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Memory and the Unconscious Mind:
An Historical Review
History and Systems of Psychology
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The study of memory emerged early in general psychology (e.g. Wundt, 1902), and continues to be an area of widespread interest, drawing together researchers from neuroscience, experimental psychology, psychobiology, and educational psychology as well as well as engendering popular interest (Siegel,1999). Advertisements abound for memory enhancers such as Ginko Biloba or Reishi mushrooms. Schools are concerned with balancing re-teaching for retention and presentation of new information. False recovered memories of child abuse have severed family ties; real recovered memories haunt adults who do not understand why they over-react to trivial events (Miltenburg, Singer, 1997). Veterans struggle with posttraumatic stress syndrome's negative impact on functioning (Siegel, 1999). Current memory research seeks to expand understanding and refine clinical interventions (Shapiro, 2001).

Siegel (1999) currently defines memory as the complex process by which we take in and store our life experience in such a way that it can influence how we interact in the future, even if we do not recall the actual experience. Many dimensions of memory are referred to in the literature (e.g., Delacour, 2001). Working, short term, and long term memory refers to length of time information is retained. Semantic memory occurs when retrieving knowledge or rules. Episodic memories are narratives from life experiences. Implicit memory, stored in the unconscious, refers to experiences encoded in the first year of life when an infant does not have language or a strong sense of self. Explicit memory occurs after language begins to develop, and may be retrieved via images, emotions or narratives. Many brain structures are activated in memory; however three that appear to be critical are the amygdala and the hippocampus, which interact with the neocortex to integrate meaning, emotion, and memory (Siegel, 1999; Begley, 2007).

This is a vastly oversimplified review, as the literature on memory is extensive. Databases sampled include: Psychclassics, Psycharticles, Psychinfo, Sage, and Proquest Central, primarily using the terms memory, unconscious, and history, as well as researcher's names. A search for university affiliated memory laboratories was conducted on Google. In addition, Dr. Hickey of Walden University generously provided articles and book recommendations. The following paper takes a broad-brush historical slant, beginning with the structural context in which memory studies began. It then moves to those thinkers who took a more process view, to those bridging both, finally concluding with a sampling of the modern integrated approach as well as current issues being raised.

The Early Years-General Psychology-Structural Orientation

While some psychologists argue that the study of the psyche began during the classical Greek era, it is generally agreed that Wundt began the formalized school of psychology in the late 1800's (Shultz & Shultz, 2008). In his writings, Wundt distinguished outer experience from inner experience. While he acknowledged that inner experience was complex, he did not think it could be studied empirically (Wundt, 1902). He saw the interconnection between physiology and psychology, and thought that both the sensory apparatus and brain functions were influenced by mental events. While he evaded the idea of the unconscious, and is best known for his structuralist stance studying conscious experience only, his beginning views regarding the influence of physiology on psychology are in alignment with current research.

Titchener differed from his teacher Wundt, arguing that the mind is a set of mental processes. What is significant here is that he included memory as one of those

processes. This was perhaps the beginning of what is today a major subdivision of general psychology. In Titchener's view, there was no hierarchy of mental or physical processes. In fact, he thought that memory operated on the same level as physical processes such as digestion or excretion (Titchener, 1898). Titchener was clear and eloquently firm regarding the boundaries of structuralism (Shultz & Shultz, 2008). He respected the work of his contemporary Ebbinghaus, the first to study memory in an empirical manner, but interpreted Ebbinghaus' findings from within his rigidly structural mind set (Titchener, 1898).

Ebbinghaus viewed memory as a passive process (Shultz & Shultz, 2008). He was a meticulous researcher, mostly working alone, on very tedious tasks using nonsense syllables. These nonsense syllables, devoid of any meaning to which the mind could attach, were the essential ingredient to making his work empirical. His work with the forgetting curve and the use of nonsense syllables still stand today (Ebbinghaus, 1885).

The Early Years-General Psychology-Process Orientation

James brought the functionalist perspective to the psychological debate. Even though it was not considered a formal school of thought, it nonetheless broke down the clear borders of structuralism and began to introduce a more process view of mental events (Shultz & Shultz, 2008). James coined the term "stream of consciousness" (James, 1890) still used today, and hinted at things that could not quite be seen as "shadows" (James, 1890). While he did not formally study the unconscious, James thought that these shadows, at the edge of our awareness, might be perceived as they moved (James, 1890). This view, along with his perception of the memory process as

more active than passive, was as a forerunner of the idea that some events exist just below the threshold of consciousness (Shultz & Shultz, 2008).

Calkins attempted to mediate between Titchener's structuralism and the functionalism of James (Calkins, 1906). She makes no mention of the unconscious in her review of either side, and she argues that the self was an individual's experience of the moment in relation to the social and physical environment. Calkins contribution comes from her focus on neurobiology as the way to bring the two viewpoints together. This thinking is confirmed in the integrated approach used today in the neurosciences.

The Unconscious Emerges

While the structuralist and functionalist thinkers were studying conscious experience in their laboratories, the idea of an unconscious mind was becoming a popular topic of discussion amongst non-academic groups of people (Shultz & Shultz, 2008).

One author, Samuel Butler (1880, 1902), though unpublished in the traditional sense through academic journals, wrote extensively on the unconscious. Years before Freud's writings on the Id, and a century before Siegel's (1999) writings on empathy within the context of brain as social organ, Butler (1880, 1902) proposed that memories lie latent in the unconscious and are brought to the surface via current stimuli. He wrote of the oneness of experience between parent and offspring. He held the position that the unconscious was a set of habits related to mind and memory (Butler, 1880, 1902).

A formal introduction of the concept of an unconscious mind was Freud's contribution. His work bridged structure and function, introducing the ideas of levels of processing in the mind by dividing consciousness into the id (entirely unconscious), the ego (partially unconscious), and the superego (Freud, 1910). He thought that each of

these levels guarded the one below, using forgetting as an active process to deal with internal conflict. Freud called this active forgetting process repression. Repression caused traumatic memories to be stored in the unconscious, only surfacing in disguise via dreams, symbols, and slips of the tongue (Freud, 1910). The levels of processing approach foreshadowed levels of cognition which was later used in cognitive psychology.

Not everyone agreed with the idea that memories were repressed in the active forgetting process. Rivers (1920) took a more physiological tact, even though he agreed that the mind had different levels of processing experience. Rivers (1920) argued that unconscious memories emerge in sleep due to the removal of higher levels of nervous system control. In addition, Janet (Shultz & Shultz, 2008) thought that active forgetting was a dissociative process, not repression. Janet's view still has implications for treatment today.

Post Psychodynamic Theory

After psychoanalysis established its boundaries as a school of thought entirely different from the academic schools, thinkers like Jung and Horney modified and stretched Freud's views into new and uncharted territory. Opposing this, Gestalt thinkers argued that there was no unconscious mind, and that the difference between conscious and unconscious is similar to the difference between mind and body. New aspects of memory were being investigated in Russia. Vgotsky and Zinchenco (Roediger 111, H.L., Gallo, D. A., Geraci, L., 2002) studied active memory processing with lists of words. Cognitive psychology emerged with its highly structural view harkening back to Titchener. Cognitive psychology, still popular today, used charts, graphs, and diagrams to show how information is processed. It also used a level of cognitive processing model,

like Freud, except in a highly academic manner. Easterbrook (1959) found that the higher the state of emotional arousal, the lower the level of information processing (including retention) that occurs. Some thinkers thought that the unconscious would become a dead hypothesis (Rivers, 1920), but this did not prove to be the case. In fact, even with its emphasis on conscious experience, cognitive psychology has endorsed the study of unconscious (or nonconscious) memory. This is because the unconscious is now thought to be capable some forms of cognition (Greenwald, 1992).

Meriting special mention, a critical turning point in memory research occurred in the 1950's with a patient universally referred to as H. M. This patient had damage to (and bilateral removal of) the hippocampus as well as surrounding neural structures associated with memory (Roediger et al, 2002). Patient H. M. could not remember, however his other cognitive functions were normal. By being able to study mental processes and brain structure in one case study, scientists were able to end the anti-location debate, confirming that brain structure was related to function. This propelled the movement forward in neurobiological studies (Preilowski, 2009).

Integration

The emergence of neurobiology as an integrating force in current psychological thinking has validated Freud's concept of the unconscious even as it does not subscribe to the theory behind it (Kihlstrom, Barnhardt, & Tataryn, 1992). After a century of controversy, the existence of the unconscious is no longer an issue as scientists have figured out ways to bring it under empirical study. For example, research regarding unconscious implicit memory was done on post-surgery cardiac patients. These patients retrieved statistically significant word association cues that had been presented while

under general anesthesia (Adams et al., 1998). The current view regarding the structure of the unconscious retains Freud's view of the levels of processing (Freud, 1910), while beginning to study its analytic power (Kihlstrom et al., 1992).

Types of unconscious memory proliferate beyond the definitive terms of short and long term memory. Somatic memory, or body based memory, is one of these (Van der Kolk, 2003). In clinical practice, Van der Kolk (2003), found that working with the body can affect how traumatic memories manifest. Other researchers think that a memory's neural nets are malleable throughout life, changing when they are expressed verbally, molded by the social context of the retelling (Dudai, 2004). Building on this is the concept of the adaptive unconscious, introduced by Goleman (2006), and furthered by the idea of mirror neurons. Mirror neurons activate when the right hemispheres of two individual's brains work together as part of one system. Goleman (2006) also discussed how individuals sustaining traumatic emotional damage to the amygdala (where fear is stored) may have a decreased ability for empathy, the state in which mirror neurons operate. Wheeler (2007) studied how damage to the amygdala may change the way the hippocampus (where memory is stored) interacts with the neocortex (center for reasoning). In 1996, Deloux had established that the interaction between these brain systems is bidirectional (Fishbane, 2007), but when traumatic memories surface from the unconscious, signals from the amygdala override those of the neocortex resulting in dysfunctionally expressed emotion (Fishbane, 2007).

Some studies (Siegel, 1999; Wheeler, 2007) show that damaged brain processes can occur whether the traumatic memory was one large trauma, or a series of smaller ones, as can happen in an insecure attachment scenario. Siegel (1999, 2007) has been

instrumental in the process of integrating memory and attachment work from many different fields. The long debated argument between nature and nurture has evolved to one where the brain is thought to develop at the interface between influences from the environment and one's genetic or biological code (Siegel, 1999). Brain development, traumatic or otherwise, does not occur in isolation, but with other brains working together as a system (Goleman, 2006; Siegel, 1999). This view holds broad implications for therapy, education, parenting and policy making, as well as having legal ramifications.

Current Issues

Siegel (1999) describes the need for further integrative studies. He argues that despite the validation and replication of studies that has occurred thus far, the relative breadth of the interdisciplinary work is still relatively narrow. While many memory laboratories exist adjunct to universities, a few are being created whose focus is integration as Siegel (1999) recommends. One example is The Center for Interdisciplinary Memory Research in Germany (<http://www.memory-research.de>) which seeks to broaden the field by working with WWII trauma victims and their children.

Hypnosis, once considered quackery, is now a legitimate area of study. Professor Hilgard at the Stanford Center for Integrative Medicine (<http://www.stanfordhospital.org>) is studying healthy dissociation via a medical hypnosis process. This possibly has ramifications for clinical work with Borderline Personality and PTSD patients who use a more dysfunctional dissociation process to cope with trauma. Additionally, technology showing promise has been developed by New Reality (<https://www.newreality.com>), which uses creative visualization and relaxation (CVR) combined with brain wave entrainment to encourage healthy dissociation from dysfunctional memory processes.

Another issue is the viability of the mind as computer metaphor. Historically the field of psychology has evolved right alongside the culture of the times. When the mechanical view of the universe was reflected in the fascination with clocks and time, psychologists were breaking down experience into quantifiable bits and pieces which could be reconstructed in a laboratory (Shultz & Shultz, 2008). When the computer age dawned, and the world was being looked at in terms of hard drives, RAM, and central processing units, psychologists began to look at the brain in a similar manner. Memory was divided into a plethora of categories. Now computers are interfacing with organic structures in prosthetics (Shultz & Shultz, 2008), and the field may be evolving into a new metaphor. One such metaphor is being proposed by Randall (2007), who offers the organic compost heap as a possibility. Randall (2007) argues that while the computer metaphor is sufficient for procedural and semantic forms of memory, autobiographical memory operates in a more organic manner. He views this type of memory as involving three basic processes; first one lays on the material (encoding experience), then it is allowed to break down over a period of time (malleable storage), and finally the material is turned and mixed in (re-narrating) in which garbage is transformed into fertilizer.

Sometimes, however, fertilizer can be transformed into garbage. This is the thinking of those concerned with the growing issue of false recovered memories. While these scientists do not dispute the existence of repressed (or dissociated) traumatic memories, they argue that because memory is malleable and neural nets are changed when moved into narrative, that the impact of the social environment is critical (Siegal, 1999). Moreover, since memories continue to change every time they are told, the social context can help heal the trauma, or it can manipulate. With the traumatic impact

recovered memories can have on families and communities, further research to clarify this controversy are much needed. In addition, some scientists argue that forgetting can be helpful; that it is one of the ways memories update themselves due to the idea that some may no longer be relevant to the individual's life (Kimball & Bjork, 2002). This point of view goes so far as to argue that perhaps intentional forgetting is part of the healing process and should not be disturbed therapeutically (Kimball & Bjork, 2002).

It is an irony of human nature that critical memories from the first years of life are not easily accessible or decipherable by adults seeking help for dysfunctional mental models (Siegal, 1999). These highly reactive implicit memories need the haven of two minds functioning as an empathetic 'we' to help heal early attachment issues (Siegal, 1999). Depending upon the severity of the trauma, this safe environment may be with a marital partner, a teacher, or a psychologist. It could be hypothesized that in order for a communication method, educational technique, or clinical model to be effective, the empathetic relationship between two minds must be present. If secure attachments protect the infant and maximize the development of healthy brain structures as well as processes (Siegal, 1999), then the possibility of a generation of securely attached infants (or a generation of adults with resolved attachment issues) could impact our culture profoundly. With the work of the neurosciences bridging the fields of psychology, biology, physics, linguistics, medicine and anthropology to name a few, the early thinking of Wundt and others who saw the connection between psychology and physiology has been borne out. Inner experience has been found to be far more complex than Wundt ever hypothesized, and today it can be studied empirically. Memory and the

unconscious, once outliers in the field of psychology, are now firmly ensconced in the mainstream of psychological study all over the world (Siegal, 1999).

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