

Was the Birth of Modern Art Psycholinguistically Minded?

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Section 1. Sciences, Humanities and the Formation of a 'Third Culture'

The organizers of the 2009 New York Academy of Sciences' "Two Cultures in the 21st Century" symposium¹ considered C. P. Snow's 50-year-old fear that a gap between the sciences and the humanities impedes social progress. Charles Percy Snow (1905-1980) is perhaps best known for the series of novels *Strangers and Brothers*, but we often forget that he was also an English physicist, who served in several important positions in the UK government. In his 7 May 1959 influential lecture called *The Two Cultures*, which provoked a heated debate and was followed by the publication *The Two Cultures and the Scientific Revolution*², it was argued that the breakdown of communication between the "two cultures" of modern society — the sciences and the humanities — was a major obstacle to solving the world's problems. Having dedicated his life to both of them as a scientist, a novelist and a statesman, Snow claimed that the quality of education in the world was on the decline: many scientists had never read Shakespeare or Dickens, and intellectuals had never heard of the Second Law of Thermodynamics. Above all, he feared a world in which science could grow divorced from politics and culture and argued that a disconnected society could not be healthy and could have great difficulties with handling the future.

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¹ Cf. Chris Mooney and Sheril Kirshenbaum (2009), *The Culture Crosser: remembering C. P. Snow*, *The New York Academy of Sciences Magazine* (on line), accessed in Sept 2010 at: <http://www.nyas.org/publications/Detail.aspx?cid=7c8633ad-434a-4dff-a162-eaca167bf2bc>

² C. P. Snow (1959), *The Two Cultures and the Scientific Revolution*, The Rede lecture 1959, New York: Cambridge University Press, 1961, accessed in Sept 2010 at: http://sciencepolicy.colorado.edu/students/envs_5110/snow_1959.pdf

Seen through an adequate lens, Snow is nowadays appreciated as an early theorist on the critical modern problem of how highly complex scientific information can be best translated into the process of political decision-making in all aspects and levels of government: he understood that the only solution is to align intellectual resources, both scientific and artistic, in order to achieve full world-changing potential, avoiding disciplinary divides or cultural disconnects.

Today, 50 years later, Snow's point is more impressive and stimulating than ever. Innovative scientific and technological solutions are the key to meeting the 21st century's economic, environmental, public health, and security challenges that transcend political borders, though in his times Snow did not know global threats such as climate change or bioterrorism. However, his vision of the need to unify the disparate intellectual camps suffering from mutual incomprehension (each of them with its own habits and vocabularies) in order to achieve the world-changing potential of science, was far-sighted. He understood that not every question could be best answered in terms of quantum mechanics and claimed that what art showed was that there are many different ways of describing reality, each of which is capable of generating truth. The result should be the formation of a third culture, closing the communication gap between the two, using them to their own advantage, i.e. as Snow put it, *Our fiction and our facts would feed off each other* (cf. discussion on this subject in section 5).

In fact, the history of our modern culture – and especially its formation in the very beginning of the 20th century – is full of examples of artists who (un)consciously tried to “close the gap”. Immersed in different artistic activities³, some of them tried to answer intuitive questions that science was sometimes able to approach only many decades later, but systematically forgetting those early artistic insights and contributions.

In the next sections of the present paper, we are going to approach three of these early 20th-century forerunners who in their writings dedicated themselves to fundamental linguistic and psycholinguistic questions that still divide many scholars in the early 21st century: (i) the role of structure in language (section 2), (ii) the

³ Our starting point here is: Jonah Lehrer (2008) *Proust was a Neuroscientist*, Boston, New York: Houghton Mifflin Company, A Mariner Book.

On Lehrer's debut, a leading neuroscientist, António Damásio, commented that it was: “a delightful, thoughtful read” and added on the cover of the Mariner Book 2008 edition: *In this technology driven age, it's tempting to believe that science can solve every mystery. After all, science has cured countless diseases and even sent humans into space. But as Jonah Lehrer argues in this sparkling debut, science is not the only path to knowledge. In fact, when it comes to understanding the brain, art got their first. Taking a group of artists – a painter, a poet, a chef, a composer, and a handful of novelists – Lehrer shows how each one discovered an essential truth about the mind that science is only now rediscovering. (...) More broadly, Lehrer shows that there's a cost to reducing everything to atoms and acronyms and genes. Measurement is not the same as understanding, and this is what art knows better than science. An ingenious blend of biography, criticism, and first rate science writing, *Proust was a Neuroscientist* urges science and art to listen more closely to each other, for willing mind as can combine the best of both, to brilliant effort.*

role of the meaning of *self* (section 3), and (iii) the relationship between language and memory (section 4). They are Gertrude Stein (1874-1946), Virginia Woolf (1882-1941) and Marcel Proust (1871-1922). All three of them had some characteristics in common: they came from well-off and educated Jewish families (Stern and Proust were of Jewish origin and Woolf's husband was a Jew); they were (financially) independent⁴ writers and significant figures in London or Paris literary societies; they were homosexual and the first European writers to treat homosexuality openly and at length. Two of them (Woolf and Proust) had serious health problems, which made them look for deep insights in order to deal with hard reality. It is also important to notice that one of the most important influences of all these artists was the science of their times: Stein was conducting psychology experiments in William James's lab, Woolf was learning about the biology of mental illness, and Proust was attending Bergson's lectures and reading his books; it is impossible to understand their art without taking into account its relationship to science.

However, the most outstanding common denominator for all three of these artists was the fact that they were strongly linguistically minded. They explored their own language practices and experiences and expressed what no scientific experiment could see at their time but what became confirmed (at least in part) by science many decades later: Stein was looking for language structure, Woolf for expression of meaning of one's *self*, and Proust for meaning of one's memories and relation between memory and language. It was not an easy task, as they lived in times when the old dream of the Enlightenment seemed within reach: life was reduced to chemistry, and chemistry to physics; the entire universe was nothing but "a mass of vibrating molecules"⁵. In such an organized world, art was supposed to be pretty and/or entertaining, and literature was expected to tell stories, and show the world as it was or could be, giving its readers some second-hand experience. The modernists turned against this world: they were not representing what they saw; they were searching for truth both outside and inside themselves, especially working (their) language, in order to make us see and understand ourselves better.⁶ (section 5).

⁴ Woolf's most famous claim is "A woman must have money and a room of her own if she is to write fiction." (In *A Room of One's Own*, 1929).

⁵ "For the most part, this new knowledge represented the triumph of a method; scientists had discovered reductionism and were successfully applying it to reality. In Plato's metaphor, the reductionist aims to «cut nature at its joints, like a good butcher». The whole can be understood only by breaking it apart, dissecting reality until it dissolves. This is all we are: parts, acronyms, atoms" (Jonah Lehrer, *Proust was a Neuroscientist*, Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008: ix).

⁶ "The birth of modern art was messy. The public was not accustomed to free-verse poems or abstract paintings or plotless novels, preferably both. It was supposed to tell us stories about the world, to give us life as it should be, or could be. Reality was hard, and art was our escape. But the modernists refused to give us what we wanted. In a move of stunning arrogance and ambition, they tried to invent fictions that told the truth. Although their art was difficult, they aspired to transparency: in the forms and fractures of their work, they wanted us to see ourselves." (Jonah Lehrer, *Proust was a Neuroscientist*, Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008: viii).

Section 2. In Search of Language Structure: Gertrude Stein

While Proust and Woolf are considered examples of the most outstanding novelists of modern literature, Gertrude Stein did not write anything that could be compared to the consecrated works of the other two, like *Miss Dalloway*, *Orlando*, *To the Lighthouse* or many volumes of *À la Recherche du Temps Perdu*.

After moving from America to Paris in 1903, Stein dedicated herself seriously to writing in different genres: novels, plays, stories, libretti and poems. She became known not for any of these works in particular but for her style that she began developing in earnest, giving it highly idiosyncratic characteristics: it was highly playful, repetitive and sometimes humorous, apparently with no sense at all. *Tender Buttons*, written in 1912 and published two years later, is the best known of Gertrude Stein's "hermetic" works. It is a small book separated into three arbitrary sections – *Food*, *Objects* and *Rooms*, each containing prose under subtitles. But in this case each section is not Stein's subject: her subject is language itself as illustrated in the following examples⁷:

(1) (In *Food*)

"A TIME TO EAT – *A pleasant simple habitual and tyrannical and authorised and educated and resumed and articulate separation. This is not tardy.*"

(2) (In *Objects*)

"RED ROSES – *A cool red rose and a pink cut pink, a collapse and a sold hole, a little less hot.*"

(3) (In *Objects*)

"APPLE – *Apple plum, carpet steak, seed clam, colored wine, calm seen, cold cream, best shake, potato, potato and no no gold work with pet, a green seen is called bake and change sweet is breadly, a little piece a little piece please. A little piece please. Cane again to the presupposed and ready eucalyptus tree, count out sherry and ripe plates and little corners of a kind of ham. This is use.*"

(4) (Fragments of *Rooms*)

"*A cape is a cover, a cape is not a cover in summer, a cape is a cover and the regulation is that there is no such weather. A cape is not always a cover, a cape is not a cover when there is another, there is always something in that thing in establishing a disposition to put wetting where it will not do more harm. There is always that disposition and in a way there is some use in not mentioning changing and in establishing the temperature, there is some use in it as establishing all that lives dimmer freer and there is no dinner in the middle of anything. There is no such thing.*"

⁷ All the quotations that follow are presented according to: Gertrude Stein (1912), *Tender Buttons*, The Project Gutenberg e-book consulted in Sept 2010, at: <http://www.gutenberg.org/files/15396/15396-h/15396-h.htm>

As the above examples 1-4 show, Stein plays with sounds (“*a little piece please*”, “*calm seen, cold cream*”, (ex. 3)), with repetitions (“*A cape is a cover, a cape is not a cover in summer, a cape is a cover and the regulation is that there is no such weather. A cape is not always a cover, a cape is not a cover when there is another...*” (ex. 4)), and with senseless juxtapositions that create humorous effects (“*Apple plum, carpet steak, seed clam, colored wine, calm seen, cold cream, best shake, potato, potato and no no gold work with pet ...*” (ex. 3), (cf. ex. 1 and 2)). All these games and strategies can be summed up in a famous quote of Stein’s writing that became a single cliché “*Rose is a rose is a rose is a rose*” (cf. ex. 2), for which she is remembered today even outside the college campus and references to cubism (when her famous portrait by Picasso is remembered). By repeating the noun, Stein struggled to separate the signifier from the referent it signified, to deconstruct it and to show that every word is made of arbitrary sounds that have nothing to do with what they signify. When we repeat the “rose sentence” what we really mean is exactly the contrary to what we say: a (word) *rose* is *not* a(n) (object) *rose*. Stein believed that only after this sort of *deconstruction* is another step of *reconstruction* possible, leading to another phase of the writing process.

The combination of Stein’s words coming from inside of her language game expose speech structure based on her (linguistic) instinct: syntactic combinations of nouns and adjectives, nouns and verbs, nouns and articles, verbs and prepositions, etc. show how the syntax of a language works, no matter what the intention to be conveyed is. This is a very special way of imagining language, when we forget that its purpose is supposed to be communication and its structure (syntax), meaning (semantics) and practice (pragmatics) are not supposed to operate independently. Stein defined language not in terms of content but in terms of its hidden structure that remained when meaning was stripped away.

The structure of language Gertrude Stein sought and fought for is believed today to be part of the structure of the brain and the innate grammar that Noam Chomsky discovered in the late 1950s⁸ and has been working on ever since⁹ and that

⁸ “Some thirty-five years ago a new science was born. Now called ‘cognitive science’, it combines tools from psychology, computer science, linguistics, philosophy, and neurobiology to explain the workings of human intelligence. The science of language, in particular, has seen spectacular advances in the years since. There are many phenomena of language that we are coming to understand nearly as well as we understand how a camera works or what the spleen is for (...) The recent illumination of linguistic abilities has revolutionary implications for our understanding of language and its role in human affairs, and for our view of humanity itself.” (Stephan Pinker *The Language Instinct* New York: Harper Perennial, 1995: 17).

⁹ Cf. *Syntactic Structures* (1957), *A review of B. F. Skinner’s “Verbal Behaviour”* (1959), *Aspects of the Theory of Syntax* (1965), *Language and the mind* (1972), *Reflection on language* (1975), *Rules and representation* (1980), *Barriers* (1986), *Language and problems of knowledge* (1988), *Linguistics and cognitive science: Problems and mysteries* (1991), *New horizons in the study of language and thought* (2000), among others.

Stephen Pinker glorified in his books, especially in *The Language Instinct* (1994) and *The Blank Slate* (2002)¹⁰.

By her writing experiments, Stein is considered to be a forerunner of *stream of consciousness*, a psychological theory often attributed to William James, which became the term used to describe the style of authors like Virginia Woolf and James Joyce, prose containing rhythmical essays or “portraits”, designed to evoke “the excitingness of pure being”. As Stein attended Radcliffe College from 1893 to 1897 and was a student of William James, performing experiments on Normal Motor Automatism – i.e. a phenomenon hypothesized to occur in people when their attention is divided between two simultaneous intelligent activities, like writing and speaking, for instance – her writing process was misunderstood, in 1934, by B. F. Skinner as an example of the “normal motor automatism”. As a matter of fact, Stein had never really accepted the theory of automatic writing, as she did not see her own work as automatic, more as an “excess of consciousness” of someone who worked with words as his/her material. She is considered not only a forerunner of the stream of consciousness but also as an important influence on modern art in general. As Sherwood Anderson put it in his public introduction to Stein’s 1922 publication of *Geography and Plays*:

“For me the work of Gertrude Stein consists in a rebuilding, an entirely new recasting of life, in the city of words. Here is one artist who has been able to accept ridicule, who has even forgone the privilege of writing the great American novel, uplifting our English speaking stage, and wearing the bays of the great poets to go live among the little housekeeping words, the swaggering bullying street-corner words, the honest working, money saving words and all the other forgotten and neglected citizens of the sacred and half forgotten city.”

Also Jonah Lehrer (2008) attributes an outstanding role to Stein in modern culture, considering her a precursor, a literary predecessor of Chomsky and of Chomskian linguistics:

“Once Stein realized – fifty years before Chomsky – that the structure of language was unavoidable, she set out to make that structure palpably obvious.

¹⁰ Stephan Pinker became famous first for his popularization of Noam Chomsky’s work on language as an innate faculty of mind and then of his own work on how children acquire language. He is most famous, though, for popularizing the idea that language is an “instinct” or biological adaptation shaped by natural selection, for suggesting an evolutionary mental module for language. His books, *How the Mind Works* (1997) and *The Blank Slate* (2002), are from the evolutionary psychology tradition (pioneered by E. O. Wilson, Leda Cosmides and John Tooby), which views the mind as being equipped with specialized tools that evolved by natural selection, just like other body parts. On this point, Pinker opposes Chomsky and others who regard the human capacity for language to be the by-product of other adaptations. Though Pinker is an ally of Daniel Dennett and Richard Dawkins in many evolutionary disputes, his idea remains controversial and *The Language Instinct* has been criticized by Geoffrey Sampson in his book, *The ‘Language Instinct’ Debate* (2005). The assumptions underlying the nativist view have also been subject to sustained criticism for instance in Jeffrey L. Elman, Elizabeth A. Bates, Mark H. Johnson, Annette Karmiloff-Smith, Domenico Parisi, Kim Plunkett (1996), *Rethinking Innateness: A connectionist perspective on development (Neural Networks and Connectionist Modeling)*, Cambridge MA: MIT Press.

As Stein observed in a pithy anticipation of Chomskian linguistics, ‘Everybody said the same thing over and over again and over again with infinite variations but over and over again’. What Stein wanted to do was see the source of this sameness, to cut words until their structure showed through.”¹¹

“Like Stein, Chomsky insisted that linguistics focus on the structure of language and not simply its individual words and phonetic tics. While linguists before Chomsky were content with classification and observation – they saw themselves as verbal botanists – Chomsky demonstrated that all their data missed the point. To see what Chomsky wanted us to see, we had to zoom out. Viewed from the lofty structuralist perspective, it suddenly became clear that every language – from English to Cantonese – was actually the same. While the words may be different, they shared the same subterranean form. Therefore, Chomsky hypothesized the existence of a universal grammar built into the brain. (...) It is this innate language apparatus that lets us order words, composing them within a structure that is at once subtle and inescapable”.¹²

Section 3. In Search of the Meaning of Self: Language in Virginia Woolf

Although Virginia Woolf (1882-1941) is considered one of the foremost modernist literary figures of the 20th century and arguably even the major lyrical novelist in the English language, she is known mostly for the “specificities” of her fiction.

Woolf suffered from a mental illness that eventually drove her to suicide in 1941. She referred to herself¹³ as *mad* and reported that she heard voices and had visions. What today could be seen as a bipolar disorder at times caused her distress and made her unable to focus for long on reading or writing; it often resulted in protracted periods of convalescence and withdrawing from her busy social life. When Woolf was not depressed she managed to work intensely for long periods at a time.

Woolf’s novels are highly experimental, as her narrative is distorted, refracted and even dissolved in the characters’ receptive consciousness. It is either uneventful and commonplace or full of ordinary, sometimes banal settings. For example, in her most famous novel *Mrs Dalloway* (1925)¹⁴, like Joyce in *Ulysses* before her, Woolf sets her narrative on a weekday in a bustling city. She centers on the efforts

¹¹ Jonah Lehrer, *Proust was a Neuroscientist*, Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008, p. 163.

¹² Jonah Lehrer, *Proust was a Neuroscientist*, Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008, p. 162.

¹³ As Virginia Woolf writes in one of her letters (Dec. 28, 1932) “My own brain is to me the most unaccountable of machinery – always buzzing, humming, soaring roaring diving, and then buried in mud. And why? What’s this passion for?”

¹⁴ Accessed in Sept 2010 at: <http://gutenberg.net.au/ebooks02/0200991.txt>

Fragments quoted according to: Virginia Woolf, *Mrs Dalloway*, New York: Harvest, 1990.

of Clarissa Dalloway, a middle-aged society woman, to organize a party, and interweaves her life with that of Septimus Warren Smith, a working-class veteran who has returned from the First World War bearing deep psychological scars and has become a shell-shocked poet. Woolf considers Clarissa's existence as one of "*those infinitely obscure lives that must be recorded*"¹⁵ and manages to expose everyday life as a vivid window into our psychology, using it to demonstrate the mind's fragility.

In Woolf's writings mind was approached as "*very erratic, very undependable – now to be found in a dusty road, now in a scrap of newspaper in the street, now in a daffodil in the sun.*"¹⁶ Overwhelmed by this feeling, Woolf believed however that there was something that kept us from disintegrating: "*What does one mean by the unity of the mind? (...) it seems to have no single state of being*"¹⁷. She discovered that "*I press to my center and there is something there.*"¹⁸: this is how the *self* emerged that made her whole out of apparently fleeting interpretations of the world. Like Clarissa in *Mrs Dalloway*, Woolf knew that her mind contained this invisible center – that was her *self*: "*Pointed; dartlike; definite. That was her self when some effort, some call on her to be her self, drew the parts together, she alone knew how different, how incompatible and composed so for the world only into one center, one diamond, one woman who sat in her drawing room...*"¹⁹.

Many years before modern neuroscience could defend it on the basis of experiments, Virginia Woolf foresaw that "*the mind is made of fragments, and yet these fragments are bound into being*"²⁰, as Jonah Lehrer (2008) put it referring to modern neuroscience²¹:

¹⁵ Virginia Woolf, *A Room of One's Own*, New York: Harvest, 1989: 89.

Cf. "*Let us not take it for granted that life exists more in what is commonly thought big than in what is commonly thought small*" (Virginia Woolf, "Modern Novels", *Times Literary Supplement*, April 19, 1919).

¹⁶ Virginia Woolf, *A Room of One's Own*, New York: Harvest, 1989: 110.

¹⁷ Virginia Woolf, *A Room of One's Own*, New York: Harvest, 1989: 97. Accessed Sept 10, 2010: <http://gutenberg.net.au/ebooks02/0200791h.html>

¹⁸ Virginia Woolf, *The Diary*, vol. 3: 275, In: *The Diary of Virginia Woolf*, Anne Olivier Bell (ed.) (1977-1980), 5 vols., London: Hogarth.

¹⁹ Virginia Woolf, *Mrs Dalloway*, New York: Harvest, 1990: 37.

²⁰ Cf. "*Almost a century later, the self remains elusive. Neuroscience has ransacked the brain and dissected the cortex, but it has not found our source. Although experiments have confirmed many of Woolf's startling insights – the mind is made of fragments, and yet these fragments are bound into being – our mystery persists. If we want to understand ourselves, Woolf's art is our most revealing answer.*" (Jonah Lehrer, *Proust was a Neuroscientist*, Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008: 170).

²¹ Cf. Michael Gazzaniga (ed.), 2000, *The New Cognitive Neurosciences*, 3rd edition, Cambridge: MIT University Press. Cf. "*Basic revisions in concepts of causality are involved in which the whole, besides being 'different from and greater than the sum of the parts', also causally determines the fate of the parts, without interfering with the physical or chemical laws for the subentities at their own level. It follows that physical science no longer perceives the world to be reducible to quantum mechanics or to any other unifying ultra element or field force. The qualitative, holistic properties at all different levels become causally real in their own form and have to be included in the causal account. Quantum theory on these terms no longer replaces or subsumes classical mechanics but rather just supplements or complements.*" Roger Sperry, 1981, "Some Effects of Disconnecting the Cerebral Hemispheres", Nobel lecture à http://nobelprize.org/nobel_prizes/medicine/laureates/1981/sperry-lecture.html (accessed Sept. 10, 2010).

*“Surreal as it seems, the modernists got the brain right. Experiment after experiment has shown that any given experience can endure for about ten seconds in short term memory. After that, the brain exhausts its capacity, for the present tense, and its consciousness must begin anew, with a new stream. As the modernists anticipated, the permanent-seeming self is actually an endless procession of disjointed moments.”*²²

*“Modern neuroscience is now confirming the self Woolf believed in. We invent ourselves out of our own sensations. As Woolf anticipated, this process is controlled by the act of attention, which turns our sensory parts into a focused moment of consciousness. The fictional self – a nebulous entity nobody can find – is what binds these separate moments together.”*²³

Section 4. In Search of the Meaning of Memories: Marcel Proust

Marcel Proust (1871-1922) was a French novelist, critic and essayist best known for his monumental work *À la recherche du temps perdu*²⁴ (*In Search of Lost Time*, first translated into English as *Remembrance of Things Past*), published in seven parts between 1913 and 1927²⁵. Proust was of poor health, suffered from asthma and spent the last three years of his life mostly confined to his bedroom, embedded deeply in his thoughts and memories, sleeping during the day and working at night to complete his autobiographical novel written mostly in a stream-of-consciousness style. The key scene of the novel is when a madeleine cake (a small, rich cookie-like pastry) enables the narrator to experience the past as a simultaneous part of his present existence and an awakening upon tasting a madeleine dipped in tea, as his aunt Léonie used to do in his childhood, on Sunday mornings at Combray, dipping it first in her own cup of tea or tisane:

“She sent out for one of those short, plump little cakes called petites madeleines, which look as though they had been molded in the fluted scallop of a pilgrim’s shell. And soon, mechanically, weary after a dull day with the prospect of a depressing morrow, I raised to my lips a spoonful of the tea in which I had soaked a morsel of the cake. No sooner had the warm liquid, and the crumbs with it, touched my palate than a shudder ran through my whole body, and I stopped, intent upon the extraordinary changes that were taking place...at once

22 Jonah Lehrer, *Proust was a Neuroscientist*, Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008: 177.

23 Jonah Lehrer, *Proust was a Neuroscientist*, Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008: 182-183.

24 Marcel Proust, *In Search of Lost Time*, 5 vols., New York: Modern Library, 1999.

Vol. I : *Du côté de chez Swann* was accessed Sept 10 2010 at: <http://www.gutenberg.org/ebooks/2650>.

25 Proust died before he was able to complete his revision of the drafts and proofs of the final volumes, the last three of which were published posthumously and edited by his brother, Robert.

the vicissitudes of life had become indifferent to me, its disasters innocuous, its brevity illusory... (...) *“And as soon as I had recognized the taste of the piece of madeleine soaked in her decoction of lime-blossom which my aunt used to give me (although I did not yet know and must long postpone the discovery of why this memory made me so happy) immediately the old gray house upon the street, where her room was, rose up like a stage set to attach itself to the little pavilion opening on to the garden which had been built out behind it for my parents (the isolated segment which until that moment had been all that I could see); and with the house the town, from morning to night and in all weathers, the square where I used to be sent before lunch, the streets along which I used to run errands, the country roads we took when it was fine.”*²⁶

While dipping his madeleine in a cup of tea, Proust collects pieces from his childhood, observations and comments on the lives of three families (Marcel's own, the aristocratic de Guermantes, and the family of the Jewish Bohemian dilettante Swann), gossip, and recollections of the past world. Thus, the novel does not have a clear and continuous plot line: Proust's memory takes the central role and apparently insignificant details prove to be the most important and senses like taste or smell (exemplified, for instance, by the texture of a napkin or the noise of water in the pipes) those which could recapture the past:

*“When from a long-distant past nothing subsists, after the people are dead, after the things are broken and scattered, still, alone, more fragile, but with more vitality...the smell and taste of things remain poised a long time like souls, ready to remind us, waiting and hoping for their moment, amid the ruins of all the rest; and bear unfaltering, in the tiny and almost impalpable drop of their essence, the vast structure of recollection.”*²⁷

Like the philosopher Henri Bergson, Proust believed that reality is best understood subjectively and its truths accessed intuitively. The cookie dipped in tea is in his case just a trigger of smell and taste, a convenient excuse for the writer to explore his favorite subject: *himself*²⁸. Starting with a plain cookie, his novel quickly swells into an epic of the artist's life: childhood, love, homosexuality, and time.

²⁶ Marcel Proust, *In Search of Lost Time*, Volume 1: *Swann's Way*, New York: Modern Library, 1998, p. 63.

²⁷ Marcel Proust, *In Search of Lost Time*, Volume 1: *Swann's Way*, New York: Modern Library, 1998, p. 63.

²⁸ *“No sooner had the warm liquid mixed with the crumbs touched my palate than a shudder ran through me and I stopped, intent upon the extraordinary thing that was happening to me. An exquisite pleasure had invaded my senses, something isolated, detached, with no suggestion of its origin. And at once the vicissitudes of life had become indifferent to me, its disasters innocuous, its brevity illusory; it was me. I had ceased to feel mediocre, contingent mortal. Whence could it have come to me, this all-powerful joy? I sensed that it was connected with the taste of tea and the cake, but that it infinitely transcended those savors, could not indeed be of the same nature. Whence did it come? What did it mean? How could I seize it and apprehend it? I drank a second mouthful, in which I find nothing more than in the first, then a third, which gives me rather less than the second. It is time to stop; the potion is losing its magic. It is plain that the truth I am seeking lies not in the cup but in myself.”* (Marcel Proust, *In Search of Lost Time*, Volume 1: *Swann's Way*, New York: Modern Library, 1998, p. 63).

Proust intuited what neurosciences showed many decades later²⁹: our sense of smell and taste are uniquely sentimental because they connect directly to the hippocampus, the center of the brain's long-term memory. All the other senses, such as sight, touch and hearing are less efficient at accessing the past as they are first processed by the thalamus, the source of language and the front door to consciousness.

Proust believed that our recollections were deceptive. The smell and taste that evoked them were real but memories were nothing more than fabrications, as exemplified in the novel for instance by his lover Albertine's beauty mark that "migrates" on her face accompanying different phases of recollection³⁰. Once more Proust intuited the scientific truth³¹ of the fallibility of memory and the imperfection of our remembrance of the past. As neurosciences show us nearly a century later³², every memory begins as a changed connection between two neurons, and communication is ongoing in synaptic clefts, i.e. vacant gaps between cells. The experiments of the last decade³³ reveal that the act of remembering changes us: it is a continual process, not a repository of inert information. Every time we remember something, the neuronal structure of the memory is reconsolidated, i.e. slightly transformed. In the absence of the original stimulus, the memory becomes altered: it becomes less about *what* we remember and more about *us*. In the case of Proust's

²⁹ Rachel Herz (2002). A naturalistic study of autobiographical memories evoked by olfactory and visual cues: Testing the Proustian hypothesis. *American Journal of Psychology*, 115 (1), 21-32.

Rachel Herz (2003). The effect of Verbal Context on Olfactory Perception. *Journal of Experimental Psychology: General*, 132, 595-606.

Rachel Herz (2004). A comparison of autobiographical memories triggered by olfactory, visual and auditory stimuli. *Chemical Senses*, 29, 217-224.

Rachel Herz (2007). *The Scent of Desire: Discovering Our Enigmatic Sense of Smell*. New York: William Morrow/Harper Collins Publishers.

³⁰ "Over the course of the novel, Albertine's beauty mark migrates from her chin to her lip to a bit of cheekbone just below her eye. In any other novel, such sloppiness would be considered a mistake. But in the Search, the instability and inaccuracy of memory is the moral. Proust wants us to know that we will never know where Albertine's beauty mark really is. "I am obliged to depict errors" Proust wrote in a letter to Jaques Rivière, "without feeling compelled to say that I consider them to be errors". Because every memory is full of errors, there's no need to keep track." Jonah Lehrer, *Proust was a Neuroscientist*, Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008, p. 82.

³¹ Freud was the first scientist to document the "dishonesty of memory" by tracing nervous hysterics in women back to sexual abuse in their childhood. Then, there was Cajal, Nobel Prize for Medicine in 1906, who hypothesized that the vacant gaps between cells were the sites of communication between neurons.

³² J. Debiec, J. LeDoux, K. Nader (2002). Cellular and systems reconsolidation in the hippocampus. *Neuron*, 36 (3), 527-538.

K. Si, E. Kandel, S. Lindquist (2003). A Neuronal Isoform of the Aphasia CPEB Has Prion-like Properties. *Cell*, 115, 879-891.

K. Nader et al. (2004). Characterization of Fear Memory Reconsolidation. *Journal of Neuroscience*, 24, 9269-9275.

A. Papassotiropoulos et al. (2005). The Prion Gene Is Associated with Human Long-Term Memory. *Human Molecular Genetics*, 14, 2241-2246.

³³ See note 32.

cookie, it shows we will never know what the original taste of his madeleine really was: the moment the taste is recalled by the author is the same in which he forgets what it really tasted like. His memories were not what really happened; they were processed like fiction and thus they were fiction:

*“How paradoxical it is to seek in reality for the pictures that are stored in one’s memory ... The memory of a particular image is but regret for a particular moment; and houses, roads, avenues are as fugitive, alas, as the years.”*³⁴

Proust’s writing was like Proust’s memories: they were things that never stopped changing. Nothing he wrote was ever permanent; he was a constant rewriter of his own texts, adding information and scribbling on his manuscripts until the very moment they were taken to the typographer.

The neuroscience of recent years³⁵ seems to have found the solution to Proust’s search for the origin of the past. Si, Kendal and Linquist (2003) believe they have found the molecule responsible for the “synaptic mark” of memory: CPEB – cytoplasmic polyadenylation element binding protein – present in the hippocampus, the brain’s memory center. Molecular biology at the very beginning of the 21st century in fact reinforces Proust’s intuitive convictions on the nature of our memory, as defended by Lehrer (2008):

*“[M]emories, as Proust insisted, don’t just stoically endure: they also invariably change. CPEB supports Proust’s hypothesis. Every time we conjure up our pasts, the branches of our recollections become malleable again. While the prions that mark our memories are virtually immortal, their dendritic details are always being altered, shuttling between the poles of remembering and forgetting. The past is at once perpetual and ephemeral. (...) Si’s experiments also show that the protein can become active for no real reason, since its transformation is largely dictated by the inscrutable laws of protein folding and stoichiometry. Like memory itself, CPEB delights in its contingency.”*³⁶

Section 5. The Proposal of a Fourth Culture

The short psycholinguistic profiles of Gertrude Stein, Virginia Woolf and Marcel Proust presented in this paper show three leading European writers of the early 20th century, at the birth of modern art, who managed to intuit and foresee different aspects of the psycholinguistic functions of human language many decades before these characteristics could be supported by neuroscientific experiments. Looking at language – its structure, expression of *self*, and the role of memory – both from

³⁴ Marcel Proust, *In Search of Lost Time*, Volume 1: *Swann’s Way*, New York: Modern Library, 1998, p. 606.

³⁵ See note 31:

K. Si, E. Kandel, S. Lindquist (2003). A Neuronal Isoform of the Aphasia CPEB Has Prion-like Properties. *Cell*, 115, 879-891.

³⁶ Jonah Lehrer, *Proust was a Neuroscientist*, Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008, pp. 94-95.

an artistic and a scientific point of view seems to show us how to deal correctly with C. P. Snow's communication gap. Half a century ago, Snow claimed the necessity to align intellectual scientific and artistic resources in order to achieve full world understanding potential, in spite of disciplinary or cultural discrepancies. Measurements defended by science are not the same as understanding, and this is what art seems to know better than science, as it often intuitively first what only some time later can be adequately measured and proved by science.

Re-examining C. P. Snow's idea, Lehrer (2008) shows that there is a cost to reducing everything to atoms, acronyms and genes. The truth is that 50 years later, we know that the third culture of today is not exactly what C. P. Snow claimed in his times. In our 21st century the third culture refers to scientists who communicate directly with the general public, translating *their* truths unidirectionally to the masses. However, this process has serious limitations: as it is unidirectional and hardly ever reflects its public, it has failed to bridge Snow's communicational gap. There is no dialogue of equals: scientists and artists continue to describe the world in disproportionate and inadequate languages³⁷. Lehrer postulates that subscribing to a very limited definition of truth is very risky, as our art should be "*a celebration of pluralism*"³⁸:

*"Unfortunately, our current culture subscribes to a very narrow definition of truth. If something can't be quantified or calculated, then it can't be true. Because the strict scientific approach has explained so much, we assume that it can explain everything. But every method, even the experimental method, has limits. Take the human mind. Scientists describe our brain in terms of its physical details; they say we are nothing but a loom of electrical cells and synaptic spaces. What science forgets is that it isn't how we experience the world. (We feel like the ghost, not like the machine.) It is ironic but true: the one reality science cannot reduce is the only reality we will ever know. This is why we need art. By expressing our actual experience, the artist reminds us that our science is incomplete, that no map of matter will ever explain the immateriality of our consciousness. (...) Like a work of art we exceed our materials. Science needs art to frame the mystery, but art needs science so that not everything is a mystery. Neither truth alone is our solution, for our reality is plural. (...) [A]ny description of the brain requires both cultures, art and science. The reductionist methods of science must be allied with an artistic investigation of our experience."*³⁹

Lehrer also defends that our current culture is in fact formed by two epistemological extremes reflexively attacking the other and writing it off as useless: many

³⁷ "[F]urthermore, the views promulgated by these scientific thinkers often take a one-dimensional view of the scientific enterprise and its relationship to the humanities" (Jonah Lehrer, *Proust was a Neuroscientist*, Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008, p. 191).

³⁸ Jonah Lehrer, *Proust was a Neuroscientist*. Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008, p. 192.

³⁹ Jonah Lehrer, *Proust was a Neuroscientist*. Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008, p. X.

scientists consider humanities as false, as art cannot be adequately measured, and postmodernists look at science as nothing but “another text”. As there is no useful dialogue, the gap is still there:

*“We now know enough to know that we will never know everything. This is why we need art: it teaches us how to live with mystery. Only the artist can explore the ineffable without offering us an answer, for sometimes there is no answer. (...) When we venture beyond the edge of our knowledge, all we have is art.”*⁴⁰

Eventually, Lehrer (2008) postulates “the fourth culture”, close in concept to Snow’s original definition of the third culture and distant from its mediatic 21st-century realizations. In order to make it work, Lehrer defends that there is a need to blur the lines that separate art and science as they “*should be reintegrated into an expansive critical sphere. Both art and science can be useful and both can be true*”⁴¹. By presenting the psycholinguistic profiles of Stein, Woolf and Proust, it is hoped this paper has exemplified this necessity in studies on language in the 21st century, conciliating its artistic and scientific contributions.

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⁴⁰ Jonah Lehrer, *Proust was a Neuroscientist*, Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008, pp.196-197.

⁴¹ Jonah Lehrer, *Proust was a Neuroscientist*, Boston, New York: Houghton Mifflin Company, A Mariner Book, 2008, p. 197.

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