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Numbers as Signs

Do numbers exist?

If numbers exist, where might we find them? They are always, so to speak, out of grasp from our physical senses. Even their origins are alluding. It's as if they've been granted some kind of nonterminating preexistence beyond our spatiotemporal realm. Do numbers exist outside our comprehension of them? Are they nothing more than a human imagination? Despite the many attacks put forth on these ontological issues, there remains a lack of semiotic analysis on the numerical digit itself. Given the set of natural numbers $\{1, 2, 3, \dots\}$, let us first analyze the set's sign elements to arrive at an origin representation.

Symbolic

Interacting with numbers are done exclusively and indirectly through the use of signs. Where in Saussurean terms, the signifier of the sign points to the unobtainable signified; the number itself. Contrast that to a photograph in Peircean terms which operates as an iconic sign. The photo sign signifier (the sign vehicle's representation) points to that which was or still is the actualized physical signified; the immediate object. A number sign however is a symbolic sign in which the signified points to an abstract object; a mathematical object.

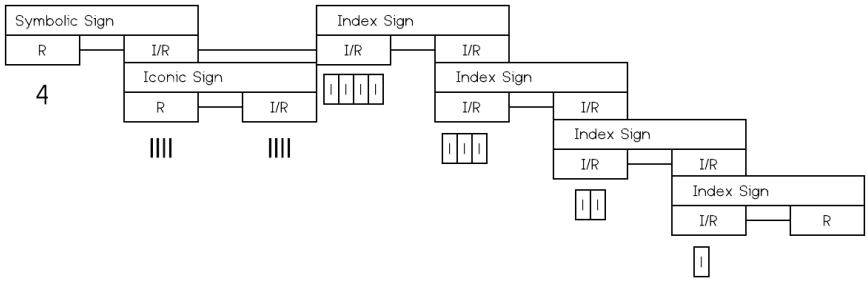
Nonsymbolic

That is not to say that number signs can only appear as symbols. In the case of repunits or more historically the tally marks, we can consider a conversion from base 10 numbers to a unary numereral system. Within this system, the sign is both the signifier and the signified of its own representation. A self-referential representation that exposes the accumulated events of it having been counted into a signed existence. The physical representation of an idealized iconic set of tallies is itself an indexical sign to the act of having been counted. An

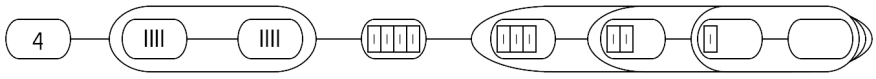
evolution of semiotic signs for numbers are revealed where the conventionalized set of indexable events becomes itself the iconic representation of past events. With increased familiarity on duplicated self-referencing signs, new foreign representations are introduced and the number becomes symbolic. That is to say, a number's creation assumes a temporal continuum which has been abstracted through symbolism. If numbers exist anywhere within this inferencing, their full existence would span the temporal continuum in which they had been counted.

Model

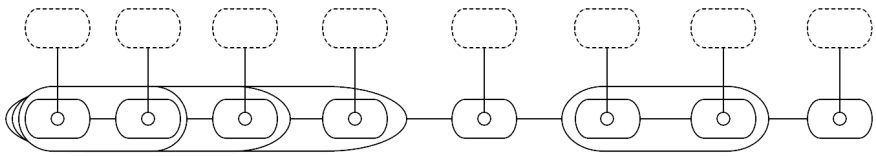
Given our description of sign transitions we can model the semiosis of the number 4.



We can simplify the model to exclude the meta labels. A true semiotic execution would express self-reference by first building two matching sign representations before inferencing the self-referenced sign. Additionally, proper termination of semiosis would require a self-referencing empty representation. We exclude these intermediately steps as they are not critical to our analysis.



The model shows us that the origin representation of numbers is nothing; i.e. there is no representation. A nonexistent representation however is not sufficient evidence to prove nonexistence. And to avoid any naive realism, we must continue to pursue a number's existence beyond any single representation. As such, we extract the representation out of the sign relata and reverse the execution to better model the arrow of time.



Time Continuum

Before symbolic abstraction, observing a number at any point in time would collapse its existence to an indexical sign where the signified representation is that of past events. However, one may be left with doubts that the time continuum is a true precondition for a number's existence. One could simply express "1 million", knowing that neither you nor I have counted to it. Additionally, "one million plus one" is "one million and one" which can be validated linguistically without having to have done the counting. At the symbolic level, the precondition of counting can be suspended and canceled through deduction of arithmetic laws. Algebra formalizes symbol manipulation further and even introduces meta symbols in order to avoid the creation of individual number signs. To peer past symbolism's capabilities consider how one would evaluate $2^{\{2}\{2^{\{2}\{2\hat{}2\}\}\}\}$ + 1. How would we know if this were prime? There are times when symbolic representation is not sufficient for actions on numbers. In these cases, we must count to their representation.

Interpreted Sense

Given our current model, we've incorporated Saussurean relata but left out the interpretent of Pierce's triadic model. We assume that the diatic model can pair it's relta with two relata from the triatic model. This justification of equivalence is beyond the scope of this analysis. We will now add linguistic statements to represent the interpreted sense.