EDITORIAL

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Commonly accepted fallacies in established knowledge as an antithesis to cumulative science

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ABSTRACT
This paper critically examines the concept of cumulative science, arguing that its conventional interpretation can impede genuine intellectual progress. Whilst acknowledging that science builds upon previous work, the author contends that the uncritical perpetuation of commonly accepted, yet potentially flawed, knowledge acts as an antithesis to true scientific advancement. The article highlights a prevailing academic pressure to cite established sources to lend credibility, which can lead to the reiteration of erroneous ideas and stifle original thought. Drawing upon the theory of intertextuality, the author posits that whilst no text is entirely original, this does not negate the capacity for researchers to synthesise unique contributions from their intellectual repository. The central thesis asserts that researchers must move beyond the mere repetition of established fallacies. Instead, they should be encouraged to formulate new theoretical frameworks grounded in their own critical conceptions and experiences. This approach does not advocate for disregarding the foundational work of predecessors, "shoulders of giants" but rather calls for a more robust scientific method. True cumulative progress, it is concluded, is achieved not through the dogmatic repetition of old knowledge, but through the courage to challenge it and propose new, rigorously developed ideas that propel the scientific endeavour forward.

KEYWORDS critique of established knowledge; cumulative scientific progress; intertextuality in academic discourse; methodological advancement in science; scientific originality and synthesis

The objective of any empirical scientific field is the establishment of a cumulative body of knowledge upon which the future of science can be built. This is the notion that science will formulate more complete and accurate theories in accordance with the volume of evidence and data gathered. Cumulative science develops not through sudden discovery but through gradual, incremental steps. Whilst revolutionary science occurs infrequently, cumulative science is the most prevalent form of scientific endeavour. What, then, should we understand precisely by the cumulative progress of science? What does this accumulation encompass? And what is its benefit -or detriment- to us as researchers?

There is a well-known metaphor: "There's no need to reinvent the wheel." The cumulative progress of science implies that each new piece of scientific knowledge or discovery is added, like a brick, upon the work that has preceded it, transforming knowledge into a colossal structure. Scientists do not typically start their work from scratch; rather, they see further by, as Newton remarked, "standing on the shoulders of giants." One of the clearest illustrations of this can be seen in the field of astronomy: Copernicus's proposition of a heliocentric model of the universe prepared the ground for Kepler to prove that planets move in elliptical orbits. Newton, drawing upon the work of both Copernicus and Kepler, was then able to formulate the reason behind these movements, the law of universal gravitation. Similarly, the invention of the microscope enabled the discovery of the cell, which in turn led to an understanding of microorganisms and diseases, ultimately resulting in the development of vaccines and antibiotics. Consequently, science often develops not through the sudden epiphanies of a single genius, but as the product of a patient, collective, and cumulative effort spanning generations, constantly evolving and self-correcting. It is for this reason that attempting to dismantle the structure established by our predecessors in order

to rebuild it from the ground up is a futile exercise. In other words, there is no need to reinvent the wheel.

When I wrote my first scientific-academic book, some of my much-esteemed academic friends were surprised to find no bibliography section at the back. I could only tell them, briefly, that there were no sources I could cite and that I had written everything from scratch. Some researchers hold the view that the greater the number of sources presented in academic work, the better and higher its quality. They are often astonished when I tell them that the famous Nobel Prize-winning dissertation of Nash, the creator of "Game Theory," contains only two references, one of which is to himself. Furthermore, this award-winning work consists of a mere 32 pages, a length that would be considered short in the social sciences today and would likely not be accepted as a dissertation by many.

In our more extended conversations, I tried to explain to my friends that the book I had written was, in fact, an intertextual work. Intertextuality, in its most general definition, is a literary and artistic theory based on the idea that every text is in dialogue with other texts that have been written before it, deriving its meaning from this network of relationships. According to this concept, no text is an entirely original and closed structure; on the contrary, it is perpetually connected to other texts through references, quotations, echoes, parodies, and subtle allusions. Concrete examples of this are frequently encountered in the arts. For instance, Joyce's novel Ulysses bases its entire structure on Homer's Odyssey, presenting a modern rewriting that is in constant dialogue with the ancient text. In Turkish literature, Pamuk's novels are nourished by a wide spectrum, from Divan poetry and folk tales to the modern Western novel, thereby creating an intertextual fabric. In cinema, Tarantino's films exhibit some of the most well-known examples of this concept, with their explicit references to countless works, from old spaghetti westerns to Far Eastern martial arts films. Thus, intertextuality is a key that demonstrates the necessity of seeking a work's meaning not only within itself but also within the vast cultural accumulation with which it converses, offering the reader or viewer a rich semantic layering. The most crucial element of the concept of intertextuality is that no text is entirely original. In reality, every text we write -every article, every book- bears traces of works that were written before it. We generally cite the most popular of these traces in our work. The others remain in the text as our own ideas, synthesised from our past readings.

Within Turkish academic literature, there is a universally accepted -and in my view, erroneous- definition of the concept of education. This definition, which I would have to attribute to its author were I to write it here, is so popular that you can encounter it in almost every study on the concept of education by Turkish researchers. However, it is highly unlikely that you will encounter this specific definition, or similar ones, in the works of researchers outside of Türkiye. As I have stated, I believe this definition to be flawed. Yet, it is so entrenched in Türkiye that if you need to define the concept of education in your work, you will often be expected to use this definition and cite its author. To me, however, the concept of education signifies very different meanings beyond this definition. These meanings contain variations to an extent that I cannot directly attribute them to any single preceding researcher. Nevertheless, proceeding from the principle of intertextuality, they have of course emerged as a result of the works I have read thus far and perhaps the experiences I have gained in fieldwork. Despite this, it is my own original thought.

This is not what we are actually referring to when we speak of the cumulative progress of science. In a study conducted in the social sciences, reiterating previous -and in our view, flawed- definitions is not consistent with the scientific method. A researcher with sufficient experience in a particular subject area ought to have formed a substantial intellectual repository related to their field of research. However, when researchers include information drawn from this repository in their studies, they feel compelled to cite the writings of previous researchers to support their own ideas in order to lend credibility to their work. I believe every researcher has experienced this situation.

Yes, science does progress cumulatively, and each study is one of the elements, like a brick, that constitutes the edifice of science. Yet sometimes -commonly accepted- flawed studies become a defective brick in the construction of this edifice, potentially acquiring the power to bring down the entire structure. At this juncture, it would establish a more robust state of affairs for the scientific method if researchers were to formulate new theoretical frameworks based on their own conceptions, rather than reiterating the commonly accepted fallacies in established knowledge.

This is not to say that we should not include the valuable works of our predecessors in our own studies or that we should disregard them entirely. No, that is not the point I wish to make. However, feeling compelled to do so presents an obstacle to the articulation and production of our ideas as a piece of work.

Today, it is, of course, necessary to include in our own work the results of other studies conducted with different participating groups and at various levels, in connection with the work we are undertaking. It is also necessary to compare our own study with the results of others in light of our findings and to derive discussion from this. In this way, the reader will have the opportunity to view the arguments put forward in the study from a broader perspective. Likewise, when presenting a theoretical framework, it is of great importance to bring together the contributions made by previous researchers to that framework. As I wrote in one of my previous articles, you are not obliged to provide a source for the fact that water boils at 100 degrees Celsius at 1 atmosphere of pressure. This is universal knowledge that is known by all, has been tested or is testable, and its results can be recorded. Another aspect of this is your own ideas. As I mentioned earlier, although no text is entirely original from an intertextual perspective, this does not mean that you cannot convey to your readers and the scientific community your "own" ideas, which have been synthesised through various filters and shaped within your own pool of thought.

To summarise, science is a field that progresses cumulatively, but the cumulative progress of science is not about uncritically accepting old ideas and relegating your own thoughts to the background. It is about standing on the shoulders of giants, as Newton said, whilst conveying your new thoughts to the scientific world, to traverse the necessary paths to become a giant yourself. Scientific progress will be achieved not by the repetition of old knowledge, but through the new ideas put forward by researchers such as you.

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Dr. Muhammet Fatih Doğan is currently working as an independent researcher. He is working on self-regulated learning, Multiple Intelligence Theory, daily life problem-solving skills, good kid phenomenon, virtue education and science education. His aim is to carry out scientific and academic studies to ensure that children are raised through education as "good" and "skilful" individuals who can make useful and realistic contributions to themselves and the society in which they live. He lives in Tekirdağ, Turkey.

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