

How to Cite in APA: Zinan, Zhang (2022). An Interdisciplinary Anthropological Approach to Augustine's Theory of Time. *Cuestiones Teológicas*, 49(112), 1-19. doi: <http://doi.org/10.18566/cueteo.v49n112.a07>
Date received: 12.07.2022 / Date of acceptance: 19.09.2022

AN INTERDISCIPLINARY ANTHROPOLOGICAL APPROACH TO AUGUSTINE'S THEORY OF TIME¹

Una comprensión antropológica interdisciplinaria de la teoría del tiempo de Agustín

ZHANG ZINAN² 

Abstract

This article attempts to explore Augustine's discussions on the issue of time from methodology and to propose some potential areas for future research to focus on. To achieve this, I start by illustrating the prominent role of philosophy in arousing interest in the theme through a brief historical introduction to the reception of Book XI of *Confessiones*. After introducing the dominance of the philosophical approach, this paper turns to the challenge and supplementation of the textual and historical methods, while highlighting how they are still limited by abstract philosophical concepts. In response to the shortcomings of existing research, I suggest that the root of its problem is the philosophical approach that reduces Augustine to static ideas. Then, I advocate an interdisciplinary and holistic approach based on different anthropological views. In the next section, through analysis of the methods and perspectives of Augustine in his discussion of time in *De Ordine*, my research intends to reveal Augustine's complicated intellectual background and reconstruct it through interdisciplinary methods. Based on the universality of knowledge in the natural sciences, the theories and methods of modern physics may be a potential tool to examine Augustine's conclusions and arguments. The recent focus of psychology on temporal cognition could also be helpful in answering Augustine's doubts. The latest developments in technology, such as deep learning, can then help clarify Augustine's terminology at the semantic level. These

- 1 My sincere gratitude goes to Prof. Dr. Anthony Dupont and Prof. Dr. Mathijs Lamberigts, for their helpful suggestions on the content and structure of this article. I am also indebted to Dr. Matthew Knotts and my friend Matthew Erickson, whose corrections of language helped to improve my expression.
- 2 PhD student of theology, Katholieke Universiteit Leuven, Belgium. Email address: zinan.zhang@kuleuven.be

instrumental methods ultimately characterise Augustine's own motivations and intentions. By appreciating his theological concerns and personal style, a theological-anthropological approach is hopeful to coordinate other methods and leads to a proper image of Augustine.

Keywords

Augustine; Time; Methodology; Science; Theological Anthropology; *Confessiones*; *De Ordine*; Interdisciplinary Methods.

Resumen

Este artículo explora las discusiones de Agustín sobre la cuestión del tiempo desde una postura metodológica y propone algunas áreas potenciales en las que se puede centrar la investigación futura. Para ello, se ilustra el destacado papel de la filosofía en el despertar del interés por el tema mediante una breve introducción histórica a la recepción del libro XI de *Confessiones*. Después de presentar el predominio del enfoque filosófico, este trabajo pasa a cuestionar y complementar los métodos textual e histórico, al tiempo que destaca cómo siguen limitados por conceptos filosóficos abstractos. En respuesta a las deficiencias de la investigación existente, sugiere que la raíz de su problema es el enfoque filosófico que reduce a Agustín a ideas estáticas. A continuación, aboga por un enfoque interdisciplinario y holístico basado en diferentes puntos de vista antropológicos. En la siguiente sección, a través del análisis de los métodos y las perspectivas de Agustín en su discusión del tiempo en *De Ordine*, esta investigación revela el complicado trasfondo intelectual de Agustín y lo reconstruye a través de métodos interdisciplinarios. Partiendo de la universalidad del conocimiento en las ciencias naturales, las teorías y los métodos de la física moderna pueden ser una herramienta potencial para examinar las conclusiones y los argumentos de Agustín. El reciente enfoque de la psicología sobre la cognición temporal también podría ser útil para responder a las dudas de Agustín. Los últimos desarrollos de la tecnología, como el aprendizaje profundo, pueden entonces ayudar a aclarar la terminología de Agustín a nivel semántico. Estos métodos instrumentales caracterizan, en última instancia, las propias motivaciones e intenciones de Agustín. Al apreciar sus preocupaciones teológicas y su estilo personal, un enfoque teológico-antropológico tiene la esperanza de coordinar otros métodos y conduce a una imagen adecuada de Agustín.

Palabras clave

Agustín; Tiempo; Metodología; Ciencia; Antropología teológica; *Confessiones*; *De Ordine*; Métodos interdisciplinarios.

Introduction

Christianity has witnessed countless challenges over the past two millennia, but the crisis it faces today is likely to be unprecedented. The scientific revolution and technological breakthroughs have brought human beings the most abundant material life in history and substantially changed the way we perceive the world. What many ancient theologians once saw as common sense has been denied by modern science. The validity of theological arguments, along with the traditional methodology, has been questioned. How to interpret and apply ancient theological discussions in a modern (or postmodern) context has become a problem that contemporary theologians must solve. In this regard, we need new perspectives and innovative methods to read the text. This article will use Augustine's investigation of time as an example to illustrate an interdisciplinary and holistic approach.

Augustine of Hippo is often regarded as a prominent contributor to the philosophy of time. In Book XI of his famous *Confessiones* (*Confessions*), Augustine revealed to the readers his process of exploration and reflection on eternity and time. After arguing that the past and the future do not exist, he tried to find out what time is and why we can measure it. The traditional view of scholars believed that he finally came to a conclusion: Time is an 'extension of the mind' (*distentio animi*, 11.26.33). Therefore, Augustine was thought to propose a psychological view of time. As this interpretation enlightened some important philosophers, such as Husserl and Heidegger, Book XI has been evaluated as one of Augustine's major philosophical legacies. The influence of these philosophers has prompted researchers to dive deeper into Augustine's text. Since then, textual analysis and historical-critical studies have identified many inadequacies in that traditional interpretation. The most notable problem is that Augustine offered seemingly contradictory definitions of time in different writings.³ In addition, questions from scientists have added new dimensions to these discussions. In response to the comment by Henri Bergson, Albert Einstein (1922) argued that the time concept discussed in philosophy could not have a nature independent of physical time.⁴ While top physicists have failed to give a definition of time⁵, their theories do lead to many counter-intuitive but verified inferences. They even changed the definition of a second.⁶ Advances in psychology and neuroscience have also contributed to a better understanding of temporal consciousness. It is therefore challenging but necessary to evaluate Augustine's theory in the light of the latest scientific research.

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- 3 Carter (2011, 302) listed nine definitions given by Augustine: time is (1) an infinitely divisible continuum, (2) a series of minimal temporal intervals, (3) composed of time numbers, (4) a non-extended present, (5) a distention of the soul (*distentio animi*), (6) subjective in nature, (7) the product of the world-soul or angelic motion, (8) an accident of an enduring substance, and (9) consisting only of past and future moments. Personally, I think this list is probably too long, but it is certainly informative for non-expert readers who want to have a whole picture.
 - 4 When Einstein discussed simultaneity with Bergson, he pointed out that simultaneity is only because human senses cannot detect time dilation at low speed. Philosophical discussions about this concept should be subordinated to the principles in the theory of relativity. In other words, mental time needs to obey the laws of physical time. Einstein (1922): "Le temps du philosophe, je crois, est un temps psychologique et physique à la fois... Il n'y a donc pas un temps des philosophes ; il n'y a qu'un temps psychologique différent du temps du physicien."
 - 5 What Richard Feynman said would be a good footnote: "What is time? It would be nice if we could find a good definition of time... Maybe it is just as well if we face the fact that time is one of the things we probably cannot define."
 - 6 In 1967, the second was defined by taking the fixed numerical value of the caesium frequency, Δ_{Cs} , the unperturbed ground-state hyperfine transition frequency of the caesium 133 atom, to be 9192631770 when expressed in the unit Hz, which is equal to s^{-1} .

In this article, I will first show how the philosophical approach has come to dominate studies on Augustine's theory of time in history, followed by a brief introduction of textual and historical research. Based on their methodological shortcomings, I propose an interdisciplinary approach. By taking the methods Augustine used in his early work *De Ordine* (*On Order*) as an example, I illustrate the innovations we can make at the instrumental level. Finally, I try to find the place of time in Augustine's theological framework and explore the possible directions of studies on Augustine.

1. Dominance of the philosophical approach

Augustine, who lived in the twilight of the Roman Empire, never wrote a monograph on the theme of time as modern scholars do. Nor did he invite other scholars to hail any of his books as “a major achievement in the field.” What Augustine presented to the readers is a wide variety of descriptions and discussions in different works. It is the researchers who decide which pieces are more important and designate them as representative of Augustine's theory of time. Any simple conclusion about the so-called “time theory of Augustine” is a selective presentation of texts under specific methodologies and perspectives. By concisely reviewing the studies and tracing their origins, we will see dominant methodologies and their limitations.

1.1 Historical origin of the philosophical approach

Although Book XI of *Confessiones* is now recognised as a masterpiece about time, it may not have been widely accepted in antiquity. In the 6th century, Eugippius made one of the most important early collections of Augustine's works, *Excerpta ex operibus Sancti Augustini*. He selected the passage from 11.23.29 to the end of Book XI and claimed in the given title that time can be measured but no one can understand what it is.⁷ Such a title clearly indicates that Eugippius himself did not find a final answer in the time exploration of Book XI. His contemporary Boethius was famous for giving an influential definition of eternity in *De consolazione philosophiae* (*Consolation of Philosophy*).⁸ Despite the similarities in expression and the fact that he was deeply influenced by Augustine, Boethius did not quote *Confessiones*.

Few studies have assessed the relationship between their time (and eternity) discussions.⁹ In the Medieval period, Augustine was confirmed as the authority in many aspects, but his time theory became

7 The Latin title is “*De tempore, quod cum homo metiri uideatur, non tamen potest comprehendere quid sit tempus.*”

8 Boethius suggested that eternity is the complete possession all at once of interminable life. In his book, Leftow (1991, 112) made a comment on Boethius' importance: “Where the concept of eternity is concerned, Augustine and Boethius were the hourglass's neck. The study of Augustine as anthologized in Peter Lombard's *Sentences* was the meat of theological education well into the 1300s, and most treatments of eternity for long after that included discussion of Boethius.”

9 Lambert (2013, 18) mentioned that “Boethius is strongly influenced by Aug's early writings, by the *Confessions*, and by *De Trinitate*...his works therefore served as a significant vehicle for the reception of—among other aspects of Aug's thought—his ideas about the Liberal Arts, his Trinitarian theology, and his ideas about the nature of good and evil.”

a target for criticism. Cardinal Robert Kilwardby, who wrote *De tempore*, paraphrased Augustine's view stating that there is no time except in the soul.¹⁰ He preferred Aristotle's view on this issue.¹¹ Albertus Magnus, the outstanding German Dominican, criticized Augustine because the psychological interpretation seems to deny the existence of time outside the soul.¹² When Thomas Aquinas was discussing eternity and its difference from time, one of his main references was the work of Boethius.¹³ Although he mentioned Augustine's name a few times, none of his quotations was from *Confessiones*. Instead, statements in *De Genesi ad Litteram* (*The Literal Interpretation of Genesis*) were taken as arguments. Later, Thomas discussed the relationship between creation and time and cited Book XII of *Confessiones*. However, Book XI remained unmentioned. Criticism even appears among those who follow the Augustinian tradition. According to Dusenbury, Henry of Ghent contributed to the notorious condemnation in 1277, in which Augustine's view of time was involved.¹⁴ It was not until the 20th century that Augustine's doctrine of time became appreciated by philosophers, such as Edmund Husserl and Martin Heidegger.

Husserl (1905) considered Book XI to be a must-read for anyone tackling the problem of time.¹⁵ He linked the psychological interpretation of Augustine's time to his phenomenological interests and studied Augustine with the concept *inneren Zeitbewußtseins* (internal time-consciousness). It is doubtful how much he cared about Augustine's own concerns. Heidegger held a similar attitude: while affirming Augustine's historical significance, he interpreted the text with his own concept of *Dasein*. They did not pay enough attention to Augustine's mystical experience related to time. On the other hand, though not famous for time studies, Wittgenstein (1933) offered his own criticism as a loyal reader of *Confessiones*. Through his philosophy of language, he argued that Augustine was simply struggling with the grammatical use of the word "time."¹⁶ Paul Ricoeur (1984) was also inspired by Book XI and proposed his own interpretation of Augustine's view of time. Ricoeur declared that Augustine's time theory is always accompanied by narrative and discussion. Although he still regarded the time of Augustine as a kind of psychological time, he noticed the difference between *anima* and *animus*, thereby distinguishing the mind from the soul. On the basis of these studies, contemporary scholars make philosophical comparisons between different theories of time and use phenomenological and analytical philosophical methods to understand Augustine.

10 DT, Q.1: *Propter has et consimiles rationes posuit Augustinus quod tempus non sit nisi in anima.*

11 Trifogli (2013, 210) argued that "the presence of Augustine amounts to nothing more than the mere quotation of his opinion, which is left without any clarification or comment. The remainder of the question deals with a genuine Aristotelian problem in genuine Aristotelian terms."

12 Physica. IV, iii, 4. "*eo quod nec Galienus nec Augustinus sciverunt bene naturas rerum.*"

13 SM. I, Q.10.

14 The most famous victim of this condemnation is St. Thomas Aquinas, but Étienne Tempier condemns a total of 219 propositions. The one related to Augustine is "*quod evum et tempus nichil sunt in re, sed solum in apprehensione.*"

15 In his lecture, Husserl said: "Der erste, der die gewaltigen Schwierigkeiten, die hier liegen, tief empfunden und sich daran fast bis zur Verzweiflung abgemüht hat, war Augustinus. Die Kapitel 14-28 des XI. Buches der *Confessiones* muß auch heute noch jedermann gründlich studieren, der sich mit dem Zeitproblem beschäftigt."

16 Wittgenstein also analysed the mental cause of Augustine's question: "Now a definition often clears up the grammar of a word. And in fact it is the grammar of the word "time" which puzzles us. We are only expressing this puzzlement by asking a slightly misleading question, the question: "What is...?" This question is an utterance of unclarity, of mental discomfort, and it is comparable with the question "Why?" as children so often ask it."

This philosophical approach has intrinsic methodological weaknesses. No matter which views philosophers have about time, they tend to have a static and abstract comprehension of history. In other words, there are many possible answers for the nature of time, but time as a theme is permanent. They assume that different thinkers throughout the ages are reflecting on the same object, which makes it possible to deny previous paradigms, as science does.¹⁷ But Augustine's discussion of time is incompatible with this presumption, because he did not discuss time within a systematic framework, but incorporated it into his own theological context and pastoral practices. Moreover, he continued to revise and develop his views throughout his life. "Time is an extension of the mind" is clearly not an appropriate summary. In order to better reconstruct the full picture of Augustine's thoughts on time, textual analysis and historical research are indispensable.

1.2 Textual analysis and historical methods

Textual analysis is one of the most fundamental methodologies. Following the philological approach¹⁸, it analyses static texts at several different levels. One can write commentaries on a whole work, focusing on its structure, or interpret specific chapters in detail. James O'Donnell's (1992) three-volume commentary is an excellent tool. On the basis of the Latin text, he listed almost every citation of Augustine and established connections with the research of that time. However, his commentary is inserted into the original text for additional clarification and therefore lacks coherence and integrity. Though he noticed some paragraphs about time in book IV, he failed to include them in the comments on Book XI. Later commentaries tend to avoid this. Johannes Brachtendorf (2005) introduced the content and structure of each book. He understood the text of Book XI in the light of the human situation, arguing that Augustine did not want to seek the nature of objective time here. Other commentaries focus on the second part of *Confessiones* or Book XI alone. Other authors, such as Kurt Flasch (1993), Dorothea Günther (1993), Carl Vaught (2005) and David Dusenbury (2014), also provided their interpretations. Since Augustine presented different descriptions and statements about time in Books XI to XIII, one of the main tasks of textual analysis is to clarify and interpret these differences.

Textual studies have also made some progress in investigating the meaning and origin of terms. For instance, Roland Teske (1996) proposed that *distentio animi* is a Latin translation of διάστασις ζώης. By tracing Augustine's investigation back to Plotinus, Teske (1983) advocated a Neo-Platonist interpretation that time is the movement of the soul of the world. Augustine never expressed similar views in the text of Book XI. Teske took some of Augustine's early works as proof, such as *De quantitate animae* (*The magnitude of the soul*) and *De immortalitate animae* (*The immortality of the soul*). A somewhat similar interpretation is that time is the movement of angels (Morrison, 1971; Rogers, 1996). These interpretations caused controversy. Donald Ross (1991) pointed out that Teske's quotation does not prove that time is the activity of the World-Soul. James Wetzel (1997), as a professor of philosophy, directly highlighted the theological context of Augustine. He believed that this is what prevents Augustine from

17 Philosophers may lack the criteria to judge right or wrong, but they always believe they are the "more right" one.

18 The philological approach is the traditional method in textual analysis, but technological breakthroughs may bring new options. I will give some examples in the second part.

following Plotinus.¹⁹ A recent article by Philippe Hoffmann (2017) suggested that the possible parallel between Augustine and Neo-Platonism in *Confessiones* is fragile. But even with so many criticisms, this Neo-Platonist interpretation is still the most influential source-critical theory. It highlights the textual coincidence between Augustine and Plotinus. This interpretation is revisited whenever scholars focus on the history of ideas (Zachhuber, 2022). Gerard O'Daly (1977) also produced a significant paper on this issue. Through grammatical investigation, he discussed how Augustine uses the word *distentio*. It was first used as a rare term to describe bodily tension. Christian authors developed its usage, and O'Daly believed that the most important meaning is care and concern for the *saeculum*. This meaning reveals the fragmented and distracted situation of human beings. He then suggested that the word *extentus* is a positive counterpart of *distentio*. As for the Latin words *intentio* and *attentio*, O'Daly claimed that they are exchangeable. These textual studies have not succeeded in providing conclusions about Augustine's view on time, but they have already shaken the foundation of previous philosophical discussions by highlighting the places where the traditional psychological understanding does not fit with the text. In the meantime, relevant studies are still limited by the specific concern of philosophical investigations, namely *Confessiones*, resulting in a lack of analysis of other works.

As in the case of textual studies, the philosophical approach overshadows the direction of historical studies as well. When discussing the issue of time, the most common perspective is the history of ideas. The possible and potential influence of ancient philosophers' arguments on Augustine is often emphasized. For instance, the Neo-Platonist interpretation is rooted in the historical-critical tradition, as in the 20th century many scholars questioned Augustine's conversion narrative and asserted the influence of Neo-Platonism on him (Alfaric, 1918; Courcelle, 1968). In addition to Plotinus, Plato and Aristotle are often mentioned. Augustine referred to Plato in his writings. But the search for a link between Aristotle and Augustine is somewhat unconvincing. In fact, there is a consensus that Augustine only had "indirect and limited" knowledge of Aristotle. Michael Foley (2003) suggested that the young Augustine abused the ideas of Aristotle, whilst in *Confessiones* the older bishop silently reused some points related to the philosopher. Jason Carter (2011) made a systematic summary of Augustine's time descriptions in various works and argued that time is an order of accidental changes. He accepted the consensus but believed that Augustine could approach Aristotelianism through the eyes of Neo-Platonists. Other ancient philosophers receive less attention. Flasch (1993) gave Seneca some pages, and Dusenbury (2014) attempted to prove that Augustine was inspired by Epicureanism. By contrast, only a handful of Christian sources were studied (Callahan, 1958; Hoffmann, 2017). This undoubtedly means a deviation from the historical Augustine's intentions and motives, since the Christian faith was always the norm in his explorations and writings. Even in his early dialogues in which he rarely quoted the Scripture, Augustine approached theology with a philosophical approach. By the time he composed *Confessiones*, Augustine had already mastered Christian doctrines and took them as arguments and principles. It is fair to say that the current state of research is quite unbalanced.

19 In his book review, Wetzel (1997, 162) said this as a philosopher: "I persist, however, in thinking that Augustine is much more compelling as a philosopher and theologian when he is not made to wear the persona of either Plotinus or Descartes. If the persona is forced upon him, he disintegrates."

In existing studies, Augustine as a person is reduced to ideas, texts, or even a symbol.²⁰ But Augustine as a composer was a whole person. The texts we see were created by Augustine's whole person in interaction with his environment, and writing is a dynamic process that occurs in time. By emphasising this simple fact, I hope the reader will realise that Augustine's body and mind were working concretely in reality. If we focus on Augustine's expressions in a static and abstract way, we inevitably misread his ideas of time. Meanwhile, contemporary methodology relies too much on specific disciplines and the research perspective is limited by disciplinary presuppositions, thus making it incapable of reconstructing the complete Augustine.²¹ I believe that if we are to overcome these shortcomings, we need to understand the similarities and differences between Augustine and modern people. On this basis, we shall reconstruct the image of Augustine through an interdisciplinary approach.²² This image must balance Augustine's anthropology with our contemporary understanding of humans. In what follows, I will refer to this methodology in terms of the anthropological approach.

2. A new light on instrumental methods

For Augustine, human beings are the union of soul and body. Today this belief would not be accepted as indisputable by everyone, but we can at least agree on the physical level: Augustine is biologically in the same category as we are. This material part is the bridge between different anthropological views. We know that Augustine shares with us the same faculties, including the senses, emotions and reason. Using this as a standard, we are able to measure some differences, including knowledge, experience and environment. Through investigations of Augustine's methods, scholars may reconstruct his intellectual context and identify these differences specifically. In this section, I will first illustrate Augustine's methods and perspectives with a specific text as an example, and then discuss the complements that modern technology can contribute.

2.1 Methods and perspectives of Augustine: *De Ordine* as an example

From his earliest works, Augustine made frequent references to time. This is partly because time is often used in daily communication, and his *Cassiciacum Dialogues* recorded conversations between friends. Nevertheless, Augustine recognised the importance of the issue of time early on. The first substantial discussion occurred in Book II of *De Ordine* (*On Order*). Augustine did not especially make a thematic investigation of time. Instead, he highlighted the role of time in areas related to it. It is difficult to categorise

20 Augustine was not an Augustinian, just as Karl Marx was not a Marxist. However, he inevitably became an ideological symbol in the Church.

21 One example is that today's historians no longer accept the historicity of miracles, but Augustine would not agree. We can reject Augustine's view through historiography, but we cannot understand his position better through such a presupposition.

22 I will use the term anthropology as the approach that concerns the different understanding of human beings, both technically and mentally. If readers can find a more suitable term, I am willing to replace it.

Augustine's approach in a modern methodological sense, but he has an interdisciplinary perspective. Now we present his methods in *De Ordine* and analyse them.

Augustine discussed the birth of various disciplines, where he first mentioned the relationship between syllables and time. Different time intervals distinguish long and short syllables.

*Then, lest it leave out rhythm and quantity, reason paid special attention to various types of voice, stops, or pauses, according to which it discovered that syllables could be arranged into long and short, depending on the **time intervals** they needed.*²³

Compared to the discussion in *Confessiones*, the concept of a time interval at this point is clearly a direct reflection of daily experience. This acoustics paradigm is later frequently used by Augustine to discuss time in subsequent works, such as *De Musica* (*On Music*) and *Confessiones*. Like Ambrose, Augustine emphasized the role of Reason, which is also the subject of measurement:

*Reason also noticed that all of this was worth very little without regular **timing** and a variety of high and low pitch sounds. Reason found an application here of what it had called meter and stress in grammar, when it diligently analyzed syllables.*²⁴

*He gave a basic description of the nature of sound and numbers, which could be seen as a precursor to *De Musica*.*

*Now number is a mental construct and, as such, ever present in the mind and understood as immortal. Sound, on the other hand, is **temporary** and fleeting, but can be memorized.*²⁵

After investigating the origin of music, Augustine turned to the birth of astrology²⁶ and geography, two disciplines with measurement as the core. Here astrology is related to both time and space.

*There it also understood that the recurring seasons, the fixed determined pathways of the heavenly bodies, and the intervals of space between them responded to numerical proportion.*²⁷

Augustine took the phrase *constantissimas temporum vices* (constant changes of times) to describe a temporal phenomenon, which is translated as "recurring seasons." However, the original text may refer to a wider range, including the alternation of day and night. In this case, a certain period of time always serves as the unit of measurement. Meanwhile, time corresponds to the interval of space, which is dictated by motions and measured by numbers. This is a spatialized time.

23 *Ord.* II, xii, 36. I use the English translation of Silvano Borruso.

24 *Ord.* II, xiv, 40.

25 *Ord.* II, xiv, 41.

26 In ancient times, astrology and astronomy were regarded as the same discipline. I will explain this in more detail in the next section.

27 *Ord.* II, xv, 42.

In the next section, Augustine made frequent references to time.

*But even those who flee from such and live a clean life can be ignorant of nothingness, of formless matter, of the form of inanimate things, of body, of species, of **space and time**, of **being in space and in time**, of local motion, of change in general, of uniform motion, of eternity, of what it is to be nowhere, or **to be beyond time**, or to be and not to be somewhere...*²⁸

The Latin word *tempus* (time) appears three times in this parallel structure, and there are even more time-related concepts. Time and space are placed together. They are first listed with themselves, followed by those existing in time and space. Before Augustine mentioned these two concepts, he used *informis materia* (formless matter), which is discussed in Book XII of *Confessiones* as one of the two beings which exist apart from time.²⁹ This term immediately follows *nihil* (nothingness), which corresponds to the order of being introduced in *Confessiones*: Formless matter is the closest existence to nothingness. This implies that there is an order in the series of concepts listed by Augustine here. Through these categories and concepts, it can be speculated that Augustine already had a framework for subsequent discussions at this time.

Augustine revealed no further clue. He then posed a series of questions about evil, which again involves time. The beginning of evil is placed in the same context as the creation of the world, giving rise to the classic paradox about the omnipotence and justice of God. Augustine's response to these questions was raw and unsatisfactory. From the change in his understanding of the relationship between creation and time, we can reasonably infer that Augustine himself, who was still a catechumen, could not answer all the questions at this time, so he chose a simple rejection. However, in his subsequent career, Augustine discussed related issues in the context of debating Manichaeism several times. Therefore, the discussion of evil here might be regarded as a refutation of Manichaeism.

At the end of *De Ordine*, Augustine pointed out that *ratio* (reason) is not disturbed by time.

*It was not truer yesterday than it is today, nor will it be truer tomorrow, or in a year's time. It would not cease to be true even if the world came to an end. It is always the same, while this world did not have yesterday, nor will it have tomorrow, what it has today. The sun changes place continuously within one hour. As nothing is permanent, everything is subjected to change within a very short time.*³⁰

The relationship between reason and time is a key to Augustine's subsequent time discussions, which he was already aware of at this point. He was not, however, prepared to discuss it in depth in this book.

*In the material world one must seriously consider the nature of time and place. The point is that a whole is always far more pleasing to understand than the parts of time or place that make it up... These things will be dealt with later.*³¹

28 *Ord.* II, xvi, 44.

29 The other being is *caelum caeli* (the Heaven of Heavens). See: *Conf.* XII, iii, 3.

30 *Ord.* II, xix, 50.

31 *Ord.* II, xix, 51.

From the above textual evidence, we can get a glimpse of the methods used by Augustine. He discussed time in terms of acoustics and astrology, and also related time to numbers. A spatialised conception of time also appeared in his early thoughts. Ethical considerations stemmed from his own Manichaean past. Following these methods, we can rebuild his intellectual context. In the second section, I will shed light on possible paths of research.

2.2 The intellectual context of Augustine

Studies on Manichaeism have become noteworthy in recent years, and Augustine is highly regarded as a source of Manichaean teachings. Scholars like Johannes van Oort (2020) suggested that Augustine had a thorough knowledge of Manichaeism. Since Manichaeism has a unique time doctrine,³² its possible influence on Augustine should be seriously considered. Benefiting from the geography of religion, we can conduct religious studies of the interaction between Manichaeism and local communities. By examining the mission of Manichaeism and its religious practices in North Africa, we may know whether Augustine had a clear understanding of the Manichaean time theory. Furthermore, Manichaeism has characteristics of both Christianity and Buddhism, so a comparative study from the perspective of interreligious dialogue is also feasible. In Buddhism, the question of time was at the heart of the debate. Sarvastivada and Vibhajyavāda provide detailed discourses on the state of the past, present and future. During the prosperous era of the Kushan Empire, these arguments spread to Central Asia. Considering the times in which Mani lived, it is likely that he learned from these schools of Buddhism when he went to ancient India.

The influence of astrology has received less attention than Manichaeism. After the scientific revolution, almost everyone believes that astronomy and astrology are two distinct subjects, which was not the case in the 4th century. Astrologers also make astronomical observations and calculations.³³ This situation can also be affirmed by the terminology: In addition to the word *astrologus* (astrologer), Augustine used *mathematicus* (mathematician) to refer to astrologers, which even caused a misunderstanding that Christians were warned to stay away from math. He indeed recognised the difference between superstition and natural science. In other words, Augustine excised the religious part of astrology after his conversion, while retaining the scientific knowledge within it. His knowledge may have been limited, but it would have been enough for him to make a choice in methodology. Current studies mainly explore Augustine's critical attitude to astrology, but few actually focus on the specific content of astrology. What tools do astrologers use to perform calculations, and how do they interpret the mathematical result ethically? Hence, it is reasonable and necessary to examine how astrological paradigms influenced Augustine's scientific knowledge. This will include many aspects: models and instruments used in astrology, formulation and revision of calendars, views on the earth and the universe, astronomical observation equipment and time measurement tools,

32 Gardner (2004, 11) gave us a precise introduction: "Mani's teaching was summarised by the catchphrase, that 'of the two principles and the three times (or moments)'. The two principles are those of light and darkness: whose realms in the beginning are separate, the dark unknowing of the light; then during the middle are in part mingled, the reality of this present universe; but at the end will be the triumph and eternal victory of life and light over death."

33 In fact, some of the most important astronomers, such as Tycho Brahe (1546-1601) and Johannes Kepler (1571-1630), are professional astrologers.

etc. By unearthing these factors, the measurement of time will be enriched and concrete practices can be reconstructed from abstract concepts.³⁴

This approach to historical reconstruction based on science and technology is not limited to astronomy. Augustine was not a top scientist of his time, like Nicole Oresme or Nicholas of Kues, but his discussion of time involved at least acoustics and mathematics. It was shortly after finishing *De Ordine* that Augustine began writing *De Musica*, which is the first time he systematically dealt with the theme of time. It is a part of a series of Augustine's (unfinished) work on liberal arts. In recent years, the book's importance has been gradually realized by researchers (La Croix, 1988; Gersh, 2009; Crawford, 2016; Wiskus, 2016; Casajus, 2020). It is important to further investigate how Augustine approached and received the theory of ancient scholars. This will involve specific schools and works, such as Neo-Pythagoreanism or Aristides. The role of mathematics is relatively more difficult to assess because Rome is known to be in a mathematical recession (Kline, 1972). There is a lack of attention even in the field of mathematical history research. But Augustine did have a keen interest in mathematical methods. In *De Quantitate Animae*, he used the language of geometry to advance his arguments.³⁵ Although the book is not directly quoted in *Confessiones*, the discussion of length in it is closely related to the incorporeal nature of the soul. *De Musica* is filled with algebraic discussions. In Book XI of *Confessiones*, we can also see Augustine's infinite division of time.³⁶ Though he did not foresee the differentiation of Newton and Leibniz, it was possible that he learned the concept of infinitesimals from the ancients, such as Democritus, Zeno and Archimedes.

To understand how Augustine acquired these mathematical ideas, the assistance of Latin literary studies is necessary. Augustine once mentioned that some people can even count the number of sands and stars.³⁷ If this is not rhetoric, it possibly indicates the masterpiece of Archimedes of Syracuse, *The Sand-Reckoner*.³⁸ Although we lack direct evidence, it is not surprising that Augustine learned some of the natural philosopher's stories or even treatises through Latin sources, since Cicero was an explicit fan of Archimedes. Only through extensive examination of Latin texts can the mathematical knowledge possessed by Augustine be sketched out. Such research may even require some degree of counterintuition: Boethius was best known in the Middle Ages for his introduction and preservation of musical and mathematical knowledge in the ancient world, but he was born almost half a century after Augustine's death. However, since they may have been influenced by the same school, Boethius' intellectual background might still serve as a reference to some extent (Gersh, 2012).

How do we draw the boundaries for these interdisciplinary studies? The standard should be based on physical limitations. Augustine could not obtain the detailed work of other scholars without reading, nor could he read Sanskrit or Chinese. Although it is impossible to find all the intermediate stages of knowledge

34 The importance of tools has always been overlooked by the philosophical approach. The use of different measuring instruments, such as the sundial, water clock, mechanical clock or atomic clock, has different effects on the perception of the measurer.

35 *An. quant.* vii-xi.

36 *Conf.* XI, xv, 18-20.

37 *Conf.* V, iii, 3.

38 *The Sand-Reckoner* is the only surviving astronomical work of Archimedes. In this book, he discussed how many grains of sand are needed to fill the universe.

transmission, the physical carrier is essential. The study of ancient manuscripts (including archaeological discoveries) can help us to confirm the accessibility of certain ideas for Augustine.

2.3 Application of contemporary science and technology

The previous analysis of the methods and intellectual background of Augustine is essentially a reconstruction of how he learned, thought, and lived as a person. But since we do not live in his time, such studies are essentially simulations based on modern ideas, always limited by our anthropological view and instrumental methods. To better understand Augustine, we must be aware of our position. On the path to Augustine, we will realise that much of his knowledge and ideas has become outdated. For instance, Augustine could use the story of Joshua as an argument of fact to prove that time is not the motion of celestial bodies, but astronomy no longer sees the story as valid.³⁹ Only by further integrating modern science and technology with the content of his work can we separate gold from sand.

We first need to examine Augustine's texts from the perspective of natural science and mathematics. Some concepts used by Augustine can be clarified in a mathematical sense. For example, to what extent does Augustine's division of the length of time correspond to the differentiation method in calculus? Is the "present without length" infinitesimal or a point? Is it even possible that such a present does not exist? An article by Steven Savitt (2000) held this view: In Minkowski spacetime, the present has no place. Similarly, it might be possible to use the measure theory⁴⁰ to try to answer Augustine's question about the measurement of time.

Physical discussions are also feasible. Ettore Minguzzi (2014) combined Augustine's time theory with Einstein's general theory of relativity. Through the establishment of models and calculations, he may prove that Augustine's view on creation and time is still valid in the context of general relativity. The simultaneity is also an important issue, which was once at the core of Einstein's debate with philosophers (Bergson, 1922; Lovejoy, 1930). Simultaneity under Augustine's theory of time is an area that is rarely touched. One of the difficulties in Augustine's discussion, namely that the existence and non-existence of a thing could be simultaneously in the present moment⁴¹, may also be examined in the framework of modern physics.⁴²

Psychology also focuses on the temporal experience. The concept of "specious present" may have a role in Augustine's discussion about the present (Arstila, 2014; McMullen, 2018; Hasanoglu, 2018). The cognitive connection between the concepts of time and space, the problem faced by Augustine, is also the topic of our study today (Bender..., 2012; Núñez..., 2012; Bottini..., 2015). But I believe that psychology is fundamentally different from the natural sciences because it has some fatal flaws: ambiguously defined

39 *Conf.* XI, xxiii, 30.

40 The measure theory is a theory that strictly expresses the measurement in daily life in mathematical language. To know more about it, see Terence Tao (2011).

41 *Conf.* XI, viii, 10.

42 What I have in mind is the thought experiment of Schrödinger's cat. This thought experiment talks about the counterintuitive conclusion of quantum superposition.

terminology, poor reproducibility and difficulty in controlling experimental conditions. Neurocognitive science may be a complementary option. By studying the relationship between brain neurology and temporal consciousness, we may be able to answer to some extent the mystery of mental activities mentioned by Augustine: memory, attention and expectation.

Technological developments also provide new tools for our research. Due to the close cognitive relationship between space and time, the spatialization of time in Augustine's language use has aroused the interest of scholars. A recent linguistic study (Nowak, 2019) supports this view and searches for the collocations of *tempus* (time) in history by distributional semantic models (DSM). According to their study of the first sixty volumes of *Patrologia Latina*, the spatialization of *tempus* is still a central concept in the era of the Church fathers, as *spatium* (space) and *intervallum* (interval) are frequently collocated with *tempus*. Meanwhile, *tempus* has been changed in the Christian context. Since Augustine's corpus is large enough to analyse, this model may play a key role in text analysis. At the same time, we can go a step further and benefit from the latest algorithms, such as neural natural language processing. Through extensive linguistic analyses of different corpora (Meyer, 2012), such as the corpus of North African authors and Christian sources, we may be able to find the linguistic habits and features of Augustine. If artificial intelligence develops further, its analysis may overturn our traditional understanding of Augustine's text.

3. Theological-anthropological synthesis

In the second part, we discuss instrumental methods of Augustine's research at a material level. Grounded in the objective similarity, it can therefore be applied to studies of other thinkers. The study results based on these methods should be compelling for all, even for non-believers. It corresponds to the corporeal part of human beings. This final section turns to the spiritual part. Since this part is very personal and invisible, there seem to be obstacles for researchers to comprehend. In many cases, it might even violate the academic norm of value neutrality. But for Augustine, his knowledge always served theological concerns. Book XI begins with praise to God and ends with a quotation from the Bible. These discussions of time, as *De Ordine* demonstrated, are philosophical pursuits of God. Is there a bridge to approach this spiritual part of Augustine?

What comes to my mind is an anthropological image of Christ and the Church, namely *totus Christus* (the whole Christ). For Augustine as well as believers today, Christ, the Church and individual Christians are in communion. The barriers of time between individuals are crossed by Christ, which is why Augustine trusted the narrative of Moses.⁴³ By this principle, we know that Augustine's spirituality and his theological concerns centred on Christ. The time discussion deals not only with the situation of the individual, but also with the Church and Christ. Looking constantly at Augustine's time discussion through the lens of Christ and the Church, we can chart his spiritual growth and identify the place of time in his entire theological framework.

43 *Conf.* XI, iii, 5.

There have been a number of recent studies on the theological importance of time. Concepts related to the definition of time, such as soul, memory and attention are the most studied (Hochschild, 2012; Karfíková, 2021; Anzalone, 2022). Creation as the context of time discussion is also highlighted (Klein, 2018; Drever, 2020). Even so, the time-related themes are far from being fully explored. In Genesis 1's creation narrative, the creation of time is not mentioned. Therefore, Augustine had to answer the relationship between the beginning of time and the eternal God. In Christology, the eternal God entered history and took on human nature. Meanwhile, salvation transcends the limit of time and extends to the ancestors who were born before Christ. In eschatology, time reaches its end, but the afterlife remains. In ethics and jurisprudence, some principles and orders change over time, while the human act is bound by time. In spiritual practice, time is what we eventually ascend away from. Through multiple sets of analogies, even the eternal Trinity is related to the structure of time itself. It is difficult to portray the full meaning of time from a single perspective, but time will always appear in other thematic discussions. This phenomenon inevitably fragmented the study of time. In view of this, I suggest that theological research on Augustine's time should be systematic and integral. The diverse time descriptions of Augustine in different periods should be reflected upon around the axis of "Spirituality – Church – Christ."

The main obstacle to this attempt seems to be Augustine's own style. How can a systematic study properly characterise his work if he did not write systematically? I am convinced that we should go back to the basic fact that all these texts are composed by a person. Many scholars tend to regard Augustine as an abstract and static author, which is an inadequate anthropological view. When confronted with paradoxes such as predestination and free will, they may unconsciously understand Augustine's arguments with linear time. This implies that the content of time is only understood in its own relevant discussion and is not substituted into other discussions. But for Augustine as a person, these concepts were interconnected in his mind. If we take an isolated concept as a clue, his expression in different works is likely not systematic. But when we draw ideas together, there must be some consistency, because the individual Augustine is the subject of all his own thoughts. He developed his ideas in time. He practised the ideas and presented them candidly to readers and audiences. From his writings, we also see his self-reflection on the tension between the spirit and the flesh. He presented himself as a whole person in the text. Such a human image is theological, so the approach to it can be properly called theological-anthropological.

Some may argue that this theological-anthropological approach is valid only within the scope of the Christian faith and would be meaningless (or even unacceptable) for non-believers. Such an objection arises from the illusion that academic results should always strive for universality. I must make it clear that Augustine did not write for a free market where everyone could buy his books and read them. He wrote with different intentions, but especially for his flocks. It is therefore perfectly justified to conduct special studies for specific groups. Because of the permanence of faith, this approach can yield constant values among Christians, thus distinguishing itself from instrumental methods that have to change over time.

Such an approach may liberate us from an illness of modern scholarship: we are always asked to avoid errors and create a perfectly self-consistent system. It is not necessary for researchers to seek a certain reconciliation of multiple statements that appear in Augustine's time investigations. We know that the consistency we are to find does not mean perfect harmony. For Augustine, his concern was to make the Christian life acceptable to others through theological work, a lifestyle based on his own ideas and experiences. Our time research should ultimately lead to the presentation of the Christian life.

Conclusion

Today time remains a puzzle, yet people use it frequently in daily life. It is associated with so many fields that any discipline alone fails to cover all its characteristics. Acknowledging the complexity of time, Augustine adopted a multidisciplinary perspective in an attempt to understand the nature of time. However, his aim was always about exploring and revealing how one can live a good Christian life and find the eternal God in the temporal world. This was established from the very beginning of his time discussion.

Unfortunately, researchers with a philosophical background tend to overlook Augustine's intention. They see the text in *Confessiones* as the culmination of Augustine's thoughts on time. The paper begins with a brief literature review of the historical development of the dominating philosophical approach. It also affects the focus and application of other methods. Behind this is an anthropological view which reduces the thinking person to the content of reflection.

I advocate a reconstruction of Augustine's person based on a contemporary understanding. This reconstruction can be divided into two parts: a focus on his instrumental methods and an approach to the spiritual inner-self. The former requires us to find his methods and to make innovative interpretations and supplement them with our technological developments. The latter needs a comprehensive analysis and synthesis through theology to understand the whole image of Augustine in his time exploration process. I believe that such an anthropological approach would best suit Augustine's intentions and remind us of our position in this seemingly "objective" academic study.

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