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Emotion, Reason, and Language: Meanings Are Made, Not Retrieved

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Emotion, Reason, and Language:
Meanings Are Made, Not Retrieved

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A B S T R A C T

Most researchers of writing are no doubt familiar with the historical, general linguistic, and neurolinguistic arguments in works by DeFrancis (e.g. 1984, 1989), Unger (e.g. 2003, 2014, 2016), and others against the conceptualization of writing systems as either phonographic or logographic, and thus against the disjoint classification of their graphic units as either phonograms or logograms. Here I discuss new studies of reasoning and conscious thought (especially Barrett 2017 and Mercier & Sperber 2017) that shed light on the classification of writing systems and their components from yet another direction. These studies make new and cogent arguments that emotion and reason are not stored routines or algorithms retrieved by mental processes akin to computer programs but are rather thoughts and behaviors that emerge in real time. Recent studies of brain states during the transition from word recognition to word understanding (Kutas & Federmeier 2011, Broderick et al. 2018) strongly suggest that linguistic meaning likewise is dynamically created on the occasion of each linguistic interaction. Given the failure of the metaphorical understanding of emotions, reasoning, and lexical meanings as prestored context-independent entities retrieved during cognitive activity, the notion of a pure logogram — a symbol representing a unit of meaning possessed by an individual word or morpheme — becomes vacuous.

PREFACE

This paper was the basis for a presentation I gave at a conference entitled "Sound and Symbol in Sinography" hosted by the Department of East Asian Studies, Princeton University, on June 19, 2018. The other presenters were Zev Handel (University of Washington), Murielle Fabre (Cornell University), and Sowon Park (UC Santa Barbara); the conference was organized by John Whitman (Cornell University), Brian Steininger (Princeton University), and John Phan (Columbia University).

Whitman took the lead in organizing the conference because he believed that the exchange of articles by Handel and myself (Handel 2013, Unger 2014, Handel 2015, and Unger 2016) in the pages of *Scripta,* a journal based in Korea tightly focused on writing systems, deserved wider scholarly attention. In his presentation, Handel introduced his forthcoming book *Sinography: The Borrowing and Adaptation of the Chinese Script* (now published by Brill) with a presentation entitled "Sound and meaning as conceptual units in script borrowing." My presentation was listed in the conference program as "New reasons to doubt the existence of pure logograms."

1. INTRODUCTION

In Unger 2003, in the context of writing-system typology, I discussed alternatives to Noam Chomsky's conception of what constitutes language. Criticisms of the Chomskyan view in recent years have focused on two problems: the difficulty of accounting for the rise of linguistic competence, as Chomsky defines it, in terms of biological evolution (e.g. Corballis 2017); and the excessive logicism that the Chomskyan concept of language requires to account for linguistic meaning.[1] These problems were latent in Chomsky's transformational grammar of the 1960s, when he sought to avoid them by erecting a psycholinguistic wall between syntax and semantics. This wall was breeched during the "linguistics wars" of the 1970s (Harris 1993), starting with the "generative semantics" of such acolytes as George Lakoff and James McCawley. A variety of other critiques soon followed. Lakoff, for instance, wrote cogently about the centrality of metaphor and culturally defined categories in the construction of meaning (Lakoff 1987); an even more radical line of attack was taken by Roy Harris and his students (Toolan 1996, Harris & Wolf 1998). Despite defenses of Chomsky's views (e.g. Bickerton 1990), and Chomsky's periodic revisions of his own position ("standard theory," "revised standard theory," "government and binding," etc.), a stream of discoveries in neuroscience (e.g. Hamrick et al. 2018) has cast ever more doubt on fundamental postulates of the Chomskyan view, such as Universal Grammar, a Language Acquisition Device, other lately evolved innate brain processes or modules dedicated to language, and the computational metaphor of cognition.

This intellectual ferment happened unfortunately to overlap the rise of the deconstructionism of Jacques Derrida in the humanities and social sciences. Together, Chomskyan formalism and the post-modernist paradigm contributed, in different ways, to the resuscitation of the notion of ideographic writing, which dates back to the 1600s (Rasula & McCaffrey 1998, Porter 2001). The self-contradictions implicit in the notion of ideogram dissuaded most linguists from endorsing the reality of ideographic writing, but some tried to reformulate the Bloomfieldian dichotomy of logographic and phonographic writing in a way that preserved the idea of meanings as atomic, logical predicates that can be paired with elements of the writing system. At the extreme, this entails the claim that texts can have a morphology autonomous of that of the language of the texts (e.g. Hannas 1997). Sampson (1985)

1 I pass over critiques of Chomsky, such as Lin 2017, which focus on Chomsky's research methodology.

and more recently Handel, in his ongoing exchanges with me in the pages of the Korean journal *Scripta*, take a less radical position, but still insist that classifying entire writing systems as logographic or phonographic is consistent with all known facts about the mechanisms of literacy, and tells us something of value about those mechanisms. I have argued that these claims are false, citing recent developments in neuroscience (e.g. Dehaene 2009, Dehaene & Cohen 2011, Bergen 2012) as well as arguments masterfully framed by DeFrancis in the 1980s. Here, however, I will attack the idea of a logographic-phonographic dichotomy of writing systems at a more fundamental level, by undermining tacit assumptions about meaning that underlie the notion of a logographic writing system.

2. REASON AND EMOTION

Let us begin with what might be called the Doctor Dolittle question: do certain higher animals beside humans possess linguistic competence? Debate over this question has been interminable because of the difficulty of defining linguistic competence. A sharper question to ask is whether reason and logic are unique to human beings or not. The longstanding view of many psychologists, mathematicians, philosophers, and linguists has been not only that they are, but also that they are the abilities that most decisively distinguish humans from all lower forms of life. On this point, both classical thinkers and modern cognitivists agree. For example, the usual interpretation of the "behavioral economics" research of Daniel Kahneman (most recently 2011) is that evolution has left many pieces of faulty pre-human neural wiring in the brain. These miswirings are the cause of common mistakes people make and biases they exhibit when they are confronted with difficult choices.[2] Reason and logic, on this account, are hard-won tools that humans have discovered thanks to conscious effort and the use of language, and are available only to the fittest, most self-disciplined individual minds. The resemblance of this theory to the Platonic theory of mathematical entities is hard to miss: reason and logic are "out there" in the universe, waiting to be discovered by intelligent life-forms.

2 "Although this paper is concerned mainly with monetary outcomes, the theory is readily applicable to choices involving other attributes, e.g. quality of life or the number of lives that could be lost or saved as a consequence of a policy decision" (Kahneman & Tversky 1979: 288).

So too in language itself — under either the classical Saussurean or the more recent Chomskyan view — meanings are conceived of as objective entities specifiable in principle, if not always practically, by means of formal logic. The goal of linguistic communication is to pass constellations of meanings from one brain to another by means of linguistic structures encoded in speech. The sender encodes and the receiver decodes the meanings that constitute the message using rules of syntax much as fax machines use deterministic electronic processes to encode and decode the pixels of an image. Any ambiguity, vagueness, error, or misunderstanding that arises in the process is ascribed to a failure of implementation or to ambient conditions beyond the control of the speaker and listener, not to the programs governing the process. Even though we do not have a complete understanding of what they are, it is assumed that the nature of language acquisition guarantees that all native speakers share the same programs, i.e. rules, linguistic forms, and the stock of meanings to which they refer.

Likewise, emotions are commonly believed to be relics of earlier stages of evolution, hard-wired into our brains, that are triggered by certain events in the world around us, and consistently manifest themselves in certain ways in our behavior, whether we are conscious of them or not. Emotions, whether seen from the classical or modern cognitivist perspective, are universal and have overt, recognizable traits — indeed, according to many theories, are localized in specific regions and layers of brain tissue. But whereas reason and language are seen as evolutionary achievements to be cultivated, emotions are seen as overwhelming urges that sweep over us unless held in check by conscious reason, for which, in turn, linguistic competence is believed to be a necessary precondition.

In Unger 2003, although I did not discuss emotions, I pointed out the long history of objections to such views of reason and language by scholars who have eschewed both the classical and cognitivist paradigms. In 2017, two impressive studies appeared offering a robust array of arguments about the nature of reason and emotion that extends this critique.[3] While neither

3 Another book published the same year, Sloman & Fernbach 2017, focuses on the fact that each of us knows a great deal less than we think we do because we labor under the illusion that we understand all the paraphernalia of technology we have incorporated into our lives. While this highlights the necessity of socialization for inference or experience, it only deals with social interactions at the macro level. The closest the authors come to something deeper is to note that machines lack intentionality.

examines linguistic meaning or semiotics directly, they each reflect a rapidly growing scientific consensus, supported by research on brain activity made possible by new technology, that strongly supports the theory that reasons and emotions are neither exterior to nor hard-wired directly in our brains. What we call reasons and emotions are, rather, experiences brought into existence "on the fly" by the ceaseless inferential activity our brains engage in during social interactions. Neither reasons nor emotions are universal or directly encoded in our genes. There is no Platonic realm in which they pre-exist. Our common biological inheritance is the brain itself, which, thanks to plasticity and redundancy, automatically constructs what we perceive as the world around us by means of concepts we have accumulated through experience and predictions informed by sensory data from both outside and inside our bodies.

The number and variety of the arguments presented by Mercier and Sperber and by Barrett independently in support of this view make a comprehensive summary of their evidence impossible within the scope of this presentation, so I will confine myself to outlining their common conclusions and explaining what I see as the implications of their findings for the study of writing systems. Of the two books, Barrett's includes a clearer picture of the intellectual history underlying these common ideas; also, although she focuses on emotions, her understanding of emotion experiences largely subsumes the concepts of reasoning and knowledge described by Mercier and Sperber. I will therefore begin by sketching out Barrett's framework.

2.1 Emotions

According to Barrett, the principal reason for the dominance of the classical theory of emotions — including its latter-day reformulation in cognitivist terms — is essentialism, i.e., the belief that emotions are discrete, innate, universal, and beyond control except by the disciplined exercise of rationality.[4] This viewpoint can be seen in the works of Descartes and Spinoza, who still used words like *passion* and *sentiment* for what later came to be called *emotion*. Essentialism was disputed by philosophers such as Hume and Kant, but met its first scientific challenge when Darwin undermined

4 Another reason for the dominance of the essentialist view has been its uncritical adoption in many fields of applied science and technology and in the law.

it *en passant* in his *Origin of Species* (1859) by demonstrating that species of organisms evolved and did not embody unchanging essences. Ironically, Darwin himself fell into the trap of essentialism in *The Expression of the Emotions in Man and Animals* (1872), a mistake that William James corrected in his *Principles of Psychology* (1890). James, who carefully distinguished instances of emotion from the rubrics given to them, much as Saussure would later distinguish *parole* from *langue*, was misinterpreted by the influential John Dewey, who went so far as to call his version of essentialism the James–Lange theory of emotion,[5] thereby creating confusion as to its intellectual lineage.

Similarly, although Darwin had described emotions as having essences, he saw them as vestigial in human beings, relics of more primitive forms of life. Because they conferred no discernible selective advantages, Darwin was unable to account for their persistence in humans. This spurred behaviorists of the 1930s to search diligently to find consistent markers of the hypothesized emotional essences, a task in which they failed so consistently that many became skeptical of the essentialist hypothesis. Their work has been largely ignored because of the influence of Floyd Allport, who has been called the father of experimental social psychology. In the 1920s, he argued that, contrary to Darwin's understanding of natural selection, emotions served purposes that ensured their survival from one generation to the next, thus reinforcing Dewey's misinterpretation of James's work and keeping the skeptics at bay. Of course, the disrepute into which behaviorism generally fell in the 1960s — in no small part because of Chomsky's criticisms of B. F. Skinner — further obscured the importance of empirical results in the behaviorist literature casting doubt on the idea that emotions are universal, genetically encoded essences.

Recently, however, thanks to advances in technology, the evidence that experiences of emotion are created by individual brains on the basis of their accumulated concepts has grown significantly. This is why Barrett cites Gerald M. Edelman's remark that experiences are "the remembered present" as a handy description of her theory: an instance of emotion is what a brain predicts its owner is about to experience in the context of incoming sense data at the moment. An instance of emotion is thus, like a sound, a subjective experience: a sound is distinct from the

5 The Dane Carl Georg Lange was the psychologist who actually claimed that emotions could be reduced to physiological reactions.

vibrations in the air that physically constitute it, and our conscious awareness of a sound is distinct from the automatic processes of auditory perception that culminate in that awareness.[6] Hence, for Barrett, "emotion is meaning," i.e. instances of emotion are instances of making sense of our bodies in the world around us at the moment of which we are conscious. The brain achieves this "making sense" by using concepts (i.e. memories) it has accumulated as guides for categorizing incoming data quickly, making predictions about them, and acting on them in real time. The experience of an instance of emotion is real enough, but it is created impromptu by mental processes that are different in each instance despite their retrospective inclusion in the same conceptual category. As Barrett says,

> You can tremble in fear, jump in fear, freeze in fear, scream in fear, gasp in fear, hide in fear, attack in fear, and even laugh in the face of fear. Each occurrence of fear is associated with a different set of internal changes and sensations.

2.2 Reason

Of course, even if all emotion experiences are meanings, one may ask whether all meanings are emotion experiences. Barrett comes close to saying that they are when she emphasizes the importance of socialization in the construction of the concepts that underlie emotion experiences, and the great acceleration in the accumulation of concepts due to the acquisition of language that normally occurs during the transition from infancy to childhood. The concept 'emotion' for her thus subsumes virtually all experiences, and I am not sure that Mercier and Sperber or Sloman and Fernbach would necessarily object to such a holistic approach. Both pairs of authors emphasize that what we know and how we reason are both far more dependent on socialization and shared language use than either the classical theory or its cognitivist version allow. Both pairs marshal evidence showing that reasons and facts are products of mental simulations of the sort that Barrett discusses in

6 It should be recalled that mid-twentieth-century attempts at the Haskins Laboratory to simulate speech through computer-based reverse engineering based exclusively on acoustical data, with no reference to articulatory features, were unsuccessful. Breakthroughs were made only after recognizing that the subjective experience of phonemes involved mental simulations of speech production, which utilized the parameters governing vocal articulation, not just its output.

relation to emotion experiences. Indeed, as Barrett points out, there are at least ten near-synonyms for 'categorization' in the literature of constructionist theories of meaning: "Experience. Perception. Conceptualization. Pattern completion. Perceptual inference. Memory. Simulation. Attention. Morality. Mental Inference."

For Mercier and Sperber, the key word here is 'inference.' "Animals make inferences all the time: they use what they already know to draw conclusions about what they don't know — for instance, to anticipate what may happen next, and to act accordingly."

> Do they do this by means of some general inferential ability? Definitely not. Rather, animals use many different inferential mechanisms, each dealing with a distinct type of problem: What to eat? Whom to mate with? When to attack? When to flee? And so on.[7]

So too is it with humans, except that "many of these mechanisms are not 'instincts' but are acquired through interaction with other people during the child's development." The acquisition of language, for instance, seems to be an instinctual process of inference, but "there are many inferences of which humans are conscious," which Mercier and Sperber call intuitions. Whereas Kahneman and other cognitivists see intuition and reason in opposition to one another, Mercier and Sperber argue that "reason itself is a kind of intuitive inference." To understand exactly what kind, they introduce the notion of *representation* as a potentially recursive mental process; i.e., humans represent "not only things and events in our environment but also our very representations of those things and events."[8] Representations of abstract ideas and what other people think "play a major role in our ability to understand one another, to communicate, and to share opinions and values." Among these representations are reasons, in which we (re)present to ourselves our explanations for the behaviors

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7 Fighting, fleeing, feeding, and mating are collectively known among psychologists as "the four F's," as Barrett wryly notes.

8 This is reminiscent of C. S. Peirce's division of signs into icons, which mimic the shapes of things; indices, which point to their locations in time or space; and symbols, which have no such relationships, and can therefore represent other symbols or combinations of symbols.

of others. We commonly give the name Reason to the mental process of intuitive inference with which we assess reasons, the proffered explanations. Thus, for Mercier and Sperber, instances of Reason are the innermost of five nested sets categorizing varieties of inference: to use mathematical notation, they hold that {inferences} ⊃ {intuitions} ⊃ {intuitions about representations} ⊃ {intuitions about reasons} ⊃ {instances of Reason}.

The at-the-moment instantiation of Reason in this model greatly overlaps with Barrett's notion of emotion experience. The denial of a single, general capacity for drawing inference mirrors Barrett's emphasis on the impermanence of concepts and the "degeneracy" of conceptualizations (i.e. the fact that many different conceptualizations may result in the same outcome in terms of behavior or experience). Reason experiences, on this account, are like emotion experiences: the concepts that our brains use to assemble them and our conscious awareness of them are heavily dependent on the social reality that contributed to the formation of the concepts and the immediate social context that, so to speak, makes it feel the way it does.

3. LINGUISTIC MEANING

As I illustrated with examples in Unger 2003, many linguists have taken the position that meaning comes into existence in just such a context-sensitive spur-of-the-moment manner. Of course, because normal brains construct social reality as part of the world around them, this social reality does not include voices speaking from nowhere freely imputing capricious or bizarre meanings to words and phrases, as Humpty Dumpty thought he could. Our experience of linguistic acts, in short, is real, but their import is something we construct at each instance.

Since 1980, empirical evidence of a dynamic process of meaning creation has been intensively studied by neuroscientists. The evidence consists of "an event-related brain potential response" called N400 because it is "a large negativity [i.e. negative change of electrical potential] with a broad (parietally maximal) scalp distribution, peaking around 400 ms." It is consistently elicited when the subject is presented with semantically unexpected words or unusual syntactic patterns. Reviewing more than a thousand research papers on N400 in 2011, Kutas (one of its discoverers) and Federmeier write,

> In sum, the N400 arises from a time period in which stimulus-driven activity enters into temporal synchrony with a broad, multimodal neural network, whose current states have been shaped by recent and long-term experience of a wide range of types (e.g., based on world experience, long-standing and recent linguistic and nonlinguistic inputs, attentional states, affect/mood, etc.). … Notably, on this view, conceptual representations are not "looked up" in memory but are dynamically created and highly context dependent: because semantic memory states are continuously changing, the meaning of a given stimulus, defined as the configuration of neural activity that is bound together in response to that stimulus, will be somewhat different across people, time, contexts, and processing circumstances. … [T]his highlights the fact that the meaning of a stimulus is not computed at a single point in time, but rather something that emerges through time, with the activity measured in the N400 representing an important aspect of that emergent process, but not, certainly, the final state.

At the end of last February, new empirical evidence for this account of meaning construction was presented in Broderick et al. 2018. Using a model of words as vectors of 400 components, the authors devised a temporal response function (TRF) that measures the semantic dissimilarity of the last word added to a string that is part of an emerging spoken sentence relative to the preceding words in the string. Broderick and his colleagues demonstrated through controlled experiments that the change in this statistic closely correlates with N400, sharpening the conclusions of Kutas and Federmeier. This research can be criticized from a linguistic standpoint for not specifying what a spoken word is with precision and for using a rather crude statistic to summarize the effects of context on lexical interpretation. On the other hand, it is remarkable that these results were obtained using a large amount of spoken stimulus: about an hour's worth of audio-book playback per subject in the experimental condition (not written material, in which visual backtracking could not be prevented). As improvements in experimental technique and theoretical framework are made, we may therefore expect to gain greater understanding of the dynamic nature of meaning creation

reflected by N400, and find the rival "look-up" model of meaning retrieval correspondingly less satisfactory.

Naturally, this undermining of the notion of meanings as discrete, context-independent packets of information associated with words or morphemes stored in the mind calls into question the claim that context-independent systems of symbols standing in one-to-one relationship with such mentally stored atoms of information exist. This is not to say that there is no difference between the phonographic and logographic uses of symbols, but rather that one must distinguish the ways in which symbols are used from the symbols themselves. A written symbol is more logographic the less its graphic structure reflects the phonological structure of the chunk of speech it is used to represent in a given context, and vice versa.[9] The meanings allegedly represented by logograms, in the mid twentieth-century sense of the term, are, from this perspective, merely names or rubrics for the morphemes that the logograms are alleged to represent in a given language. Such names play no role in the prelexical recognition of words and morphemes in the brain, whether stimulated by speech or writing, and are therefore unnecessary for that recognition.[10] Under normal circumstances, the comprehension of speech or writing requires only information about the form of the stimulus. By contrast, atomic meanings are conscious analytic concepts we use to clarify or discuss the products of understanding *after* they have emerged in real time, or when we conflate memories of temporally disjoint linguistic events, ignore the differences in the circumstances that gave rise to them, and speak about them as if they existed in a Platonic realm of ideals.

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9 An element of a writing system has intensional signficance by virtue of how it contrasts graphically with other elements of the system; it has extensional significance by virtue of how the chunks of speech it stands for contrast with other chunks of speech. Its extensional significance is a function of contrasts between the chunk of speech with which it is associated in a given context and other chunks of speech. Whereas graphic contrasts are essentially all alike, such linguistic contrasts are of two kinds (Martinet's "double articulation" of language) that are simultaneously present in every instance of speech. It is the difference between these two kinds of contrast (phonological and higher-level) in the layered structure of speech that imparts to an element of a writing system in a given context a more or less phonographic or logographic character. The element's intensional significance has no *a priori* representational function.

10 I am reminded of the objection of my former colleague Mary Beckman, an outstanding experimental phonetician, to the term International Phonetic Alphabet. The IPA was really, she argued, the International Phonemic Alphabet.

Such retrospective abstraction is, of course, important, for it is the basis of conscious teaching and learning. But just as conscious learning is a far cry from initial language acquisition, so too is the notion of fixed meanings a poor model for how linguistic interactions give raise to pragmatic understanding.

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