

A New Definition of *Infinity*

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Introduction:

Like every other field of human intellectual invention, the science is not free from misconceptions. There are many of them seen as myth and miseducation.¹ Some lasted quite longer than others and among the long-term misconceptions of the human knowledge, the one around infinity. We could never define it accurately nor perceive it as a practical notion along the history.

Many old beliefs surrounded infinity, and they lingered for thousands of years. Philosophy, mathematics and science repetitively treated it and, each time, landed in the vaguer conclusions than before.

One of the reasons for this conceptual confusion is the unidimensional view on it:

¹ For a list of some of them see: 25 Popular Science Myths Debunked, BY TBS STAFF January 6, 2022. Source: thebestschools.org/magazine/25-popular-science-myths-debunked/

- Philosophy through a speculative-abstractive construction,
- Mathematics by a purely quantitative treatment,
- Theology trying to project it to deity,
- Art endeavoring to visualize the invisibility of it.
- ...

What we eventually got as a general definition in dictionaries and lexicons was a kind of absurdity like: “the quality of being infinite”,² or, “an indefinitely large amount or number”. Or, for instance: “Unbounded space, time, or quantity”.³

While all these definitions have to do something with infinity, the latter could not be easily as oversimplified as we can see it in these descriptions. On the other hand, when we refer to a specific field of sciences, we can see the reducing character of what is provided as a definition: “A range in

² The New Lexicon Webster’s Dictionary of the English language, 1987, p.496.

³ The American Heritage College Dictionary, 2002, p.711.

relation to an optical system in which light rays reflected from objects may be regarded as parallel”.⁴

This disparity of approaches lasted for centuries and its outcome was the alienation of this concept from any fair treatment that encloses as well its encompassing conceptual capacity as its practical repercussions.

While each specific arena of human knowledge can keep digging in its own understanding of infinity, it seemed to us that an interesting initiative could be to combine pertinently different conceptions of infinity in an attempt to see how a better apprehension can result from.

Like the physicists who try to get to a unifying theory, as Theory of everything, that could marry quantum physics and the theory of relativity, we should attempt doing the same thing in epistemology for finding the common denominator

⁴ Ibid.

of the speculative, philosophical, metaphysical, physical, mathematical and scientific conceptions of infinity.

When we decided to make an effort for this purpose, the first question that was raised was what methodology we should use for it. To accomplish this task, we needed a method, or more precisely, a methodology that can seem capable and relevant at the same time. This is how we proceeded:

Usually, we refer to things, facts, notions, etc. to craft a definition or a description of something. This conditioning technique creates a definitional dependency that would not suit to a notion that can't, ontologically, accept any restraint these borrowed constitutive elements would impose to it.

Our definition should reduce the implication of such restricting elements in its core and elaborate itself in such a way that it keeps its objectivity on the one hand and its conceptual self-sufficiency on the other hand.

To do so, we chose to move with a counter-intuitive modality: Rather than having recourse to definite things or qualities for shaping a new definition of infinity, we departed from a point where we can put every phenomenon, without any exception, nor exclusion, under the coverage of the concept we would like to define.

So, we did not begin with a usual formulation like *Infinity is something (this or that)*; in place of that, we picked a term that could include all things without any restraint or exception. This brought us to the idea and term of “everything”. We selected this term as the first piece in our formulation, and then, looked for the most direct and the least engaging verb in any language, which is the universal verb “to be”. And immediately after these two pieces, we mention the concept we are trying to describe.

So, by combining these three points we obtained:

Everything is infinite.

So far, we respected the following technical points:

First, we construed a theoretical framework to remove all restrictions this concept had to undergo within specific arenas. Our emphasis had been oriented on the most obvious ontological point we can perceive for this concept: *apeiron*; the word refers to the Greek equivalent of ‘unbounded’, ‘unlimited’.

Second, our methodology had to remove the trend according to which infinity should be specific or categorized in different sorts. In a classical way, infinity is divided in three sorts: “the mathematical, the physical, and the metaphysical”.⁵ This artificial distinction is just inadequate for a unified vision/definition of infinity; so we scored it. If physics is looking for a ‘theory of everything’, we have also to look for

⁵ Infinity, mathematics; By Rudy Rucker; [britannica.com/science/infinity-mathematics](https://www.britannica.com/science/infinity-mathematics)

a definition that could cover everything with regard to infinity.

And the third methodological point: by combining the boundlessness (apeiron), as the original idea of the concept, and the total refusal of any distinction, we reached a statement that was theoretically able to release the concept of infinity from all its previous man-made restrictions and put it in the highest conceptual status that the collective human mind could formulate. This is how, by pushing away all limitations, bounds, diversification, classification, restrictions, and segmentation, we could reach the following statement:

Everything is infinite or is not.

This announcement is as well inclusive as exclusive: Its inclusiveness is related to the usage of 'everything'. This term includes all material and non-material realities and is not supposed to exclude anything that accounts for reality,

of any kind.⁶ We could have used “all” instead of, but ‘everything’ is more concrete to communicate in our mind since we can see any phenomenon as a ‘thing’, and in this case, “everything” means simply all phenomena.

On the other hand, the statement pushed to a minimum the elements of which it’s composed. Only one neutral verb is used (*to be*), in both affirmative (*is*) and negative forms (*is not*). The negative mode of the verb assures the exclusiveness of the assertion.

Everything + is + infinite + [or] + is not.

In this statement, the obsession to use the least possible is stretched to extreme for the sake of avoiding any confusion or conjecture in this very first step.

The statement is not surely yet the definition, but by its strength points, it opens the path to see infinity as the most

⁶ Reality here means anything whose existence doesn’t need any external actor of perception.

encompassing feature we could find in the whole existence since it doesn't omit anything and covers all.

At this stage, the question is how to extract the definition of infinity from this assertion that attributes infiniteness to anything that exists.

The broad scope of this assertion is just the initial necessary point regarding a different apprehension of infinity. We have still some more steps to run before we get to the premises of a definition for it.

Always, to remain consistent in our counterintuitive approach, we keep expanding the above statement by bringing more precision to it. The question that naturally emerges from this assertion is: What does "*everything is infinite or is not*" mean?

This pushes us towards more precision. The idea is to develop the basic assertion as far as necessary to get enough

stuff for building the definition of infinity up. For doing that, we argue as follows:

Everything is infinite suggests that infinity should be found in it. And if it's the case, how infinity could be running in a thing? Or more precisely, what is infinite in a thing so that we could say that the thing is infinite. And especially, if, as asserted, "*Everything is infinite*", what is precisely and objectively, infinite in everything?

This natural question, stemming from the above assertion, pushes us towards underscoring what is effectively and factually infinite in any single phenomenon. Here we should avoid any attribute that is not substantial or a part of ontological fabric of the phenomenon; like for instance its lifespan that is linked to the man-made concept of time and is not a structural core of the phenomenon. Where and in what we look for infinity in a thing should be objectively

existing and free from any necessity of the subjective perception of the human being or alike.

All these conditions lead us to the very structure of a thing that we call **composition**. By composition, we mean what everything is made of. So, what composition is to a thing is what that thing is.

We notice that here instead of the usual description of things we use another way. Usually, we say that the things are made of matter, but here we said that things are made of composition. The difference is that when you refer things to matter, you have to explain then what the matter is made of; but we avoid such a vicious circle attitude and refer to composition, which is a self-sufficient concept is meaning simply “the combining of distinct parts or elements to form a whole”; or, “the manners such parts are combined or related”.

So, we avoid thereby referring the definition of things to a new content and suggest a term that is just a container. See the difference:

Everything is of matter.

Everything is a combination.

Taking the first assertion in account will necessitate the definition of matter that will imply the same process we are running to get the definition of infinity. It means that will be a double task with its complications; while by proposing the term composition we did not suggest anything that covers a hidden meaning to reveal like the term matter does it. By saying that *everything is a composition*, we advocate that everything is “the combining of distinct parts or elements to form a whole”.

Instead of the usual substantialist⁷ trend in providing definitions, we use a structuralist approach to land in a kind of functionalist description of what is going on inside any single thing.

From the statement “*Everything is infinite*” we deduced the statement that “*Everything is composite [a composition]*”.

So, we can then infer that:

- If everything is infinite, then,
- A thing is infinite, and
- If a thing is a composition, therefore,
- The composition [of everything] is infinite.

⁷ As suggested by some, like Pierre Bourdieu, The French sociologist, “a substantialist approach privileges things rather than relations and, as such, has a tendency to reify the [the relational realities], to essentialize [...] phenomena, and to embody a positivist orientation to ...[intellectual activity]”. When it comes to infinity we can see how the counter-intuitive approach invites us to avoid this substantialist habit and search for a different road to do so.

Source: link.springer.com/chapter/10.1057/9781137407009_5

Thereby, we bring an additional element of precision to the first statement and transform it into this one:

Everything is infinitely composite.

And by combining it with the other more explicit formulation of “everything is infinite or is not” we can obtain:

Everything is infinitely composite or is not.

This latest statement is following the same rules that we implied in the first one: It is inclusive, direct and clear.

- It's inclusive because it treats 'everything'.
- It's direct, because it uses just one stating verb (is).
- It's clear because it limits its announcement to one aspect which is being infinitely composite.

The liberty of its content is such that we could even interchange its object and rephrase it as:

Everything is compositely infinite.

And then:

Everything is compositely infinite or is not.

This second assertion, in its both formulations, is a kind of technical precision to the first one. It states that being infinite, as a general state of everything, means that the thing is compositely infinite.

Now, we keep going with this argument by focusing on the aforementioned definition of composition (composite). “Composite” being defined as “made of distinct components, compound”.⁸

So, if the composition is infinite, it means that its components are infinite. This is the first technical precision that we add to our two first assertions with the intention of elaborating a definition of infinity. We state:

⁸ The American Heritage College Dictionary, 2002, p.294.

- There are infinite components in everything that compose it.

And again here, the question emerges about what a component is; to answer that we can refer to the first assertion of our argument and says that, as “*everything is infinite*”, the component(s) will be infinite as well.

And if we continue asking what we mean by “*every component is infinite*”, we can say that “*every component is infinitely composite*”. This implies that in each of the components that compose a thing, there are infinite subcomponents. And in this way, we can keep going by asking the same questions, and of course, providing the same answers for each of the subcomponents. This search simply streams endlessly.

We get this statement that contains all the elements that had been so far developed:

Everything is composed of infinite components and subcomponents.

Even though this assertion looks more explicative than previous ones, we don't yet, however, have enough stuff to shape our definition of infinity. And to be consistent with our methodology, we should bring on more precision to the last statement above.

As we used the term composite, we should now take into consideration another aspect of this term's definition: "A complex material in which two or more distinct, structurally complementary substances to produce structural or functional properties not present in any individual component".⁹ We should, therefore, include this aspect of definition in our descriptive formulation of infinity:

⁹ Ibid.

The components compose a thing through a combination they shape. To shape the composition, the components should relate to each other. So, a more precision would be that the composition, that makes a thing, is a combinatory form in which relations between the components take place. We can call these relations between the components, *interrelations*, which are equivalent to bilateral and multilateral connections between components.

Here again, an obvious inference comes up: if components and subcomponents are infinite, so will be their interrelations. Their infinite number of interrelating components and subcomponents will suggest an uncountable number of interrelations between them as well. We keep it up as another technical precision to contribute later in our construction of the infinity's definition:

- There are infinite interrelations between components and subcomponents.

The journey continues with this guess on whether the infinite components and their infinite interrelations are sufficient to consider everything as infinite.

What incites precaution is that from infinite links between infinite components we get plausibly infinite possibilities of interconnections. This means that the ways and modalities are shaping these infinite interrelations between uncountable components are infinite too. The certainty on this aspect results from the infinite character of the two previous precisions: Infinite components and their Infinite interrelations. If we elaborate an equation with these two variables, they produce naturally the countless ways they can connect, interconnect and combine. Any mechanical or frozen picture of this countless combinatory reality will be counter-intuitive to the concept of infinity, referred to its original *aperion* meaning: unbounded.

Therefore, this is the third technical precision we bring about regarding the main assertion:

- **The ways the uncountable interrelations are shaped between the countless components are infinite.**

These are then the basic inferences so far:

In *everything*, we can find:

1. Infinite number of components and subcomponents,
2. Infinite interrelations between the components and subcomponents,
3. Infinite ways these interrelations are established.

Now, let's remind that our purpose in this development is to get a new definition or description of infinity. And the question is whether the above assertions and inferences can be at this stage sufficient to shape this definition or not.

We can formulate so far that:

- Infinity is what by which everything gets a boundless composition.
 - Infinity is what by which the number of components and subcomponents becomes countless.
 - Infinity is what by which the number of interrelations between the components and subcomponents is uncountable.
 - Infinity is what by which the ways the countless interrelations between uncountable components and subcomponents are established are unlimited.

So, we should see how we can define what is accomplishing these three functions in everything, and we call that, infinity.

We said that:

- A thing is infinite,

- A thing is compositely infinite,
- The composition is infinite in its components, the interrelations between these components, and the ways these interrelations are established.

Now if a thing is nothing but its infinite composition, a first version of the infinity's definition will be infinity is what by which a thing exists. The subtle point is that infinity here is not the cause of the thing's existence, but what makes the case. We call it causation.

In other words, infinity does not create existence but makes existence possible. When we formulate the things in terms of creation, we suppose to bring about from a non-existing state to existence. This is not what "*causation*" means: causation is the process by which the presence of something becomes possible.

Sun causes sunlight, but it doesn't create sunlight; what makes possible the presence of this latter is the internal

mechanisms of the sun. Beyond our nominalist and formalist approach, this is more accurately the composition of what we call sun that is causing sunlight. There is something that is making both to exist, sun and sunlight, and this is a composition with its components, their interrelations and ways of interrelating.

Now, a more consequential question is what is making this composition, composed of components/subcomponents, their interrelations and the ways of interrelating? What makes all of this? Here again we should avoid falling in this epistemological trap of looking for something else but these elements themselves to explain what makes them exist and act. How we should exercise this precaution? By stating that:

- What makes component is subcomponents, their interrelations and the ways of interrelating.

And then,

- What makes subcomponent is sub-subcomponents, their interrelations, and ways of interrelating.

And this keeps going. This reasoning is running in such a way that at no point, we can find a non-conventional starting point, able to be spontaneously presented as either creating point or creating agent. There is no element that can be presented as a creator or even a so-called original cause.

Any point, any element or any phenomenon we can see as “initial point”, has a precedent, and its precedent also has a pre-precedent, and this goes on forever as well.

In the same way, there is no point, for whatever that exists, that we can consider as its final point, or its last outcome or so. Any phenomenon or any element is causing the presence of a new element or a new phenomenon, and this latter, in its turn, does the same thing and this goes ceaselessly as well.

So, what relates the phenomena is a chainlike interconnection that puts them in a causal and continuous relationship. These causal chains are start-less and endless as well. They are infinite.

Again here we can say that infinity is what divests the causal chains from starting or ending points.

When we observe subtly this reasoning, we can detect that what is genuine is not really the status of things, but the action that is going on within them. This means that the undeniable substance of everything is not the matter, as we used to think of, but what makes matter exist. And what makes matter to exist is not, as wrongly defined, particles and atoms, since these are, in the end, themselves a kind of matter. So, it doesn't make sense to say that matter is made of matter.

What would be more meaningful is to clarify what makes matter and this is not but action, and what is in action is its

infinitude: the infinitude of components, of their interrelations, and the ways they are shaped.

Or more precisely

1. The infinitude of the action that makes components exist.
2. The Infinitude of the action that makes interrelations between the components exist.
3. The Infinitude of the action that makes the ways these interrelations between the components exist.

So, if we summarize all of these in *infinitude in action*, we have our version of the definition for infinity.

So, we get our definition of infinity from the observation of what is going in anything and thanks to which a thing exists. This is *infinitude in action*.

Infinitude in action is technically genuine since this is the sole objective reality that is going on beyond our perception

and interpretation. We can't deal with infinitude in action but through observation; unbiased observation of the technicality of reality.

The existence's process has segments and each segment is caused by something else, what is not caused by something else in this process and is causing all the rest, is not but *infinitude in action*.

So, infinitude in action is causing:

- Things to exist.
- A thing itself is caused by its composition that is caused by infinitude in action.
- Composition is caused by its components that are caused by infinitude in action.
- Components are caused by subcomponents that are caused by infinitude in action.
- Subcomponent is caused by sub-subcomponents that are caused by infinitude in action.

- And this keeps going endlessly.

Or we can say that

- Compositions are caused by the interrelations of components and these interrelations are caused by infinitude in action.
- And these interrelations are caused by the ways that shape them, and these ways are caused by infinitude in action.

So, we can see that, at the end of the day, infinity, translated into “*infinitude in action*”, can explain the matter, things, universe, and beyond all of this, existence. We see that infinity, through this definition, stands for the causation of existence. Therefore:

- Infinity is infinitude in action.
- Infinitude in action is what causes existence.

In conclusion

We see that all the attempts to give a reducing definition of infinity could not help us to get a better understanding of existence since their focus was always on what it is and not on what it does.

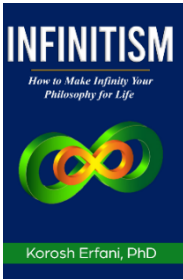
Through a counter-intuitive demarche, we searched the infinity's presence in the real world, and we saw that it is pervasive and inclusive. Nothing having been able to escape infinity during our observation, we looked for its role in the existence of everything. What we saw was that anything, to exist, needs to be infinite. One then can obviously infer that what is not infinite cannot/doesn't exist; therefore, everything that exists is infinite. Infinite is not a characteristic of a thing among others, like lifespan or size or height and so; it's the sole substance of everything.

To explain how infinity is the only and exclusive genuine, objective, and substantial core of everything, we found that every phenomenon is a composition and that this latter is an

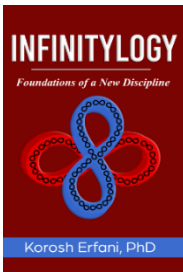
infinite of components, of their interrelations, and of the way these latter are done. This infinity is making all of these three points exist in a continuous action, and that's why we called it *infinity in action*, or simply said, *infinity*.

Infinity is a theory that takes the above elaboration as its basis and excerpts all the upshots and consequences that result from such a vision over existence. And then, *Infinitylogy* seeks mechanisms by which this causation is done in the real world as *infinity in action* within matter. Infinity is then nothing but the technicality of existence to exist. It is then everything that exists.#

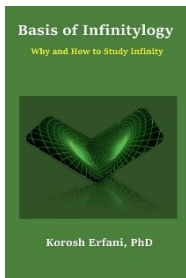
Books published so far:



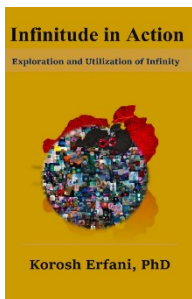
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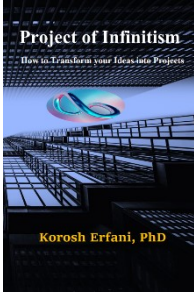
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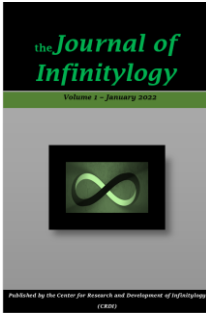


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The Journal of Infinitylogy



The Journal of Infinitylogy, Volume 1, January 2022, CRDI Publication

Our books in other languages



● *Infinitism: The Philosophical theory to change, (Book in Persian), ILCP Publishing House, 2020, 1018 pages. (possible translation in the future)*



- The CRDI plans translating these mentioned English books in French in the future.

www.thecrdi.co



Our websites



- Website on the *Center for Research and Development of Infinitylogy* (CRDI)

www.thecrdi.com

- Website on the philosophical theory of *Infinetism* and its applications.

www.infinetism.info

- Website on *Infinitylogy* as a new discipline and its establishment:

www.infinitylogy.com

- Website of the ILCP Publishing House

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