Autobiographical Memory: How Your Past Shapes Your Identity

Authored by

mohammad looti

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Autobiographical memory is a memory system consisting of episodes recollected from an individual's life, based on a combination of episodic (personal experiences and specific objects, people and events experienced at particular time and place) and semantic (general knowledge and facts about the world) memory.

Theories

Formation

Conway and Pleydell-Pearce (2000) proposed that autobiographical memory is constructed within a self-memory system (SMS), a conceptual model composed of an autobiographical knowledge base and the working self.

Autobiographical knowledge base

The autobiographical knowledge base contains knowledge of the self, used to provide information on what the self is, what the self was, and what the self can be. This information is categorized into three broad areas: lifetime periods, general events, and event-specific knowledge.

Lifetime periods are composed of general knowledge about a distinguishable and themed time in an individual's life, such as the period you spend at university (university theme), or when you entered the workforce (work theme). Lifetime periods have a distinctive beginning and ending, but they are often fuzzy and overlap. Lifetime periods contain thematic knowledge about the features of that period, such as the activities, relationships, and locations involved, as well as temporal knowledge about the duration of the period. The thematic information in these periods can be used to group them together under broader themes, which can reflect personal attitudes or goals. As an example, a lifetime period with the theme of "when I lost my job" could fall under the broader category of either "when everything went downhill for me" or "minor setbacks in my life."

General events are more specific than lifetime periods and encompass single representations of repeated events or a sequence of related events. General events group into clusters based on a common theme, to the effect that when one memory of a general event is recalled, it cues the recall of other related events in memory. These clusters of memories often form around the theme of either achieving or failing to achieve personal goals. Clusters of general events that fall under the category of "first-time" achievements or occasions seem to have a particular vividness, such as the first time kissing a romantic partner, or the first time going to a ball game. These memories of goal-attainment pass on important information about the self, such as how easily a skill can be acquired, or an individual's success and failure rates for certain tasks.

Event-specific knowledge (ESK) consists of vividly detailed information about individual events,

often in the form of visual images and sensory-perceptual features. The high levels of detail in ESK fade very quickly, though certain memories for specific events tend to endure longer. Originating events (events that mark the beginning of a path towards long-term goals), turning points (events that re-direct plans from original goals), anchoring events (events that affirm an individuals beliefs and goals) and analogous events (past events that direct behaviour in the present) are all event specific memories that will resist memory decay.

The sensory-perceptual details held in ESK, though short-lived, are a key component in distinguishing memory for experienced events from imagined events. In the majority of cases, it is found that the more ESK a memory contains, the more likely the recalled event has actually been experienced. Unlike lifetime periods and general events, ESK are not organized in their grouping or recall. Instead, they tend to simply 'pop' into the mind. ESK is also thought to be a summary of the content of episodic memories, which are contained in a separate memory system from the autobiographical knowledge base. This way of thinking could explain the rapid loss of event-specific detail, as the links between episodic memory and the autobiographical knowledge base are likewise quickly lost.

Hierarchical structure of the autobiographical knowledge base

These three areas are organised in a hierarchy within the autobiographical knowledge base and together make up the overall life story of an individual. Knowledge stored in lifetime periods contain cues for general events, and knowledge at the level of general events calls upon event-specific knowledge. When a cue evenly activates the autobiographical knowledge base hierarchy, all levels of knowledge become available and an autobiographical memory is formed.

When the pattern of activation encompasses episodic memory, then autonoetic consciousness may result. Autonoetic consciousness or recollective experience is the sense of "mental time travel" that is experienced when recalling autobiographical memories. These recollections consist of a sense of self in the past and some imagery and sensory-perceptual details. Autonoetic consciousness reflects the integration of parts of the autobiographical knowledge base and the working self.

Working self

The working self, often referred to as just the 'self', is a set of active personal goals or self-images organized into goal hierarchies. These personal goals and self-images work together to modify cognition and the resulting behaviour so an individual can operate effectively in the world.

The working self is similar to working memory in that it acts as a central control process, controlling access to the autobiographical knowledge base. The working self manipulates the cues used to

activate the knowledge structure of the autobiographical knowledge base and in this way can control both the encoding and recalling of specific autobiographical memories.

However, the relationship between the working self and the autobiographical knowledge base is reciprocal. While the working self can control the accessibility of autobiographical knowledge, the autobiographical knowledge base constrains the goals and self-images of the working self within who the individual actually is and what they can do.

Types

There are four main categories used to classify the types of autobiographical memories. These are:

Biographical or Personal: These autobiographical memories often contain biographical information pertaining to who you are, such as where you were born or the names of your parents.
Copies vs. Reconstructions: Autobiographical memories have different levels of authenticity. Copies are vivid autobiographical memories of an experience that contain a considerable amount of visual and sensory-perceptual detail. Reconstructions are autobiographical memories that are not reflections of raw experiences but are rebuilt to incorporate any new information or interpretations made in hind-sight.
Specific vs. Generic: Autobiographical memories also vary as to the level of detail. Specific autobiographical memories contain a detailed memory of a certain event (event-specific knowledge), while generic autobiographical memories are vague and hold little detail other than the type of event that occurred. Repisodic autobiographical memories can also be categorized into generic memories, where one memory of an event is representative of a series of similar events.
Field vs. Observer: Autobiographical memories can be experienced from different perspectives. Field memories are memories recollected in the original perspective, from a first-person point of view. Observer memories are memories recollected from a perspective outside ourselves, a third-person point of view. Typically, older memories are recollected through an observer perspective, and observer memories are more often reconstructions while field memories are more vivid like copies.
Autobiographical memories can also be differentiated into Remember vs. Know categories. The source of a remembered memory is attributed to personal experience. The source of a known memory is attributed to an external source, not personal memory. This can often lead to source-monitoring error, wherein a person may believe that a memory is theirs when the information actually came from an external source.

Functions

Autobiographical memory has been theorized to serve three broad functions: directive, social, and

self-representative. A fourth function, adaptive, was proposed by Williams, Conway and Cohen (2008).

The directive function of autobiographical memory is to use past experiences as a reference for solving current problems and a guide for our actions in the present and the future. Memories of personal experiences and the rewards and losses associated with them can be used to create successful models, or schemas, of behaviour. which can be applied over many scenarios. In instances where a problem cannot be solved by a generic schema, a more specific memory of an event can be accessed in autobiographical memory to give some idea of how to confront the new challenge.

The social function of autobiographical memory works to develop, maintain, and nurture social bonds by providing material for people to converse about. Seen as one of the most fundamental functions of autobiographical memory, sharing personal memories with others is a way to facilitate social interaction. Disclosing personal experiences can increase the intimacy level between people and reminiscing of shared past events strengthens pre-existing bonds. The importance of this function can easily be seen in individuals with impaired episodic or autobiographical memory, where their social relationships suffer greatly as a result.

Autobiographical memory performs a self-representative function by using personal memories to create and maintain a coherent self-identity over time. This self-continuity is the most commonly referred to self-representative function of autobiographical memory. A stable self-identity allows for evaluation of past experiences, known as life reflection, which leads to self-insight and often self-growth.

Finally autobiographical memory serves an adaptive function. Recalling positive personal experiences can be used to maintain desirable moods or alter undesirable moods. This internal regulation of mood through autobiographical memory recall can be used to cope with negative situation and impart an emotional resilience. The effects of mood on memory are explained in better detail under the Emotion section.

Methods of study

Diaries

Memory can be inaccurate and critical details of a raw experience can be forgotten or re-imagined. The diary method of study circumvents these issues by having groups of participants keep a diary over a period of weeks or months, during which they record the details of everyday events that they judge to be memorable. In this way a record of true autobiographical memories can be collected.

These true autobiographical memories can then be presented to the participants at a later date in a recognition test, often in comparison to falsified diary entries or 'foils'. The results from these studies can give us information about the level of detail retained in autobiographical memory over time, and if certain features of an event are more salient and memorable in autobiographical memory.

One such study performed by Barclay and Wellman (1986) included two types of foils in their recognition task: ones that were entirely false and ones that were the original diary entry with a few details altered. Against the false foils, participants were found to be highly accurate at recognizing their true entries (at an average rate of 95%) and false foils were only judged as true 25% of the time. However, when judging between true diary entries and the altered foils, the altered foils were incorrectly judged as true 50% of the time. Barclay and Wellman theorized this was due to the tendency to group similar or repeated autobiographical memories into generic memories or schemas, and thus diary entries that seemed familiar enough to fit into these schemas would be judged as true.

Memory probe

Originally devised by Galton (1879), the memory probe method uses a list of words as cues to bring to mind autobiographical memories, which the participant then tries to describe in as much detail as possible. The answers can then be analyzed in order to gain a better understanding as to how recall of autobiographical memory works, especially in cases dealing with brain damage or amnesia.

Recent studies have altered the memory probe method to use non-verbal cues for memory, such as visual images or odours. Chu and Downes (2002) found ample evidence that odour cues are particularly good at cueing autobiographical memories. Odour-cued memories for specific events were more detailed and more emotionally loaded than those for verbal, visual, or non-related odour cues.

Emotion

Emotion greatly affects the way autobiographical memories are encoded and how people retrieve those memories. Emotional memories in general are reactivated more, they are remembered better and have more attention devoted to them. Through remembering our past achievements and failures, autobiographical memories directly affect how we perceive and feel about ourselves.

Positive

Positive autobiographical memories tend to contain more sensory and contextual details than

negative and neutral memories. People high in self-esteem were found to recall more details for memories where the individual displayed positive personality traits compared to memories dealing with negative personality traits. People with high self-esteem also devoted more resources to encoding these positive memories over negative memories. In addition, it was found that people high in self-esteem reactivate positive memories more often than people with low self-esteem, and reactivate memories about other people's negative personality traits more often to maintain their positive self-image.

Positive memories also appear to be more resistant to forgetting. All memories fade, and the emotions linked with them become less intense over time. However, this fading effect is seen less with positive memories than with negative memories, leading to a better remembrance of positive memories.

As well, recall of autobiographical memories that are important in defining ourselves will differ depending on the associated emotion. Past failures seem farther away than past achievements, regardless if the actual length of time is the same.

Negative

Negative memories generally fade faster than positive memories of similar emotional importance and encoding period. This difference in retention period and vividness for positive memories is known as the fading affect bias. In addition, coping mechanisms in the mind are activated in response to a negative event, which minimizes the stress and negative events experienced.

While it seems adaptive to have negative memories fade faster, sometimes it may not be the case. Remembering negative events can prevent us from acting over-confident or repeating the same mistake, and we can learn from them in order to make better decisions in the future.

However, increased remembering of negative memories can lead to the development of maladaptive conditions. The effect of mood-congruent memory, wherein the mood of an individual can influence the mood of the memories they recall, is a key factor in the development of depressive symptoms for conditions such as dysphoria or major depressive disorder.

Dysphoria

Individuals with mild to moderate Dysphoria show an abnormal trend of the fading affect bias. The negative memories of dysphoric individuals did not fade as quickly relative to control groups, and positive memories faded slightly faster. In severely dysphoric individuals the fading affect bias was exacerbated; negative memories faded more slowly and positive memories faded more quickly than non-dysphoria individuals.

Unfortunately, this effect is not well understood. One possible explanation suggests that, in relation to mood-congruent memory theory, the mood of the individual at the time of recall rather than the time of encoding has a stronger effect on the longevity of negative memories. If this is the case, further studies should hopefully show that changes in mood state will produce changes in the strength of the fading affect bias.

Depression

Depression has a major impact on the retrieval of autobiographical memories. Adolescents with depression tend to rate their memories as more accurate and vivid than never-depressed adolescents, and the content of recollection is different.

An individual with depression will encounter trouble remembering specific personal past events and instead will recall more general events (repeated or recurring events). Specific memory recall can further be inhibited by significant psychological trauma occurring in comorbity. When a specific episodic memory is recalled by an individual with depression, details for the event are almost non-existent and instead purely semantic knowledge is reported.

This lack of remembered detail is especially seen in the recall of positive memories; generally people remember positive events with more detail than negative events, but the reverse is seen in those with depression. Negative memories will seem more complex and the time of occurrence will be more easily remembered than positive and neutral events. This may be explained by mood congruence theory, as depressed individuals remember negatively charged memories during frequent negative moods. Depressed adults also tend to actively rehearse negative memories, which increases their retention period and vividness.

Another explanation may be the tendency for individuals suffering from depression to separate themselves from their positive memories, and focus more on evidence that supports their current negative self-image in order to keep it intact. Depressed adults also recall positive memories from an observer perspective rather than a field perspective, where they appear as a spectator rather than a participant in their own memory.

Finally the autobiographical memory differences may be attributed to a lower hippocampal volume in depressed individuals.

Effects of age

Temporal components

Memory changes with age; the temporal distribution of autobiographical memories across the lifespan, as modelled by Rubin, Wetzler, and Nebes (1986), is separated into three components:

Childhood or infantile amnesia
The retention function (recency effect)
The reminiscence bump

Infantile amnesia concerns memories encoded in very early childhood, before age 6, where very few memories before age 3 are available. The retention function is the recollection of events in the first 20 to 30 most recent years of an individual's life. This translates to more memories for events closest to the present, a recency effect. Finally, there is the reminiscence bump occurring from around age 40, marked by an increase in the retrieval of memories from ages 10 to 30. For adolescents and young adults the reminiscence bump and the recency effect coincide.

Age Effects

Autobiographical memory demonstrates only minor age differences. Nevertheless, distinctions between semantic versus episodic memories in older adults compared with younger people have been found.

Episodic to Semantic Shift

Piolino, Desgranges, Benali, and Eustache (2002) investigated age effects on autobiographical memory using an autobiographical questionnaire which distinguished between the recall of semantic and episodic memory. They proposed a transition from episodic to semantic memory in autobiographical memory recollection with increased age. Using four groups of adults aged 40-79, Piolino and colleagues found evidence for a greater decline in episodic memories with longer retention intervals and a more substantial age-related decline in recall of episodic memory than semantic memory. They also found support for the three components of autobiographical memory, as modelled by David Rubin and colleagues.

Semanticizing memories, generalizing episodic memories by removing the specific temporal and spatial contexts, makes memories more persistent than age sensitive episodic memories. Recent memories (retention interval) are episodic. Older memories are semanticized, becoming more resilient (reminiscence bump). Semantic memories are less sensitive to age effects. With the passing of time, autobiographical memories may consist more of general information than specific details of a particular event or time. In one study where participants recalled events from five life periods, older adults concentrated more on semantic details which were not tied to a distinct temporal or spatial context. Younger participants reported more episodic details such as activities, locations, perceptions, and thoughts. Even when probed for contextual details, older adults still reported more semantic details compared with younger adults.

Voluntary versus involuntary memories

Research on autobiographical memory has been overwhelmingly focused on voluntary memories, memories that are deliberately recalled; nevertheless, research has evidenced differential effects of age on involuntary and voluntary autobiographical memory. One study found that fewer involuntary and voluntary memories were reported by older adults compared with younger adults. The voluntary memories of older adults were not as specific and were not recalled as quickly as those of younger adults. There was no consistent distinction between involuntary memories for younger and older adults.