Numbers as Discovery and Invention: From Unspeakable Existence to Human Language

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Abstract

Are numbers discovered or invented? We argue that numbers exist independently of humans, yet in a form that is unspeakable, as suggested by Parmenides and Wittgenstein. Numbers become speakable only when human observers provide language, symbols, and operations. Thus, numbers are neither purely discovered nor purely invented; they emerge as a fluctuation between discovery and invention. We illustrate this view with examples such as prime numbers, zero, and imaginary numbers, and provide a simple formal model of this duality.

1 The Unspeakable Existence of Numbers

Even in the absence of human beings, the universe is structured numerically: planetary cycles, ratios of physical constants, and prime distributions are present. However, these structures remain unspeakable. As Parmenides emphasized, existence is beyond words; as Wittgenstein argued, what cannot be spoken must be passed over in silence.

2 Numbers as Human Expression

With the arrival of human observers, numbers acquire language. Symbols such as $1, 2, 3$, operations like $+$ or $\times$, and abstractions like zero and infinity transform the unspeakable into the speakable. Thus, numbers are not created ex nihilo, but expressed through invention grounded in discovery.

3 Examples

3.1 Prime Numbers

The infinitude of primes is independent of humans. Euclid's theorem shows that primes exist necessarily, regardless of human recognition. Yet primes become part of human thought only through symbolic proof.

3.2 Zero

Zero did not exist in early number systems. It was invented as a placeholder and later as a concept, though the absence it denotes has always existed. This shows the interplay of discovery (absence) and invention (symbol).

3.3 Imaginary Numbers

The unit $i = \sqrt{-1}$ has no direct physical counterpart. It was invented to extend equations but later discovered to be indispensable in quantum mechanics and engineering. This duality exemplifies the fluctuation between invention and discovery.

4 Mathematical Formulation

Let N denote the concept of number. We model it as:

$$N = F(D, I),$$

where D represents discovered aspects (natural structures, cosmic ratios) and I represents invented aspects (symbols, operations). If $D = 0$, numbers collapse into arbitrary sign-games. If $I = 0$, numbers remain mute and inaccessible to humans. Only through their interplay does N exist as human knowledge.

5 Conclusion

Numbers pre-exist as unspeakable structures, yet they become speakable only through human invention. Thus, numbers are neither purely discovered nor purely invented but arise as a fluctuation between both. They are the dialogue between the silent order of the universe and the expressive capacity of human language.

Keywords

Numbers; Discovery vs Invention; Parmenides; Wittgenstein; Philosophy of mathematics; Fluctuation philosophy

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