

# Chapter I. The Peculiar Emergence of *Homo Scribens*

Writing is an odd behavior, done by no other life form on this planet, as far as we know. Most behaviors or responses of living organisms are directly traceable to immediate life needs—such as finding or gathering sustenance, seeking oxygen, protecting integrity of the organism or its territory, fleeing danger, hunting, or finding and attracting mates. Even elaborate communications or displays, such as among birds, seem to be related to mating or territory protection. Bonding behaviors, as in caring for young or in ape mutual grooming, can be attributed to continuation of the species, mutual protection, feeding, dominance recognition, and other needs. But only humans spend long hours inscribing words on media which may be shared or even kept private—and spend many years learning how to do this. Often the texts produced seem to be for amusement, imagination, emotional engagement, or solving abstract conceptual puzzles. If the path from these behaviors back to needs can be traced, as I believe they can, nonetheless the path is often long, complex, circuitous, and nonobvious.

Yet such writing and reading behaviors use our evolved capacities as humans, derived from prior forms of life and expressed in the hundred or more millennia of human life before the emergence of writing. In particular, writing engages our biological inheritances of sociality and consciousness that long preexisted writing, just as it typically engages our eyes, limbs, and fingers (although over the last century or so we have been inventing alternative input and reception means). Reading and writing are social behaviors that facilitate social interaction, sharing of meaning, and coordination of action. This sociality of literacy expands the communicativeness of spoken language from which it initially grew, to facilitate communication over time and space, expanded cultural memory and institutional records, and critical inspection of each other's words, among other things (Goody, 1986). Reading and writing are also intensely private psychological activities, playing out in the minds or consciousness of individuals in both production and reception. Writers' thoughts and feelings prompt the words they share, and readers must mentally reconstruct the meanings, thoughts, and feelings of writers from the inscribed marks. As in speech, thoughts and feelings of speakers are directed to affect the thoughts and feelings of recipients, but in writing the immediacy of the interaction fades, so the meaning resides more fully in the words without the gestures or expressions or other aspects of social presence. In contemporary reading and writing practices carried out in semiprivacy there may be little to notice behaviorally beyond people making marks or looking at inscribed objects, holding them, turning pages, and the like. Yet internally within readers and writers, complex neural activities are engaged in forming, recognizing, or responding to those marks. These internal meaning-making activities

occasionally become visible in facial expressions, outbursts of laughter or tears, or even body posture (Bazerman, 2013).

Writing expands consciousness by externalizing it, allowing us to examine our inscribed thoughts (Goody, 1977, 1987). Reading gives us access to the extended observations, thoughts, and imaginations of others even as we may learn to examine them critically and reconcile them with what others have written and what we may think. By engaging with what others write, we can come to enter more fully into others' perceptions, knowledge, and ways of thinking, coming to see them as different than our own, perhaps then to try to communicate in response across that distance. Speaking socializes human consciousness, and then literacy draws human consciousness into an even more extensive social space.

While spoken language fosters social arrangements among people who meet face-to-face, writing fosters more extensive and complex social arrangements, differentiated by organizations, institutions, and common interests rather than temporal and geographical locality (Bazerman, 2006; Goody, 1986). This has many consequences for the understanding of audiences. The credibility of the author, for example, may rely more on social and institutional identities, evidence, and other "objective" representations available to a wider group, rather than the personal knowledge and trust of one's interlocutor common in spoken language (Eisenstein, 1979). Similarity of thought, shared abstractions, or reliance on similar influential texts can also foster trust among dispersed peoples. Participating in the same geographically dispersed organization or institution and acting within defined organizational roles, as well, facilitate mutual reliance on each other's written words (Bazerman, 1988). Further, the audience's exposure through writing to a greater range of experiences, views, and knowledge of others can expand its members' consciousness as they become more accepting of difference of perspectives; knowledge of such an occurrence might lead authors to cast their thoughts to be intelligible and perhaps acceptable across differences.

Literacy's intertwining of the intensely personal experience of consciousness with the intense sociality of communicative humans, extending the potentials of spoken language, has created behaviors and ways of life radically different from those of any other life form, and has made cultural evolution a major theme in human life, yet literacy rests on the prior evolution of life forms that has produced consciousness and sociality. Consciousness, however it may be defined by different researchers, has been found to exist in many animals (Damasio, 2010, 2018, 2021). As well, sociality, communication, coordination, signaling, even using sounds to do so are not uniquely human, but rather exist in varying ways throughout the animal kingdom, and even in the plant kingdom (Wohlleben, 2016). While some of the linkages and mechanisms of this biological evolution remain speculative, some strong hypotheses have emerged in recent years drawing on recent research, and I will review some of them below, considering their implications for the emergence of writing. Even if future research will falsify details or even the larger sweeps of these hypotheses, something similar to them will

most assuredly emerge, with perhaps even more applicability to understanding how and why humans write and how we can expand human capacity to do so.

Evolutionary research has grown both in detail and scope since the publication of Charles Darwin's *On the Origin of Species* in 1859, *The Descent of Man* in 1871, and *The Expression of the Emotions in Man and Animals* in 1872. Despite Darwin holding a number of beliefs conventional to his time about race, sex, disability, and civilized behavior that have not worn well in the intervening years, the idea that humans have evolved from and bear many characteristics of other animals has of course been robustly confirmed and elaborated. A more recent overview of evolution from the simplest microorganism to the more complex was proposed by Maynard Smith and Eörs Szathmáry (1995a, 1995b). In an even more recent rearticulation, Szathmáry (2015) identified seven evolutionary transitions, from protocells to societies with natural language, most notably humans (though some other complex animals in their communications are controversially considered to be able to use aspects of natural language—see Herbert S. Terrace et al., 1979, on one side and Sue Savage-Rumbaugh et al., 2009, and Denise L. Herzing et al., 2012, on the other). Szathmáry's (2015) first four transitions (protocells, prokaryotic cells, eukaryotic cells, and plastids) have to do with the development of genetic inheritance systems, where information passed from one generation to the next is entirely within the genetic code. In these organisms there is no post-genetic learning that elaborates or transforms the genetic information either in the individual or in the group. With the fifth transition to multicellularity, however, responses to the environment may embody learning across generations, leading to organism changes that may affect the genome. The sixth transition Szathmáry identified as Eusocial animal societies, which are marked by social signaling that can lead to learning by the individual and society. The last transition to societies with natural language supports the aggregation of knowledge within and across generations. According to Szathmáry,

It was language, with its unlimited hereditary potential, that opened up the possibility of open-ended cumulative cultural evolution, also specific to humans. Cooperation among relatives does exist in humans [as in many animals that raise their young], but it significantly goes beyond. Shared interest can elicit extensive cooperation among unrelated individuals. (p. 10109)

Cultural learning is not directly encoded in the genome and is only inheritable by external transmission. Writing's invention elaborated, accelerated, and amplified the potential of spoken language for cultural learning and transmission and thus cultural evolution. Writing is continuous with the ideas of both inheritance and transmission of information responsive to the environment. Information is shared across generations inside and outside the genome. Information becomes communal property among different non-familial individuals, each with their

somewhat different genomes but able to cooperate with each other and to share information and knowledge among them.

Neuroscientist Antonio Damasio (1999, 2010, 2018, 2021) has investigated the evolutionary path of sensing and response embodied in neural evolution that has led to the formation of consciousness. Damasio has noted that though the simplest one-celled creatures lack distinct neural cells, they do sense changes within the cell, some of which are induced by external conditions that impinge upon the cell. These sensed conditions then trigger chemical responses to return to homeostasis, or equilibrium. Other researchers have also pointed to anticipatory or predictive actions based on prior experience, called allostasis, also with the aim of maintaining homeostasis (Sterling, 2020). As Damasio has outlined, as organisms become more complex and multi-cellular, they develop neural cells that transmit sensed information across cells within the body and in turn trigger bodily responses. In some animals these neural cells aggregate to form a brain that becomes a center for information and maps the state of the body outside the brain (that is, neural sensory inputs are associated with neural brain receptors). These brain mappings of bodily states can then transmit signals to trigger responses in other parts of the body, although some sensed departures from homeostasis and resultant responses may stay within the cell or localized in non-brain parts of the body. Within the brain, signals of bodily states are interpreted as emotions; that is, embodied sensations about the state of the body result in embodied responses or movements. The promising “predictive processing” approach towards studying brain functioning highlights the brain’s role in interpreting lower level neurological information in order to direct current action (for a technical presentation of this approach see Clark, 2013; for a technical review of evidence see Walsh, 2020; and for a popular presentation see Clark, 2023).

In a further evolutionary development, sense organs gain information about the external environment (such as through sight, sound, taste, odor, and touch); these sense organs also send their information to the brain to be mapped and interpreted (that is, each sensory neuron corresponds to a receptive brain neuron to create a brain map of the sensory input, which then connects with another set of neurons that identifies the sensory input with a perceived object, such as a barking dog or a speeding car) (Man et al., 2015). This information about the external environment is mapped within the brain and connected with the map information of the body’s state, again leading to bodily response.

While some bodily states and bodily responses may remain involuntary and outside of awareness, the state of the brain (itself a bodily organ) can also become mapped along with the responses triggered throughout the body, providing the organism awareness of its neural system and the embodied emotions in the form of feelings. Damasio (1999, 2010) hypothesized that recognition of this neural map as belonging to the organism’s self is the origin of consciousness. This kind of consciousness exists in many animals and makes possible calculation and choices informed through feelings so as to return to homeostasis.

Recognition of this mapped consciousness allows evaluation of feelings and calculation of which feelings should be attended to and how they might be responded to. The selection and prioritizing of feelings to be responded to can be considered a kind of reasoning.

This identification of consciousness with the awareness and monitoring of brain functioning gives consciousness a bodily neurobiological function similar to neurobiological functions at lower levels, such as the monitoring and regulation of digestion or heartbeat. The monitoring and regulation of the brain itself allows for reflective activity and choice making with respect to those brain activities. It also places the brain in control of those choices, using those very neurological tools of awareness, adding another layer of neurological control. Consciousness as so conceived also has consequences for communal reflection and choice making once the organisms are able to communicate some of those neurological contents, as language makes possible. Through conversation, speaking creatures can comment on each other's spoken thoughts and potentially influence each other. Further, through language, multiple participants can compare, weigh, and make choices about thoughts to regulate communal behavior (such as in the way Michael Tomasello has suggested as discussed later in this chapter). Writing further extends the geographic and temporal range of communal reasoning and communal influence on the thoughts of the individual.

Some bodily reactions, however, remain outside of consciousness, with the sensed difficulties and reactions even remaining at the cellular or regional level outside the brain (think of the autoimmune system's reaction to infectious agents), while other bodily actions, though monitored and reacted to by the brain, are typically not consciously attended to, unless suffering extreme abnormality (think of normal operations of the heartbeat or lungs). At the same time, information from the external world, monitored and perceived through sense organs, also is mapped, thus providing information about how to respond to the external world. This ability to monitor sensory input from the environment can evoke feelings about the surroundings, so as to make choices of response. This meeting of internal and external sensations also provides resources to deal with some of the difficulties in internal states, such as connecting, for example, sensed hunger with the sight of edible berries or potential prey.

The complex internal processing of information from both inside and outside the skin barrier also points to the complexity of what happens neurologically as we write (or for that matter in reading as we make meaning and internal sense of the words inscribed by others.) In writing, our gists or impulses to write may start out in a deeply embodied way, driven by emotional pressures or internal states—whether arising from unresolved feelings that lead us to try to make sense of our experiences in trauma writing (Pennebaker & Chung, 2007) or to put in order our view of what is occurring in the world, or driven by external demands that nonetheless mobilize our neural systems, such as the need to complete a report to maintain our jobs and establish corporate success to provide the means

of life in a modern urban world. Emotions, then, are underneath and pervasive in our cognitively demanding tasks, but emotions also pervade our monitoring, mapping, choice making, and connecting of information from many parts of our neurological system, as coordinated through our higher level cognitive maps that monitor and guide our writing processes (see Tatiana V. Akhutina, 2003, for possible mechanisms of inner speech emerging into public language). Inversely, the more deeply we read, the more we reconnect the localized linguistic and semantic processes with the full suite of cognitive and affective resources throughout the neurological system, which includes what we learn through our senses and from symbolic communication with others. There is still much to learn about this, but no doubt the picture will show that both reading and writing engage large parts of the brain and other parts of the body. How else could reading make our hearts race; or lead us to burst out laughing; or provide us internal senses of pleasure, fear, or anxiety; or give us the satisfied sense of understanding?

Damasio (2010) speculated about the role of language and consciousness in forming culture, but because his research and data all are situated in neural processes in the individual organism, his discussion of socially produced culture and its impact on consciousness is limited. Tomasello's (2001, 2010, 2019) extensive comparisons of the behavior of young humans with chimps and other great apes, however, give us strong insights into how biology intersects with sociality, culture, and language. Tomasello and his colleagues (2005) have found that although humans and simians are similar in many aspects of intelligence, there are great differences in their sociality, with large consequences for their thinking and culture. As they noted, although both apes and humans are aware of the knowledge and state of mind of their fellow creatures and have some ability to communicate desires and bodily states, they have great differences in their ability to collaborate and develop shared attention and collective intentionality. As a consequence, humans have collaboratively formed distinctive cultures in different regions and in different social groups, in contrast to ape cultures that vary only in small details from locale to locale.

A key element in shared attention and collective intentionality is shared eye gaze that infant humans form shortly after birth with caregivers and then other adults, and ultimately with peers. This shared eye gaze supports shared attention, the formation of language, shared information, collective intentionality, social norms, and states of mind (Tomasello, 2019). Humans' biologically evolved visible eye whites surrounding pupils (even more pronounced in young children) support this shared eye gaze. Among chimps and apes, intersubjectivity and mutual attention are limited to dyads and cooperative projects seem limited to those imposed by dominance systems. Among human children, however, group identity, shared projects, empathetic understanding of peers, and formation and enforcement of group norms seem to arise spontaneously, using language's richer set of tools to share perceptions of the world and each other, to assert mutual obligations, and to negotiate cooperative enterprises.

Although schooling and learning of literacy are beyond the scope of Tomasello's inquiries, which end with children of six or seven years, it is not difficult for us to see how reading and writing create more extensive opportunities for shared attention, meaning, and action through enduring and transportable visual signs. Literacy, further, supports the formation and transmission of knowledge, negotiation, and enforcement of communal agreements and norms as well as the ability to form, affiliate, and act within larger groups over time and space. Writing, additionally, extends language's capacity for sharing feeling, imagination, ideas, concepts, and thinking through extended statements that are open to critical examination, circulation, and retention among more organized groupings of interlocutors. Consequences follow for our perception and knowledge of the world and each other along with transformed ways of life. Most fundamentally, speech mediates our relation to the material world and each other through symbols, which gain robustness, quasi-stability, elaboration, and circulation through inscription.

When they came together under the right conditions, human consciousness and sociality produced the remarkable and ever evolving invention of literacy, which continually transforms our consciousness and societies, bringing into being new ways of living within evolving cultures. What those right conditions for the development of literacy might be is little known, though the three major historical examples of the Middle East, China, and Mesoamerica suggest that agriculture and sedentary ways of life seemed to give rise to record keeping, knowledge of the seasons with climate cycles, and the need for communication at a distance as governance and power become centralized and dominance displays were extended over greater domains. These factors were accompanied by extension of group norms, ideology, and affiliation within centralized settlements and their hinterlands. From these early roots, culture and society continued to evolve, with literacy forming the communicative infrastructure of many of the emergent forms and institutions of social organization (as are considered in later chapters in this volume).

These cultural changes as far as we know have not required nor brought about any biological changes within the genome. Rather, the information is all encoded among people in their communication, which then changes the conditions for each human's postpartum development. The complexity of the postpartum information needed to survive and thrive in modern society as transmitted through texts has driven the growth and evolution of the cultural institution of schools, which are centrally about engaging students in reading and writing about the various domains of inscribed human knowledge, whether religious or secular. Schooling's organized apprenticeship in literate knowledge may now last sixteen years or longer in developed countries, bringing young people from early childhood into adulthood in their twenties when they are prepared to enter into economically advanced work cultures. Only at that point, perhaps after a quarter or a third of their expected lifespan, are people presumed to have sufficient

knowledge, socialization, and modes of thinking to be able to navigate the complex symbolic landscape of modern knowledge, information society, and cultures in order to participate in more advanced social roles.

This odd form of life we humans have developed through our biological and cultural inheritances has relied on our consciousness and sociality to invent technologies of language and inscription. These symbolic means have allowed us to aggregate large amounts of information to investigate and manage our place in the world collaboratively. Through such means we have come to dominate other life forms and hold the fate of the planet in our hands. This odd literate form of life increases the pace of the world's transformation in directions that are hard to predict with clarity. Many perils and problems face human societies in the near term, with uncertainty about whether we will develop the knowledge, cooperations, and sociality to address our long-term perils successfully. If we do, much will be mediated by texts of knowledge, governance, commerce, and ideology, and we will enter into new ways of life within evolving cultures. If we do not, much of our troubles will be exacerbated by our texts of ideology, commerce, insufficient knowledge, failed cooperation, and failed governance. Perhaps this biological evolutionary experiment of creatures who speak and are capable of inventing writing is doomed, as we are too clever by half for our own good, to be replaced by other creatures with capacities better suited for survival. If that is the case, we humans would have had a spectacularly complex, if brief, run on this planet.

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