ISSN 2055-0286
Advances in Social Sciences Research Journal; Vol. 13 No. 04 (2026) (168-177)
https://doi.org/10.14738/assrj.1304.20240

Freedom, Volition, Ego Development, Personal Responsibility, and Internal Chattering within Us

Edoardo Casiglia[1,2] (ORCID 0000-0002-0003-3289) & Erik Gadotti[2,3] (ORCID 0009-0003-1506-4728)

1. University of Padua, Studium Patavinum, Dept. of Medicine, Padua, Italy
2. University of Trento, Dept. of Psychology and Cognitive Science, Trento, Italy
3. Institute Echosystem Artigianelli, Dept. Deep in Mind, Trento, Italy

Abstract: This paper advances a paleo-psychological reconstruction of the evolution of human consciousness, arguing that the Ego is a relatively recent development in *Homo sapiens*. For most of human history, individuals are proposed to have functioned without reflective consciousness, initially guided by instinct and later by a symbolic, non-verbal Unconscious. Around 60,000 years ago, a primitive symbolic thought emerged, marking the development of the Unconscious. The later emergence of articulated language (approximately 35,000 years ago) profoundly transformed mental structure, rendering the Unconscious increasingly verbal. This shift gave rise to the *bicameral mind*, characterized by internally-generated cortical voices experienced as external, authoritative commands – often attributed to leaders or deities – and not subject to critical evaluation due to the absence of a conscious Ego. The transition to Ego consciousness is situated around the second millennium BC and is linked to cultural and environmental factors, including the rise of writing and abstraction, as well as disruptive historical events. The disappearance of bicameral voices is hypothesized to have selected individuals capable of generating a meta-representational function: the Ego, a complex emerging from the Unconscious and endowed with self-awareness. Despite this transition, remnants of bicameral voices persist in modern humans as unconscious processes influencing behaviour, decision-making, and moral frameworks. These processes manifest in both pathological conditions (e.g., schizophrenia, obsessive-compulsive disorder, Tourette syndrome, etc.) and normal cognition (e.g., inner speech, cultural conditioning, moral principles, and preconscious neural activity preceding decisions). Consequently, *conscious will* is interpreted as illusory, grounded in underlying unconscious mechanisms shaped by evolutionary history.

GENERAL CONSIDERATIONS

Contrary to popular belief, egoic consciousness has not always existed. Rather, it is a very recent development in the evolutionary process that led to contemporary *Homo sapiens*. Theories supported by historical documentation trace the origin of consciousness to a period around 1250 BC, that is, the Late Bronze Age, although the written historical sources on which these theories are based are obviously later. The earliest written documents attesting to the birth of the Ego are some glosses of the so-called Homeric $Ιλιασ$ (Iliad) [Ομέρον, 2000] and the most recent parts of the Hebrew Bible, known as the Mosaic Bible or הברית הישנה (The Old Testament) while the remaining parts of these two works – likely composed by multiple authors – reflect a non-conscious thought.

All species of the genus *Homo* (likely twenty, 19 of which are extinct) have therefore been non-conscious, and the last one (the *sapiens*) has only recently become so. This may seem absurd to us, who were born and raised in an environment where consciousness

appears to be present and pervasive, but the fact remains that non-conscious humans were able to live, reproduce themselves, discover and manage fire, produce artefacts capable of producing other artefacts, build huts and then buildings, domesticate plants and animals, conquer territories, build empires, etc., without any need for consciousness [Jaynes, 1996].

This raises a very complex question that has only tentative answers: what was the psychic life of non-conscious *Homo sapiens* like? Obviously, we know nothing about the ancient, extinct *pre-sapiens* species: we have no idea what their minds were like, if they even had one. Indeed, these humans, all pertaining to prehistory (that is, a period by definition devoid of writing), left no written documents, and it is therefore impossible even to infer the typology of their thought processes. These species – or at least the individuals who survived long enough to reproduce – had a highly alert sensorium, were highly efficient, and were capable of adapting to some extent, but they were unaware of it. The reconstruction of the birth of consciousness is relevant to the discipline called *paleo-psychology* and is based on an excursus that is partly narrative-inferential and partly scientific.

For millennia, *Homo sapiens* had neither an Unconscious nor an Ego, but only instinct, like animals. Then an Unconscious developed, of which he was obviously unaware, but which worked *sub limine*. Then from the Unconscious arose the Ego, but for millennia *Homo sapiens* didn't consider whether or not to have one: he simply vaguely sensed his existence, mostly as a group [Jung, 2015]. Later, he began to question the Ego, often wrongly. Later still, when he became fully aware of his own Ego, he began to understand that an Unconscious existed (we are in the psychoanalytic phase). At this point, he laboriously realized that it was the Unconscious that produced the Ego (we are in the last 30 years). A paradoxical trend (nothing → instinct → unconscious → Ego → Ego who knows Ego exist → Ego who discovers the unconscious → Ego who understands Ego come from the unconscious).

FROM THE ISTRINCT TO VOICES TO EGO

The Istinct Phase

For a long initial phase, the various species of the genus *Homo,* originating through mutation from the genus *Australopithecus*, acted purely by instinct, like animals. They had no structures to act otherwise. It's difficult for us today to understand what acting by instinct might mean; what is certain is that we weren't aware of it because consciousness wasn't there. Instinct drove individuals of the species *ergaster, erectus, heidelbergensis, neandertalensis,* floresiensis, denisova, *naledi,* etc. including for hundreds of thousands of years those of the species *sapiens* to act in a somewhat automatic manner. Natural selection of the fittest ensured that those with the most fervent instincts survived and perpetuated the genetic heritage. That's all. Then the brain enlarged in an anterior direction. A larger brain could depend on the centrosomal protein Cep63 [Marjanovic et al., 2025] and a more intelligent brain on the protein PTB1 [Gueroussov et al., 2015] responsible for alternative splicing. However, it was not before 75,000 years ago that the *sapiens* experienced a cognitive push that made its brain plastic, adaptable, and ductile, which was good for the evolutionary aspects of the species but also made human species particularly gullible, impressionable, and prone to uncritically accepting the opinions of others, a condition necessary for the birth of the Ego [Casiglia, 2020].

The Phase of the Symbolic Unconscious

As far as we know, the birth of the Unconscious mind concerns *Homo sapiens* only. Around 60,000 years before the present, at the end of the Würm glaciation, the *sapiens* progressively began to *think*, and consequently to behave in innovative ways. His thinking was symbolic, and constituted a simple outline of what would later become the human mind.

It must be assumed that the Unconscious developed progressively, through successive mutations[1] and the action of the environment. It must also be assumed that the Unconscious gradually took on the characteristics it has today, that is, although it is no container, it contained and contains forgotten things, traumas that have not been made conscious, things that have never reached the level of consciousness due to lack of *libido* [Jung, 2015], unremembered dreams, repressed things and unsolvable conflicts [Casiglia, 2020]. This happened not all of it at once, but a little at a time. The difference between the primitive Unconscious and our current Unconscious is that at that time there was only the Unconscious without the Ego: a situation that our ancestors absolutely could not understand, not being conscious, and which we too struggle to understand. This entirely symbolic ancestral Unconscious had nothing verbal about it, since language had not yet appeared. Individuals of the *sapiens* species communicated with each other, but not verbally. Communication was entirely nonverbal, and body language, along with magical beliefs, dominated.

The Birth of Language and its Incredible Consequences

For *Homo sapiens* to develop language, three steps were necessary: 1) lowering of the larynx, which in non-human African Great Apes and even in primordial sapiens was positioned too high, 2) development of a brain area responsible for the production of articulated phonemes (now generically called Broca's area), and 3) development of a brain area responsible for understanding heard language (now generically called Wernicke's area). All these phenomena concern sapiens only[2].

Archaeological finds have clarified that the lowering of the larynx occurred around 35,000 years BC [Kay et al., 1998] and – allowing speech – must have had an extremely favourable impact, given that selection permitted and maintained it despite the risk of suffocation *ab ingestis*. The formation of the motor area for speech must have occurred around 28,000 BC, given that only from that period onward do fossil skulls show signs of vessels and nerve pathways leading from this area on the developing bone on the inner surface. The same method has made it possible to ascertain that an auditory area for speech must have formed around 23,000 BC. Based on the approximate dates above, it is clear that *Homo sapiens* first learned to speak, and only later did he begin to understand what he was saying and what others were saying to him (the same sequence, on an ontogenetic rather than phylogenetic scale, occurs with the child, who practices babbling, then progressively learns to speak and only then fully understands the others). It was probably during this phase that his tendency toward socialization began to emerge, fostered by his exposure to the

[1] A human reproductive sexual act induces 50 to 100 mutations [Kong et al., 2012; Roach et al., 2010; Veltman & Brunner, 2012]. Added to these are the mutations due to the mutagenic activity of environmental γ rays (**6-7 µSv/day** [UNSCEAR 2000, 2008; BEIR VII, 2006].

[2] See the nice BBC scientific video https://m.youtube.com/watch?v=o589CAu73UM in which the possible language of *Homo neanderthalensis* is reproduced.

ancestor of wolf to dog, a highly social animal [Tancredi & Cardinali, 2023]. Always based on the dates, the development of language is a recent phenomenon that concerns only modern post-glacial *sapiens*, placed in the post-domestication history-agriculture phase, certainly not in the hunter-gatherer men. It was a phase in which the symbolic Unconscious had already been formed for about three tens of thousands of years.

The Phase of the Bicameral Mind and of Unconscious Voices

The development of an articulated speech, which was first a sort of *chanted speech* [Casiglia, 2020] had formidable consequences. First, the Unconscious, from being symbolic, progressively became verbal. This was for evolutionary reasons, as verbal language is much more efficient at transmitting information, even at the unconscious level (Table 1).

The first and most important consequence of emerging speech was the appearance of disembodied voices that were heard directly from the auditory areas without passing through the ears [Casiglia, 2022; Jaynes, 1996; Kujisten, 2006]. These were admonitory voices that gave survival instructions and were not criticized or questioned because there was no Ego to criticize them. They had the power of *neurological commands*, so hearing them and acting were one and the same. These cortical voices likely originated in an area of the nondominant hemisphere roughly symmetrical to Wernicke's area, which was (or would soon be) in the dominant hemisphere. It must be said that, during that period known as *bicameral phase*, it was difficult to say which hemisphere was dominant: based on motor aspects the left side was more often dominant since we know left-handedness was as rare as it is today, but based on auditory aspects the right side was considered dominant precisely because it was the source of the bicameral voices that governed activity and represented the vestiges of a *will* that did not yet exist. These bicameral voices performed the *functions of the will* and determined the *drive to action*, which otherwise would have been ensured only by instinct, as still happens in animals today. But in the *sapiens*, who had developed the Unconscious, this purely instinctual life was no longer possible: the path to the birth of the Ego was now marked.

Analysis of ancient surviving documents indicates that bicameral voices were primarily (but perhaps not exclusively) those of kings, chiefs, leaders, heroes, and parents, living or more often deceased. Their phonemes were heard by *sapiens* via the cortical pathways, even at a distance from the person or even after their death. Even a small degree of stress [Klemperer, 1992], such as a decision, was sufficient to evoke them [Jaynes, 1996], as still happens to some schizophrenics today.

In all cultures, these bicameral voices had a *numinous meaning*, were even attributed to gods (as among the Mycenaeans), or belonged to real people who after death had become gods as the  (Ilani in Mesopotamic Akkadian), etc., or the Japanese ラレス (Lares in Latin). They represented important figures capable of resolving the istinct / Unconscious or Unconscious / Unconscious conflicts, and did so in a so brilliantly way that this system of voices persisted for 30,000 years, ensuring not only survival but also the evolutionary transition by natural selection from hominids to modern humans. Later, their function would be performed by the Ego, or at least so most people believed.

The Linguistic Ego Phase

Here we enter the heart of the subject of this paper, which deals with voices in the conscious era. After tens of thousands of years of honest and efficient service, at a certain point the bicameral voices fell silent, not always at the same time for all populations. Where this occurred most early was in the Fertile Crescent, the cradle of domestication, the transition from hunter-gatherers to settlers, and the first writing.

Writing, with its need to express complex concepts in symbolic characters in one-to-one correspondence with the objects of the world, was a powerful push towards *abstraction*, a predisposition for which had formed in the brain of sapiens thanks to the *angular gyrus*. Born above all to recognize predator and prey in the background[3], abstraction, which feeds on syntactic structure, was soon extended *by exaptation* to all phenomena of the world itself, and is the basis of our current ability to recognize only objects of which we have a mental image[4] and allows for metaphors.

The sudden silence of the voices, which likely took only a single generation, was due to external events acting on a substrate already genetically primed for abstraction. These external events were represented – at least in the Fertile Crescent – by catastrophic events such as the volcanic explosion on the island of Thera (now Santorini in the Aegean) which were followed by forced migrations, displacing bicameral humans from the source of their voices (burials, totems, tall buildings, etc.). According to Julian Jaynes's theory, deprived of the ability to summon their voices on demand, these humans lost the ability to make even trivial decisions and, through the well-known mechanism of Darwinian selection, perished without reproducing. Indeed, only those few *sapiens* individuals who, through mutation, were already capable of constellating the bicameral voices, produced a meta-metaphorical function that today, with Carl G. Jung, we call *the Ego complex* [Jung, 2015] This complex replaced the voices, adding the previously unknown *awareness of existence*, one of the great functions of the Ego. Being aware of existing and dying provided such a selective advantage that *the Ego complex*, culturally transmitted on a predetermined and selected substrate, refuses to go away and has come down to us, the descendants of those few predisposed individuals who survived the apparent loss of their voices.

We say *apparent loss* because voices continue to exist in contemporary *sapiens*, both in the form of the Ego and as residual unconscious voices. We will discuss this in the following crucial paragraph.

Bicameral Voices, Today

Nowadays, in contemporary *sapiens*, bicameral voices no longer present themselves as voices. They could not, having aggregated from the place to the Ego. This does not mean voices have disappeared: they have simply become mostly inaccessible to consciousness, and hide under the false guise of other psychic realities. It is true that the bicameral voices

[3] leading to the current *plant blindness* [Allen, 2023], an evolutionary *neglect of green* due to sensory overload which causes us to perceive an object while neglecting the plant background

[4] Studies conducted by us at the University of Padua with the 3 sub-tests of the ENB Protocol (Brief Neuropsychological Examination) on a large number of unselected males and females [Casiglia et al., 2017] demonstrate that the average abstraction of the general population is 4.2+2.0 (this is a dimensionless score whose maximum is 6 points).

have aggregated to form the Ego and under normal conditions are no longer perceived as voices, but it is also true that they continue to act subliminally.

Many modern psychotics tend to criticize the voices sparingly, while ancient bicameral humans did not criticize them at all because they lacked a conscious Ego. Aside from capacity for criticism, the cortical voices heard by modern psychotics are exactly the same as those heard by ancient bicameral men. Just like the ancient bicameral voices, the modern voices of schizophrenics are mostly – but not exclusively – triggered by even minimal stress [Klemperer, 1992]. This is perfectly outlined in several fundamental works that have highlighted the anthropological significance of normal and pathological voices. Hearing cortical voices is not in itself a sign of pathology: Carl G. Jung reported hearing very well-structured voices on several occasions, and his mother was also subject to them [Jaffè, 1962]. Auditory hallucinations (actual cortical voices) can be heard by perfectly normal subjects when falling asleep, when waking up, in conditions of sensory deprivation and stress, thus acting as fossil remnants of the bicameral era [Jaynes, 1996]. It's not the quantity or quality of the voices that differentiates the today's psychotics from ancient bicameral men, and it's not these characteristics that differentiate today's psychotics from today's normal people, but whether the voices are criticized or not.

In certain circumstances, unheard unconscious voices are much even more pervasive. This is the case with Tourette's disease [Martino et al., 2020] in which the subjects are literally forced to pronounce words and phrases beyond their control, and alien hand syndrome [Manea et al., 2024] in which the subject performs what could be described as uncontrolled (even automatic) movements. These are two clearly pathological conditions, which nevertheless are very didactic in demonstrating the presence, even in contemporary sapiens, of bicameral voices that cannot be disobeyed.

Another scenario is obsessive-compulsive neurosis: what is it if not a condition caused by unconscious voices telling us for instance *wash your hands, wash your hands, wash your hands*? These voices speak, or rather whisper, below the threshold of consciousness, and we, like bicameral man, hear the voices without being aware of them; and obey. According to Jung, these neuroses involve a fragment of the personality (a complex) that has separated from the main personality and operates separately: an unconscious fragment, obviously, a fragment made up of unconscious voices.

Then there are non-pathological, or not always pathological, circumstances in which inaudible voices act to modify behaviour. This is the case of conditioning, powerful time-clocked messages that guide the actions of *sapiens*. Often, these are cultural and educational legacies left deliberately or unintentionally in the family or at school. What is it, if not an inaudible voice, that *sapiens* hears when obeying the command *don't urinate in public*, *don't walk naked in the street*s, etc. – all commands sapiens possess but animals do not, because the latter have not undergone a bicameral preparatory phase. Some conditioning is subtle and, just like bicameral instructions, speaks inaudibly with the voice of parents: *be careful with boys, don't take substances, study for college, avoid bad company, crime doesn't pay, be careful with boys, don't get pregnant at 16, choose medicine after graduation*... Just like the bicameral voices, these conditionings are not recognized as such by the Ego: they are not verbal, either in origin (sometimes deriving from the context or from the simple behaviour of educators) or in their manifestation (they may be merely symbolic). But try to explore them, and they will always be thought of and defined

as verbal, because contemporary sapiens thinks only verbally and syntactically, in the form of metaphor. Like Homeric heroes or biblical patriarchs, like the Mycenaean *Ἀχιλλεύς* (Achilles), like the biblical *אַבְרָהָם* (Abraham), we unknowingly submit to their will. And the mysterious process of volition is nothing more than acquiescence to our residual unconscious archaic voices [Casiglia, 2022; Jaynes, 1976; Kujisten, 2006]. We base on this our personality and our natural moral code, a code engraved in our hearts *(I will put my law within them, and write it on their hearts* (Amos 8:11). We might add: engraved in the form of archaic subliminal unconscious voices that we constantly hear without knowing it and that play a large role in volition. Imagine you're driving and suddenly realize you need to slow down; where did this decision to slow down come from? From an internal command, evidently, perhaps from the voice of your mother, not necessarily living, telling you *slow down!* But you don't hear it that way; you feel it unconsciously as an urge to slow down. And it seems to have the characteristics of your own free decision. The moral code is, in short, a diffuse set of unconscious internal voices of bicameral origin, sometimes well-coordinated, sometimes not; in the latter case, morality appears shaky. Modern unconscious voices, like the archaic ones that were actually heard as voices, are generally admonishing and benevolent. But, for example, the voices of a child raised by a somewhat dishonest father might also unconsciously tell him, *steal, you clever one!* making him a thief by free will. And certain people with a disturbed mental state might even hear internal voices telling them to harm, to kill, as happened to the puppet-hero *Ἀχιλλεύς* or the puppet-patriarch *אַבְרָהָם*, poor bicameral men of thousands of years ago: what could they possibly know?

A further example of the power of hidden voices is currently of interest primarily to neuroscientists, while it is hardly recognized or accepted by psychologists despite its universal validity. It just concerns once more the aforementioned process of volition, which is certainly not conscious. As demonstrated with both EEG (Libet & Gleason, 1983) and fMRI (Soon et al., 2008), the decision is always preceded by a *preparatory potential* that arises seconds or minutes beforehand from the premotor cortex, thus clearly being a preconscious (unconscious) phenomenon. It doesn't matter whether the action falsely appears voluntary, deliberate, conscious, and made at that moment: this depends on a backdating that has had evolutionary Darwinian significance (it has proven more useful for the *sapiens* species to believe they are the director of their own decisions rather than a simple puppet). The power of these occult voices that generate decisions is such that we all conform to their commands in every daily decision, as did the bicameral men of the Paleo-Neolithic period. The difference between them is that they did not claim to be free like us, because they lacked an Ego capable of differentiating itself from the Unconscious and rising above it, thus deceiving themselves.

Finally, a few important words on internal chattering, a set of unconscious voices that constitutes inner speech [Alderson-Day & Fernyhough, 2015]. These voices accompany us constantly, during sleep (when they can partially resume in dreams their symbolic role) but also during wakefulness. The cerebral cortex is always active, and inner speech could be the verbal expression of the so-called default mode network [Menon, 2023]. The voices of internal chattering – voices not included in the Ego – can nevertheless take on a quasi-egoic aspect and act as if they were alternative Egos drawing into a conversation with the Ego. They then take on the characteristics of a real interlocutor: *what am I doing here? what should I do now? why can't I decide?* etc. We are dealing here with a very strong bicameral legacy, or, more precisely, a remnant of the brief historical phase (around 1250

BC) in which the ancient bicameral voices began to fall silent and the Ego began to manifest itself, so that voices and Ego fully coexisted for a while. The first voices are documented in the *Ιλιασ* and in the הברית הישנה, two strong documents straddling the bicameral and conscious eras. In the *Ιλιασ*[5], *Ηεχτορ* (Hector) reflects thus: *ὤ μοι ἐγώ· τί νύ μοι τάδε θυμὸς ἐνὶ στήθεσσι κελεύει* (why does the *θυμὸς*[6] in the chest say these things?); this is still a pure bicameral command of the hear→obey type. *Ἀχιλλεύς* receives a weakened command with a nuance of persuasion or impulse[7] (*τίπτε μοι ἦτορ ἐνὶ στήθεσσι φίλοισιν ἀνώγει*, why does the heart urge?) in which it is no longer *θυμὸς* that speaks but *ἦτορ (étos)*. In the הברית הישנה there is an exact parallel with God said !אַבְרָהָם *(Abraham!)*, an order without internal deliberation from an absolute authoritarian voice perceived as external without introspection[8]; and with *Samuel, Samuel!* where a real externalized voice is heard[9]. All these cortical voices heard by the Mycenaean characters as external are the bicameral dawns of the internal voices that we still perceive *sub limine* today.

REFERENCES

Alderson-Day, B., Fernyhough, C. (2015). Inner Speech: Development, Cognitive Functions, Phenomenology, and Neurobiology. Psychological Bulletin 141: 931-965. doi: 10.1037/bul0000021.

Allen W. (2003). Plant blindness. BioScience 53: 926. doi: https://doi.org/10.1641/0006-3568(2003)053[0926:PB]2.0.CO;2

BEIR VII. (1998). Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII, Phase I, Letter Report (1998). National Research Council (US) Board on Radiation Effects Research. National Academies Press US. doi: 10.17226/9526

Casiglia E et al. (2017). Caffeine Intake and Abstract Reasoning Among 1,374 Unselected Men and Women from General Population. Role of the –163C>A Polymorphism of CYP1A2 Gene. Clinical Nutrition ESPEN 20: 52-59. doi: 10.1016/j.clnesp.2017.04.001.

Casiglia E. (2022). Consciousness, Hypnosis and Free Will. In: Kuijesten M. Conversations on Consciousness and the Bicameral Mind. Julian Jaynes Society, Henderson. (p. 200-216).

Casiglia E. (2020). The Ego and its Voices. Anthropology and Archeo-psychology of Egoic Consciousness. CLEUP, Padova.

Gueroussov S, Gonatopoulos-Pournatzis T, Irimia M, Raj B, Lin ZY, Gingras AC, Blencowe BJ. (2015). An Alternative Splicing Event Amplifies Evolutionary Differences Between Vertebrates. Science 349: 868-873. doi: 10.1126/science.aaa8381.

Jaynes J. (1976). The Origin of the Consciousness in The Breakdown of the Bicameral Mind. Houghton Mifflin, Boston.

Jung CG. (2015). Opera Omnia. First Edition.

Klemperer, F. (1992). Stress-induced Hallucinations. British Journal of Psychiatry. 161: 576-577. doi: 10.1192/bjp.161.4.576a.

[5] *Ιλιασ*, XXII, 122

[6] *θυμὸς* (thumós), a very material entity that for example leaves the body following a wound, is however the closest thing to the mind for the Mycenaeans devoid of interiority and Ego.

[7] *Ιλιασ*, IX, 322

[8] Βιβλια, Γενεσισ, 22,1

[9] Βιβλια, Πσαλμσ, 1 Σαμυελ 3

Kong A., Frigge, M.L., Masson, G, Besenbacher, S., Sulem, P., Magnusson, G., Gudjonsson, S.A., Sigurdsson, A., Jonasdottir, A., Wong, W.S.W., Sigurdsson, G., Walters, G.B., Steinberg, S., Helgason, H., Thorleifsson, G., Gudbjartsson, D.F., Helgason, A., Magnusson, O.T., Thorsteinsdottir, U., Stefanssonet, K. (2012). Rate of de novo mutations and the importance of father's age to disease risk. Nature 488: 471-475. doi: 10.1038/nature11396.

Kuijsten, M. (2006). Reflections on the dawn of consciousness. Julian Jaynes Society, Henderson.

Jaffé, A. Memoires Dreams Reflections of Carl G. Jung. Pantheon Books, New York, 1962.

Libet, B., Gleason, C.A., Wright, E.W., Pearl, D.K. (1983). Time of Conscious Intention to Act in Relation Tto Onset of Cerebral Activity (Readiness-Potential). The Unconscious Initiation of a Freely Voluntary Act. Brain 106: 623-642. doi: 10.1093/brain/106.3.623.

Manea, M.C., Iliuta, F.P., Manea, M., Lacau, R.M., Varlam, C.I., Mares, A.M., Ciobanu, C.A., Ciobanu, A.M. (2024). Alien Hand Syndrome: Pathophysiology, Semiology and Differential Diagnosis with Psychiatric Disorders. Biomedical Reports 20: 74. doi: 10.3892/br.2024.1762.

Marjanovic, M., Sánchez-Huertas, C., Terré, B., Gómez, R., Frederik Scheel, J.F., Pacheco, S., Knobel, P.A., Martínez-Marchal, A., Aivio, S., Palenzuela, L., 2, Wolfrum, U., McKinnon, P.J., Suja J.A., Ignasi Roig, I., Costanzo, V., Lüders, J., Stracker, T.H (2025). CEP63 Deficiency Promotes P53-Dependent Microcephaly and Reveals a Role for the Centrosome in Meiotic Recombination. Nature Communications 2015; 6: 7676. doi: 10.1038/ncomms8676.

Martino, D., Johnson, I., Leckman, J.F. (2020). What Does Immunology Have to Do with Normal Brain Development and the Pathophysiology Underlying Tourette Syndrome and Related Neuropsychiatric Disorders? Frontiers in Neurology 11: 567407. doi: 10.3389/fneur.2020.567407.

Menon, V. (2023). 20 Years pf the Default Mode Network: A Review and Synthesis. Neuron 111: 2469-2487. doi: 10.1016/j.neuron.2023.04.023.

Ομέρον. Ιλιασ. (2000). Ιδεοθέατρον, Oxford Classical Text, Αθιναι.

Roach, J.C., Glusman, G., Smit, A.F.A., Chad, D., Huff, C.D., Hubley, R., Shannon, P.T., Rowen, L., Pant, K.P., Goodman, N., Bamshad, M., Shendure, J., Drmanac, R., Jorde, L.B., Hood, L., Galas, D.J. (2010). Analysis of Genetic Inheritance in a Family Quartet by Whole-Genome Sequencing. Science 328: 636-639. doi: 10.1126/science.1186802. Epub 2010 Mar 10.

Kay, R.F., Cartmill, M., & Balow, M. (1998). The Hypoglossal Canal and the Origin of Human Vocal Behavior. Proceedings of the National Acadademy of Sciencies USA. 95: 5417-5419. doi: 10.1073/pnas.95.9.5417.

Soon, C.S., Brass, M., Hans-Jochen Heinze, H.J., Haynes, J.D. (2008). Unconscious Determinants of Free Decisions in the Human Brain. Nature Neuroscience 11: 543-545. doi: 10.1038/nn.2112.

Tancredi, D., Cardinali, I. (2023). Being a Dog: A Review of the Domestication Process. Genes 14: 992. https://doi.org/10.3390/genes14050992

UNSCEAR (2000). Sources and Effects of Ionizing Radiation. Report to the General Assembly, with Scientific Annexes. United Nations, New York.

UNSCEAR (2008). Sources of ionizing radiation. The UNSCEAR 2008 Report Volume to the General Assembly (A/63/46) and two scientific annexes. Report to the General Assembly with Scientific Annexes. United Nations, New York

Veltman, J.A., Brunner, H.G. (2012). De novo mutations in human genetic disease. Nature Reviews Genetics 13: 565–575. doi: 10.1038/nrg3241.

Table 1: Evolutionary Events Preceding, Accompanying and Following Language Birth in *Homo sapiens*.

Key dates	People / period	Events
About 75,000 BC	Middle Paleolithic	Lowering of the larynx.
From 60,000 BC	Middle Paleolithic	Birth of the Unconscious.
About 30,000 BC	Fertile Crescent, Middle Paleolithic → Neolithic	Beginning of the bicameral voices.
From 28,000 BC	Middle Paleolithic → Neolithic	Broca's area and articulation of the first phonemes.
From 23,000 BC	Middle Paleolithic → Neolithic	Wernicke's area and comprehension of spoken language.
From 12,000 BC	Middle Paleolithic → Neolithic	Beginning of the cult of the dead.
From 9,000 BC	Fertile Crescent	Beginning of domestication and agriculture.
From 8,000 BC	Fertile Crescent	Civitas.
About 3,200 BC	Mesopotamia, Bronze age	The invention of writing. The beginning of history.
About 2,500 BC	China, Bronze age, ancient historical age	The dead are buried with stone utensils and food, and later (1200 BC) with servants as well.
About 2,500 BC	Mesopotamia, Bronze age, ancient historical age	The dead are buried with 7 jars of beer, 420 cakes, 23 measures of grain, 1 garment, and 1 bed (the amount of food indicates how long they were considered alive and speaking).
About 2000 BC	Assyria	The dead are called *ilani* (gods).
About 850 AD	Greece, ancient historical age	The dead are fed broth and food through straws between their jaws; since they still speak, it is incomprehensible that they are dead. 1 Hesiod speaks of golden men who became sacred spirits, good guardians of mortals. Plato mentions heroes who, after death, become spirits who tell people what to do.
250-1520 AD	Maya, Aztecs, South America, ancient historical age	Maya nobles are buried in the plazas where the living gather. The dead are often called huaca (*godlike*); the individual dies only a long time after his death (the time necessary for his hallucinatory voice to fade); it is said: *he who died became a god*; the Aztecs told the conquistadors that their history began when a statue in a temple of an earlier culture began to speak, ordering the crossing of the lake; the conquistadors claimed that the Aztecs were the kingdom of the devil, since *the devil himself speaks to the people through the statues*.