<td>brother/sister</td>
</tr>
<tr>
<td>Family</td>
<td>birth others</td>
</tr>
<tr>
<td>Rest</td>
<td>father, mother</td>
</tr>
<tr>
<td>Death</td>
<td>partner, spouse</td>
</tr>
<tr>
<td>Parents</td>
<td>brother/sister, child, grandparents</td>
</tr>
<tr>
<td>Partner</td>
<td>death others</td>
</tr>
<tr>
<td>Family</td>
<td>war, liberation</td>
</tr>
<tr>
<td>Other</td>
<td>travel, trip, journey</td>
</tr>
<tr>
<td>Travel</td>
<td>finances, leisure</td>
</tr>
</tbody>
</table>
| Rest | }
practice these designs are difficult to realize because they are expensive, time consuming and many respondents and different samples are needed over a long period. For this reason and also because over a period of five years no significant effect of Period is expected no specific design was used in this LIM-study to control for confounding effects of Age and Period.

Analysis of data of respondents who took part at all three waves allows assessment of intra-individual or within-person dynamics and inter-individual or between-person variability in intra-individual dynamics, i.e., the effect of age and gender on stability and change. Besides, each separate wave can be considered as a cross-sectional study. Comparison of results of these three cross-sectionals allows the measurement of change for a group of people at the aggregate level, but does not allow measurement of change at the level of the research subject (Baltes, Reese & Nesselroade, 1988; Ferraro & Kelley-Moore, 2003; Schaie & Hofer, 2001).

Respondents

The first wave of the study (W1) started with 98 men and women drawn from three age-categories: young, middle and older adulthood. At baseline, the mean ages and the age ranges for the three groups were 23.5 (18-30), 43.3 (31-55), and 67.4 (56-84) years, respectively. The youngest group included 18 men and 16 women, the middle group 17 men and 18 women and the eldest group 12 men and 17 women. The participants were Caucasians of primarily middle to higher socioeconomic status, recruited initially from educational and health organizations in two Dutch metropolitan areas and then sampled by means of the snowball method, i.e., a method whereby participants are asked to nominate other possible participants who meet the selection criteria (Sugarman, 2001).

At the second wave (W2), two years later, 83 subjects participated (drop-out 15%). Attrition was due to illness (n = 2), refusal (n = 8) and not being traceable (n = 5).

At the third wave (W3), five years after the first wave, 77 subjects participated (total drop-out 21%). Attrition was due to death (n = 4), refusal (n = 13) and not being traceable (n = 4). The four participants who had died all belonged to the older age group. Two-way contingency analyses were conducted to evaluate whether there was an effect of age or gender on attrition over the three waves. There was no effect of age ($\chi^2 = 1.261$, df = 4, $p = 0.87$) or gender ($\chi^2 = 0.900$, df = 2, $p = 0.96$) on attrition over three waves. Table 1.2 shows the number of respondents (men and women) per age group per wave and mean age with standard deviation per subgroup. The difference in average age between the different waves is not exactly two and five years as it was not possible to interview each respondent after exactly two and five
years, respectively. Due to attrition of the oldest participants in the older age group, the difference in mean age between the waves is lower than two and five years in this age group.

Table 1.2 W1 | W2 | W3*: Number and mean age with standard deviation (SD) of men and women per age group per wave.

<table>
<thead>
<tr>
<th></th>
<th>Young</th>
<th></th>
<th>Middle</th>
<th></th>
<th>Older</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Total</td>
<td>Men</td>
<td>Women</td>
<td>Total</td>
</tr>
<tr>
<td>W1 (N = 98)</td>
<td>18</td>
<td>16</td>
<td>34</td>
<td>17</td>
<td>18</td>
<td>35</td>
</tr>
<tr>
<td>Mean age</td>
<td>23.3</td>
<td>23.6</td>
<td>23.5</td>
<td>41.7</td>
<td>44.9</td>
<td>43.3</td>
</tr>
<tr>
<td>SD</td>
<td>3.8</td>
<td>3.5</td>
<td>3.6</td>
<td>6.8</td>
<td>6.3</td>
<td>6.6</td>
</tr>
<tr>
<td>W2 (N = 83)</td>
<td>14</td>
<td>13</td>
<td>27+</td>
<td>17</td>
<td>17</td>
<td>34</td>
</tr>
<tr>
<td>Mean age</td>
<td>24.9</td>
<td>24.6</td>
<td>24.7</td>
<td>43.6</td>
<td>47.2</td>
<td>45.4</td>
</tr>
<tr>
<td>SD</td>
<td>3.6</td>
<td>3.0</td>
<td>3.3</td>
<td>6.8</td>
<td>6.2</td>
<td>6.7</td>
</tr>
<tr>
<td>W3 (N = 77)</td>
<td>15</td>
<td>14</td>
<td>29+</td>
<td>15</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Mean age</td>
<td>28.0</td>
<td>28.2</td>
<td>28.1</td>
<td>47.3</td>
<td>49.8</td>
<td>48.5</td>
</tr>
<tr>
<td>SD</td>
<td>3.9</td>
<td>3.4</td>
<td>3.6</td>
<td>6.7</td>
<td>6.4</td>
<td>6.5</td>
</tr>
</tbody>
</table>

*W1 | W2 | W3 = full data of Wave 1 (W1), Wave 2 (W2) and Wave 3 (W3) analyzed independent from each other.

+At the second wave fewer respondents of the young age group participated than at the third wave due to illness and not responding

A total of 74 subjects participated in all three waves. Table 1.3 shows the number and mean age with standard deviation of these participants per age group per wave.

Table 1.3 W1→W2→W3*: Number and mean age with standard deviation (SD) of men and women - who participated in all three waves – per age group per wave.

<table>
<thead>
<tr>
<th></th>
<th>Young</th>
<th></th>
<th>Middle</th>
<th></th>
<th>Older</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Total</td>
<td>Men</td>
<td>Women</td>
<td>Total</td>
</tr>
<tr>
<td>W1 (N = 74)</td>
<td>13</td>
<td>13</td>
<td>26</td>
<td>15</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Mean age</td>
<td>22.8</td>
<td>22.6</td>
<td>22.7</td>
<td>42.3</td>
<td>44.7</td>
<td>43.5</td>
</tr>
<tr>
<td>SD</td>
<td>3.9</td>
<td>3.0</td>
<td>3.4</td>
<td>6.7</td>
<td>6.4</td>
<td>6.6</td>
</tr>
<tr>
<td>W2 (N = 74)</td>
<td>13</td>
<td>13</td>
<td>26</td>
<td>15</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Mean age</td>
<td>24.9</td>
<td>24.6</td>
<td>24.7</td>
<td>44.2</td>
<td>46.7</td>
<td>45.4</td>
</tr>
<tr>
<td>SD</td>
<td>3.8</td>
<td>3.0</td>
<td>3.4</td>
<td>6.7</td>
<td>6.4</td>
<td>6.5</td>
</tr>
<tr>
<td>W3 (N = 74)</td>
<td>13</td>
<td>13</td>
<td>26</td>
<td>15</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Mean age</td>
<td>27.9</td>
<td>27.7</td>
<td>27.8</td>
<td>47.3</td>
<td>49.8</td>
<td>48.5</td>
</tr>
<tr>
<td>SD</td>
<td>3.8</td>
<td>3.0</td>
<td>3.4</td>
<td>6.7</td>
<td>6.4</td>
<td>6.5</td>
</tr>
</tbody>
</table>

*W1→W2→W3 = analysis of longitudinal data of 74 respondents who took part in Wave 1 (W1), Wave 2 (W2) and Wave 3 (W3).
Henceforth, the heading ‘W1 | W2 | W3’ refers to a presentation of the full data of Wave 1 (W1), Wave 2 (W2) and Wave 3 (W3) which are analyzed separately and independently from each other, while the heading ‘W1→W2→W3’ refers to the analysis of longitudinal data of 74 respondents who participated in all three waves.

**Life-line Interview Method**

*Administration*

To elicit autobiographical information the Life-line Interview Method (LIM) was used. As the LIM was discussed in the previous paragraphs, the description in this chapter will be limited to the practical application of the instrument.

In Figure 1.1 an example of a LIM|Life-line is presented for a 43-year old man with a description of the life events this man mentioned on his life-line including the ages at which the events took place and the affective value of the events. This example is based on various life-lines and life stories of men of the middle age group. The affect of the life events was first rated on a 5-point scale and was than rescaled on a two-point scale (positive and negative). The procedure for the rating of affect is described in Chapter 3.

A typical LIM-session, then, starts with a short introduction after which the respondent is shown a board with LIM-paper, i.e., a blank piece of paper (A4 landscape format) on which a grid is printed. The grid consists of a bottom and top line (296 mm), connected by two solid and one dotted vertical line of equal length (180 mm) at 0 mm, 180 mm and 296 mm from the origin, respectively. The horizontal axis on this paper symbolizes the time-dimension, the vertical axis the affect-dimension.

The interviewer introduces the general plan of the session by saying that he is interested in the human life course with its ups and downs, rises and declines etc., which are all completely different from one person to another. The interviewer, then, explains that he would like to hear the life story of the respondent in a special way. After giving three examples of life-lines, from simple to complex, the respondent is asked to draw his life-line in the blank LIM grid from birth dot (middle of solid line, 0 mm) to his calendar age (solid line, 180 mm) without much thought. Next, the respondent is asked to label each peak and each dip by chronological age and to tell what happened at a certain moment or during an indicated period. When all peaks and dips are labeled, the respondent is asked to tell something more about each event and in this way the life story is obtained. After the past life-line has been labeled and described in detail, the future is explored in the same manner. The respondent is asked at what age he expects to die. Then, starting from the age point where the past life-line has stopped,
Figure 1.1. Top: LIM\textit{Life-line} of a 43-years old man with age (in years) on the horizontal axis and affect on the vertical axis. Below: overview of the series of life events with age and affect (+ = positive, - = negative) for past and future.
the respondent is asked to continue the line until the dotted age-line (296 mm) of expected death is reached and the whole procedure of labeling the peaks and dips of the future life-line, and giving an explanation of the events is repeated. The final result of a LIM-interview is a life-line and a life story based on important life events, labeled by chronological age, for both past and future of the individual.

Procedure
The interviews took place at the university or at the respondents’ home. After a short introduction, the LIM was administered. The interview was tape-recorded and a verbatim report of the interview was made. At the end of the interview the personal particulars of the respondents were noted and the respondent was given the opportunity to express his feelings about telling his life story. Finally, the respondent got a small reward for his participation. A LIM-interview lasted on average about 40 minutes; the drawing of past and future life-line, however, didn’t take more than a few minutes. The older respondents were, the more time they needed to tell their life story. As far as possible, respondents were interviewed each wave by a different interviewer in order to reduce interviewer bias (Hoyle, Harris & Judd, 2002). Between the first and second wave, and between the second and third wave, the respondents were contacted once; they got some general information about the study and were thanked again for their participation.

Analysis
Unit of analysis
When analyzing autobiographical texts, the first and most fundamental step should be the identification of the unit of analysis (Kovach, 1995) also named ‘coding unit’ or ‘recording unit’ (Smith, 2000). In case of the LIM|Life story the life event is the basic unit of analysis. The life stories were typed out verbatim resulting in the so called ‘raw’ life story. In order to reverse the ‘raw’ life story into chronologically ordered units, a type-instruction was developed containing specific instructions for creating the so called ‘integrated’ life story. All information concerning a specific event - a peak or dip on the life-line - was put together. In this way different units of text were created in chronological order; each unit included the age at which the event happened or was expected to happen, a short description of the event and an explanation of the event. All irrelevant text such as remarks of the interviewer and standard sentences the interviewer used was left out in this final version of the life story resulting in a chronological readable story. This integrated story is the basis for all analyses. In this thesis
analysis will be restricted to different aspects (number, affect and content) of the basic elements of the life story, the life events.

Statistics
Simple descriptive statistics will be used to describe qualitative and quantitative variables, for instance, the percentage of events per category. When determining the distribution of (positive and negative) events over the lifespan the number of events reported in a certain period will be determined according to reported age at the time of event, and, subsequently, the number of events will be translated into percentage of events per period. Results will be presented in figures and the patterns will be inspected visually.

Univariate and multivariate analyses-of-variance will be carried out to determine the effect of age and gender on the variable(s) of interest. Multivariate analyses-of-variance for repeated measures will be conducted in order to determine the effect of time (past/future) or wave (three waves) on the variable(s) of interest.

When it is not possible to conduct statistical analyses because of small numbers or in case of categorical variables rules will be generated in order to determine whether a result will be considered noticeable.

Organization of results
In the Results section of the following chapters, first of all, full data of each wave will be analyzed separately and independently from each other. To this type of analysis will be referred to by the heading ‘W1 | W2 | W3’. Analysis of the three waves will result in a description of inter-individual differences at each wave but also in the description of different patterns. Results of the three waves will be compared to each other with respect to patterns found at each wave and it will be determined whether patterns which are found at the first wave are also found at the second and third wave and can be considered as stable patterns. When there is a systematic, orderly change in patterns over time, the change can probably be attributed to age changes. When changes in patterns seem to be arbitrary, they are probably due to error, effect of testing, or attrition (Drenth & Sijtsma, 2006).

Second, longitudinal data of 74 respondents who took part at all three waves will be analyzed in order to study the individual stability and change of certain aspects of autobiographical memory over time and the effect of age and gender on stability and change of these aspects. This type of analysis will be referred to by the heading ‘W1→W2→W3’.

For clarity reasons and because of the enormous amount of data full results will not always
be presented in the Results section but they can be found in the Appendix on the cd-rom in the back of this book. To results which can be found in the Appendix will be referred by an ‘A’ before the number of the table or figure.