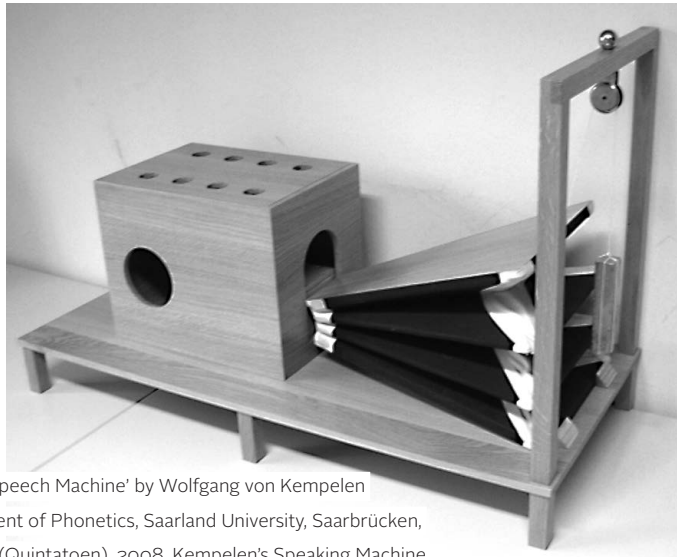| Title	The Economies of Language in Digital Space/s
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Figure 1. Replica of the 'Acoustic-Mechanical Speech Machine' by Wolfgang von Kempelen (originally produced in 1791 [2]) by the Department of Phonetics, Saarland University, Saarbrücken, Germany, 2007-9. Photo by Fabian Brackhane (Quintatoen), 2008. Kempelen's Speaking Machine directly followed the seminal work by Russian Professor Christian Kratzenstein who had made apparatus to artificially produce thus explain the physiological differences between five long vowels (/a/, /e/, /i/, /o/, and /u/). [3] These attempts to produce the sounds of human speech were the precursors of modern electrical/digital speech synthesis. Used with permission via the Creative Commons Attribution-Share Alike 3.0 Unported license.

THE ECONOMIES OF LANGUAGE IN DIGITAL SPACE/S

by

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THE CHANGING LANGUAGES OF IMAGE AND TEXT

In a time when the ontologies and ecologies of language are being radically challenged by the unstable modes of representation posed by the digital, networked environment; and whose very relationship to temporality has, according to Johanna Drucker, in her essay "Digital Ontologies," been altered, it seems timely, if not essential, to reconsider the question of where 'sense' or meaning lies in mechanized and digitized language, if it lies at all. [4] The word 'lies' possesses a dual meaning in this context, and in the debates over truth in language, the static image of thought via language, as a conduit for verac-

ABSTRACT

As language (both writing/speech) rapidly changes due to on-going developments in speech recognition systems, text-to-speech and chat bots, this paper focuses on the various attempts to synthesize, and mechanize language over time: to submit it to the logical, rational, and mechanical: to atomize and/or render it as pure code. This involves looking afresh at the kinds of philosophical questions these developments raise with respect to language – as a 'human' phenomenon – which is increasingly being mediated by technology. The question – what is language when it is made by a machine? – touches upon ethical concerns; the notion of linguistic agency, and the shifting relationship between language and thought. While attempts at synthesising speech can be traced back as far as Roger Bacon (1200s) and Christian Kratzenstein, (1770s) more recent attempts to mechanize speech include early 20th c. mechanisms for encoding speech, such as the 1939 World's Fair 'Parallel Bandpass Vocoder' and 'Voder,' (1940). [1] Alan Turing's work with 'Universal' computing languages, and their implications for AI, as well as the recent Siri application for the iPhone are more recent examples of the move towards forms of language which are removed from the body and rendered through code. The claim is that such mechanical interventions into language, both foregrounds and problematizes our relationship with language as a primary human technology. This paper proposes that we might want to pay particular attention to the changing forms of language as they are experienced/mediated through such technologies, and to the implications for identity, human agency and the larger 'moral economies' they imply.

ity has been discredited; increasingly subject to the infinite material fluctuations of digital surface[s].

Drucker suggests that the most pressing question of the digital amounts to: "[T]he basic issue of whether an idea can exist outside of instantiation in material form with respect to the digital environment." [5] Her

remark poses a question about the [im]materiality of the digital, and its ephemeral, paradoxical nature: both existing and not at the same time; thus unsettling our ideas about the identity of both images and language, and their status as meaning-full. In turn, it leads to us question whether our conception of language (whether writing or speech), is profoundly

changed by its capacity to be stored as digital code? If traditional forms of photography have entered into what Ken Hollings calls a pathological phase – wherein the digital, networked image and the movement and distribution of images is more significant than any content 'in' the image, undermining any of its aesthetic or semantic properties, then this question of where 'sense' or meaning is located in the image becomes further accentuated and complex, and this also applies to language whose move towards code suggests that its very meaning as an expression of human thought and identity needs to be reconsidered. As Ken Hollings remarked:

> [T]hanks to the digital camera, we don't take photographs anymore but generate social networks instead – [what] we call photography is a pathological condition and has suffered greatly from being regarded as an 'art form' for so long, and might never recover." [6]

The trajectory of both Drucker and Hollings' questions accelerates to a remark about the identity and status of language[s] in general (whether visual or linguistic) when they move to the material/immaterial space of the digital. The ways in which we store, access, and distribute photographs is, by analogy, of real importance here. Rarely printed, and frequently residing in the 'cloud,' personal photography in particular, would suggest that the status of photographs has so radically changed in the current context as to be indescribable within any prior system of sign/signified, true/false, or traditional indexicality. The 'sickness' from which both photography and language suffer is perhaps rooted in their inability to accommodate or bend to any alternative systems of meaning required by new digital contexts. An alternative system of meaning would need to take into account both photography and language's altered circumstances, caused by their proliferation within digital environments and ephemeral social spaces, and the accompanying challenges to their ontologies. These new modes of production and distribution require different philosophical 'moves' to accommodate the nebulous, networked, dematerialized contexts we find both images and language operating in. Ken Hollings offers the insight that:

> [T]hanks to the digital camera, we don't take photographs anymore but generate social networks instead – [what] we call photography is a pathological condition and has suffered greatly from being regarded as an 'art form' for so long, and might never recover. [7]

The consequent dematerialisation of language can be seen to extend all the way to Artificial Language, with its reduction to units of code, removing it further and further from the body and from the human agent. This collapsing of the space between the mechanical and the linguistic, their entwining, raises important ethical questions about the continued role of language as a phenomenon which shapes what it is to 'be' human, and to possess an identity through language, or indeed to 'think.' Language and the subject are differently configured in the world of AI and synthetic speech, requiring a different philosophy of language to account for these changes. The ethical status of language is in question when machine-made, and while all language could be argued to be a technology, the increasing mediation of advanced technologies shifts the ethical and ontological framework of language further than ever before. This is partly due to the increasing ubiquity of such languages, which have moved out of the world of relatively arcane scientific experimentation, and into the everyday.
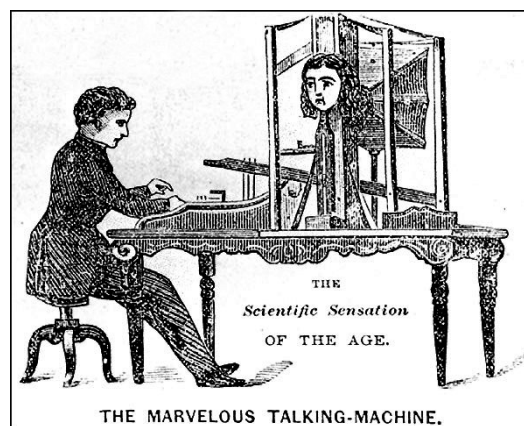

Figure 2. *Faber and the Euphonia* is a Victorian illustration of Joseph Faber's "Speech Organ" from 1846. Image posted by Erin at the Dead Media Archive, 2010. Used with permission via the Creative Commons Attribution-Share Alike 3.0 Unported license.

The Origins of Language-as-Code

The desire to mechanize language and render it coterminous with both the ideas and practical realities of machines, has a long history, reaching all the way back to the Enlightenment, and earlier. Language, as the primary interface between us, and the 'out there,' was and continues to be, a source of mistrust; the locus of a frequently troubling level of subjectivity, wherein human agents are the carriers of meaning, and disruptive potential, constituting an anarchy of articulation, which is seen as needing to be managed and contained. We can see the roots of such anxieties in the practice of philosophy itself, as explained by Ian Hacking:

> One reason why language matters to philosophy and not to Zoology is that philosophers are often concerned with domains where our common ways of thinking and arguing lead us not to clarity and a satisfactory technical language, but rather to ambiguity, equivocation, contradiction, and paradox. [8]

The problem for philosophers is that the same word can have many meanings (Thomas Hobbes called this the "inconstancy" of language [9]) and such ambiguity is seen to lead to confusion between concepts, whereby a perversion of judgement takes place. To counter this (and as a precursor to later work by Gottfried Wilhelm von Leibniz), Baruch Spinoza, John Wilkins, [10] along with Francis Bacon proposed that a 'mathematical' approach to language be adopted; one in which clear and unambiguous definitions of terms were agreed::

> Although we think we govern our words... certain it is that words, as a Tater's bow, do shoot back upon the understanding of the wisest, and mightily entangle and pervert the judgment. So it is almost necessary, in all controversies and disputations, to imitate the wisdom of mathematicians, in setting down in the very beginning the definition of our terms... [11]

The notion of language as instrumental, as something which should be removed from the human body and its propensity for the kind of sensual subjectivity which creates ambiguity, is a precursor to symbolic logic and analytic philosophy. Philosophers such as Wilkins and Leibniz have historically attempted to treat language as highly mechanised instruments of thought, through the construction of a 'mathesis' or, in Leibniz's term, a "Characteristica Universalis," [12] which attempts to suppress languages' expressive dimensions in favour of hard logic. John Wilkins (1668), in *An Essay Towards a Real Character and a Philosophical Language*, is one of the first to attempt to outline a new 'universal' language. He says:

> If to every thing and notion there were assigned a distinct Mark, together with some provision to express Grammatical Derivations and Inflexions; this might suffice as to one great end of a Real Character, namely, the expression of our Conceptions by Marks which should signify things, and not words. And so likewise if several distinct words were assigned for the names of such things, with certain invariable Rules for all such Grammatical Derivations and Inflexions, and such only as are natural and necessary; this would make a much more easy and convenient Language than is yet in being. [13]

Wilkins goes on to say:

> By now if these Marks or Notes could be so contrived, as to have such a dependance upon, and relation to, one another, as might be suitable to the nature of things and notions which they represented; and so likewise, of the Names of things could be so ordered, as to contain such a kind of affinity or opposition in their letters and sounds, as might be some way answerable to the nature of the things which they signified. This would be a farther ad-

vantage superadded: by which, besides the best way of helping the Memory by natural Method, the Understanding likewise would be highly improved; and we should, by learning the Character and the Names of things, be instructed likewise in their Natures, the knowledge of both which ought to be conjoined. For the accurate effecting of this, it would be necessary, that the Theory it self, upon which such a design were to be founded, should be exactly suited to the nature of things. But, on supposal that this Theory is defective, either as to the Fulness or the Order of it, this must needs add much perplexity to any such Attempt, and render it imperfect. And that this is the case with that common Theory already received, need not much be doubted; which may afford some excuse as to several of those things which may seem to be less conveniently disposed of in the following Tables, or Schemes proposed in the next part. [14]

It is clear from these remarks, that Wilkins himself had doubts about the validity and 'perfectibility' of such a project, which relied upon an exact and natural correspondence between marks and objects/concepts. Such a closing of the gap between word and object, required a leap of faith. He explains that while notions are agreed upon, their expression in marks or sounds is not (they are arbitrarily assigned).

However, as Louis Couturat has pointed out, Leibniz criticized such linguistic systems for their concerns with:

[P]ractical uses rather than scientific utility, that is, for being chiefly artificial languages intended for international communication and not philosophical languages that would express the logical relations of concepts. [15]

Within Leibniz's advocated form of rationality and abstract thinking, promoted by the creation of an entirely artificial symbolic language such as his "Characteristica Universalis," ideas are assigned a single symbol, and rules are established for their combinations and use, such that "all abstract reasoning would be reduced to mere algebraic calculations" [16] with the result that the errors and uncertainty associated with the figurative, shifting, imaginative language of ordinary discourse are eliminated, in favour of an emergent form of artificial language which suppresses the sensual. Words, which are assigned a precise technical meaning, stand not for themselves, but for concepts. As Stuart Hampshire explains: "Words or symbols within mathematics do not derive their meaning from the images which may be used to illustrate them, but stand for clearly defined conceptions." [17] The system emulates pure, mathematical reasoning: clear, unambiguous, abstract, error-free, and for Leibniz: "Words are logical counters which have a purely intellectual significance, [they] stand in this sense for clear and distinct ideas," [18] that offer an alternative to a language shot through with error and uncertainty; one wholly unsuited to the rationalist doctrine. Leibniz continues:

If one could find the characters or symbols to express all our thoughts as cleanly and exactly as arithmetics expresses numbers, or as analytic geometry expresses lines, one could do the same as one can do with arithmetics and geometry, as much as they are subject to reasoning. This is because all investigations that depend on reasoning would take place through the transposition of these characters, and by a kind of calculus. [19]

In these historical examples, it's clear that language is to be progressively removed from the sensual arena; one which is subjectively conditioned by the human being who utters and/or writes, and is instead to be rendered code-like and mechanical: 'tamed' by reason and logic.

Formal Logic as Artificial Language

Georg W. Hegel said: "That the subject matter of logic is thought, with that everyone agrees." [20] Richard Schusterman more recently counters with: "The philosopher cannot award the sole birthright by mere logical analysis for there seem to be rival logics governed by different aims." [21] Schusterman suggests that logic per se is not the only form in which thinking takes place, but this notion is persistent throughout the history of philosophy. The projects of Wilkins and Leibniz, can be broadly contextualised within the traditions of logical analysis, as a specific aspect of philosophy, and be seen as both a precursor to, and extension of it. We might see logic as the prototype form of artificial language, wherein its functionality is so detached from the human and the sensual as to be mechanized and reduced to small units akin to code. Language in this context is instrumental, dehumanised, decontextualized: a set of abstract placeholders for any real world events. Logic is the science and practice of rational thinking. It determines something, and asserts (predicates) about that something, in the pursuit of truth or validity. It does this purely through language as an instrumental phenomenon. Martin Heidegger remarks:

Of its own accord, a determining so understood tries to measure up to that about which the statement is made. The measuring up to that about which the determination and statement are made, the adequatio, characterizes what we generally mean by the truth of statements. Aoyos, can be adequate or inadequate, true or false. [22]

Aristotle locates truth in correspondence, or in other words, in the identity between objects and concepts (in their quality of 'matching'). [23] This concept of truth as a set of correspondences grounded in language, and requiring a perceiving subject, is repeated in Thomas Aquinas, [24] Leibniz, and later in Immanuel Kant, who inherits the traditional concept of truth, while introducing new concepts of "subject," "knowing," and "judgment." [25] Ludwig Wittgenstein stated: "The correspondence or non-correspondence of [a proposition] with reality constitutes its truth or falsity." [26] In all versions, truth and correspondence, subject (mind) and object, and the search for identity, not difference (which would invite contradiction) are assumed, actively pursued, and considered intrinsic to method, whose 'ground' is this very search for correspondence or identity. [27]

Traditional (formal) logic is grounded in, and requires, a belief in the physical determinism (positivity) of language, aligned with fixed notions of time and space. It demonstrates and infers 'valid/invalid' outcomes, based on the formal deployment of language within rule-bound systems of subject-predicate (syllogistic), or symbolic form (on/off, right/wrong, yes/no: all rooted in binary thinking). In the *Tractatus Logico-Philosophicus*, Wittgenstein takes logic to be the principal 'ground' of both language and the world "Logic pervades both reality and how we apprehend reality. To pass beyond its limits, the limits alike of language and world, is to speak non-sense." [28] In his essay "Some Remarks on Logical Form," Wittgenstein outlines the principles of Logical Positivism, which Bertrand Russell had earlier proposed. [29] He explains how every proposition has both a content and a form, but that the 'pure' form is only available to us if we abstract from the meanings of individual words. What counts is not solely word-level semantics; logic must account for variables, which are subject to the same syntactical constraints as the constants. Logic must also avoid the trap which ordinary [natural] language falls into, of being able to construct seemingly sensible statements that, on closer inspection, are revealed to be "pseudopropositions." [30] These might involve phrases such as "the Real, though it is an *in itself*, must also be able to become a *for myself*," [31] effectively rendering large portions of philosophical discourse meaningless.

Propositions can be reduced to what Wittgenstein terms 'atomic' elements, where more or less complex arrangements of words and sentences containing embedded propositions, 'logical sums' or truth functions are progressively stripped away to reveal the most reductive, bare, minimal form, underlying the various material instances of language:

We must eventually reach the ultimate connection of the terms, the immediate connection which cannot be broken, without destroying the propositional form as such. They, then, are the kernels of every proposition, they contain the material, and all the rest is only a development of this material. [32]

The proper task of a theory of knowledge, according to Wittgenstein, is to find these extra-linguistic, 'atomic' facts (which can be thought of broadly as spatio-temporal events) and to make clear how they are constructed out of, or made possible by, the words or symbols of material language. Wittgenstein seeks to establish a hierarchy of linguistic significance, in which the material event of language is subordinate to the formal structures of language. His difficulty is in finding a method for excluding what he feels are the endless misunderstandings which plague ordinary language (its stubborn indeterminacy), while allowing for 'pure' form to reveal itself – abstracted from language as such. The answer he proposes is a symbol system which exchanges ordinary language for unambiguous, singular, and precise symbolic representations, which in turn provide a clear image of the logical structure. [33] However, in a further complication, this 'atomic' form cannot be seen, nor can it be predicted (a-priori).

Ordinary language poses the primary relation of language (and logic) as subject-predicate based, but this leads to an unwelcome generality, a lack of precision, which denies the fullness of the abstraction it seeks to

express. Phrases participating in the subject-predicate form offer no more precise opportunities for drawing conclusions than that they share this *form*. For instance, "I am lazy" and "the weather is fine" share no common content, only the same subject-predicate form of organization. Their content has no guaranteed character of correspondence; it's unclear how they could be deployed as a means to attain knowledge of the 'pure' facts of language.

The situation is further complicated by the sheer multiplicity of the world-phenomena which logical translation meets with, one which requires a logical form capable of embracing this multiplicity, and which simultaneously possesses the same breadth in its own formal architecture and system. Wittgenstein describes how a 'pure' logical language must encounter and consist of:

[T]he whole manifold of special and temporal objects, as colours, sounds, etc., etc., with their gradations, continuous transitions, and combinations in various proportions, all of which we cannot seize by our ordinary means of expression. [34]

The conclusion he comes to is that ordinary language is to be replaced in logical formations by numbers (rational or irrational), since numbers alone have the ability to represent "atomic propositions" [35] while entering into their very structure; becoming an integral part of the architecture of the expression in a way unavailable to ordinary language.

In In other examples, for Noam Chomsky, [36] the symbols of a formal language are meaningless in themselves. In such formal languages, meaning is based solely on position and relation within a system. Logical language is understood as a series of axioms and variables, whose application within the system can be applied universally and confer meaning by virtue of

their position alone. This 'formal' system of language and philosophy held that the ambiguities of ordinary language were unsuitable for doing precise conceptual analysis and so language had to first be translated into a formal language to which mathematical logic could apply. This language would be logically clear and precise or 'pure.' Similarly, Willard V. Quine offered the following thought: "To be is to be the value of a variable." [37] Apart from the ontological commitment this statement involves, it also demonstrates how Quine's philosophy of language holds that the objects of language (words, utterances) are to be understood as a series of axioms and variables, which are meaningless in themselves, but whose application within the system can be applied universally, attaining meaning with respect to position alone.

All 'formal/symbolic' systems of logic hold that the ambiguities (and 'intensities') of ordinary language are unsuitable for doing precise conceptual analysis, and so language first has to be translated into a formal language to which a rigorous 'mathematical' logic could apply. Language would be rendered logically clear and precise or 'pure' as a result of this operation. – George Lakoff and Mark Johnston state:

Scientific (or philosophical) theories are systems of axioms in mathematical logic, where the symbols are meaningless and need to be interpreted in terms of set-theoretical models ...Technically, a logical form in itself is meaningless-just a group of symbols .. A formal language needs to be interpreted to be meaningful. [38]

Such 'mathematical' languages are distinct from natural languages ('formal' versus 'everyday' language) and the underlying assumption (shared by Chomsky and others) is that for language to be precise and scientifically rigorous, it is essential to theorize from within such a formal system. In other words, within

logic, it is not possible to see meaning in the symbols themselves, but only in the relations between those symbols. In them, syntax is independent of semantics, and these are a consequence of a-priori philosophical assumptions about the relation between language and thought, language and self, and language to its-self: its identity. It follows automatically that to engage with such languages, and the theories that encircle them, is to accept the world-view they partake of, and that they in turn reinforce. Logic represents the ultimate move to make language mechanical and subservient to the requirements of function. It detaches language from the human and suggests that its formal architecture is its predominant feature. In making language 'artificial' and unbound from the subject who speaks and writes, it further participates in the removal of language from the body, and lays the ground for the on-going elimination of intimacy and nuance in language as a phenomenon, which is created by, and for, human beings.

Language now becomes a technical instrument, part of the technologization of the world, which Heidegger warned against the dangers of. [39] This kind of logical analysis most properly belongs to science, and marks the moment when philosophy becomes a form of reductive technical and formal thinking.

Subjectivity and Universal Language

Michel Foucault, in *The Thought from Outside*, argued that language is empty form, in much the way that logic suggests. We fill it with subjectivity, but it pre-exists us, as a series of generic, non-particular entities. The 'I' becomes our identity, but one born of an empty pronoun which lies in wait for a subject to utter it. "Fated to speak, then, and to have power over speech. But only by taking over and animating the empty forms of language. Forms, concepts, that pre-exist the subject and will outlive it." [40] Only a determinate subject can animate the 'I,' we speak, we blog, we confess, we

network, we dis/connect, through a language, which waits to be directed to a content. As Foucault reminds us, language, in itself, has an existence which is prior to its directedness, prior to its role in communication. It lies in wait, for a subject to inhabit it. The primary 'I' of language is impersonal, arbitrary, indifferent; a kind of mechanical 'prior' to language, which requires human agency to shape it into language in itself; returning it to the agency of human beings. However, these ideas are complicated by the contemporary technological, environment and the on-going proliferation of artificial languages, speech recognition systems and synthetic, coded forms of language.

On September the 9th 2011, an article appeared in the online Telegraph [41] outlining an experiment in which two science students had set up a randomized conversation between a pair of Chatbots (online avatars/robots). These entities usually converse with a human being, but the experiment involved them speaking with one another (the discussion quickly turned to the existence of God). These synthetic voices lack the timbre and richness of the human voice: their timing is fractionally, but significantly out of synch. What became compelling was observing where the breakpoints came in that staggered, awkward exchange; how the logic of argument quickly broke down, and the nuances and subtleties of conversational form were lost; how 'inhuman' it was, without being able to explain exactly why. It's a reminder that so much of communication is in the gaps, the spaces, the interstices, in the non-informational attributes of language; in the subtleties of timing and the association with the subject who speaks. Expression in language is reverberation, resonance. It's the unmediated, one might almost say erotic dimensions of language which we miss in mechanized speech: its non-representational, libidinal form. We miss its intimacy and connection to the attributes of a language, which emanates from the body. Language is much more than simple point-

for-point communication, while as Friedrich Nietzsche in *The Will to Power* pointed out, thinking itself is an infinitely more complicated affair, happening at, or beyond limits of apprehension:

> *Causality eludes us; to suppose a direct causal link between thoughts, as logic does – that is the consequence of the crudest and clumsiest observation. Between two thoughts, all kinds of affects play their game: but their motions are too fast, therefore we fail to recognize them, we deny them.* [42]

Emulated speech, sampled from the various tonalities of voice, never manages to feel unshackled from its mechanical, coded foundations, and in turn its roots in pre and post enlightenment attempts to render language mechanical and abstract are exposed.

While the Situationist International, in 1963, wrote: "Under the control of power, language always designates something other than authentic experience," [43] Bell Labs were automating the human voice, [44] forcing a new space to open up between writing and speech, in the poetry of code; one as fundamentally detached from authentic experience as it is possible to be. This new relation between language and experience, between the subject and language, has only just begun to be understood. Meanwhile, most of us instinctively flee from the automated voice, rejecting the cold, dispassionate, pseudo-communication of coded speech. Maurice Blanchot offers the following insight:

> *When When two people speak together, they speak not together, but each in turn: one says something, then stops, the other something else (or the same thing), then stops. The coherent discourse they carry on is composed of sequences that are interrupted when the conversation moves from partner to partner…The power of speaking interrupts itself, and this interruption plays a role*

> *which appears to be minor – precisely the role of subordinated alternation. This role, nonetheless, is so enigmatic that it can be interpreted as bearing the very enigma of language: pause between sentences, pause from one interlocutor to another, and pause of attention, the hearing that doubles the force of locution.* [45]

Tone, timing, emphasis, modulation – these are all tiny, intramundane, but essential pointers to the 'human' in language, where tone of voice, pacing, and emphasis is everything. We can tell an entire story with the nuances and inflections of our speech, and with the spaces between elements. Space and time are essential components of language, and conversation is where we experience the full force of this dynamic. In conversation, a pause designates the distinction between two statements. Someone starts to speak, and is interrupted by another or, pauses voluntarily to allow the other to speak. By virtue of the voluntary or enforced interruption of the stream of words, the silence of the one becomes the ground of the other. Differently put: a space is created whereby another voice can enter the language stream and be heard: "Interruption happens for the sake of understanding," [46] which amounts to saying that the void is as important, if not more so, than speech itself.

But where, in this temporal structure, does true listening happen? Is conversation, conceived of as an equitable proposition really possible or simply an illusion? In the space which allows another voice to be heard, is there listening/hearing/ understanding or just waiting? Given the shortness of time between the 'something said' of the one and the response of the other, how much thought can we realistically give to what others say? Before we respond, have we really heard? It's not just about the structure of time and space in language, but a matter of intention, and intention is a human attribute.

Artificial voice recognition systems are ubiquitous in the technological world of late, the Siri application, [47] automated phone systems and robots, come close to human speech, but they never replicate conversation as we understand it. Despite a somewhat uncanny-inducing near proximity to conversation, complete with carefully intonated responses, the absence of a human subject is ultimately unsettling, and unfulfilling. You know that the disembodied series of synthesized sounds, or recorded and processed 'voice' on the other end of the phone is 'listening' but not hearing. There is no comprehension, only a series of pre-programmed responses: an absence, which brings the nature of 'conversation' sharply into focus. As Wittgenstein said: "In a conversation: one person throws a ball; the other does not know whether he is supposed to throw it back, or throw it to a third person, or leave it on the ground, or pick it up and put it in his pocket, etc." [48]

We can convey disinterest, annoyance, empathy and control through such conversational nuances. How can coded language simulate these types of intramundane details of our interactions? They require a sensitive and attuned human agent, to be constantly reading for signals, and a feedback system to be in place, which allows for the subtle interplay between signs and responses, space for error and adjustment, and the ability to inhabit multiple timings. Understanding is found in the far-from-seamless flow of such interactions, it's not a question of communication, but of 'listening' and 'hearing' differently, and of a heightened sensitivity to the most miniscule deviations from the basic structure of the message being conveyed.

CONCLUSION

Having reviewed some of the many attempts to mechanize language over time, and considered how this endeavour has removed language from the human subject and the body that produces it, the question finally becomes: which philosophical questions about language remain the same, and which change, once we enter these new linguistic contexts? Of course, the politics of information as it is expressed through language as its agent, is never far from these questions.

In 1963 and 1966 respectively, the Situationist International and Mustapha Khayati published two articles on language and power within the magazine *Internationale Situationniste*. The first, entitled "All the King's Men" . 49 offers a stark reminder of the ways in which language, in the grasp of authoritarian forces, does damage to the authenticity of human experience, by always designating something 'other,' in the servicing of capitalist ideology. The second essay: "Captive Words: Preface to a Situationist Dictionary" . 50 goes further, in claiming that, as with René Descartes' proposal for a "Mathesis Universalis," 51 thought is in danger of becoming subordinate to mathematical rigor, stripped of its insubordinate, poetic potential. Both texts reiterate the Situationist theme of resistance to such power moves by proposing a language, liberated from its role as information and which recognizes and harnesses the fact that: "[Words] are not completely automated: unfortunately for the theoreticians of information, [they] are not in themselves 'informationist;' they contain forces that can upset the most careful calculations." . 52

In these fluid, mobile, immaterial contexts, grounded in coded speech and human-to-machine and machine-to-human translations, we need new ways of thinking through questions of what language 'is.' We need to philosophize about it differently, in a digital space and time, to take account of the on-going removal of language from the human, and the increasingly

blurred lines between ourselves and the machines that produce it. These are ethical questions as well as philosophical ones, and they are in turn deeply rooted in the politics of language:

> 'When I use a word,' Humpty Dumpty said, in rather a scornful tone, 'it means just what I choose it to mean – neither more nor less.' 'The question is,' said Alice, 'whether you can make words mean so many different things.' 'The question is,' said Humpty Dumpty, 'which is to be master – that's all.' 53 ∎

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1. "At the 1939 World's Fair a machine called a Voder was shown. A girl stroked its keys and it emitted recognisable speech. No human vocal cords entered into the procedure at any point; the keys simply combined some electronically produced vibrations and passed these on to a loud-speaker." Vannevar Bush, "As We May Think," in *The Atlantic Monthly*, 1945, 94. For photographic documentation also see: http://www.davidszondy.com/future/robot/voder.htm (assessed October 20th 2013)

2. John P. Cater, *Electronically Speaking: Computer Speech Generation*, (Indianapolis: Howard M. Sams & Co., 1983), 72.

3. For details see Haskin's Laboratories, science of the spoken word page: http://www.haskins.yale.edu/featured/heads/SIMULACRA/kratzenstein.html (assessed October 20th 2013)

4. Johanna Drucker, "Digital Ontologies: The Ideality of Form in/and Code Storage: Or: Can Graphesis Challenge Mathesis?," *Leonardo* 34, no. 2 (2001): 141-145.

5. Ibid., 141.

6. Ken Hollings, email exchange with the author, November 2012.

7. Ken Hollings, "Requiem for the Network," in *Essay* 5 (2011).

8. Hacking shows, a number of contemporary philosophers such as Gilles Deleuze, Walter Benjamin and Jacques Derrida will claim that the opposite is true, and that ambiguity, equivocation, contradiction, and paradox, are precisely where meaning is located; not in clarity and technical precision. See: Ian Hacking, *Why Does Language Matter to Philosophy?* (Cambridge: Cambridge University Press, 1975), 5.

9. Thomas Hobbes, "Of Speech: Abuses of Speech," *The Leviathan* (reprinted from the edition of 1651), ed. W.G. Pogson Smith (Oxford: Oxford University Press, 2010), Chapter IV.

10. The "Mathesis Universalis" is a proposal to create a universal science (and associated language based on the same principles), which would eliminate errors of reasoning. The original conception can be attributed to René Descartes. Cf. Frederick P. Van de Pitte, "Descartes' Mathesis Univer-

salis," *Archiv für Geschichte der Philosophie*. Volume 61, Issue 2 (2009):154–174. The idea is later associated with Leibniz and John Wilkins in the works cited elsewhere in this section of the paper.

11. From Francis Bacon's *The Advancement of Learning*, cited in Hacking, *Why Does Language Matter to Philosophy?*, 6.

12. We might further attempt to tease out the details of the relationships between such mathematical languages and Enlightenment reasoning through a review of the work of those philosophers such as Leibniz, who attempted to create a "Characteristica Universalis," in 1677; a universal language, which would eliminate the errors associated with natural languages. This consisted of what he called "... a kind of *general algebra* in which all truths of reason would be reduced to a kind of calculus. At the same time, this would be a kind of universal language or writing, though infinitely different from all such languages which have thus far been proposed; for the characters and the words themselves would direct the mind, and the errors – excepting those of fact – would only be calculation mistakes. It would be very difficult to form or invent this language or characteristic, but very easy to learn it without any dictionaries." Cf. Gottfried Wilhelm Leibniz, *On The Art of Combination*, 1666, translated in Parkinson 1966: 10–11, and Leibniz, letter to Nicolas Remond, 10 January 1714, in Loemker 1969: 654. Translation revised.

13. John Wilkins, *An Essay Towards a Real Character and a Philosophical Language* (John Martin, Printer to the Royal Society, London, 1668), 21.

14. Ibid. Note: original italics and capitalization retained, language modernized as necessary i.e. easie to 'easy,' onely to 'only.'

15. Louis Couturat, *La Logique de Leibniz* (Paris: Felix Alcan, 1901), 201.

16. Stuart Hampshire, *Spinoza* (London: Pelican, 1951), 21.

17. Ibid., 20.

18. Ibid.

19. Leibniz further states: "I should still hope to create a kind of universal symbolistic [spécieuse générale] in which all truths of reason would be reduced to a kind of calculus. At

the same time this could be a kind of universal language or writing, though infinitely different from all such languages which have thus far been proposed, for the characters and the words themselves would give directions to reason, and the errors – except those of fact – would be only mistakes in calculation." Leibniz, From a letter to Nicholas Raymond, 654.

20. Georg W. Hegel, *Science of Logic* (London: Routledge, 2004).

21. Richard Schusterman, *Surface and Depth, Dialectics of Criticism and Culture* (New York: Cornell University Press, 2002), 86.

22. Heidegger, *The Metaphysical Foundations of Logic* (Indiana: Indiana University Press, 1984), 2.

23. Cf. Aristotle, 'The Interpretations,' *The Complete Works of Aristotle,* ed. Jonathan Barnes (Princeton, NJ: Princeton University Press, 1995), vol. 1.

24. Aquinas said: "Truth is a 'correspondence between intellect [mind/soul] and thing." *Quaestiones Disputatae De Veritate,* QI, Art. I.

25. Kant said: "What is truth? The nominal definition of truth, namely that it is the agreement of cognition with its object, is both granted and presupposed." Immanuel Kant, *Critique of Pure Reason,* trans. P. Guyer and A. W. Wood (London: Cambridge University Press, 1998), A58.

26. Ludwig Wittgenstein, *Tractatus Logicus Philosophicus* (London: Routledge, 2001), §T2.222. First published in Wilhelm Ostwald's *Annalen der Naturphilosophie,* 1921.

27. Martin Heidegger will later inquire into the nature and meaning of this reliance on correspondence or identity, by re-posing it as a relation (mediation/translation) between two 'somethings' (mind/object, statement/reality, etc.). Martin Heidegger, *Being and Time* (New York: HarperOne, 1962).

28. David Silverman and Brian Torode, *The Material Word: Some Theories of Language and its Limits* (London: Routledge, 1980), 51.

29. In the 1929 essay "Some Remarks on Logical Form," Wittgenstein outlines the principles of Logical Atomism which Bertrand Russell had earlier proposed in *The Principles*

of Mathematics (London: W.W. Norton, 1937. First edition 1903) and in his 1918 lectures, which were later published as "The Philosophy of Logical Atomism" in *Logic and Knowledge* (Macmillan, New York: 1956). In "Some Remarks on Logical Form," Wittgenstein explains how "every proposition has both a content and a form. We get the picture of the pure form if we abstract from the meaning of the single words." See: Ludwig Wittgenstein, *Aristotelian Society* 9 (1929): 1. Reprinted in – *Readings in the Philosophy of Language*, ed. Peter Ludlow (Cambridge, MA: MIT Press), 209.

30. In the *Tractatus Logico-Philosophicus*, Wittgenstein makes the claim that each and every proposition can be reduced down to its most elementary facts, which in turn can be referred to states of affairs in the world. In this way, he claims that the truth as a consequence of the irreducibility of those primary elements, and as a result of their combination. This is called the theory of 'logical atomism,' wherein each of these 'atomic' elements is true or false, independently of the others, and can seen as units in a system that reveals the truth. "There is one and only one complete analysis of the proposition," 3.25. "The simplest proposition, the elementary proposition, asserts the existence of an atomic fact," 4.21.

31. Wittgenstein, op. cit, 1.

32. Ibid.

33. Ibid.

34. Ibid

35. Ibid.

36. Cf. Noam Chomsky, *Language and Mind* (New York: Harcourt, 1972).

37. Cf. Willard V. Quine, *Quintessence: Basic Readings from the Philosophy of W. V. Quine* (Cambridge MA: Belknap Press, 2008).

38. George Lakoff and Mark Johnston, *Philosophy in the Flesh, The Embodied Mind and its Challenge to Western Thought* (New York: Basic Books, 1999): 447-449.

39. These ideas are explored in: Heidegger, *The Question Concerning Technology, and Other Essays* (New York: Harper Perennial, 1982).

40. Michel Foucault / M. Blanchot, *Thought From Outside/ Michel Foucault as I Imagine Him*, trans. J. Mehlman and B. Massumi (New York: Zone Books, 1990).

41. "Chatbots Speak," Telegraph, September 9, 2011, http://www.telegraph.co.uk/news/picturegalleries/howabout-that/8752014/Robots-argue-about-God-during-first-conversation.html (accessed September, 9th, 2011).

42. Friedrich Nietzsche, *The Will to Power* (London: Vintage, 1968), 477.

43. Ken Knabb, *Situationist International Anthology*, trans. Ken Knabb (Berkeley, CA: Bureau of Public Secrets). "All the King's Men," originally appeared in *Internationale Situationniste* 8 (Paris, January 1963). See: http://www.bopsecrets.org/SI/8.kingsmen.htm (accessed October 8th, 2013).

44. Alex, Charles, Audrey, Claire, Anjali, Arnaud and other 'voices' synthesized by Bell and AT&T labs recite fragments of Shakespeare, sing, repeat phrases, speak in dialect, and use street-smart colloquialisms, in attempt to replicate those dimensions of language which go beyond its representational functions, but strikingly fail to achieve the intricacies and nuances of the human version. For a list of synthesized speech samples, from the 1963 onwards see: DECtalk 3, Synth, MIT Lab, (1992) http://www.soundboard.com/sb/Synthesized_Speech_Voices.aspx (accessed October 13th, 2013).

45. Maurice Blanchot, *The Infinite Conversation,* ed. and trans. Susan Hanson (Minneapolis and London: University of Minnesota Press, 1993), 75.

46. Ibid.

47. "Siri is an intelligent personal assistant and knowledge navigator which works as an application for Apple Inc.'s iOS. The application uses a natural language user interface to answer questions, make recommendations, and perform actions by delegating requests to a set of Web services." See: http://en.wikipedia.org/wiki/Siri (accessed October 15th, 2013).

48. Ludwig Wittgenstein, *Philosophical Investigations*, trans. G.E.M. Anscombe, 3rd ed. (New York: Macmillan, 1958), 43.

49. "All The King's Men." See: http://www.bopsecrets.org/SI/8.kingsmen.htm, (accessed, October 19th, 2013). "All the King's Men" originally appeared in *Internationale Situationniste* #8 (Paris, January 1963). Translation by Ken Knabb.

50. Mustapha Khayati, "'Captive Words: Preface to a Situationist Dictionary." See: http://www.bopsecrets.org/SI/10.captivewords.htm, (accessed, October 19, 2013). "Captive Words" originally appeared in *Internationale Situationniste* #10 (Paris, January 1966). Translation by Ken Knabb

51. "Descartes' Mathesis Universalis:" 154–174,

52. Op. Cit. "All The King's Men."

53. Lewis Carroll (Charles L. Dodgson), *Through the Looking-Glass and What Alice Found There,* (London: Macmillan, 1996), 124. (First published, Raleigh, NC: Hayes Barton Press, 1872).