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Proust - the Scientist

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Abstract

Proust was not only a French writer, but - based on his incredible scientific knowledge and descriptions in his novel - to some extent, a neurologist and psychologist. Far ahead of his time, Proust illustrated in his masterpiece *In Search of Lost Time* a link between personal memories and sensory stimuli. In his novels, he explains the mechanism of memory retrieval after perceiving a sensation.

Without a doubt the most famous scene of *In Search of Lost Time* remains the moment when the taste of a French pastry, called “madeleine,” rekindles the childhood memories of the narrator Marcel in the first volume *Swann’s Way*. Similarly, listening to Vinteuil’s Sonata triggers and maintains Swann’s love for Odette and its expression in the second volume of the masterpiece *In Search of Lost Time*.

His descriptions reveal that human senses are not only linked to personal memories, but may also trigger them. Moreover, contemporary studies in the biological field have shown that there are correlations between stimuli and intangible feelings and states of mind, such as love, hatred, and sympathy, primarily located in the amygdala of the human brain.

Reading Proust’s masterpiece *In Search of Lost Time* through the lens of current neurological studies opens an interesting and innovative perspective on the subject of memory retrieval and shows that he was not “only” a writer, but also an observational scientist.

Keywords

Proust, memory, neurologist

Richardson and Steen state that “[f]ew critics have as yet produced cognitively informed interpretive readings of literary texts that at the same time fully acknowledge their historical specificity” (5). I strongly agree with them in a sense that “[t]his deficiency is unfortunate” because “recourse to cognitive, evolutionary, and neuroscientific models can usefully extend the parameters and productively complicate the methodologies of literary and cultural history” (6). The emergent field of cognitive literary criticism is the beginning of a “new interdisciplinarity” (Richardson and Crane 123) or “what [also] might be called a ‘neural historicism’” (137) where it is important to “forge links between literary studies and cognitive science” (Richardson and Steen 2). Turner and Iser have done some interesting research concerning the reader’s mind. Less work has been done, however, on the writer’s mind even though “by delineating the models of mental operations that influenced writers working in earlier historical periods, critics can negotiate between these historical models (whether intuitive or explicitly theorized) and the more recent paradigms of cognitive neuroscience” (6). That is why, in this article, I will try to focus on the writer’s mind. Which “mental operations” inspired Proust to write a work like *À la Recherche du Temps Perdu*? How can we use today’s biological knowledge to find out more about former writer’s “mental operations” throughout their writing process? This is important because this intuitive knowledge of “writers working in earlier time periods” has inspired in turn today’s scientific research.

Furthermore, Richardson and Crane state that “[l]iterary studies will also need to pay new attention to various writers’ attempts, through history, to imagine, understand, and represent their own cognitive

processes" (132) because they claim that "university presses attempt to maximize sales with academic titles that can be marketed across disciplinary lines" (123). They solely terminate their article "Literary Studies and Cognitive Science: Toward a New Interdisciplinarity" with the following quote: "Those willing to cross disciplinary lines in the age of cognitive science stand to contribute similarly productive models and to elicit a whole range of new meanings in the texts, practices, and historical and cultural configurations that we study" (137).

"Et pourquoi ne pas se prévaloir de l'œuvre de Proust pour la défense des intérêts scientifiques?" (146) asks Vannucci in his work *Marcel Proust à la Recherche des Sciences*. Indeed. Why not? In times of an evolving and fast moving world, literary scholars need to become more flexible and broaden their knowledge in other disciplines such as hard sciences. Many writers and philosophers have always been interested in and fascinated by contemporary scientific findings. Due to their curiosity some of their scientific knowledge found its way into novels and influenced these writers. That is why, in order to understand the whole extent of literary work, today's critics have to be proficient in hard sciences as well.

Proust is the ideal author to study these intersections between art and science, because "[p]our Proust, représentant par excellence de la culture littéraire, la science et les arts offrent deux approches complémentaires du savoir. Il ne craint pas d'énumérer plusieurs points de contact entre ces deux côtés traditionnels de la connaissance humaine" (Vannucci 159). Critics like Wimmers and Vettard noticed more than one decade ago Proust's link to contemporary scientific disciplines such as physics, psychology, philosophy but also neuroscience. While Vettard is pointing out Proust's connection to Einstein, Wimmers seems convinced that "[r]eading Proust in the twenty-first century will, no doubt, be enriched by ... interdisciplinary perspectives" (182) such as neuroscientific ones. In her work *Proust and Emotion*, she argues "that an interdisciplinary approach to emotions might be the most fruitful" (181). I strongly agree with her viewpoints. In this article I will try to depict the underlying neuroscientific assumptions Proust makes well before scientists had access to brain imaging techniques.

In his work *In Search of Lost Time*, Proust uses the madeleine episode to trigger Marcel's autobiographical memory retrieval. His understanding of psychological and neurological processes in the human brain is impressive, if you take into account that research methods like fMRI (functional magnetic resonance imaging) could not be explored in the beginning of the 20th century. That is why Proust can be considered as a pioneer of his time period. Proust was no conventional author, but could have also pursued a career in neurology, psychology or biology.

Wimmers made similar observations in her work *Proust and Emotion*. She states that "[e]motions ... are best studied within a concrete situation viewed over time and from different perspectives" (181). It seems that Proust knew about this all along from the beginning of the 20th century. In his novels he provides us with concrete situations like the madeleine episode that elicits the odor- and taste-evoked memories of the narrator, but also the Vinteuil Sonata that is undoubtedly somehow linked to Swann's love for Odette and triggers music related memories. Wimmers has observed that

Proust's novel, by allowing us to witness how a character, with a given sensibility, emotions, memory, and views evolves in time, and by providing us, moreover with the retrospective evaluation of a narrator already engaged in the process of giving shape to his life, involves us in an intricate web of associations that is far richer and more revealing about complex emotions than any single theory could possibly be. (180)

It is thus not surprising that Proust is omnipresent in today's biological research. His depictions of memory recall inspired scientists and their discovery was coined "the Proust phenomenon" (Chu and Downes 511). Daselaar, a scientist who was working on auditory recalled memories, found out that "visual and other sensory areas may have their greatest effect late in the process" (226) of memory retrieval. In order to support his theory, he quoted the French novel in his research paper:

Proust (1928/1934) described something similar in his classic account of autobiographical memory wherein the smell and taste of a ‘petite madeleine’ first produces ‘an exquisite pleasure ... detached, with no suggestion of its origin’ and then after a time ‘the memory returns ... immediately the old grey house upon the street ... rose up like the scenery of a theatre and with the house the town. (Daselaar et al. 226)

Whereas Herz, researcher who studied odor-evoked memories, states that “Proust’s childhood memories of his aunt’s house in Combray [sic] that he describes in *Swann’s Way* may never have come back to him had he not smelled the linden tea and madeleine biscuit concoction” (223). And indeed, there is compelling evidence that “odors are thought to be ‘the best cues to memory’ ... not only because of their emotionality, but more importantly because they may be able [to] bring to consciousness memories that would otherwise be forever forgotten” (Herz 223). Since the madeleine episode is the key scene that triggers the story told by Marcel, the narrator of Proust’s novel, it would have been very unfortunate, “had he not smelled the linden tea and the madeleine biscuit concoction” and those memories may have been lost to time. Furthermore, research has given evidence that “memories recalled by odors [are] significantly more emotional and evocative than those recalled by the same cue presented visually or auditorily” (217). These scientific findings are consistent with Proust’s assumptions in the beginning of the 20th century. That is why the madeleine episode is often referenced amongst scientists. For those reasons we should take note that research indicates that there are connections between sensory perception like odor or music and our autobiographical memories as well as our emotions.

These findings are also consistent with neuroanatomy. Aggleton and Mishkin discovered in 1986 that “the olfactory area is unique among the senses in synapsing directly with the amygdala-hippocampal complex” (Herz 222). In other words, odor-evoked memories are powerful in terms of memory retrieval due to the olfactory cortex in the human brain being directly linked to the hippocampus, the area of the human brain where our declarative memory is located, and the amygdala, the area where our emotional center is located in the brain.

The following diagram shows the activity of different parts of the human brain during memory retrieval. The data was collected throughout fMRI measurements by Daselaar. For this purpose, he presented auditory cues to his participants who were blindfolded and unable to receive any external visual stimuli. The first graph shows mainly the activity in the hippocampus. The second graph demonstrates the activity in the visual cortex of the human brain. Therefore, it can be concluded that “memory access-related activity (i. e. hippocampus ...) are all on a descending slope ... whereas the time courses of the regions associated with elaboration (i. e. visual cortex ...) are on an ascending slope” (Daselaar 222). In other words, the hippocampus seems to be active in the beginning of a memory recall, but its activity is decreasing over time, whereas the visual cortex shows a rather low activity in the beginning of memory retrieval, but rises with time.

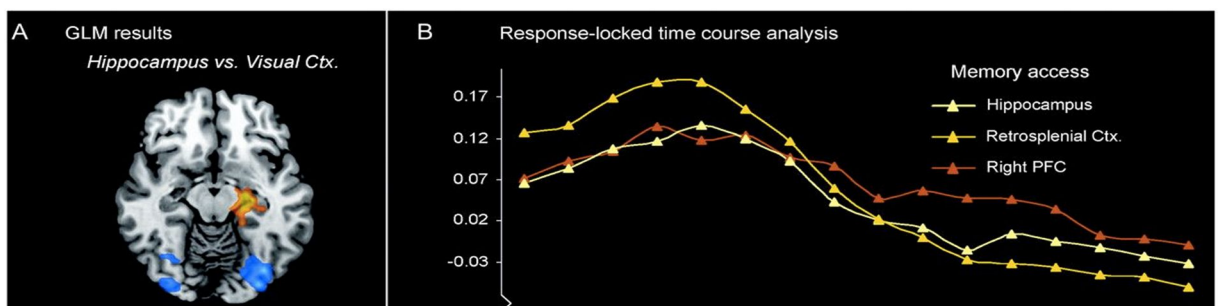


Figure 1: Activity in the hippocampus (yellow) data by Daselaar, Sandar M. et al. “The Spatiotemporal Dynamics of Autobiographical Memory: Neural Correlates of Recall, Emotional Intensity, and Reliving.” *Cerebral Cortex*, 2008, 217-29. Accessed 14 Mar 2016.

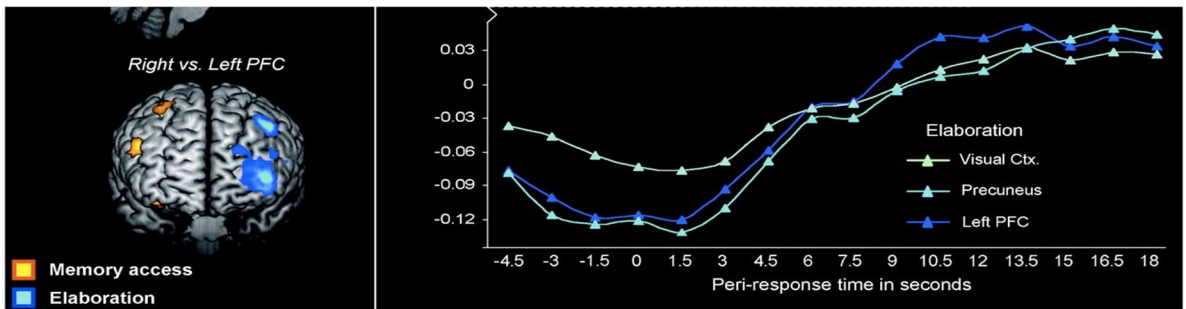


Figure 2: Figure 1: Activity in the visual cortex (green) data by Daselaar, Sandar M. et al. “The Spatiotemporal Dynamics of Autobiographical Memory: Neural Correlates of Recall, Emotional Intensity, and Reliving.” *Cerebral Cortex*, 2008, 217-29. Accessed 14 Mar 2016.

I argue that Proust’s narrator is referring to the decreasing activity in the hippocampus when he is describing gradual loss of strength in the process of memory retrieval. I also claim that Proust was able to describe “the descending slope” at the beginning of the 20th century in the absence of the technologies described above:

Je bois une seconde gorgée où je ne trouve rien de plus que dans la première, une troisième qui m’apporte un peu moins que la seconde. Il est temps que je m’arrête, la vertu du breuvage semble diminuer. Il est clair que la vérité que je cherche n’est pas en lui, mais en moi. Il l’y a éveillée, mais ne la connaît pas, et ne peut que répéter indéfiniment, avec de moins en moins de force, ce même témoignage que je ne sais pas interpréter et que je veux au moins pouvoir lui redemander et retrouver intact, à ma disposition, tout à l’heure, pour un éclaircissement décisif. Je pose ma tasse et me tourne vers mon esprit. C’est à lui de trouver la vérité. (CS 45)¹

Of course, due to the limited knowledge of brain organization, he cannot call it “hippocampus” and needs to describe the process in other words, but the narrator is aware of the fact that there is something going on in his mind that has to be excluded from every possible distraction. He knows that the memory is fading as time passes. That is why, afraid of losing his memory, he puts down his cup and focuses on his mind. The narrator tells us,

Je veux essayer de le faire réapparaître. [...] et je sens tressaillir en moi quelque chose qui se déplace, voudrait s’élever, quelque chose qu’on aurait désanchré, à une grande profondeur; je ne sais ce que c’est, mais cela monte lentement. (CS 45/46)

In this quote, Marcel’s introspection matches the description of the increasing activity in the visual cortex during memory retrieval. The description of “something that leaves its resting-place and attempts to rise” (Proust, *Senses of Consciousness* 41) and the fact that the narrator “can feel it mounting slowly” seem to perfectly describe the graph in Daselaar’s data. Moreover, the narrator seems to reinforce my theory by confirming: “Certes, ce qui palpète ainsi au fond de moi, ce doit être l’image, le souvenir visuel, qui, lié à cette saveur, tente de la suivre jusqu’à moi” (CS 46). Albeit a foreign terminology to him, it appears undeniable that he is referring to the visual cortex when depicting the visual memory in this description. Moreover, he seems to be perfectly aware of the fact that the visual experience is somehow linked to that taste.

¹ CS stands for *Du côté de Chez Swann*.

Furthermore, the data of contemporary research, which claims that “memories recalled by odors [are] significantly more emotional and evocative than those recalled by the same cue presented visually or auditorily” (Herz 217) matches Marcel’s discovery in the novel: “La vue de la petite madeleine ne m’avait rien rappelé avant que je n’y eusse goûté” (CS 47). Also Proust’s reasoning behind this process appears to be very scientific: “[P]eut-être parce que, en ayant souvent aperçu depuis, sans en manger, sur les tablettes des pâtisseries, leur image avait quitté ces jours de Combray pour se lier à d’autres plus récents.” This statement is again consistent with today’s findings where there is compelling evidence that our brain is constantly rewiring its neurons throughout lifetime, a phenomenon known as neuroplasticity.

In order to talk about the Vinteuil Sonata, I have to give some information about the importance and quality of musically recalled memories. Interestingly enough, participants of Herz’s study with odor-evoked memories “did not believe that their odor-evoked memories were the most emotional. In fact, they believed that their musically recalled memories were” (Herz 218). Therefore, “[a]udition is an especially important contrast cue because music is considered to be a very potent emotional reminder.”

In addition to that, when Marcel is drinking the tea and eating the madeleine, positive feelings are triggered. The narrator tells us about a “plaisir délicieux” (CS 45) and “puissante joie” he is feeling. These remarks are consistent with Jäncke’s study on music where “songs [that] evoked mainly positive [feelings] such as nostalgia [...] were recognized significantly better than those rated as less positive” (Jäncke 21.4) in terms of retrieved emotions.

However, in spite of odor-linked memories being considered the most emotionally provocative cues, music-linked memories are not less important, since “[i]t is impossible to determine whether it is the odor or the memory that elicited this emotion, because an odor that is linked to an emotional association is just that - the scent and the emotional association are inextricably intertwined” (Herz 222).

We can conclude that memories triggered by a song can also elicit strong emotions. I argue that this is the case when Swann falls in love with Odette by listening to the Vinteuil sonata over and over again. In this context, we have to take into consideration that in Proust’s novels love always develops via esthetics such as art or music, meaning that Swann justifies his love for Odette with the fact that she reminds him of Botticelli’s famous painting of Jethro’s daughter, Zipporah.

A similar mechanism is triggered when he is describing the Vinteuil Sonata experience. Curiously enough, the first encounter of Odette leaves a rather negative impression upon Swann: “[E]lle était apparue à Swann non pas certes sans beauté, mais d’un genre de beauté qui lui était indifférent, qui ne lui inspirait aucun désir, lui causait même une sorte de répulsion physique” (CS 195). After reading this description, it seems safe to make the presumption that Swann is not going to fall in love with this woman, but he does. In contrast, the first encounter of the Vinteuil Sonata leaves an extremely positive impression upon Swann. The narrator tells us about Swann’s “grand plaisir” (208) he experiences while listening to the sonata and tells us that he “avait éprouvé pour elle [la sonate] comme un amour inconnu” (210).

So how would a researcher approach this phenomenon of Swann falling in love with Odette? I claim that there is a progressively developing neuronal connection between the sonata and Odette in Swann’s brain. After that connection was built, a flood of positive emotions mask the negative ones originally felt for Odette. I argue that this neuronal link was built in Mrs. Verdurin’s living room, while Swann and Odette, being forced to sit next to each other on the couch, listen to the pianist playing the Vinteuil Sonata.

The initial description of the Vinteuil Sonata experience that describes Swann’s feeling before he even meets Odette and knows the title of the sonata is pretty interesting because it is an allegory for Swann’s and Odette’s future relationship. This quote is a key quote in the novel, because it can be considered a prolepsis for the whole relationship between Swann and Odette with all its ups and downs. Although the narrator claims to talk about music, Odette and her character of a courtesan who is manipulating and using Swann is already present.

D'un rythme lent elle le dirigeait ici d'abord, puis là, puis ailleurs, vers un bonheur noble, inintelligible et précis. Et tout d'un coup, au point où elle était arrivée et d'où il se préparait à la suivre, après une pause d'un instant, brusquement elle changeait de direction, et d'un mouvement nouveau, plus rapide, menu, mélancolique, incessant et doux elle l'entraînait avec elle vers des perspectives inconnues. Puis elle disparut. Il souhaita passionnément la revoir une troisième fois. Et elle reparut en effet, mais sans lui parler plus clairement, en lui causant même une volupté moins profonde. Mais, rentré chez lui, il eut besoin d'elle : il était comme un homme dans la vie de qui une passante qu'il a aperçue un moment vient de faire entrer l'image d'une beauté nouvelle qui donne à sa propre sensibilité une valeur plus grande, sans qu'il sache seulement s'il pourra revoir jamais celle qu'il aime déjà et dont il ignore jusqu'au nom. (CS 210)

Consequently, this description illustrates the connection between the sonata and the woman. The woman and the composition have both a massive influence on Swann. They have such a power over him that they can lead him everywhere they please. This quote proves that Odette and the sonata are inextricably intertwined in Swann's mind. The text even states explicitly the existence of such a connection: "La petite phrase² continuait à s'associer pour Swann à l'amour qu'il avait pour Odette" (CS 236).

The quote "Mais, rentré chez lui, il eut besoin d'elle" (CS 210) illustrates Swann's emotional dependence on Odette. Swann is obsessed with this woman and incapable of living or being without her. Research has indicated that there is a reward area in our brain, which is active in a very similar way when we either listen to music, or see the person we are in love with, or take drugs. And indeed, "[à] voir le visage de Swann pendant qu'il écoutait la phrase, on aurait dit qu'il était en train d'absorber un anesthésique qui donnait plus d'amplitude à sa respiration" (237). Hence, while listening to the sonata Swann himself looks like he is on drugs.

In conclusion, based on scientific knowledge, I argue that Swann learned to love Odette. There is compelling evidence that some forms of love are forms of addictions. I claim that this is the case for Swann's love to Odette. Swann is on the one hand addicted to the sonata and therefore, he will listen to it over and over again. However, in his mind, the sonata is strongly linked to Odette. Consequently, every time he listens to the sonata, he will think of Odette and he will relive moments with her. Since the Jäncke study taught us that positive memories are more likely to be recalled than negative ones, Swann will mostly remember the positive moments with Odette and get the feeling of nostalgia. His love for Odette seems to be the result of a learning process similar to classical conditioning. How else could it be that he falls in love with a woman for whom he had initially feelings of repulsion?

This process is similar to the pattern of revising for an exam. If we revise something often enough, we will memorize it better and our memories will be transferred from the short-term to the long-term memory, a process that takes place in the hippocampus of the human brain: "Glutamate receptors in the hippocampus appear to trigger the complex cascade of biochemical reactions that convert short-term memories into permanent ones, a process called long-term potentiation" (Powledge 517). Thus, if we can connect memories to positive feelings, the learning effect will be higher. This is often used in an educational and pedagogical context, where teachers try to positively reinforce their students in order to get better results in terms of learning. Addiction researchers are also interested in this phenomenon: "Because craving and reinforcement are aspects of learning, it is not surprising that addiction researchers are interested in glutamate, the neurotransmitter most associated with the learning process."

Last but not least, let me share three thoughts. Firstly, I think it is obvious that Marcel would have been the ideal study participant of Daselaar since he was describing the process of memory retrieval and further elaboration similar to the data Daselaar has collected. Secondly, Swann is addicted to the

² The sonata is often referred to as "little phrase" in the novel.

Vinteuil Sonata and therefore also to Odette. His love for her is the result of a learning process. Thirdly, I think Proust could have succeeded in a scientific career. He would have been pleased, had he had access to today's scientific vocabulary. His long sentences testify to his struggle for words in order to describe the complexity of psychological and neuronal processes in the human brain. According to Luckhurst, Proust asserts that "[a]rt, too, uncovers laws and truths and [that] these truths are just as necessary as those of physics or chemistry" (Luckhurst 48). I claim that reading *Du côté de chez Swann* through the lens of modern neuroscientific discoveries has proven that he was right. I will defend the same statement as Luckhurst does, when he argues that "[l]iterary truth is equated with scientific truth, and defended as such" (49). I also agree with his statement that "[w]hat fascinates Proust is not so much the science but, rather the revolutionary and revelatory effects which science can have on perception, 'votre vision des choses'" (53). *In Search of Lost Time* and its underlying psychological insights seem to leave no doubt that Luckhurst was right when making this assumption.

Even though Proust was more than once compared to Einstein, because his contemporaries were aware of the fact that both of them revealed big natural laws,³ Proust always stayed modest and pretended to know and understand less of Einstein's theories than he actually did. Becoming widely known at about the same time of the 20th century, both Einstein as the scientist and Proust as the scientific artist contributed in a crucial way to today's scientific knowledge.

What does this mean for literary research? Richardson and Crane mention the work of the two cognitive psychologists Richard Gerrig and Raymond Gibbs and consider it very promising in terms of "new interdisciplinary work," but at the same time, deplore that "neither has much to say about ... additional evidence from neuroscience" (135). This might be because there is a lack of detailed neuroscientific knowledge among scholars of other disciplines. Vannucci claims in that context that "[o]n peut d'ailleurs noter, en passant, qu'en règle générale, les scientifiques possèdent davantage de culture littéraire que les littéraires de culture scientifique" (Vannucci 145). I strongly promote a change in this attitude. In order to fully understand contemporary literary work, scholars have to deepen their knowledge in both disciplines, science and literature, in order to be capable of interdisciplinary approaches. "Pour Proust la distance entre les deux domaines, sciences et arts, n'est pas insurmontable" (162). Consequently, it should not be insurmountable for us, the critics, as well.

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³ Einstein discovered the relativity, whereas Proust discovered the deep psychological mechanisms that underlie love and memory retrieval.

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