

Reasonable Measurement and Motion : Numerical Order in the Soul and Music

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Abstract: This article argues that according to Augustine, the soul can conduct and perceive musical motions because the soul has been measured by God according to the same harmonic/numerical order based on which the whole cosmos has been measured. The measured soul is rational and has numerical functions. The unchangeable numerical order of musical motion can only be conducted by the ethical movement of the rational soul. Therefore, the harmonious music as a physical motion reflects the harmony of the inner motion of the soul. Since reasonable/ logical thinking and ethical behavior reflect the measurement/ temperance of the soul, there must be a priori *ratio* which is the *modus* for both logical and ethical movements; otherwise, the inward motion of the soul cannot move well.

Key Words: soul; music; measurement; motion; order; harmony; reason; numbers

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Augustine holds that because the soul has been measured by God, by the *modus* embedded in it, the soul can recognize the unchangeable principle of the harmonic order in the temporal realm. Since the harmonic order can be best illustrated by musical motion which only manifests itself in time, Augustine defines that music is the science of good measurement and movement^[1]. Regarding the created forms in the temporal realm, Augustine says that “the form [species] changeable only in time is prior to that changeable in both time and place. ^[2]” Musical motion is superior to any other motion because the order of musical motion is merely in the sequence of time yet directly floods into the soul, rather than in the dimension of space. This article explores how, according to Augustine's musical-cosmological view, the soul can be measured and moved according to the eternal *ratio* of God and how human reason can apply the unchangeable principle of music as a science measured by God.

[1] Augustine, *De Musica*, 1. 2. 2-3. 4, *Patrologia Latina* 32, ed. J. P. Migne (Paris; Migne, 1841). Note: In this article, quotations from Augustine's works translated from the original texts to English are my own, unless otherwise indicated.

[2] *Ibid.*, 6. 14. 44.

1 The Musical-Cosmological Concept of Measurement and Motion

Augustine's theory of motion and measurement anatomizes musical motion and the micro-motion of the soul from a musical-cosmological perspective that, throughout his work, dominates his philosophical thinking regarding motion and time. The unchangeable mathematical principle is the basis of Augustine's musical cosmology and his theory of time and motion. When measure refers to God's creation, it indicates the divine order and the wisdom of God, by which God measured all things and set them in orderly motion. Stephen Gersh also recognizes this Augustinian philosophical paradigm, pointing out that the exploitation of musical paradigms and the employment of musical methods remain central to Augustine's philosophical and religious project, and that the particular relations between music, motion, and time established by *De Musica* underlie the application of such paradigms and methods^[3].

According to Augustine, in the temporal realm, measure and motion cover all creatures which under obligation to change according to their unchangeable *modus* (unchangeable nature measured by God). The science of measurement is about movement, time, and numbers in the physical world, and the end of these elements is about the unchangeable order. Measurement and motion are two keywords in Augustine's music definition. Musical motion as an ordered motion is modulated (operated) by human beings both physically in time and rationally in mind. The harmony of both psychic and physical motions is maintained by a harmonic *modus*. Therefore, Augustine's theory of motion and measurement interlocks time, music, and the soul. Augustine simply raises this question: "What would happen if all things were perhaps made from music? As much as the noun *modulationis* (modulation) is widely used with reference to all kinds of instruments, it can hardly be unreasonable, correct?^[4]" This musical-cosmological worldview was first conceived by Pythagoras. The Pythagorean scholars believed that the created world is a cosmos, namely, an ordered, harmonious whole rather than chaos because it has been measured and governed according to the immutable harmonic principle. Even though Aristotle does not identify himself as a Pythagorean, he also affirms that the world is a cosmos, as he says: "The motion must have been either enforced or natural. But if it was natural, careful consideration will show that there must have been a cosmos... Moreover, "disorderly" is nothing else but "unnatural," for nature is the proper order of sensible things.^[5]" Aristotle further insists that "the order of the world is eternal."^[6] After Aristotle, Ptolemy was the most influential scientist in medieval times, being the first astronomer to develop the Pythagorean hypothesis (both for astronomy and music theory) to a significant level. Ptolemy observed the resemblances between celestial motion and musical motion, comparing celestial order to Greek musical modes^[7]. Aristides Quintilianus makes a similar observation: "There is also in the

[3] Stephen Gersh "The Metaphysical Unity of Music, Motion, and Time in Augustine's *De Musica*," in *Christian Humanism: Essays in Honour of Arjo Vanderjagt*, ed. Alasdair A. MacDonald, et al. (Leiden: Brill, 2009), 313-314.

[4] Augustine, *De Musica*, 1. 2. 3.

[5] Aristotle, *On the Heavens*, 3. 2, trans. W. K. C. Guthrie (Cambridge: Harvard University Press, 1971).

[6] *Ibid.*, 2. 14.

[7] Jocelyn Godwin, ed. *The Harmony of the Spheres: A Sourcebook of the Pythagorean Tradition in Music* (Rochester: Inner Traditions International, 1993), 34.

body of the universe a palpable paradigm of music. The fourth, again, reveals the material tetractys, the fifth connotes the ethereal body, and the octave the musical motion of the planets. ^[8]”

Based on the unchangeable cosmic-harmonic principle observed by the Pythagorean scholars, Augustine developed his musical-cosmology by investigating the eternal *Ratio* in musical motion and the micro-cosmic motion of the soul rather than exploring astronomy (the celestial motions). Therefore, in *De Musica* I, Augustine states that in order to reach the highest sanctuary from where music has been issued, he begins his investigation by studying the numerical order of musical motion that will unerringly guide him to the highest sanctuary ^[9]. In *De Musica* VI, Augustine states that by sense perception, man cannot judge the rhythm of celestial motions, which are “in the ratio of one to two hours or days or months or years (for they would at least be hindered by sleep), or approve them as iambs of motion. ^[10]” However, man can perceive the mathematical ratio of micro-motion, which is proportional to the celestial motions, because man’s magnitude was measured by God according to the proportion between man and the universe ^[11]. Augustine claims that in the activity of observing the ratio of celestial motions in days, months, and years, only reason can assess the observation of the senses and discern the proportion of motions that surpass the senses; and only reason can perceive the harmony of eternity, from which “times are made and ordered and changed, imitating eternity as they do when the motion of the heavens turns back to the same state. ^[12]” Kepler agrees with Augustine, stating that “there is never judgment of sensations except in the cerebrum; and the effect of joy never arises from a sense-perception except in the heart. ^[13]”

In *De Musica* Book I, Augustine devotes a full chapter to analyzing the relationship between motion and measurement from a musical-cosmological perspective and states that without motion no *modus* can be observed:

Now, since we admit *modulationem* (mensuration) is named from *modo* (measure), you would never have to fear that *modus* (measure) will be exceeded or not fulfilled, except in things that are moving in a certain way. Or rather, if nothing moves, we cannot fear anything being out of *modus* (measure), can we ^[14]?

The phrase “things are moved in a certain way” refers to all kinds of motion and change in the temporal realm (e. g., plants growing, animals’ life rhythm, etc.). The nature of all things has been measured by God. Their nature is the *modus* in them. Only in motions can the unchangeable *modus* (measure) which is the nature of things be found. Augustine classifies two kinds of motions: one is harmonic motion, which is measured according to numerical *modus* in advance before things begin moving, and the other is chaotic motion, which is not measured. He explains that “those which are

[8] Aristides Quintilianus, *On Music*, 3. 20, trans. Thomas J. Mathiesen (New Haven: Yale University Press, 1983), 188.

[9] Augustine, *De Musica*, 1. 13. 28.

[10] *Ibid.*, 6. 7. 19.

[11] *Ibid.*

[12] Augustine, *De Musica*, 6. 11. 29.

[13] Johannes Kepler, *Epitome of Copernican Astronomy and Harmonies of the World*, trans. Charles Glenn Wallis (New York: Prometheus Books, 1995), 16.

[14] Augustine, *De Musica*, 6. 11. 29.

related to some numerical measurement are superior to those which are not.^[15]” The former refers to the fact that all creatures move/change either in space or in time according to their measured nature. The latter refers to man’s chaotic motion which is a consequence of deliberately ignoring the embedded measurement in the soul.

Augustine asserts that all mutable things moving in order must contain *modus*, which can be understood as the metaphysical principle that determines the substance of creatures and the way they mutate in the temporal realm. *Modus* is the power to hold parts in harmony. “Therefore, truly, applying small and inadequate parts for unity, this is called moderation because a certain *modus* remains in it. Without *modus*, moderation cannot be, and unity would become nothing because what excessively proceeded would be called immoderate which should be blamed.^[16]” *Modus* is also the standard for harmonious movement. “For we can’t say anything moves well if it does not contain *modus*.^[17]” “Therefore, *modulatio* (modulation) is appropriately called the science of moving, or at any rate that by which something is made to move well.^[18]” Simon Oliver also offers a profound insight into this discussion: “To put the matter simply, motion requires a principle and goal that are beyond motion. These are the boundaries that ‘measure’ movement.^[19]” Augustine points out that the word *modulari* (to mensurate) is applied to every created entity which is maintained by *modus*:

Is it possible to hear or to use the word *modulari* (to mensurate) in contexts other than those related to singing or dancing? ...I know that the word *modulari* comes from *modo*, and, as has just been said, *modus* (measure) is contained in all things created well, as well as in many songs and dancing which are pleasant but are very reprehensible. I want to fully understand what exactly this term *modulatio* (modulation) is, for this one word contains the definition of such a great discipline. Here, certainly, we do not study what any singer or actor knows^[20].

Clearly, the discipline of *modulatio*, here studied by Augustine is not fine art, but the liberal (divine) art. Through the science of music, Augustine is searching out the unchangeable principles by which to prove that this world was measured, numbered, and ordered by God in musical harmony. Although *modulationem* (a change/motion in the quality of a sound or modulation) relates to music, Augustine asserts that all created things can be perfectly created and moved harmoniously in temporality due to the power of *modulationem*, stating:

Obviously, you know that *modulationem* pertains to music only, although *modus* from which the word *modulationem* is derived, can also be in other things ... We

[15] *Ibid.*, 1. 9. 15.

[16] Augustine, *De Natura Boni contra Manichaeos liber unus*, 21, *Patrologia Latina* 42, ed. J. P. Migne (Paris: Migne, 1865).

[17] Augustine, *De Musica*, 1. 2. 3.

[18] *Ibid.*

[19] Simon Oliver, “Augustine on Creation, Providence and Motion,” *International Journal of Systematic Theology* 18, no. 4 (2016): 393.

[20] Augustine, *De Musica*, 1. 2. 2.

should know that *modulationem* must be in all things that are well done. For I certainly see that nothing is done well unless it moves well^[21].

Measurement, in other words, is the standard of order. Only God is the highest standard, so Augustine indicates that, in fact, “in speaking of the highest *Modus*,” he means “the highest *Bonum* (Good).^[22]” “God is neither the *modum* which is said to be contained, nor the finite *modum* which can be arranged, but by no means is He immoderate,” Augustine writes. “[Y]et the *Modus* grants all things their *modus* so that they can exist in a certain *modo* (way/manner).^[23]” The *modus*, which God put in things is the unchangeable law that determines their nature and the way they mutate in the temporal realm. The measurement of God can be understood as the creation of God or the motion of God, the motion of the motionless first Mover. According to Aristotle, “there is a prime mover, itself unmoved; and the conviction is strengthened by a consideration of the initiating principles of the (more familiar) agents of motion.^[24]” When Augustine concludes *De Musica*, he relates Aristotle’s motionless mover to the Christian God who commands a life-giving motion (*vitalis motus*) and, though Himself motionless, enacts numbers in time and space for the condition of motion^[25]. The *vitalis motus* is the unchangeable order/principle of God^[26]. Augustine also implies the unmoved Mover in *The Immortality of the Soul*, where he writes: “Every action, in turn, is moved, or causes moving. Hence, not all that is moved, and certainly not all that causes moving, is subject to change.^[27]” And, “there can be something that remains unchanged, even though it moves things that are subject to change.^[28]”

Based on Pythagorean scientific tradition, the discipline of music is regarded as natural science and subdiscipline of mathematics because the ratio of harmonic order is the law of both human music and cosmic harmony. In *De Musica*, Augustine consistently argues for his definition of music as the science of good measurement and movement; “Since we are discussing numerically ordered movements (musical motion), I think we should first consider numbers themselves, and decide that whatever sure and fixed laws in the movements manifest to us shall be searched and apprehended.^[29]” The harmonic order in musical motion reflects the unchangeable law which can neither be invented nor be modified by human beings, while the same order in the vast cosmos refers to the creation of the first Mover who orders the motions of all things (including human reason) according to the eternal *Modus*. Therefore, the substance of creatures can be numbered and measured, and the human mind, which has been measured by God, has the ability to reason the substance of things by their *numeros* and *measuras*. In her “Measure, Number, and Weight in Saint Augustine’s Aesthetics,” Carol Harrison provides the insight that “Measure, number, and weight therefore together constitute the

[21] *Ibid.*, 1. 2. 2-2. 3.

[22] Augustine, *De Natura Boni*, 22.

[23] *Ibid.*

[24] Aristotle, *Physics*, 8. 6; 259a20-25, trans. P. H. Wicksteed, F. M. Cornford (Cambridge, MA: Harvard University Press, 1934).

[25] Augustine, *De Musica*, 6. 17. 58.

[26] *Ibid.*

[27] Augustine, *De Immortalitate Animae liber unus*, 3. 3, *Patrologia Latina* 32, ed. J. P. Migne (Paris: Migne, 1841).

[28] *Ibid.*, 3. 4.

[29] Augustine, *De Musica*, 1. 11. 19.

unity of existence under God and lie at the basis of Augustine's metaphysics.^[30]” However, from an aesthetic point of view, Harrison intends to argue that the triad of measure, number, and weight serves as the revelation of the beauty of the Trinitarian God, by which fallen man might be reformed and acquire an artistic vision in the coming life^[31]. Therefore, instead of addressing the issues of order, she only equates order to weight, as she says, “Weight (*ondus*) and order (*ordo*) are both used for the third member of the triad.^[32]” However, according to Augustine, measure, number, and order indicate the substance of both the metaphysical and physical world; therefore, Augustine regards God as the highest *Modus*, the One, and the *Ordo*; obviously, he never regards God as *ondus*. When measure and number relate to weight, they only indicate the substance of the physical world; nevertheless, logically, order as the standard for measure, number, and weight can neither be omitted nor equal to weight. Augustine is clear that “He has ordered all things in measure, number, and weight.^[33]” “Yet, all things under God who has ordered all things in measure, number, and weight, inevitably contain some *modus*.^[34]”

2 Measurement and Motion of the Soul

2.1 The Harmonic *Modus* of the Soul

Augustine holds a Pythagorean view that God has measured the human soul by the same ratio/standard (*modus*), by which He also measured the motions of the heavenly hosts. He praises *aequalitas* (equality, uniformity) as the standard of beauty. When Augustine talks about equality, he indicates the ratio of one to one, which is unison in music. This perfect equal ratio is the principle of harmony: “[T]he beautiful things are pleasing to people because of numbers, and equality is shown as a requirement in beautiful things.^[35]” The ratio of equality is the basis of harmony because it ensures separate parts agree with each other. So Augustine argues that beauty should be as the whole in harmony: “But aren't all things capable of division more beautiful if their parts concord in equality than if they were discordant and dissonant?^[36]” Kepler made the same statement: “I recognized nothing more beautiful than the ratio of equality.^[37]” Since harmony is the essence of equality, Augustine argues that it is the harmonic power that demands equality and keeps our bodily movement even^[38]. The harmonic power in the soul is the rational number of the soul, namely, the human reason (*ratio*). It assesses the preference of the senses and guides the soul to true joy^[39]. Augustine's understanding of the harmonic power accords with Ptolemy, who applies the harmonic power to the principles of all beings in matter, movement, and form:

[30] Carol Harrison, “Measure, Number and Weight in Saint Augustine's Aesthetics,” *Augustinianum* 28, no. 3 (1988): 592.

[31] *Ibid.*, 602.

[32] *Ibid.*, 600.

[33] Augustine, *De Genesi contra Manichaeos libri duo*, 1. 16. 26, Patrologia Latina 34, ed. J. P. Migne, (Paris: Migne, 1865).

[34] Augustine, *De Natura Boni*, 21.

[35] Augustine, *De Musica*, 6. 13. 38.

[36] *Ibid.*, 5. 2. 2.

[37] Kepler, *Harmonies of the World*, 238.

[38] Augustine, *De Musica*, 6. 8. 20.

[39] *Ibid.*, 6. 9. 24; 6. 11. 29; 6. 13. 38.

The principles of all beings are matter, movement, and form; matter as the material of their origin, movement as their cause, and form as their purpose. The power of harmony cannot be regarded as an object; it is something active, not receiving impressions from without—nor as a goal, because it already possesses something: harmonic and rhythmic rightness, or order and beauty according to rules—but as a cause which orders material and gives it natural form. ^[40]

The first ratio of the fewer and the more in the music system is one to two. For Augustine, the ratio of octave 1:2 is both the power of creation and the power of reconciliation, for it is the power of perfect harmony. In *De Trinitate*, Augustine demonstrates that the ratio 1:2 is the power of reconciliation because Christ's bodily death and resurrection responding to the death and resurrection of both the human soul and body is the ratio of one to two ^[41]. He also holds that God has put this ratio in the human soul:

This ratio (1:2) can be called agreement, or accord, or singing, or more suitably, consonance, which is the great power in all composite structures, or better perhaps the "coadaptation of creatures." I am reminded that the word co-adaptation is harmony (*ἀρμονία*) in Greek. Though space cannot show the quantity of harmony, the power of one to two is found especially in us since it is naturally implanted in us (and by whom, unless by Him who created us?) Therefore, even the ignorant cannot fail to perceive it, whether when singing themselves or hearing others. ^[42]

Regarding the embedded harmonic ratio in the human soul, Augustine also mentions this issue in his letter 166 to Jerome, which mainly discusses the origin of the human soul. He states that humans have been endowed with the capability of music by God so that they should have rational souls to know the truth that the world was created in musical harmony. Augustine believes that Isaiah received the revelation from God when he asked this question: "Lift your eyes and look to the heavens; Who created all these ^[43]?" So he says:

For not in vain has the prophet, instructed by divine inspiration, declared concerning God, "He brings forth in measured harmonies the course of time." For which reason music, the science or capacity of correct harmony has also been given by the kindness of God to mortals having reasonable souls, intending to keep them in mind of this great truth. ^[44]

[40] Godwin, ed. *The Harmony of the Spheres*, 23.

[41] Augustine, *De Trinitate*, 4. 3. 5, *Patrologia Latina* 42, ed. J. P. Migne (Paris: Migne, 1865).

[42] Augustine, *De Trinitate*, 4. 2. 4.

[43] Isaiah 40:26.

[44] Augustine, *Epistola* 166, *Girolamo*, 5. 13, *Patrologia Latina* 33, ed. J. P. Migne (Paris: Migne, 1865).

Augustine quotes Isaiah 40:26, reinterpreting the passage as “*Qui profert numerose saeculum*” (He brought forth in measured harmonies the course of time). According to the version of *Vulgata Latina*, this verse is “*qui educit in numero militiam eorum*”^[45]. For Augustine, although time is not heavenly motions, the harmonious movements of the heavenly hosts generate the rhythm of time (day, month, and year). And the great truth is that God ordered every creature in the succession of time, and the consummation of creation is the harmony of the arrangement of all things, while man has been endowed with harmonic reason by which man has the rational soul to perceive harmony. In *De Musica*, Augustine also explains that human reason as the harmonic power has been planted in the body by the Creator:

The thing which tacitly commends equality and harmony and restrains and keeps us from arbitrary, unequal motions in the application of acting through bodily members is something judicial. It also keeps us from walking unequal steps, or from beating irregular intervals, or from eating or drinking with the uneven motions of the jaw, or from scratching with uneven motion of the nails. I do not know what kind of judicial thing it is, but it certainly convinces us to believe that God, the Creator of all living beings, who is the author of all harmony and peace, has embedded it in the soul^[46].

Reason is a harmonic power of the soul that is able to analyze unity and synthesize parts. Sense perception can collect the information of parts and report it to the soul, but reason can synthesize the information and unite it in harmony. Therefore, when a sound stops moving, reason still can calculate the ratios of intervals between the vanished sound, the sound which is sounding in the present and the sound which will sound in the future. Otherwise, “[i]n a song (*carminis*), if syllables should live and be perceived only for as long as they sound, the harmony and beauty of the connected work would in no way please them^[47].” Only the soul can synthesize the information of moving events together, while conduct and evaluate them by reason. The parts in the sequence of time cannot be meaningful to moving events unless the soul by the help of reason (the harmonic *modus*) understands the harmony of the wholeness and rationally conducts the parts according to the standard of harmony. Johannes Kepler holds the same view regarding the function of harmony with reference to the rational soul:

The perfection of the world consists in light, heart, movement, and the harmony of movements. These are analogous to the faculties of the soul: light, to the sensitive; heat, to the vital and the natural; movement, to the animal; harmony, to the rational.^[48]

2.2 The Motion of the Soul

Love is an inner motion (*motus*) of the soul. Beauty has the power to delight the soul; therefore, it

[45] “He brings out the starry hosts in numbers.”

[46] Augustine, *De Musica*, 6. 8. 20.

[47] Augustine, *Epistola* 166, 5. 13.

[48] Kepler, *Harmonies of the World*, 14.

always relates to love^[49]. Augustine raises a question: “Do you love beauty (*Pulchritudinem amas*)?” This love does not indicate an aesthetical appreciation or enjoyment of a pleasing object, but it is a longing for the right order in God, the Beauty. Werner G. Jeanrond says, “For Augustine, proper love is always *amor dei*, never *amor sui*. Proper desire is always directed towards God as the *summum bonum*^[50].” *Amo* means to love, to enjoy and to be obliged or grateful for something. Regarding the manner of pure love for God, Augustine uses another word *diligens* to indicate a wholehearted attentive love that humans should give to God and other people according to the divine order: “The soul keeps order, so that with its whole self, it loves (*diligens*) God above itself, and loves its fellow souls as itself^[51].” *Caritas* is usually used for Christian love. It literally means high price and costliness, and kindness and sympathy towards others. Augustine uses this word to indicate the unconditional love of God, and humans can receive this love from God and share it with their neighbors.

Regarding how humans can properly love according to the divine order, the inner motion of the soul is the primary concern of Augustine’s investigation. According to the hierarchical order between the Creator and created beings, human beings are deemed exceptional among all creatures because they were created in God’s image. God, the Archetype of the divine image of man, is the highest Good. The orderly progression, from good to very good, then to the highest Good is hierarchically arranged by the providence of God. “God, therefore, the supreme Truth, by an inviolable and unchangeable law, rules all creation; the body subjects to the soul, the soul to Himself, and so everything to Himself^[52].” According to the unchangeable principles of goodness in the realms of physic, logic, and ethics, Augustine developed his concept of beauty which affirms that the soul and body are both beautiful, but they beautifully exist in different degrees. The body is beautiful in the physical realm, but the soul is beautiful in both logical and ethical realms, and only the soul is able to ascend to the highest degree if it desires to do so. However, human beings, as creatures of God, are not able to make themselves beautiful unless they agree or live in harmony with the divine order according to which they were designed to be beautiful, good, and righteous. Augustine figuratively illustrates the journey of the soul’s attention retreating from interacting with the sensible world and back to its inner world, then ascending to the presence of God. Augustine asserts that there are seven steps for the soul to ascend:

Let’s call the first motion of the soul’s ascending from the lowest to the highest, animation; second, sense; third, skill; fourth, virtue; fifth, tranquility; sixth, entering; seventh, contemplation. They also may be named in this way: of the body; through the body; about the body; towards itself; in itself; towards God; in the presence of God. They also may be as follows: beautifully of another, beautifully through another; beautifully about another; beautifully towards a beautiful; beautifully in a beautiful; beautifully towards Beauty; beautifully in the presence of Beauty.^[53]

The first three motions—animation, sense, and skill are abilities of the soul that must be done

[49] Augustine, *De Musica*, 6. 13. 38.

[50] Werner G. Jeanrond, *A Theology of Love* (New York: T&T Clark International, 2010), 54.

[51] Augustine, *De Musica*, 6. 14. 46.

[52] Augustine, *De Quantitate Animae*, 36. 80, *Patrologia Latina* 32, ed. J. P. Migne (Paris: Migne, 1841).

[53] *Ibid.*, 35. 79.

with the cooperation of the body in the sensible world. The fourth and fifth motions, virtue and tranquility, are conducted by the spiritual power which can be accomplished in the soul alone, so Augustine calls these motions of the soul “towards itself” and “in itself.” The sixth motion, entering, is the motion of the soul arriving at the spiritual realm, and the seventh, contemplation, is the soul being in the presence of God. Further, Augustine applies an adverb “beautifully” (*ulchre*) to modify all motions of the soul. Firstly, animation is beautifully moving of the body; sense is beautifully moving through the body; skill is beautifully moving about the body. These physical acts can move beautifully because of the operating power of the soul, and the body as a good creation can be beautifully subjected to the soul. Secondly, Augustine uses the adjective “beautiful” (*ulchrum/ulchro*) to illustrate the image of the soul. Virtue and tranquility are inner motions in the soul itself; therefore, virtue is the soul beautifully moving towards the beautiful (itself); and tranquility is the soul beautifully being in the beautiful (itself). Finally, Augustine uses the noun “Beauty” (*ulchritudinem*) to indicate that God is the source of all beautiful things and the prime power/measurement of all things moving beautifully. Therefore, the soul beautifully moves towards the Beauty, then the soul beautifully contemplating in the presence of the Beauty is the highest degree of the ascending journey of the soul in the order. The orderly journey of beauty can be summed by Smalbrugge’s words: “Beauty does not exist in itself. It only exists in order to overcome the scattered self and become the expression of the connected self. It has no right to be a reality in its own right; it is God’s right^[54].”

In *De Musica* VI, Augustine developed his innovative theory about the numerical power of the soul. In great details, except for the numbers in physical sound can be heard, he expands on the five kinds of tacit numbers (rational numbers, operating/advancing numbers, perceiving/hearing numbers, sensuous numbers, and memory numbers), which are responsible for inner *motus* (motion) of the soul. “We can see that these different kinds of numbers that can be distinguished are of one nature, namely, motion and affection of the soul,^[55]” Augustine says.

The motions (*motus*) of our soul are not alien to us. They are nourished with us together by rational knowledge, the finest moral principles, and eternal life, just as the body is nourished by grain, fruits, and fresh plants. When all these motions harmonize with reason (*ratio*) and truth, we have blessed and peaceful life that can be called joy, holy love, chaste, and goodness.^[56]

Motus can be understood as emotion. However, in the modern context, the word ‘emotion’ mainly refers to humans’ feelings or involuntary responses to objects based on physical conditions and sensory information. Thus, it is not a proper match to *motus* in the primary texts which includes both chaotic motions based on senses and feelings and harmonious motions based on ratio and truth. The harmonious motion of the soul must be conducted in the divine order. For Augustine, if the soul

[54] Matthias Smalbrugge, “Beauty and Grace in Augustine,” in *Studia Patristica*, vol. 49, ed. J. Baun, A. Cameron, M. Edwards and M. Vinzent (Leuven: Peeters, 2010), 13.

[55] Augustine, *De Musica*, 6. 9. 24.

[56] Augustine, *De Genesi Contra Manichaeos*, 1. 20. 31.

means to be a whole, it must have God as its Master and the body as its servant. The soul can thus understand its body through the motions of senses and its Master through the motion of reason. In the lawful order, rational inner motion directs physical motion. Then, in the temporal realm, the spiritual and physical motions concord with the consummate harmony of eternity. Augustine's conception of the soul and the body places the soul and the body into the unbroken divine order rather than dividing them into two separate parts. Without considering the divine order, Augustine's dualistic conception of the soul and the body is quickly misunderstood. Some scholars argue that Augustine actually exalts the physical world in order to oppose the view that Augustine maligns the body while exalting the soul^[57]; while others, such as R. J. O'Connell says that Augustine is in a dilemma or commits to a conflict regarding this issue^[58]. Andrea Nightingale even claims: "Since his mind is subject to psychic time and his body to earthly time, Augustine cannot find a stable place to situate himself^[59]." In fact, Augustine strives to search for the perfect balance in the divine order, as in *De Musica*, he declares: "For we shall keep free of them since they are temporal, by using them well, as with a board in flood by not throwing them aside as burdensome and not grasping them as stable^[60]." Augustine's opinion on the wholeness of the soul and the body is the same as that of Aristides Quintilianus, who holds that the soul cannot do anything on the earth without the body as its servant. In his *On Music II*, he states:

Since the soul is neither able to be present and to do things on earth unless it should be contained by the binding material of the body (which indeed, descending to its proper depth, both swallows the soul and prevents it from departing) nor yet at any time truly and in consonance with the universe would be able to perfect its foreknowledge of sensible objects unless it should also have sagacity and perception of the beautiful things from that place, the soul, therefore, needed a certain double nature, which was both in possession of judgment and would not deprecate the things of earth for their connection with the body.^[61]

Aristides holds that rational beauty should be preferred to an irrational beauty according to the properly ordered love of the soul. He assumes that God "instilled memory in the soul as an antidote for its irrationality and dispatched with the soul^[62]." However, Augustine holds that God, the *Ratio* bestows reason (*ratio*) on the soul as an antidote for irrationality. For Augustine, the ability of reasoning and turning away from chaotic movements should be credited to the gracious redemptive power of God, rather than to human memory. In his *De Musica*, Augustine argues that memory is an ability common to all animals and that some animals have a keener memory than that of human

[57] Carol Harrison, *Beauty and Revelation in the Thought of Saint Augustine*; Joseph Anthony Mazzeo, "The Augustinian Conception of Beauty and Dante's Convivio"; David van Dusen, *The Space of Time: A Sensualist Interpretation of Time in Augustine, Confessions X to XIII*.

[58] See R. J. O'Connell, *Art and the Christian Intelligence in St. Augustine* (Oxford: Blackwell, 1978), 133.

[59] Andrea Nightingale, *Once Out of Nature: Augustine on Time and the Body* (University of Chicago Press, 2011), 18.

[60] Augustine, *De Musica*, 6. 14. 46.

[61] Aristides Quintilianus, *On Music*, 2. 2.

[62] *Ibid.*

beings. However, no animals except human beings received reason as an intelligent gift^[63]. Once the soul clings to the irrational, the irrational motions impressed in memory can become an overwhelming burden/or form a bad habit that makes it difficult for the soul to turn back to the rational^[64]. Regarding the role of memory in knowledge, Augustine agrees neither with Plato's concept of recollection that the process of learning is a recollecting of things which are already in mind nor with the notion that opposes the theory of recollection by stating that memory only recollects things in the past. He points out the weakness of both parties that they ignore the mental activities of human reason by which humans can comprehend the unchangeable truth and remember experiences not only in the past but also at the present because things unchangeable cannot be the past^[65].

By dissecting the spiritual basis of musical motion, Augustine analyses mental activities (psychical motions). Musical motion consists of the order of measured numbers in the sequence of time, which must be modulated by the soul. Augustine assumes that unless the power of the soul is numerical, it cannot measure musical motion. Therefore, he divides the inner motion of the soul into five faculties: the ability to operate, the ability to listen, the ability to appreciate, and the ability to remember, and the ability to evaluate all other numbers according to the harmonic order. According to their strengths, they receive their names: operating/advancing numbers, perceiving/hearing numbers, sensuous numbers, memory numbers, and rational numbers respectively. The soul is one, but it has different faculties of numbers. The inner movements of the soul are the incorporating motions of these numbers. Only the sixth numbers, the sounding numbers are the motions of the body. The acoustical sounds are the motions that are conducted by the cooperation of the inner movements of the soul but are presented by the body. Thus, a total of six kinds numbers operate musical motions. When beginning to explore the movement of the soul, Augustine raises the question of where the numbers of rhythm exist:

We may pass from corporeal to incorporeal things, tell me if you will that when we recite this verse, *Deus creator omnium*, where you think the four iambs and twelve times, which constitute the verse, are? Is it to be said these numbers are only in the sound heard or also in the hearer's sense belonging to the ears, or also in the act of the reciting, or because the verse is known, in our memory too?^[66]

Augustine logically argues that the rhythmical numbers of the verse exist in all of them. When the verse *Deus creator omnium* is sung, the inner motion of the singer consists of performing, listening, appreciating, and remembering; these four activities are in both the soul and body. As the body is the servant of the soul, Augustine maintains that the motion of acoustical sounding numbers presented by the body is initiated by the soul—otherwise, the body would be the artisan, and the soul would be the material of the body. This, Augustine tells us, would be ultimate absurd:

[63] Augustine, *De Musica*, 1. 4. 8.

[64] *Ibid.*, 6. 11. 33.

[65] Augustine, *Epistola 7*, Nebridio, 1. 2, *Patrologia Latina* 33, ed. J. P. Migne (Paris: Migne, 1865).

[66] Augustine, *De Musica*, 6. 2. 2.

Can we subordinate the soul to the body that would act upon the soul and impose its numbers, so that the body would be an artisan but the soul a matter made from or in bodily numbers? If we believe this, we must believe that it is worse. What can be more wretched, more loathsome than to believe this?^[67]

Therefore, bodily sounding numbers are acoustical products of the motions of the soul. Listeners can hear the musical sound without sensing a performer's motion because musical sound is an incorporeal physical substance existing independently after being produced by the performer. Both dancing and music present their rhythmical beauty by motion. However, the beauty of dancing cannot be separated from the bodily movement in space; it only attaches to where the body is, and the audience's eyes must be set on the place where the dancer is moving; while musical motion in space can be independent of the physical motion of the performer, for it cannot be confined to the space where the performer is moving, and it can travel to the listener's ears. Since dancing is a visible rhythmical motion, it cannot be properly performed without the accompaniment of musical motion which invisibly serves as a conductor of visible dancing in respect to the body moving rhythmically as well as emotionally. In a general sense, Augustine also calls sounding numbers corporal numbers which can be applied to the measured rhythmical numbers in dancing^[68].

Except for the sounding numbers, which are manifested only in physical conditions, the other four kinds of numbers, operating/advancing numbers, perceiving/hearing numbers, sensuous numbers, and memory numbers stay in both the soul and the body and connect activities between the two. Sensuous numbers' motion is to like or dislike the movements of other numbers in both the soul and the body. The harmonic power of rational numbers evaluates the action of sensuous numbers whether its motions of rejecting or accepting could be justified; therefore, there are two judicial numbers:

So, it is one thing to accept or reject these motions either when they are first produced or revived by the memory, and this is done in delight at the fitness or in the distaste at the absurdity of such movements or affections; and another thing to appraise whether they delight rightly or not, and this is done by reasoning if all this is true.^[69]

These two judicial numbers are all embedded in the soul. The former are the mortal, sensuous numbers and the latter are immortal, rational numbers. When the soul under the guidance of rational numbers pursues the ultimate goal of its motion as being a part of the harmonious motion of the whole universe, the sensuous numbers peacefully serve the body and rightly take care of the motion of another three numbers (operating numbers, perceiving/hearing numbers, and memory numbers). If the motions of these numbers are harmonious, their motions are easily, and the soul will not pay attention to them, while if they are disordered, their motions are difficult, the soul has to pay more attention to it, and this is what is called "sense."^[70] "When the difficulty in action cannot be hidden

[67] *Ibid.*, 6. 5. 8.

[68] *Ibid.*, 6. 9. 24.

[69] *Ibid.*

[70] *Ibid.*, 6. 5. 10.

from attention, this is called “perceived,” and this perceived difficulty is called “pain” or “trouble.”^[71] The sensuous numbers can cause the body to feel comfortable or uncomfortable when in trouble or pain. When the body has a need, the soul will pay more attention to it; this is hunger or thirst^[72]. When the soul observes something unusual, this unusual perception is called “sickness” or “discomfort.”^[73] And the soul is attentive to any sickness attacking the body and prepares to help the body when it is weak or its health declines. When the body is at rest and in good health, it does not need any attention from the soul, only difficult movements of the body require additional attention. Augustine explains that “[n]o attention is needed to give to it in its surpassing peace. This affection to the body is called health. Indeed, it needs none of our attention, not because the soul does nothing in the body, but because it does nothing more easily.”^[74]

When the soul serves God (its Lord) and rules body (its servant), nothing can make the soul move with difficulty; neither sickness in the body nor trouble from the outside can disturb its true peace. “This disposition, in which the soul fears neither adversity nor death, can only be called fortitude.”^[75] When the soul takes care of the body, this attention will not affect the soul, but when the soul pays attention to the desire (*concupiscentia*) of the body, this attention will affect the soul. By devoting its attention to the desire of the body, the soul ignores its Lord and the rational numbers are neglected, while the motion of operating numbers, perceiving numbers, and memory numbers pay full attention to the desire of the body. Consequently, sensuous numbers threaten to manipulate the three kinds of numbers to work together in yielding to its preference on the bodily desire. In this way, the soul becomes enslaved by the preference of sensuous numbers. The soul cannot be led astray by the sensuous numbers and ignore its position as the master of the body unless it pays full attention to the bodily desires and ignores its Lord^[76]. This is the reason that Augustine is cautious in expressing appreciation for music. He prefers not to listen to music over paying full attention to sensuous enjoyment that will satisfy only his physical pleasure and result in his ignoring the immortal truth. He explains that “my physical delight...strives to be first and to take the leading role, though it deserves to be allowed only as secondary to reason^[77].” When he was attracted only by the charm of a melody to fulfill the pleasure of the inner motion of the sensuous numbers, Augustine knew that he was sinning. Without considering the relationship between the motions of sensuality and reason explicated by Augustine in *De Musica*, some scholars hastily concluded that Augustine was hypersensitive or had an equivocal attitude towards music^[78]. In fact, for Augustine, when sensuous numbers take charge, the soul has already initiated the motion of turning away from the order of God, which is clearly a disordered motion.

Since the ability of counting/measuring time lies in the soul, when the soul loses the ability to count time, its body dies. When the soul loses the ability to evaluate the motions of itself by rational

[71] *Ibid.*, 6. 5. 9.

[72] *Ibid.*

[73] *Ibid.*

[74] *Ibid.*, 6. 5. 13.

[75] *Ibid.*, 6. 5. 50.

[76] *Ibid.*, 6. 5. 13.

[77] Augustine, *Confessionum libri tredecim*, 10. 33. 49, Patrologia Latina 32, ed. J. P. Migne (Paris: Migne, 1841).

[78] Brian Brennan, “Augustine’s *De Musica*,” *Vigiliae Christianae* 42 (1988): 277.

numbers, it dies spiritually, meaning that it turned away from God because, in this situation, the soul could conduct neither itself moving in inner harmony nor its body moving in the right way. Augustine states how these four kinds of numbers, whose activities relate to both the soul and the body, lead the soul to ignore the eternal *Ratio* and throw their movements into disarray:

The love of acting on the many impulses of its bodily passions turns the soul away from the contemplation of eternal things, diverting its attention toward the care of sensuous pleasure; the soul does this with reacting numbers. But the love of operating on bodies also turns the soul away, and makes it restless; the soul does this with advancing numbers. The phantasias and phantasms turn the soul away; these it does with memorial numbers. Finally, the love of the vainest knowledge of such things turns it away; this it does with sensuous numbers where lies the rule of a certain skill by which imitation is enjoyed; consequently, curiosity is born by caring itself, namely, the enemy of peace. Then, vanity imposes itself as truth. ^[79]

Therefore, Augustine argues that it is not the body leading the soul to disordered movements, but the soul that initiates the disordered motions and, as a consequence, abuses its body. Whether the body does good or evil, Augustine refutes that the body initiates physical movement and in turn influences the soul. Therefore, Augustine charges the evil of the soul rather than blame the body. More specifically, it is the soul that turns away from the truth and leads the movement of the body to falsity. When the soul has a false goal, the body will move falsely as well because the body passively accepts the demands of the soul. “Since the true should be preferred rather than the false, though the soul is superior to the body, the true in the body is better than the false in the soul. ^[80]” So when the false motions only exist in the soul, such as in dreaming and phantasy, or in the will, as long as they are false, they should not be superior to the motion of the body. Although the desire for sin is only in the soul, the consequence of disordered psychical movement is the death of the body as well as the soul. As Augustine says: “Certainly, as no Christian doubts, we are dead both in the soul and the body; in the soul, because of sin; in the body, because of the punishment of sin, and through this also in the body because of sin. ^[81]” The soul can freely initiate false movements, but it cannot freely stop falsely moving because the power of sin catches it by the numbers of memory in its habit. It can be set free only by withdrawing from the false motions and joining the movement of rational numbers. “Thus, with a determined retreat from every wanton movement where lies the fault in the soul’s essence, and with a restored delight in rational numbers, our whole life is turned to God, giving numbers of health to the body, not taking pleasure from it ^[82]. ”

The restoration of the soul’s movement of rational numbers can only be achieved by the power of God, the harmonic power of 1:2. According to Augustine, the unchangeable *Ratio* has three characteristics: firstly, it always considers good measures, for it is the standard; secondly, it moves freely, for it is subordinate to

[79] Augustine, *De Musica*, 6. 13. 39.

[80] *Ibid.*, 6. 4. 7.

[81] Augustine, *De Trinitate*, 4. 3. 5.

[82] Augustine, *De Musica*, 6. 11. 33.

nothing; thirdly, it discerns the way to the territory of its own beauty^[83]. Augustine illustrates a perfect Person who submitted all numbers in charge of psychical motions to the unchangeable *Ratio* and lived a sinless life for the benefit of others^[84]. He does not mention the name of Jesus, but all descriptions indicate that the perfect Person is the Lord Jesus, the *Ratio*, who would like to rescue the soul from wanton disordered movements and restore the harmonic power of the soul:

However, the soul takes actions, with help from God, its Master to extract itself from loving inferior beauty by fighting and destroying its own habit that wars against itself; At the point of having victory by the power from above to impede desires and envy of itself, the soul soars to the firm support of God; isn't such an action for you called the virtue of temperance (*temperantia*)?^[85]

Temperance (*temperantia*) means self-control or self-discipline, but it also means modulation. The soul was modulated originally according to the same ratio by which the celestial hosts are still moving harmoniously. However, after violating the divine order, the soul moves disorderedly. If the soul turns back to the *modus* (measurement) of the unchangeable *Ratio*, it would receive the virtue, temperance (modulation) and move harmoniously.

Within the Pythagorean tradition, parallels are drawn between musical motion and psychical motion. Augustine's predecessors, not only Plato and Pythagoras but also Ptolemy and Aristides Quintilianus, wrote compelling works on this issue. As Aristides says:

These numbers, some say, have been so specified because the soul operates by numbers—the soul of each person by numbers corresponding to the arts and the soul of the universe by numbers corresponding to nature; but the more precise say that these numbers present the property of the soul's power and essence.^[86]

Ptolemy analyses the power of the soul in terms of harmonic ratio and divides the power of the soul into three parts: the power of thought corresponding to the octave, the power of feeling to the fifth and the power of life to the fourth. He also divides the power of life into three intervals: growth, maturity, and decline; the power of feeling into four intervals: seeing, hearing, smelling, and tasting; and the power of thought into seven: imagination, understanding, reflection, meditation, opinion, reason and knowledge, corresponding to the seven intervals of the octave. In another way, Ptolemy makes an analogy between the power of the soul and three harmonic ratios: reason corresponding to the octave, emotion to the fifth, and desire to the fourth^[87].

In spite of the fact that Augustine's concept of the numerical soul is in line with the Pythagoreans, to anatomize the motions of the soul and the method of psychical analysis is an innovation of Augustine. This

[83] *Ibid.*, 6. 10. 25.

[84] *Ibid.*, 6. 14. 45.

[85] *Ibid.*, 6. 15. 50.

[86] Aristides Quintilianus, *On Music*, 3. 24.

[87] Godwin, ed. *The Harmony of the Spheres*, 25-26.

significant and esoteric psychical analysis is at best ignored and at worst misinterpreted^[88].

3. Music Measurement and Motion

Since Augustine holds a musical-cosmological view, in his *De Musica*, the flavor of Plato's *Timaeus*, Ptolemy's *Harmonics*, and Aristides Quintilianus' *On Music* is evident. These three forerunners are the Pythagoreans who hold that the ratios of the first four number (1:1, 1:2, 2:3, 3:4) are the fundamentals of both the harmonic tuning system and the cosmic motion. However, unlike his three forerunners who pay more attention to observing the harmonic principle in the astronomical, musical motions of the spheres, uniquely, Augustine's whole concern is to prove that the Christian God is the author of the unchangeable harmonic principle. He developed his theological point by philosophically addressing rhythmical motion of music and the micro-motion of the soul from a musical-cosmological view. Augustine's innovation is that his research in musical motions proves that the mathematical ratios of the first four numbers (1:1, 1:2, 2:3, 3:4) not only determine the Pythagorean tuning system but also condition the rhythmical system.

The topics of *De Musica* II – V focus on mathematical ratios of measured rhythmical numbers, which are the dynamics of musical motion. Augustine explains: "I see the measure of the times as the only reason for imposing the name of the foot."^[89] There is no other moving object in temporality that can be more essentially numerical than musical motion which is manifested by both the ratio of pitches and the ratio of rhythm. Musical sound is an incorporeal non-spatial motion which is neither a changing of location nor a changing of quality or quantity. The changing in musical motion is about the sequential flow of harmonic ratios in time. The unchangeable harmonic principle which conducts musical motion is the eternal wisdom. Augustine maintains that the *modus* of human music should come from the transcendent *Modus* above. So, he reasons that in order to understand the innermost sanctuary of eternity, one must first, as he goes on to point out, explore the reason for human music:

All well measured movements and anything keeping measured boundary that ensures beauty and delight within itself admittedly belong to the rationale of discipline, which is a science of good measurement. However, when these motions take a long period to be accomplished, the proper ratio of measurement which is beautiful and takes an hour or more cannot be perceived by our senses. Since music in a certain manner, proceeds from the innermost of the sanctuary and leaves its footprints on our senses or on things that can be sensed by us, mustn't we follow the same footprints which is suitable for us to be guided without any error so that we can arrive at the place called sanctuary? Then let us not speak of those bounds of time extending beyond the capacity of our senses, but discuss, as far as reason goes, short intervals

[88] See W. F. Jackson Knight, *St. Augustine's De Musica: A Synopsis*, London: Orthological Institute, 1949; Martin Jacobsson, ed. *De Musica VI: A Critical Edition with a Translation and an Introduction*, Ph. D. diss., Stockholms Universitet, 2002. Knight and Jacobsson interpret the word "numbers" as rhythms, missing altogether the significant philosophical meaning of numbers in the Pythagorean tradition.

[89] Augustine, *De Musica*, 1. 1. 1.

which delight us in singing and dancing. ^[90]

In his letter to Memorius, Augustine explains why he decided to write *De Musica*. Firstly, he explains that true liberty is not in the liberal arts, but only in God who grants freedom to man; secondly, he explains that music is a path to knowing the wisdom of God since the power of numbers is best presented in music movement, as he says:

Truly, among all mutable things, which move because of the power of numbers, motions are most easily recognized in music, which furnishes a path of rising to the higher secrets of truth. Along with this path, Wisdom pleasantly reveals herself, and in every step of providence meets those who love her. ^[91]^[92]

Augustine told Memorius that he never attempted to analyze the rhythm of King David's psalms in the six books of *De Musica* because he did not read Hebrew and it was impossible to explore the original meters of psalms while referring to a translated version^[93]. Augustine's theory of rhythm is based on Latin verses. Therefore, focusing on the rational measurement of music, Augustine, as a professional rhetorician, begins *De Musica* by distinguishing music from grammar:

When you hear a kind of innumerable sounds in which distinct measures can be observed, we admit this kind of sounds cannot be attributed to the art of grammar. Don't you think that it is another discipline which contains harmonious numbers and skillful measurement? ...If I am not mistaken, this is what is called music. ^[94]

For Augustine, the difference between grammar and music is that the measure of music rhythm is the measure of time and determined by the unchangeable ratio, while the rule of grammar can be changed by human authority and customs. In Book II – V, Augustine concentrates on discussing five rhythmical issues. His theory of rhythm includes the ratios of syllables, metrical feet, rhythms, meters, and verses. He carefully distinguishes their differences and offers philosophical reasons for their cause and principles.

Firstly, he begins with syllables, the basic cells of rhythm, and metrical feet. When the syllable's length violates the rationale of the verse, the sense of ears would be offended. So, Augustine states that the measured numbers in reason are the cause of our sensuous pleasure: "Undoubtedly, the things in the sound which please you are the measured numbers, while disorders cannot present pleasure to your ears. ^[95]" Since the ratio of syllables' length is determined by reason, one syllable must be put together with other syllables based on mathematical ratios. The position of the interval

[90] *Ibid.*, 1. 13. 28.

[91] Wisdom 6:17.

[92] Augustine, *Epistola* 101, Memorio, 3, *Patrologia Latina* 33, ed. J. P. Migne (Paris: Migne, 1865).

[93] *Ibid.*

[94] Augustine, *De Musica*, 1. 1. 1.

[95] *Ibid.*, 2. 2. 2.

of one long syllable can be replaced by two short syllables if the two short syllables' length of intervals together equals the long syllable. Three long syllables cannot parallel to the position of six short syllables unless the lengths of their intervals are the same. In a chorus of multiple voices and polyphony, rhythmical counterpoint is based on the unchangeable mathematical principle. Syllables are sounds, and sounds make counterpoints to each other in movement thanks to their ratios of time length. Therefore, "when syllables are compared with each other, movements containing numbers which are measured by the length of time are compared with each other."^[96]

Since syllables consist in motion, the shortest syllable dies as soon as it begins, although the longer syllable keeps a relevant interval, but is eventually replaced by another syllable. This instant extinguishing is the nature of motion in time. In the comparison of one syllable with another, the first ratio of syllables is one to one, and the second ratio is one to two. The long syllable is called "two times" because "the long ought to be double time. And therefore, if the interval the short syllable occupies is rightly called one time (*tempus*); likewise, the interval the long one occupies is rightly called two times (*tempora*)."^[97]

The ratio of syllables, namely, the ordered set of sounds, is called a foot. In fact, the ratio of syllables is the ratio of time in movements. Augustine says that "we imposed names on all movements having certain numerical relations to each other... for they were so related with respect to time."^[98] Since musical motion consists of numbers, Augustine points out the unchangeable ratio in the changing successiveness of temporal motion; when the rhythmic ratio of double to single followed by the ratio of single to double, musical motion shows a change in the order, but the ratios of numbers remain the same^[99]. In total, Augustine discusses twenty-eight metrical feet according to the ratios of numbers, concluding with a list of them by name^[100].

Because of measured progression, one foot consists of syllables no fewer than two and no more than four. So "in any foot, no arsis or thesis takes more than four times. And there cannot be a rest interval fewer than one time or more than four."^[101] A beat consists of one arsis (upward beat) and one thesis (downward beat), and they are equal to each other. A rest (*siletur*) is valued as a time-interval in a foot, but it occupies the time-interval without making a sound. "So, when you find some defect in a regular foot, you ought to consider whether there is a measured rest-interval that has been accounted for in compensation of the defect."^[102]

Augustine's definitions of rhythm and meter are almost the same as the definitions which we still use nowadays. The combination of feet without a definite ending and measure in succession is called rhythm in Greek, and it is called number (*numerous*) in Latin; while the rational combination of feet with a distinct ending and a measure in rotating succession is called meter in Greek, and measure (*mensio* or *mensura*) in Latin^[103]. Therefore, "all meter is rhythm, but not all rhythm is meter. For

[96] *Ibid.*, 2. 3. 3.

[97] *Ibid.*

[98] *Ibid.*, 2. 4. 4.

[99] *Ibid.*

[100] *Ibid.*, 2. 8. 15.

[101] *Ibid.*, 3. 8. 18.

[102] *Ibid.*, 3. 8. 17.

[103] *Ibid.*, 3. 1. 2.

the name, rhythm makes such an extensive appearance in music that the whole part of it having to do with longs and shorts has been called rhythm. ^[104]” When coming to the difference of verse and meter, Augustine specifies that “all verse is also meter, but not all meter verse. Therefore, all verse is rhythm and meter. ^[105]” He further defines verse as two members joined together in fixed measure and ratio ^[106]. A member cannot have fewer than three times, and the shortest verse cannot contain fewer than eight times. So, if one member has three times and another member has four times, a rest-interval is required to fill in the foot in order to form a complete verse, for “a meter can only be a verse if it has two members harmoniously joined together. ^[107]” The minimal meter starts with the combination of two feet and the fourfold progression measures meter; therefore, a meter can only be extended to eight feet as the maximum. Since a verse cannot exceed eight feet (the longest foot is four times), the longest verse cannot have more than thirty-two times. The ratio of time and meter is kept in progression by a circle rolling forward, and numbers in a circle can neither be fewer than two nor more than four. “And whatever ratio is used for the return to the beginning is also used for passing to another such combination. We rightly call this kind of combination a cycle (*circuitum*); in Greek [it is] called *periodos*. ^[108]” In a rhythmical circle, to keep verses according to ratio is to measure time. “Since ending a verse to keep it within its proper bounds is proper only to the time-measure,” Augustine states that “this mark can be taken [from nowhere other] than from time. ^[109]”

In his investigation of the characteristics of rhythms, Augustine discovered that the ratios of 1: 1, 1: 2, 2: 3, 3: 4 create equality and harmony in the rhythmical motion. These ratios are the fundamentals of the Pythagorean tuning system: the unison, the octave, the fifth, and the fourth, respectively. Augustine pays no specific attention to intervals of pitches in *De Musica*; however, he discovers the same significant ratios in rhythmical intervals:

Therefore, in the numerical law from one to four, not every number has proportion with itself. In the first feet, as has been proved, parts are equal to each other (1:1). Then the union of single and double emerges in one to two (1:2); the sesquialter union in two and three (2:3); and the sesquitercian in three and four (3:4). ^[110]

He concludes that “Meter starts with quadruple feet; verse starts with quadruple times and is completed by them; obviously, the *modus* of quaternary ratio preserves the expansion of meter and verse in uniting feet and times. ^[111]” Augustine reinforces his investigation on the ratios of the first four numbers by a question: “From where, then, is the measure of this progression of one to four [1-2-3-4]? ... where, I ask, do these things come from, if not from the highest and eternal rule of

^[104] *Ibid.*

^[105] *Ibid.* , 3. 2. 4.

^[106] *Ibid.*

^[107] *Ibid.* , 5. 13. 27.

^[108] *Ibid.* , 4. 17. 37.

^[109] *Ibid.* , 5. 4. 6.

^[110] *Ibid.* , 2. 10. 19.

^[111] *Ibid.* , 3. 9. 21.

numbers, likeness, equality, and order?^[112]”

Measuring music is equal to measuring time by the ratios of numbers. On the other hand, musical motion should be measured by a certain measured time. The ratios between syllables, feet, meters, and verses maintain equality and harmony in time intervals, by which a rational beauty occurs to the mind. Since humans perceive physical, musical motion naturally with their ears, they are more likely to take personal will into consideration rather than considering the unchangeable ratio of harmonic law. “Yet, for rational measuring, which is not something about ear, but a characteristic of the mind, determined by true and certain ratios, not by irrational opinion.”^[113] The mathematical ratio of musical motion is the rational harmonic law, which cannot be changed by human authority. Therefore, for Augustine, truth itself is the supreme authority of God, and nothing can exceed it, so it is unnecessary to seek human authority to reinforce unchangeable truth. As he states: “It is a human weakness and shame when seeking a human authority for strengthening men’s reason since nothing is to be preferred to the authority of truth and reason itself; it is certainly better than any man.”^[114]”

4. Conclusion

Through analyzing the measurement and motion of the soul and music, we can conclude that since music is the temporal motion of pure numerical ratios when musical motion is measured by the soul, time is measured as well. Musical motion, as the ordered numbers in the sequence of time, must be modulated by the soul before it moves in time, just as the celestial spheres are measured by God before they move harmoniously. Augustine argues that unless the soul has a harmonic numerical power, it cannot measure musical motion. Therefore, the soul must have been measured according to the infallible harmonic ratio 1:2, by which it has been endowed with reason, namely, the rational harmonic power. According to Augustine’s investigation, the soul consists of five classes of numbers, which are responsible for the inner motions. The corporeal motion numbers, which exclusively belong to the body, are the product of the five latent numbers in the soul. Therefore, a physical motion must be accomplished by six classes of numbers. The rational numbers are the embedded *modus*, the reason of the soul, which can be ignored by the soul, but the ignorance of the soul results in disordered motions psychically as well as physically. Nevertheless, humans can turn away from absurd motions and chaos by the redemptive, harmonic power of God. In his investigation on rhythmical motion, Augustine discovered that the principle of rhythm is also based on the ratios of the four-fold progression (1-2-3-4), which determines the harmonic law of both the tuning system and celestial motions. The mathematical-harmonic law cannot be shaped by human authority or customs any more than the measurement of the long and short rhythm of celestial motions can be controlled by humans.

[112] *Ibid.*, 6. 17. 57.

[113] *Ibid.*, 5. 5. 10.

[114] *Ibid.*

中文题目:

理性的测量和运动:灵魂和音乐中的数理秩序

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提要:本文论证的主题是奥古斯丁认为灵魂有能力支配和感受音乐的运动是因为上帝用规范宇宙和谐的数理秩序也测量了灵魂。被测量的灵魂是理性的,并具有数理的功能。音乐中的不变的和谐的数理秩序只能在理性灵魂的伦理运转中被实施。因此,和谐的音乐作为物理运动反映着灵魂内在运动的和谐。理性/逻辑思考和伦理行为映现出灵魂的度量或节制,灵魂本身一定具有先验的理性/数理(Ratio)作为灵魂的度量(Modus),否则灵魂的内在活动就无法正常运转。

关键词:灵魂;音乐;秩序;和谐;数字