7.1 What are autobiographical memories

- Memories that we store of life events that seem to make up “who we are” - i.e. ‘self’-defining:
  - Complex memories, different sensory inputs, engage many different processes in the brain at retrieval;
  - Give our lives continuity and help us integrate with other people;
  - Very sensitive to brain injury (distortion, amnesia);
  - Self-defining memories that changed life direction (e.g. an experience with a good teacher that inspired a career choice);
  - Can be dysfunctional, pathological (e.g. PTSD).

7.2 Autobiographical memory across the lifespan

- Autobiographical memories are complex and take effort to maintain and consciously recall;
- Some autobiographical memories may “pop out” fully-formed in response to cues - could be relevant to the conversation or unwanted intrusions (e.g. PTSD);
- Conway and Pleydell-Pearce (2000) suggest the working self is a cognitive structure that controls when autobiographical memories are recalled or inhibited:
  - It is made up of a goal hierarchy of active goals and a set of self-conceptions (how we see ourselves);
  - The self profoundly affects which autobiographical memories are constructed, retained and made accessible by the working self;
  - Autobiographical memories are more likely to be formed during periods in which the self changes because self-defining memories are
more likely to come from these periods;
  o These goals and self-conceptions directly affect how what we experience in the present is encoded into memories.

● The working self develops across the lifespan:
  o It emerges in early infancy and **Erikson and Erikson (1982)** linked the relationship between the working self and autobiographical memory to the changes that happen across the lifespan (see DSE212 Psychosocial theory on identity formation, normative crises etc.)
  o Changes in this relationship stabilise in adolescence/early adulthood;
  o The number of autobiographical memories that can be accessed is shown in a **lifespan retrieval curve**, where adults around 50 years typically:
    ■ cannot access early infant autobiographical memories and only a few in later years (< 10 years) - **childhood amnesia**;
    ■ can recall high numbers of memories from 10-30 years (peak at 20-25 years) - **reminiscence bump**;
    ■ can recall high numbers in recent years - **recency effect**.

### 7.2.1 Childhood amnesia

● Young children (as young as 30 months) do have autobiographical memories but these become inaccessible;
● This is not due to general development in intellect, language etc. as they were accessible before this development;
● There isn’t a generally accepted explanation for why adults can’t access childhood autobiographical memories but:
  o Conway and Pleydell-Pearce suggest the working self goal hierarchy changes, and the adult working self is unable to access childhood goal hierarchy because it is so different.
  o It could also be that the child episodic memories are so emotionally saturated that the adult working self couldn’t cope with them so actively limits them

### 7.2.2 The reminiscence bump

● This surge in autobiographical memories between 10 and 30 years can only be detected if remembering is open (free recall) and unbiased (not cued), and care must be taken to ensure rememberers don’t ‘get stuck’ remembering lots from a particular time.
● Autobiographical memories show this peak, but so do other types of **autobiographical knowledge** such as films, songs and public events.
- Reminiscence bump memories are more salient and accurate/detailed than other memories, and are judged by the rememberer as more important.
- The memories recalled tend to be specific to individual rememberers - no general themes such as first-time experiences, or experiences that were more pleasant or ‘better’ than in other parts of the lifespan;
- Two possible explanations have been proposed for why memories in this lifestage are easier to recall:
  - Rubin (2002) proposed a ‘novelty hypothesis’ whereby times in which many changes occur lead to fuller memory encoding;
  - Conway and Pleydell-Pearce (2000) suggest that many experiences between 10-30 years are self-defining, and because they define identity and are new and unique for the self, they assume high importance.

7.2.3 Recency

- The recency effect can be explained in terms of more recent experiences simply being easier to recall and less recent ones being forgotten.
- Forgetting less recent memories might be due to them being attenuated because they’re less relevant to the self.

7.3 Autobiographical knowledge, episodic memory, the working self, memory construction

- There are two important aspects of autobiographical memories:
  - Distribution across the lifespan as demonstrated by the lifespan retrieval curve;
  - the fact that we have to construct autobiographical memories from conceptual autobiographical knowledge, generic images and episodic memories:
    - Example: the autobiographical memory of “getting the results of our last OU exam” is made up of what we know about this, e.g. we usually get a notification email or hear they’re out on Facebook, you get them on the course website etc. plus memories of “what it’s like finding out the results are available”, added to the actual memory of getting that results email, checking the course website, seeing the result ...;
    - Example: “the last time you had Chinese food” requires that you try to remember things about your own life (where you usually go to eat/buy it, who you go with) as well as semantic facts (what kinds of food are “Chinese”, where are the local restaurants). Once you find an event that might fit you may recollect emotions to do with the event, or sensory memories
(visual, smell, taste). You might mis-remember some details, such as thinking you were with particular people - monitoring processes try to detect these errors.

7.3.1 Autobiographical knowledge

- **Conway and Pleydell-Pearce (2000)** proposed two kinds of autobiographical knowledge: **general events** and **lifetime periods**.

#### 7.3.1.1 General Events

- These include **single events** ("That day we went to London"). **recurring events** (work meetings) and **extended events** ("when we went on holiday to Spain")
- These **general events** can in turn be grouped, e.g. "holidays we went on", "sad occasions" etc.
- Groups like this appear to correspond to achieving goals relating to the self.
- While **general events** can take emotional, verbal or image forms, they are **most often image-based**.
- This autobiographical knowledge can be used to access sensory-perceptual episodic memories in order to form an autobiographical memory which in turn will often contain generic images.

#### 7.3.1.2 Lifetime periods

- **Robinson (1992)** found general events that concerned **skills acquisition** and **personal relationships**, typically when one or more goals were achieved.
- These lifetime periods can contain representations for times, places, people, activities, goals and emotions.
- Memories of “first-time” events can create long-lasting evaluations of the self by cueing other memories.
- **Bluck and Habermas (2000)** referred to the **life story**, a set of themes that describe a person’s life. These themes are made up of **life story schemas** that link autobiographical knowledge.
  - Example: the lifetime period “when I was at university” might provide the autobiographical knowledge (representations of places, people etc.) that can be used to form life story schemas for “becoming independent”, “moving away from home”, “learning new subjects”, “meeting other students” and so on.
  - These schemas form the basis for **lifetime period evaluations**, such as “I was academically successful”, and **themes** such as “I’m a more academic than practical person”
- Lifetime period autobiographical knowledge is less concrete than general events - it’s conceptual rather than event-specific.
7.3.2 Episodic and semantic memory

- **Tulving (1972)** proposed that:
  - episodic memory contains personal spatio-temporal memories (specific times and places) but
  - semantic memory contains social context-free facts
- However fractionating LTM into episodic and semantic memory like this is problematic:
  - Episodic memories must contain semantic knowledge, so how can we tell where one ends and the other begins?
  - Some semantic memories contain spatio-temporal information like episodic memories, e.g. knowledge of "breakfast" includes the time of day it's eaten, where it's typically eaten etc., so is this a semantic or episodic memory?
  - Autobiographical knowledge can contain spatio-temporal knowledge, e.g. knowing the fact of where you went on holiday last year;
  - Tulving now suggests episodic memories are those recollective memories that make you feel that you’re experiencing the past.

- **Episodic memory** contains unique past events, contextual details and autonoetic consciousness (See Chapter 6, section 7)
- **Semantic memory** concerns facts about the world, or noetic consciousness.
- **Autobiographical memory** consists of both episodic and semantic contents, the amounts are affected by:
  - Age of memories - recent memories tend to be more episodic, remote memories are often more semantic;
  - Event frequency - unique events tend to be more episodic, repeated ones more semantic;
  - Rehearsal - infrequently retrieved memories tend to be more episodic, frequently retrieved ones more semantic;
  - Age and mental health of participants - older or more depressed adults tend to remember fewer episodic memories.

- **Conway (2001)** tried to redefine episodic memory to address these issues:
  - Proposed that it is a repository of mainly sensory-perceptual rather than spatio-temporal knowledge about recent experiences ("experience-near") over relatively short timescales;
  - If these memories are linked to autobiographical knowledge they endure; if not they are forgotten.
  - For example events from today are fresh in memory but only those events from weeks ago that are linked to previous autobiographical knowledge are still remembered.
7.3.2.1 Recollective experience

- **Recollective experience** is the sense of feeling oneself within a memory;
- This feeling state *indicates* that the related representation is an actual memory of a prior experience, not a dream or fantasy.
- However having a recollective experience does not *prove* that the prior experience happened - it could be a false memory.

---

7.3.3 The working self

- The cognitive effort needed to construct an autobiographical memory puts the whole cognitive system into retrieval mode *(Tulving, 1983)*
  - Attention is focused inwardly, awareness becomes strongly influenced by feelings of recollecting and “being there”;
  - Other cognitive processes are strongly attenuated so this could be dysfunctional (e.g. in PTSD), so the **working self controls the process to stop it being pathologically disruptive** - this is one of its main functions *(Conway and Pleydell-Pearce, 2000)*.

7.3.3.1 Goals and the working self

- The working self contains a **complex hierarchy of goals, goal-related knowledge** (lifetime periods, life story, schema) and **active models of the self**;
- This goal structure is used to form episodic memories and to abstract autobiographical knowledge - experiences that are related to our life goals are encoded into autobiographical memories;
- **Self-memory congruency**: goals may be more accessible to consciousness if they match an individual's personality type:
  - *Markus (1977)* found strongly dependent or strongly independent people could recall memories of acting in those ways more easily than people with other personality types;
  - Other researchers confirmed this, e.g. *McAdam (1982)* found people with the goals of achieving intimacy or of achieving power recalled more peak experiences where they acted in these ways;
  - This suggests the goal structure of the working self makes autobiographical knowledge that related to current goals more available.

- **Woike (1995)** used a diary study to investigate the link between personality and memory:
  - Participants recorded memorable events over 60 days;
  - Explicit and implicit motives were extracted from these reports:
    - implicit motives are unconscious drives to achieve positive emotional experiences, e.g. “feeling close” indicates intimacy is a
explicit motives are those that are consciously set by the individual, and are thought to relate to self-concepts and social categories e.g. having the goal to achieve a particular status or acquire a possession.

- The diary study and a subsequent experimental study supported the hypothesis that implicit motives would lead to the formation of memories that had a high affective/emotional content, and explicit motives would result in memories that were not particularly emotional.

- In follow-on studies Woike showed recall of memories to do with agency (e.g. mastery, humiliation) were linked to agentic personality types that emphasise independence and difference while those that were common in people with communal personality type had high emotional content (e.g. love, friendship).

- This suggests that personality type affects the memories most likely to be recalled, perhaps because the working self that controls this makes memories that are aligned to the individual's goals more available.

- Pillemer et al. (1996) found students reported vivid life changing/turning point memories to do with their education. These were self-defining in that important long-term goals such as career choices were formed at the time.
  - While some of these were positive ("I realised I wanted to be a ..."), others were negative ("I realised I would never be any good at ...").

- Singer and Salovey (1993) found that happy memories were linked to achieving goals, and sad ones were linked to failure to achieve goals.

- They proposed that self-defining memories held information about progress towards long-term goals. Strauman (1996) suggests these goals may have been adopted to fill perceived gaps in the self from childhood, and Thorne (1995) found childhood memories in 20-year olds were to do with wanting love or help as a child but that later memories were related to reciprocal love or helping others.

- The working self is a useful model that helps make sense of links between personality and autobiographical memory. Findings like these suggest it moderates access to knowledge, adding to and making more accessible those memories that fit the self-image and inhibiting those that do not.

7.3.4 Constructing autobiographical memories

- Autobiographical memories may spring to mind ("direct retrieval") or may need to be constructed intentionally ("generative retrieval");
  - While generative retrieval usually takes significant cognitive effort, often triggered by an initial cue, it can be fast and fluid, for example in the course of a conversation about an event where the construction is done as the conversation flows.
  - Direct retrieval may be unwanted, e.g. spontaneous recall in PTSD can be hugely dysfunctional.
● **Cues** trigger activation of autobiographical knowledge structures in LTM continually, but usually not strongly enough to bring them to conscious awareness;

● However when a cue does trigger activation of a general event (e.g. “When I bought my car”) with its linked episodic memories (e.g. “the sales man with the wig who sold it to me”, “the sales office where I had to queue up”, “not being able to find my bank card”), direct retrieval can occur and all the parts of the memory become available together rather than having to be retrieved and assembled in the generative mode.

● The resulting autobiographical memory can be **inhibited by the working self if this would disrupt achieving a more important goal** or it can be linked to working self goals and be made accessible.

● Alternatively the cue can be **elaborated** and used to try retrieval again, a process that can continue through **iterative sampling** to make the cue specific enough that it's more likely to match an episodic memory and trigger formation of an autobiographical memory.

● **Haque and Conway (2000)** demonstrated both generative and direct retrieval in response to cue words (locations, activities and emotions):
  ○ Participants who were shown cue words on computer screens had to recall an associated memory;
  ○ They were asked to report what they were recalling after 2, 5, and 30 seconds;
  ○ Memories were categorised into **autobiographical knowledge** (general events, lifetime periods), **specific autobiographical memories** or “nothing”;
  ○ Generative retrieval was indicated by general events or lifetime periods while direct retrieval was indicated by specific autobiographical memories;

● Both types of retrieval were observed but while generative retrieval was high at two seconds then declined to thirty seconds, specific memory formation increased with time.

● **Functional neuroimaging studies** suggest particular brain areas are involved in the processes that form autobiographical memories;

● These areas are **neural correlates** of autobiographical memory processes;

● Some examples that illustrate this include:
  ○ **Search**: a retrieval cue triggers a **search/retrieval process** involving the left lateral pre-frontal cortex (PFC);
  ○ **Self**: the search process interacts with **self-referential processes** in the medial PFC, leading to retrieval of a spatio-temporal event;
  ○ **Recollection**: is controlled by the hippocampus;
  ○ Retrieval of **emotional content**: is mediated by the amygdala;
  ○ **Vividness** is more associated with autobiographical memory in non-laboratory tasks, and is linked to activity in the parahippocampal region;
  ○ **Visual imagery**: is associated with activation in the occipital region (where the visual cortex is located);
  ○ The **“feeling of rightness” (FOR)** of retrieved autobiographical images is monitored by the ventromedial PFC.
● “Laboratory memory” is different to “Autobiographical memory”:
  ○ **Autobiographical memory** tasks require participants to process pre-existing knowledge of their past experiences and evaluate its emotional content;
  ○ **Laboratory memory** tasks require them to use conscious search and retrieval strategies to recall/recognise past experiences or experimental stimuli.

● Functional neuroimaging studies of autobiographical memory are more effective than typical laboratory studies of autobiographical memory because:
  ○ The **complex process** through which autobiographical memories are **constructed** is hard to investigate using simple laboratory stimuli;
  ○ **Recollective qualities** such as the emotional content and the vividness of autobiographical memories are hard to study in the lab;
  ○ **Remote memories** (as opposed to recent memories) can’t be created in the lab, and these are important in the study of how we consolidate memories (bind them into LTM).

● Monitoring processes may differ - lab tests of autobiographical memory may use deliberate complicated monitoring processes in the brain to ensure that memory details are all correct, “natural” recall may use the lightweight intuitive FOR process.

### 7.4 Autobiographical memory in distress

- A major symptom of **PTSD** is the generation of persistent, intrusive memories related to previous trauma.
- Spontaneous memories of feelings and sights from the time of the trauma are re-experienced, and the sufferer is constantly at risk of being thrown into the highly cognitively demanding retrieval mode, which can prevent them from functioning normally in everyday life;
- Indicators are the occurrence of a **traumatic event**, the person's **response at the time of the event** and the later **psychological symptoms** they display.

### 7.4.1 Traumatic event

- Traumatic events that result in PTSD usually involve witnessing of actual or threatened death or serious injury to self or others.
7.4.2 Response at the time of trauma

- Some people are exposed to death often (e.g. paramedics) but usually don’t suffer from PTSD;
- PTSD seems to follow reactions of despair, horror or intense fear when the traumatic event is experienced as very stressful;
- It may be related to physiological response such as massive release of glucocorticoids in the brain at the time of the event;
- Conway and Pleydell-Pearce (2000) suggest the situation fundamentally challenges the individual’s goal system:
  - e.g. dying is generally not one of the person’s life goals, so the trauma can’t be integrated into autobiographical memory by the working self;
  - encoding some of the experience might be beneficial if it helps avoid the situation in the future so patches of the experience can be “burnt” into memory without being linked to autobiographical knowledge in the usual way.
- Detachment or dissociation is a common experience in PTSD (and a strong predictor of the problem) with the person feeling as if they watched the traumatic event from outside their body or in slow motion. This has been explained as the working self protecting itself from being overwhelmed by emotion.

7.4.3 Subsequent psychological symptoms

- Three groups of PTSD symptoms are commonly found: re-experiencing, avoidance and hyperarousal.

7.4.3.1 Re-experiencing symptoms including intrusive memories

- These include intrusive memories of the traumatic event in the form of dreams or flashbacks that include sensory and emotional feelings from the time of the traumatic event;
- These are accompanied by severe physiological reactions and psychological distress, and lead to intense cognitive overload.
- The re-experience in PTSD is of aspects of the original event, which contrasts with other psychological conditions such as psychosis and OCD where imagined events intrude on everyday life.

7.4.3.2 Avoidance symptoms

- Cues encountered in normal life can prompt recall of detailed episodic memories if they match the autobiographical knowledge being searched for;
Many cues for events associated with the traumatic event may exist and may generalise (e.g. being attacked by a bearded man may result in intrusions being triggered by any bearded man), and so recall of the traumatic event may be easily triggered;

Sufferers may consciously avoid cues if they’ve those that trigger recall of trauma, leading to dysfunctional behaviour (e.g. refusing to leave the house if seeing moving vehicles would trigger an episode). Avoidance can cause the problem to persist rather than helping to alleviate it.

7.4.3.3 Amnesia as avoidance

- Involuntary amnesia of the trauma or parts of it is a different kind of avoidance.
- This may be due to the working self suppressing encoded information about the event or failing to encode it in the first place due to emotional overload.
- It could also be related to physiological reactions such as release of abnormal levels of glucocorticoids which inhibit the medial-temporal lobes (amygdala, brainstem, hippocampus) that are essential for LTM.
- This psychogenic amnesia (psychologically generated) differs from organic amnesia (caused by physical damage).

7.4.3.4 Hyperarousal symptoms

- Hyperarousal symptoms include exaggerated startle reflex (excessive jumpiness), hair-trigger irritability and poor concentration due to the intensive cognitive effort associated with involuntary retrieval of the traumatic event.

7.4.4 Impact of symptoms

- Similar symptoms to these are normal for short periods after any trauma, but for a diagnosis of PTSD these symptoms must persist for more than a month, and they must cause significant distress.
- Summary: to be diagnosed with PTSD a person must:
  - have experienced a traumatic event;
  - react to it with fear, horror or helplessness;
  - experience persistent intrusive recurrence of the event;
  - avoid cues associated with the event or display psychogenic amnesia of the event;
  - show hyperarousal symptoms.
7.4.5 The nature of intrusive trauma memories

- PTSD and experience-near memories are both often image-based with sensory-perceptual-affective content (e.g. contain sounds, smells, pain or other physical feelings experienced at the time of the original trauma);
- They can be visual or auditory images, that can contain emotions or thoughts (“I’m going to die”) that were felt during the original event;
- In contrast, other disorders such as anxiety often present verbally (e.g. thinking about worries in words rather than just feeling);
- These can be re-experienced so vividly that it can feel that the event is happening again in the present - “live feel” (Brown and Kulik, 1977);
- This could be because the traumatic episodic memories don’t feel “in the past” because they are not linked to past autobiographical memories.
- An aim of PTSD therapy is to make these memories feel like recollections rather than live experiences (Ehlers and Clark, 2000).
- Unlike normal memories, PTSD memories are consistent exact copies of the past experience but a small percentage of the images triggered may not be from the past experience (Holmes, 2005):
  - Example: the woman who experienced traumatic recall of her daughter being burned in a fire, and also of being dead but unmarked by burns (Hackmann et al., 2004).
- Contradictions like this may be due to emotional conflict within the patient;
- The existence of distortions like this conflicts with the idea that the purpose of forming the memories is to protect us in the event of future recurrence of the traumatic event.
- PTSD images occur in a dissociated fashion, with often 3-5 images linked to the worst parts of the traumatic event. These “worst parts” consist of sensory-perceptual information (including what was felt and thought) that was encoded at the most intense times of the traumatic event. These may correspond to the times when the working self was most challenged.

7.5 Conclusion: what are autobiographical memories for?

- Correspondence models consider the accuracy and amount of information remembered in autobiographical recall, coherence models are concerned with how linked-up the memories are to others;
- Adaptive coherence models contain aspects of both, e.g. episodic memories capture snapshots of experience but the working self decides
what is retained (linked to existing autobiographical knowledge).

- Autobiographical memories that are retained are linked to appropriate autobiographical knowledge, i.e. interpreted in terms of what they mean to self-goals etc. so their main function may be to bind the self (what we’d like to exist) to reality (what really exists).