

Anecdotally, elderly relatives may seem rather forgetful about recent events (such as what they watched on television the night before), but love recounting stories from their youth (e.g. the Queen's coronation). How well have theories of memory accounted for this phenomenon?

by Patricia Karsten

Elderly person's apparent forgetfulness with respect to recent events, where at the same time they retain and recount many memories dating from long time ago, has been referred to as Ribot's law of Regression (Ribot 1882; as cited in Holland and Rabbitt, 1991). The phenomenon will be discussed in the context of psychological research in autobiographical memory. It seems to partially contradict the well-established notion of a lifespan retrieval curve, an observation describing the facilitated access of elderly people to personal memories dating back to early adulthood, but also for recent events, compared to less easy access to memories from middle adulthood. The notion of a goal-oriented self-memory system (Conway and Holmes 2005; Conway and Pleydell-Pearce 2000) provides a useful reference frame for understanding the lifespan retrieval curve and apparent contradictions to the typically observed pattern. Further insights are gained by taking into account life circumstances and using a functional approach, as well as considering the findings of the cognitive perspective on age-related changes in memory performance.

The lifespan retrieval curve depicts how many memories from different encoding ages older adults (from about 35 years of age onwards) can memorize in free recall (Conway and Holmes, 2005). The curve begins with a 'childhood amnesia' period, from which practically no autobiographical memories are accessible to an adult. First memories become available for an age at encoding of around 2 years, but not earlier. The curve then shows the 'reminiscence bump' with an increased availability of memories dating back to ages 10 to 30, and especially many for the narrower period from 15 to 25 years of age at encoding. The last third of the curve is characterized by relatively fewer memories for the period of middle adulthood, followed by a steady increase in memories as the recent past is approached.

The notion of a goal-oriented self-memory system may provide a basis for understanding the structure and development of autobiographical memory (Conway and Pleydell-Pearce, 2000). Conway et al. posit the 'working self' as a control process organizing both encoding and retrieval of self-related memories, explicitly drawing the parallel to Baddeley's notion of 'working memory' (Baddeley 1986; as cited in Conway and Pleydell-Pearce, 2000) and its function for memory in general. The working self operates upon the 'autobiographical knowledge base', where all memories at different levels of specificity are stored, structured in 'lifetime periods', 'general events', and 'event-specific knowledge (ESK)'. According to Conway and Pleydell-Pearce (2000), the working self incorporates the currently active hierarchy of goals or motivations of the individual, which provide the interpretative framework that seems to actively shape the construction of autobiographical memories.

In this light, the period of childhood amnesia is explained as reflecting the profound change in goals between an infant (up to the age of about 2 years) and the older child, which begins to develop language, and associated with this, a different set of goals (Conway and Holmes 2005), maybe less centred on immediate physical and emotional needs. With reference to Erikson's stages of identity development (Erikson 1950; as cited in Conway and Pleydell-Pearce, 2000), the reminiscence bump is seen as comprising the period of identity formation and the

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establishment of a rather stable adult goal system. Conway and Holmes (1999) found that the first part of this phase, ages 10 to 20, seems to be characterized by many memories about social events, suggesting an increasing need for positioning the self in social relations and society. The second part of the reminiscence bump at ages 20 to 30 is marked by memories about intimacy events, which may be related to a further development of individual goal structures that orient the self towards bonding with a lifetime partner and founding a family.

The self-memory system account predicts that episodes which are important to the goal structure of the individual will be retained in memory through a process of linking and integrating it with existing autobiographical memory structures, while episodes that are not goal-relevant will soon be forgotten because they lack access cues which ground them in the working self's goal structure (Conway and Pleydell-Pearce, 2000). This may explain the typical rise in available autobiographical memories in the third section of the lifespan retrieval curve in elderly people – recent events may be better recalled than events from middle adulthood because of their stronger relation to the currently active goal system of the individual.

At the same time, the self-memory system account is able to explain the above cited anecdotal evidence of elderly people forgetting recent events while retaining vivid memories from earlier periods of their lives, by making reference to the goal-structure of the working self. In so far as the well-memorized earlier events date back to a period of identity formation, they may have been intensely related to the stabilizing adult goal system, and remain easily accessible throughout the whole life. Contrasting to this, everyday events that bear no specific importance to the individual, as the mentioned TV program, will rapidly be forgotten, even if they are very recent. The self-memory system perspective thus provides an explanation why certain episodic memories are retained even over very long periods, while others are not.

But when studying memory, it is also important to take into account the life circumstances of research participants, as Holland and Rabbit (1991) have shown. They compared free-recall autobiographical memory performance of healthy elderly persons in different life circumstances, and found significantly less memories for recent events in elderly persons living in residential care, compared to those living autonomously in the community. To explain their findings, Holland and Rabbit pointed to differences in rehearsal that seemed to be related to the current life situation: Persons in residential care reported elevated rehearsal of early memories, while persons living autonomously did not report this rehearsal. The effect of this rehearsal pattern may be to facilitate access to early versus recent memory in elderly persons living in residential care.

Holland and Rabbit's results support their suggestion that memory performance is influenced by the use an individual makes of it. Older people living independently use their memory of recent events in much the same way as younger adults to cope with everyday life requirements, and so largely retain the ability to form new memories. Contrasting to this, older persons in residential care rely on others to organize their everyday life, so they have less need to memorize recent events. In order to maintain a sense of personal identity while leading a rather uneventful life, they prefer to rehearse earlier events and share these with others.

This view is in line with functionalist approaches, which typically distinguish three basic functions of autobiographical memories: They are used to develop and maintain a sense of self and identity (self function), they serve in communication to strengthen social bonds with others (social function), and they provide the experiential basis which helps to better understand the present, predict the future and thus guide behaviour (directive function). It is conceivable that living in residential care diminishes elderly persons' reliance on the directive memory function

and at the same time increases the importance of the self and social functions of memory, leading to preferential sharing of earlier, identity-relevant memories in social relations.

A further aspect which needs consideration is the question in how far aging-related, physiological changes influence elderly persons' memory performance. In this context, the distinction between episodic and semantic memories is helpful. Episodic memories are highly specific and vivid memories about specific events, typically accompanied by mental imagery and a sense of self in the past, also termed 'autonoetic consciousness'. Contrasting to this, semantic memories comprise general knowledge about the self and real-world concepts, without reference to specific episodes in the past (Rybash and Monaghan 1999). Relating these concepts to autobiographical memory, Levine, Svoboda, Hay, Winocur, and Moscovitch (2002) suggest that normal aging seems to go along with losses in the quality and richness of episodic memory details, which is compensated for by relative advantages in semantic knowledge, for example better ability to extract essence and meaning of events. Using an Autobiographical Interview method, they found a preference in older adults towards semantic autobiographical memory components, which they explained with psychological changes related to personal growth and wisdom, but also with changes in efficiency of retrieval processes, which render access to episodic details more difficult for older than for younger adults. Consequently, apparent forgetfulness for recent episodes in healthy elderly persons, as postulated by Ribot's law, may also be related to typical aging-related cognitive changes.

But there is evidence from analysis of episodic and semantic components of autobiographic memory over the lifespan which is at odds with this suggestion. In a study based on the remember-know paradigm, Rybash and Monaghan (1999) assessed autobiographical memory in healthy elderly men. Research participants' memories were elicited as associative responses to cue words, then dated and categorized by research participants themselves according to whether they contained objective knowledge about the personal past (semantic memory) or were recollectively remembered with a feeling of re-experiencing the past (episodic memory). Rybash and Monaghan found that both episodic and semantic memories showed the typical shape of the lifespan retrieval curve, with childhood amnesia, reminiscence bump and increasing number memories for late adulthood when approaching the recent past. If there had been preferential reliance on semantic memory for the recent past, the lifespan retrieval curve should not have shown the same recency effect for episodic autobiographical memories. These findings contradict the idea that elderly adults generally have less access to episodic memories from their recent past as a normal consequence of aging.

On the other hand, laboratory findings strongly support the notion of age-related changes in memory functioning. Based on a cognitive approach, Craik and Luo (2008) describe these changes with reference to the systems view of memory, which distinguishes 5 separate memory systems (Tulving et al. 2000; as cited in Craik and Luo 2008). Besides episodic and semantic memory, these are procedural memory for cognitive and motor skills, the perceptual representational systems for encoding and retaining of incoming sensory information, and finally working memory, as comprised of a short-term store and control processes to manipulate information in the store. According to Craik and Luo, the largest performance differences between younger and older adults appear in episodic memory, while other memory subsystems are less affected. Episodic memory performance seems to be specifically impaired in free recall tasks, in tasks that require participants to form associations between unrelated items, in tasks assessing memory for the source of information, and prospective memory tasks which require remembering the intention to do something, for example keeping an appointment.

But these laboratory findings do not necessarily imply less efficient memory of healthy older adults in real-life situations. For example, despite weaker laboratory performance in prospective

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memory tasks, older adults seem to outperform younger adults in real-life situations, where they are typically more reliable than younger adults in keeping appointments (Craik and Luo 2008). Similarly, the ecological validity of tasks assessing free recall performance or the ability to memorize unrelated information can be questioned, because in real-life, information typically is related and real-life situations typically provide many cues that help with encoding and retrieval of information. The laboratory comparison of memory performance may thus support a view of impaired memory performance in the elderly based on young adults' performance as a benchmark, while having difficulties taking into account in how far apparent "impairments" are in a way efficient adaptations to the requirements of real life.

To conclude, by making reference to the relative importance of memories for the goal-system of the individual, the self-memory system perspective provides a plausible explanation as to why elderly people retain certain episodic memories from their youth over long periods, while recent episodes are often quickly forgotten. But functionalist approaches have shown that anecdotal evidence supporting Ribot's law should not be over generalized, because life circumstances influence the use an individual makes of his memory. Observed patterns of memory performance may to a certain extent be the consequence of individual adaptation to personal life circumstances, rather than evidence for inevitable consequences of aging.

The cognitive perspective points to age-related cognitive changes that alter memory performance, but it cannot generally be said that these lead to less efficient real-life memory performance in healthy elderly persons, as compensatory strategies are applied and psychological growth helps to function effectively in the community. Overall, the presented theories of memory provide good insights into the characteristics of memory in older age, although the exact interplay of the multitude of internal and environmental factors that may influence memory performance remains difficult to fully explain.

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