

The Autobiographical Self: Who We Know and Who We Are

What we sense as a “self” emerges from stimuli both from within and without our body through complex levels of neural integration. The integration of memory and self is not a one-time occurrence but involves lifelong development. The autobiography of self is the accumulated unique mental narrative that emerges from our experiencing and participating in the flow of events and interpersonal encounters that reach a level of awareness critically facilitated by emotional tone.¹⁻⁶ Autobiographical memory plays an important role in the construction of personal identity. An individual’s construction of themselves through time serves the function of creating a coherent and largely favorable view of their present selves and circumstances.⁷⁻¹¹

The autobiographical self is a product of an extended consciousness that places a person in an individual history over time, aware of a lived past and anticipated future. From a multilevel coalescence of

Barton J. Blinder, MD, PhD, is Clinical Professor, Department of Psychiatry and Human Behavior, School of Medicine, University of California, Irvine.

Address correspondence to: Barton J. Blinder, MD, PhD, 400 Newport Center Drive, Suite 706, Newport Beach, CA 92660; fax 949-721-9572; or email bblinder@uci.edu.

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Barton J. Blinder, MD, PhD

signals within the somatosensory system integrated through special thalamic lines into the insula, the more fundamental homeostatic and momentary events lead to the beginning of a self-process. The complexity of our identity and autobiography are subsequently dependent on extensive personal memory and language.⁴ An autobiographical memory is accessible to awareness and contrasts with non-voluntary memory, which is non-declarative, dominated by impression and anchored to procedural skills.^{1-4,12}

The self is not the same as the conscious self because much of who we are as individuals takes place outside of conscious awareness. Viewing the self as a network of memories (conscious explicit memories and unconscious memories) and integrating this perspective with neurobiological studies in humans and animals will gradually allow us to relate the explicit and implicit “self” to detailed brain mechanisms that underlie our most complex states of mind.¹³⁻¹⁵ Our internal self-representation and our representational world are interwoven in the narrative we construct from our autobiographic memories.^{16,17} Recent years have witnessed an upsurge of interest among theorists and researchers in autobiographical recollections, life stories, and narrative approaches to understanding human behavior and experience.¹⁸

The idea that identity is a “life story” resonates with a number of important themes in developmental, cognitive, personality and social psychology.¹⁸⁻²³ There is a fundamental narrative fabric of autobiographical identity construction in which time plays a critical role (past, present, cyclical, static, and fragmentary).²⁴⁻²⁶

The brain is a natural story teller. Core and extended consciousness emerge from neural patterns. Animals have core consciousness, but only higher mammals have extended consciousness. Emotions are an integral part of human thinking; “feelings” contribute to the elaboration

of the self as a person with an individual history, aware of a lived past and anticipated future.¹⁻⁴ One’s self is both a story and a locus of being. What is the neurobiological architecture of the autobiographical self, and why does it prompt the rewriting of memories, fictional scenarios, pretension, and imagination?²⁷

DEVELOPMENTAL AND BIOLOGICAL DETERMINANTS

Individual experiences with all their complexity and diversity contribute to and form the autobiographical structure of personality development. A major focus of psychotherapy is understanding how mental conflict arises from problematic emotional and relational experiences, past experience, and habitual modes of reacting and relating magnifying and coloring mental conflict.²⁸

Explicit memory (declarative, awareness) has an operational base in the hippocampus, with connections to the thalamus, cortex, and other sites in the limbic system. It is divided into semantic (facts, knowledge) and episodic (spatial, temporal, sensory) memory. The latter is particularly significant for autobiographical events.

Memory is state dependant, with a relationship between encoding cues and retrieval cues. Retrieval is a reconstructive process, not a replica of experience. With immaturity of the hippocampus and preoperational cognition in early childhood, elaborations, errors, and affect-laden insertions are more likely to occur. Retelling of the narrative of events in psychotherapy may lead to a modification of the memory. Clarification and interpretation in psychotherapy may be an important procedure in modifying the potency of complicated cues that elicit both the overelaborated memory and its associated viscerio-emotional component.²⁹

Children acquire a cultural-specific construal of the self and a form of autobiographical remembering through the daily interactions with parents, teachers,

and peers. This is the larger cultural context that defines the meaning of self and the form of autobiographical remembering.³⁰ Personal autobiographical memory is functionally and structurally related to the use of cultural myths and social narratives. The relative emphasis put on the self in different cultural and social contexts influences the form and function of autobiographical memory and the need for developing a uniquely personal life narrative in those contexts.³¹ The lack of specific memories of personally experienced events that occurred prior to 3 or 4 years old is related to the inability of children to encode personally experienced events (as personally experienced, ie, in terms of their causal relationships). At about 4 to 5 years, as the ability to represent the emotional source as well as the content of knowledge emerges along with a theory of a mind in another, the autobiographic organization of memories as personally experienced events is also established.^{23,32-33}

At ages younger than 4 or 5, children find it difficult to integrate self-related tasks into a coherent temporal organization and a self concept-extended in time.³⁴⁻³⁶ Thus, the concept of an autobiographical self emerges at around 4 years as a function of the child’s representational capacities,³⁶ specifically, the ability to hold in mind multiple representations of the world simultaneously. The child can then evaluate causally the relevance of previous states of the self to the present self, leading to the capacity to represent and gradually evaluate the temporal and causal relationships among memories of previously encoded experiences of the self.³³ Ultimately to be recalled as an item of autobiographical memory, the memory representation of a specific event that a person has experienced must not only specify the event itself but must also represent the fact that the memory has been caused by the event (memory for the causal source of knowledge). Children before the 4 or

5 years are notoriously bad at identifying the causal source of their beliefs.²³ Parent-child conversations are a medium through which children can begin to understand the meaning of past experience.¹⁰ More specifically, parental reminiscence style and the child's evolving self concept mediate important social cultural constructions of autobiographical memory.³⁶

The ability to relate multiple representations underlies the establishment of an abstract historical-causal self-concept (autobiographical stance), which integrates memories of previously unrelated states of self into an organized, coherent, unified, autobiographical self-representation. Individuals with severe developmental psychopathology have profound restriction in their ability to organize multiple representations of their experience.³³

Older adults are more likely to selectively retain memories with distinctive characteristics (self reliant, emotionally intense, and remote)³⁸ and subjectively travel back in time to relive personal events in the most distant past rather than in the recent past.

Voluntary and involuntary retrieval may access different samples of autobiographical memory. Involuntary memories are more often of specific emotionally intense, less positive, and more unusual events.^{12,13}

In adolescence, the cognitive tools necessary for continuity and global coherence in a life story (autobiographical reasoning) coalesce in the direction of self-understanding and a coherent account of the past.³⁹ However, when stressed by current depression or family violence, adolescents strategically avoid details of past experiences in order to regulate affect. Similarly depressed children give fewer specific memories compared



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with controls.³⁷ Impaired autobiographical memory in depression may be partly due to elevated cortisol levels, which often accompany depressed mood.⁴⁰

Autobiographic memories modify during young adult development and enhance narrative identity with greater understanding of emotional nuance, self-differentiation, and personal development.¹⁸ Mental “time travel” through subjective time that allows one to experience the past through self awareness is the last feature of autobiographical memory to become fully operational.⁴¹

NEUROBIOLOGICAL STUDIES

Several neurobiological studies have contributed more recently to our under-

standing of brain function and its relationship to self-reference and positive and negative self regard. Distinct neural circuits in adjacent regions of the prefrontal cortex serve the cognition and emotional affects of self-reflection. The medial prefrontal cortex relates to self description (positive and negative), while the valence (positive and negative) is processed differentially in the ventral and anterior cingulate areas.¹⁵ There is evidence that the hippocampus may make a critical contribution to the creation of new experiences and may affect fundamental components of the ability to experience the past.⁴³ Future events construction uniquely involves the right

hippocampus, while the left hippocampus is involved with both past and future. Episodic memory systems contribute to imagining the future and are especially involved in self-referential processing.⁴²

Overall medial frontal cortex activities predict judgment of self-relevance and subsequent memory performance.⁴⁵ There appear to be differentiated areas of the brain involved in our knowledge of persons and objects. Memories of people involve the right middle prefrontal cortex and medial frontal cortex. These and related areas deactivate with object judgment so that person knowledge may be functionally dissociated from other classes of semantic knowledge within the brain.^{44,46}

Relevant to the autobiographical self, the left hippocampus appears to be more responsive to memories for events that occur in a specific time and place that characterize one's personal autobiographic memory store from throughout the person's lifetime. Left and right hippocampus and medial frontal cortex may interface to produce a unitary representation of the unique past.⁴⁷⁻⁴⁹ More recently Greenberg has found coactivation

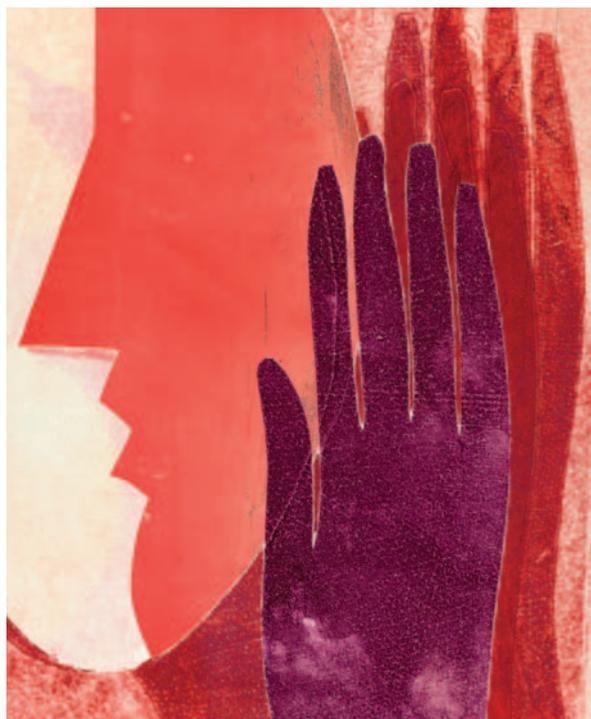
of the amygdala, hippocampus and right inferior frontal gyrus during autobiographic memory retrieval but not retrieval of semantic facts. It appears to be pronounced functional connectivity from activation of fronto-temporal regions that operate during recollection of episodes from the personal past.⁵⁰

Episodic memories provide the sensory perceptual component of experiencing self recollection, while autobiographical memories provide the content.^{19,20} The foregoing and further fMRI studies are demonstrating a distinct functional neuro-anatomical disassociation between episode and semantic autobiographic memories.⁵⁰

Brain regions involved in autobiographic memory retrieval are influenced by a triggered memory's emotional significance and its relationship to the individual's time axis. There is a relationship between emotional states and retrieval and the level of phenomenal detail of retrieved memory. Recall of perceptual sensory and semantic elements is better for positive emotional memories than for neutral ones.⁵¹

Markowitsch found right amygdala and temporal frontal activation with autobiographical memory versus fictitious memory. It was the experiential character and special emotional arousal that distinguished memories of real-life events from that of fictitious episodes.⁵² Emotional arousal produces a shift of the autobiographical network with activation in emotion centered regions of the brain and deactivation in regions associated with cognitive processes.⁵³ The autobiographical memory complex may involve a complex of functions including episodic memory, self reflection, visual imagery, attention, executive function, and affective and semantic processing.

The above imaging studies suggest



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that autobiographical recollection is mediated by a distributed fronto-temporal parietal system, with the anterior medial prefrontal cortex positioned to integrate sensory information with self-specific information. The emergence of autobiographical recollection at about 4 years old coincides with the timing of prefrontal regressive cortical and progressive white matter changes that help support the development of its high-level capacity.²¹

Distinct neural circuits in adjacent regions of the prefrontal cortex subserve positive and negative emotional aspects of self-reflection.¹⁵ The intricate neuronal mechanisms of episodic memory and the conscious recollection of autobiographical events remain largely unknown. Ultimately, unit-recording studies in animals may be crucial for understanding the neural physiological substrate

that enables people to remember their individual pasts. The autobiographical self emerges from these neural operations that give rise ultimately to a unitary sense of self.

IMPLICATIONS FOR PSYCHIATRIC DIAGNOSIS AND TREATMENT

Alteration of autobiographical memory has been studied in several psychiatric diagnoses and as part of general relationship to emotionality and traumatic experiences. A salient finding in depression is overgeneralized autobiographical memory, with diminished specificity for past events.

This may be part of a general deficit in retrieving the specific details of the context in which information was acquired.⁵⁴ When recalling autobiographical events, emotionally disturbed patients summarize categories of events rather than retrieving a single episode. This appears to be a functional avoidance when emerging recollections pressure affective equilibrium. There may be decrease in executive capacity and control that decreases focus on accurate retrieval in favor of distraction.⁵⁵

Interestingly, repression may not be a specific defense but rather an action of a general executive control process directed at declarative memories of past experience.⁷ A close relationship of autobiographical self and emotion strongly involves episodic memory in depression. Autobiographical memory in depression is characterized by overgeneralities, intrusive memories of stressful life events, and a pull toward mood congruent recollections. Overgenerality (diminished specificity in memories) may be a trait marker indicating vulnerability to persistent depression.^{56,57} For instance, the lack of memory specificity correlates with depression and not with anxiety disorder or

history of trauma.^{58,59} Researchers have concluded that low memory specificity may be one of the mechanisms through which abuse history and affective disorder increase an individual's vulnerability to deliberate self harm. Adolescents currently stressed by depression or family violence strategically avoid details of past experience to regulate affect.³⁹

Patients with obsessive-compulsive disorder and depression may have excessive cognitive-capacity consumption because of preoccupation with intrusive thoughts, resulting in both increased time to recollect and decrease in specific memory.⁶⁰

There may be a global episodic autobiographical memory impairment of positive memory in depression. Positive intervention to improve the self-relevance of positive memories may be an important strategy for patients.^{56,57} In patients with borderline personality disorder, decreased specificity of autobiographical memory was associated with both depression and degree of dissociation.⁶⁰⁻⁶² Patients with bipolar depressive disorder in remission may show autobiographical memories that are negative overgeneralized and decreased in imagery similar to patients with unipolar depression.⁶³

Memories of people with social phobia contain fewer sensorial details but rich self-referential information. When recalling social situations, they saw themselves from an observer perspective, viewing themselves as if from outside.⁶⁴ In schizophrenic patients, frequency and consistency of conscious recollection in autobiographic memory was reduced.⁶⁵ In a case of a woman whose remembering dominated her life, Parker and Cahill report a patient who exhibited nonstop, uncontrollable automatic and accurate memories of her personal past. They termed this phenomenon "hyperthymestic syndrome."⁶⁶ In the psychotherapeutic process dialogue, clarification, perspective, and reinterpretation of past events elicits affective and experiential determinants of memory and facilitates

a reconstructive self-narrative.⁶⁷ Error, causality, and attribution correction is fundamentally a learning process emancipating the unitary self (explicit and implicit] from false beliefs.⁶⁷⁻⁷³

SUMMARY AND CONCLUSION

The autobiographical self is a complex, mental phenomenon integrating memory (past, present, and images of future), emotion, and experience into an extended consciousness that conveys a lived past, an ambient present, and an anticipated future. Developmental, neurobiologic, and cultural determinants give form, modify, constrict, and expand the possibilities of adaptive and creative reactions, plans, and behavior.

Increasing our understanding of the operations that underlie autobiographic memory and experience will enlighten our diagnostic precision and therapeutic skill.

REFERENCES

- Damasio AR. Investigating the biology of consciousness. *Philos Trans R Soc Lond B Biol Sci.* 1998;353(1377):1879-1882.
- Damasio AR. *The Feeling of What Happens: Emotion, Reason and the Human Brain in the Making of Consciousness.* New York, NY: Harcourt-Brace; 1999.
- Damasio AR. Emotion and the human brain. *Ann NY Acad Sci.* 2003;1001:101-106.
- Damasio AR. Feelings of emotions and the self. *Ann NY Acad Sci.* 2003;1001:253-263.
- LeDoux JE. The self: clues from the brain. *Ann NY Acad Sci.* 2003;1001:295-304.
- Debre J, LeDoux J. From self knowledge to a science of self. *Ann NY Acad Sci.* 2003;1001:305-316.
- Anderson MC, Green C. Suppressing unwanted memories by executive control. *Nature.* 2001;410(6826):366-369.
- Addis DR, Tippet LJ. Memory of myself: autobiographical memory and identity in Alzheimer's disease. *Memory.* 2004;12(1):56-74.
- Devos T, Banaji MR. Implicit self and identity. *Ann NY Acad Sci.* 2003;1001:177-211.
- Bird A, Reese E. Emotional reminiscing and the development of an autobiographical self. *Dev Psychol.* 2006;42(4):513-526.
- Walker WR, Skowronski JJ and Thompson. Life is pleasant and memory helps to keep it that way. *Review of General Psychology.* 2003;7(20):203-210.
- Berntsen D. Voluntary and involuntary access to autobiographical memory. *Memory.* 1998;6(2):113-141.
- Berntsen D, Hall NM. The Episodic nature of involuntary autobiographical memories. *Mem Cognit.* 2004;32(5):789-803.
- Moss H. Implicit selves: a review of the conference. *Ann NY Acad Sci.* 2003;1001:1-30.
- Moran JN, Macrae CN, Heatherton TF, Wyland CL, Kelley WM. Neuroanatomical evidence for distinct cognitive and affective components of self. *J Cogn Neurosci.* 2006;18(9):1586-1594.
- Jacobson E. The Self and the Object World — vicissitudes of their infantile cathexes and their influence on ideational and affective development. *Psychoanal.* 1954 9:75-127.
- Sandler J, Rosenblatt B. The concept of the representational world. *Psychoanal.* 1962;17:128-145.
- McAdams DP, Bauer JJ, Sakoda AE, et al. Continuity and change in the life story: a longitudinal study of autobiographical memories in a merging adulthood. *J Pers.* 2006;74(5):1371-1400.
- Conway MA, Pleydell-Pearce CW. The construction of autobiographical memories in the self memory system. *Psychol Rev.* 2000;107(2):261-288.
- Conway MA. Sensory-perceptual episodic memory its content autobiographical memory. *Philos Trans R Soc Lon B Biol Sci.* 2001;356(1413):1375-1384.
- Levine B. Autobiographical memory and the self in time: brain lesion effects functional neuroanatomy and lifespan development. *Brain Cogn.* 2004;55(1):54-68.
- Neisser U. Five levels of self knowledge. *Philosophical Psychology.* 1988;1:35-59.
- Neisser U. The roots of self knowledge: perceiving self, it, and them. *Ann NY Acad Sci.* 1997;818:18-33.
- Piefke M, Weiss PH, Zilles K, Markowitsch HJ, Fink GR. Differential remoteness and emotional tone modulate the neural correlates of autobiographical memory. *Brain.* 2003;126(Pt 3):650-668.
- Piefke M, Fink GR. Recollections of one's own past: The effects of aging and gender on the neural mechanism of autobiographical memory. *Anat Embryol (Berl).* 2005;210(5-6):497-512.
- Brockmeier J. Autobiographical time. *Narrative Inquiry.* 2000;10(1):51-73.
- Steen FF. *Autobiography Studies.* 1998;13(1):7-38.
- Blinder BJ. Psychodynamic Neurobiology. In: Beitman B, Blinder B, Thase M, Riba M, Safer D, eds. *Integrating Psychotherapy and Pharmacotherapy.* New York, NY: Norton; 2003:161-180.
- Wang Q, Brockmeier J. Autobiographical remembering as cultural practice: understanding the interplay between memory, self, and culture. *Culture and Psychology.* 2002;8(1):45-64.

30. Nelson K. Self and social functions: Individual autobiographical memories and collective narrative. *Memory*. 2003;11(2):125-136.
31. Perner J. About belief and remembering the factual. In: Mitchell P, KJ Riggs, eds. *Children's Reasoning and the Mind*. Sussex, UK: Psychology Press; 2000:361-401.
32. Perner J, Lang B. Development of frame of mind and executive control. *Trends Cogn Sci*. 1999;3(9):337-344.
33. Fonagy P, Gergely G, Jurist E, Target M. *Affect Regulation, Mentalization and the Development of the Self*. New York, NY: Other Press; 2002:74-81;242-251.
34. Povinelli DJ, Simon BB. Young children's understanding of briefly versus extremely delayed images of the self: emergence of the autobiography stance. *Dev Psychol*. 1998;34(1):188-194.
35. Povinelli DJ, Landry AM, Theall A, et al. Development of young children's understanding that the recent past is causally bound to the present. *Dev Psychol*. 1999;35(6):1426-1439.
36. Wang Q. Cultural effects on adults' earliest childhood: Recollections and self description implications: the relation between memory and self. *J Personality and Social Psychology*. 2001;21(2):220-233.
37. Vrielynck N, Deplus S, Philippot P. Overgeneral autobiographical memory and depressive disorder in children. *J Clin Child Adolesc Psychol*. 2007;36(1):95-105.
38. Piolino P, Desgranges B, Clarys D, et al. Autobiographical memory, autothetic consciousness and self perspective in aging. *Psychol Aging*. 2006;21(3):510-525.
39. Johnson RJ, Greenhoot AF, Glisky E, McClosky LA. The relations among abuse, depression, and adolescents' autobiographical memory. *J Clin Child Adolesc Psychol*. 2005;34(2):235-247.
40. Buss C, Wolf OT, Vitt J, Hellhammer DJ. Autobiographical memory impairment following acute cortisol administration. *Psychoneuroendocrinology*. 2004;29(8):1093-1096.
41. Piolino P, Hisland M, Ruffevelle I, Matuszewski V, Jambaque I, Eustache F. Do school-age children remember or know the personal past? *Conscious Cogn*. 2007;16(1):84-101.
42. Addis DR, Wong AT, Schacter DL. Remembering the past and imagining the future: common and distinct neural substrates mediate event construction and elaboration. *Neuropsychologia*. 2007;45(7):1363-1377.
43. Hassabis D, Kumaran D, Vann SD, Maguire EA. Patients with hippocampal amnesia cannot imagine new experiences. *Proc Natl Acad Sci U S A*. 2007;104(5):1726-1731.
44. Mitchell JP, Heatherton TF, Macrae CN. Distinct neural systems subserve person and object knowledge. *Proc Natl Acad Sci U S A*. 2002;99(23):15238-15243.
45. Macrae CN, Moran JM, Heatherton TF, Banfield JF, Kelley WM. Medial prefrontal activity predicts memory for self. *Cerebral Cortex*. 2004;14(6):647-654.
46. Mason MF, Banfield JF, Macrae CN. Thinking about actions: The neural substrates of person knowledge. *Cerebral Cortex*. 2004;14(2):209-214.
47. Maguire EA. Neuroimaging studies of autobiographical event memory. *Philos Trans R Soc Lon B Biol Sci*. 2001;356(1413):1444-1451.
48. Maguire EA. Neuroimaging, memory, and the human hippocampus. *Rev Neurol (Paris)*. 2001;157(8-9 Pt 1):791-794.
49. Levine B, Turner GR, Tisserand D, Hevenor SJ, Graham SJ, McIntosh AR. The functional neuroanatomy of episodic and semantic autobiographical remembering: a prospective functional MRI study. *J Cogn Neurosci*. 2004;16(9):1633-1646.
50. Schaefer A, Philippot P. Selective effects of emotion on the phenomenal characteristics of autobiographical memories. *Memory*. 2005;13(2):148-160.
51. Markowitsch HJ, Thiel A, Reinkemeier M, Kessler J, Koyuncu A, Heiss WD. Right amygdale and temporo-frontal activation during autobiographical memory but not during fictitious memory retrieval. *Behav Neurol*. 2000;12(4):181-190.
52. Svoboda E, McKinnon MC, Levine B. The functional neuroanatomy of autobiographical memory: a meta-analysis. *Neuropsychologia*. 2006;44(12):2189-2208.
53. Raes F, Hermans D, Williams JN, et al. Is overgeneral autobiographical memory an isolated memory phenomenon in major depression? *Memory*. 2006;14(5):584-594.
54. Williams JM, Barnhofer T, Crane C, et al. Autobiographical memory specificity and emotional disorder. *Psychol Bull*. 2007;133(1):122-148.
55. Lemogne C, Piolino P, Jouveat R, Allilaire JF, Fossati P. Episodic autobiographical memory in depression: a review. *Encephale*. 2006;32(5 Pt 1):781-788.
56. Lemogne C, Piolino P, Friszer S, et al. Episodic autobiographical memory in depression: Specificity autothetic consciousness and self perspective. *Conscious Cogn*. 2006;15(2):258-268.
57. Wessel J, Meeren M, Peeters F, Arntz A, Merckelbach H. Correlates of autobiographical memory specificity: The role of depression, anxiety, and childhood trauma. *Behav Res Ther*. 2001;39(4):409-421.
58. Sinclair JM, Crane C, Hawton K, Williams JM. The role of autobiographical memory specificity in deliberate self-harm correlates and consequences. *J Affect Disorder*. 2007; Jan 26 (in press).
59. Wilhelm S, McNally RJ, Baer L, Florin I. Autobiographical memory in obsessive compulsive disorder. *Br J Clin Psychol*. 1997;36(Pt 1):21-31.
60. Jones B, Heard H, Startup M, Swales M, Williams JM, Jones RS. Autobiographical memory and dissociation in borderline personality disorder. *Psychol Med*. 1999;29(6):1397-1404.
61. Krems I, Spinhoven P, Van der Does AJ. Autobiographical memory in depressed and non depressed patients with borderline personality disorder. *Br J Clin Psychol*. 2004;43(Pt 1):17-29.
62. Mansell W, Lam D. A preliminary study of autobiographical memory in remitted bipolar and unipolar depression and the role of imagery in the specificity of memory. *Memory*. 2004;12(4):432-446.
63. D'Argembeau, A VanderLinden M, d'Acremont M, et al. "Phenomena characteristics of autobiographical memories for social and non-social events in social phobia. *Memory*. 2006;14(5):637-647.
64. Danion JM, Cuervo C, Piolino P, et al. Conscious recollection in autobiographical memory: An investigation in schizophrenia. *Conscious Cogn*. 2005;14(3):535-547.
65. Parker ES, Cahill L, McGaugh JL. A case of unusual autobiographical remembering. *Neurocase*. 2006;12(1):35-49.
66. Williams JM, Teasdale JD, Segal ZV, Soulsby J. Mindfulness based cognitive therapy reduces overgeneral. *J Abnorm Psychol*. 2000;109(1):150-155.
67. Wang Q, Ross M. What we remember and what we tell: the effects of culture and self priming? On memory representations and narratives. *Memory*. 2005;13(6):594-606.
68. Wang Q. Relations of maternal style and child self concept to autobiographical memory in Chinese, Chinese immigrants and European American three year olds. *Child Dev*. 2006;77(6):1794-1809.
69. Johnson SC, Baxter LC, Wild LS, Pipe JG, Heiserman JE, Prigatano GP. Neural correlates of self-reflection. *Brain*. 2002;125(Pt 8):1808-1814.
70. Riva G, Waterworth JN. Presence and the self a cognitive neuroscience approach. *Presence-Connect*. 2003;3(3); www.informatik.umu.se/~jwworth/Riva-Waterworth.htm.
71. Park RJ, Goodyer OM, Teasdale JD. Effects of induced rumination and distraction on mood and overgeneral autobiographical memory in adolescent major depression disorder and controls. *J Child Psychol Psychiatry*. 2004;45(5):996-1006.
72. Barry ES, Naus MJ, Rehm LP. Depression, implicit memory, and self: a revised memory model of emotion. *Clin Psychol Review*. 2006;26(6):719-745.