

Communication

Operationalizing the Maturon: Development of a Psychometric Instrument for Quantifying Human Maturity Using the Human Maturogram (hMTG) Framework

Oluwadare Ogunlade* 

Department of Physiological Sciences, Obafemi Awolowo University, Ile-Ife, Nigeria

Abstract

Traditional approaches to assessing human maturity (hM) have often been fragmented, relying on qualitative observations or domain-specific metrics that overlook the holistic interplay of biological, psychological, and social dimensions across the lifespan. This paper introduces the Human Maturogram (hMTG), a conceptual and quantitative framework designed to advance the emerging field of maturology. The hMTG enables multidimensional maturity assessment across life stages, structured through five concentric cycles: milestones, lustra, decades, generations, and three maturity stages-dependence, independence, and interdependence. A key innovation is the Maturity Time Expression ($T_{\text{maturity}} = L_a D_b G_c S_d$), which contextualizes maturity through indexed time parameters. Building on this, the Ogunlade Maturity Equation ($hM = [A - 1] + [a \ b \ c \ d]$) quantifies human maturity in maturon (mat)-a proposed unit representing the expected developmental maturity of a 1-year-old. This quantification supports calculating the Percentage of Human Maturity (%hM) by comparing observed versus predicted hM based on chronological age. The hMTG introduces a categorical maturity spectrum: Pre-maturity (0%), Formative (1-49%), Functional (50-84%), Fulfilled (85-94%), Transcendent (95-100%), and Cosmotic ($\geq 101\%$), representing increasing levels of developmental integration, social impact, and legacy consciousness. Practical illustrations demonstrate the hMTG's potential for objectively assessing developmental complexity and individual growth. This framework unifies fragmented maturity assessments and offers a robust psychometric tool with wide-ranging applications in research, education, clinical practice, and leadership development-marking a significant step forward in operationalizing human maturity through maturology.

Keywords

Human Maturogram (hMTG), Human Maturity (hM), Maturon, Quantitative Framework, Percentage of Human Maturity (%hM), Developmental Milestones, Maturology

1. Introduction

Human development is a complex, multifaceted process that encompasses physical, socio-emotional, mental, and spiritual growth and maturity. Human maturity (hM) is a multifaceted construct encompassing biological, psycholog-

ical, and social dimensions. Traditional assessments of maturity have often relied on qualitative observations or domain-specific quantitative measures, which may not capture the holistic nature of human development. This work is a

*Corresponding author: ogunladeomotomilayo@gmail.com (Oluwadare Ogunlade)

Received: 22 June 2025; **Accepted:** 11 July 2025; **Published:** 30 July 2025



Copyright: © The Author(s), 2025. Published by Science Publishing Group. This is an **Open Access** article, distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

foundational study on how to quantitatively expressed human development as discrete number, expressed to the nearest whole number by the use of human maturogram (hMTG), Maturity Time Expression (MTE) and Ogunlade Maturity Equation (OME). The Human Maturogram (hMTG) emerges as an innovative framework aiming to quantify maturity across various dimensions, offering a comprehensive tool for both research and practical applications in the field of maturology.

Historically, maturity assessments have been domain-specific. In 1976, a study assessed biological maturation in adolescence using "maturograms," which are graphic analyses composed of "pubertograms" and "dentograms," representing pubertal and dental physical characteristics, respectively [1]. Furthermore, the Tanner Scale provides a method for assessing physical development during puberty based on secondary sexual characteristics [2]. While valuable in clinical settings, such measures are limited to biological maturation and do not account for psychological or social development. Similarly, the Vineland Social Maturity Scale evaluates social competence but lacks integration with other maturity domains [3]. In the psychological domain, tools like the Psychosocial Maturity Inventory have been developed to assess aspects such as self-reliance, identity, and work orientation among adolescents [4]. However, these instruments often focus on specific age groups and may not provide a continuous measure applicable across the lifespan. Moreover, they may not integrate biological or social maturity aspects, leading to a fragmented understanding of overall human development. The need for a comprehensive maturity assessment tool is further underscored in organizational contexts. Models like the People Capability Maturity Model (PCMM) have been employed to assess and improve workforce development processes [5]. While effective for organizational development, such models are not designed to assess individual maturity levels across diverse domains.

In healthcare, maturity models have been utilized to evaluate the readiness and effectiveness of healthcare systems and practices [6]. These models focus on organizational maturity rather than individual human development, highlighting a gap in tools available for assessing personal maturity comprehensively. The concept of maturity extends beyond individual assessments to societal and developmental frameworks. Robert Havighurst's developmental task theory outlines age-specific tasks essential for successful development, emphasizing the interplay between biological, psychological, and social factors [7]. However, this theory lacks a quantifiable measurement system to assess individual progress across these tasks.

Moreover, the Max-Neef's Fundamental Human Needs framework identifies universal human needs, suggesting that fulfilling these needs is essential for human development [8]. While this model provides a holistic view of human needs, it does not offer a quantifiable method to assess individual maturity in meeting these needs. In the realm of psychological

assessment, continuous models of latent traits have been proposed to address the need for measuring developmental variables like maturity on a continuum [9]. These approaches, however, remain largely theoretical in the maturity field, lacking widespread application or integration into practical assessment frameworks. The hMTG seeks to address these limitations by providing a multidimensional, quantifiable assessment of human maturity. By integrating biological, psychological, and social dimensions, hMTG offers a comprehensive framework applicable across various contexts and age groups. The development of hMTG is informed by existing maturity models and aims to provide a standardized tool for assessing and tracking human development.

In the Nigerian context, studies have highlighted the need for maturity assessments in various sectors. For example, research on the quality maturity levels in Nigerian university libraries indicates a basic understanding of quality management implementation, suggesting potential for development through structured maturity assessments [10]. Implementing tools like hMTG could facilitate such development by providing clear metrics for assessment and improvement. Furthermore, the application of maturity models in healthcare has demonstrated benefits in identifying systemic gaps and guiding improvements in human-centered processes [6]. Adopting a comprehensive maturity assessment tool like hMTG could enhance individual and organizational development by providing insights into various maturity dimensions.

The integration of digital technologies in maturity assessments has also been explored. For instance, the use of hyperspectral imagery in assessing peanut maturity showcases the potential of technological tools in providing objective, quantifiable assessments [11]. Similarly, incorporating digital tools into hMTG could enhance its applicability, scalability, and accuracy in various settings, including education, clinical psychology, and public health. From a developmental psychology standpoint, maturity is often aligned with developmental tasks and milestones that are presumed to be achieved at certain ages [7]. However, these markers may not always correspond with true developmental progress. The hMTG allows for a more personalized and context-sensitive evaluation of maturity, integrating data across domains and over time.

The integration of scientific approaches into maturity measurement can also help unify fragmented assessment tools. By applying psychometric and statistical modeling techniques such as item response theory and multidimensional scaling [9], the hMTG has the potential to evolve into a robust, validated measure akin to intelligence quotient (IQ) scales or personality inventories. Recent efforts in human factors engineering and safety-critical industries have shown that maturity frameworks can be successfully applied to improve behavior, system performance, and resilience [12]. These insights offer a template for applying maturity science to individual development using tools like the hMTG.

Moreover, the foundational biological literature on growth and development confirms that physical, psychological, and social systems do not mature in isolation [13]. Tools like hMTG that consider the interaction of these systems in a unified framework offer a novel contribution to understanding human potential and functioning.

Overall, the development of hMTG represents a significant advancement in the quantification of human maturity. By integrating multiple dimensions of development into a single, standardized assessment tool, hMTG offers the potential to enhance research, clinical practice, and organizational development. Future research should focus on validating hMTG across diverse populations and contexts to establish its reliability and effectiveness as a comprehensive maturity assessment instrument.

2. The Roles of Human Maturogram (hMTG) in Assessment of Human Maturity (hM)

Human Maturogram (hMTG) is a comprehensive frame-

work of twenty-four lustra (L1 to L24), spanning a 120-year lifespan, to map human development from infancy to late adulthood. Each lustrum corresponds to a specific age range and is characterized by distinct milestones, challenges, and opportunities (Figure 1). This novel model strategically comprises five concentric cycles: milestones (innermost), lustra, decades, generations, and maturity stages (outermost). The milestones cycle outlines standardized developmental traits mapped to chronological age progression. Subsequent cycles partition the lifespan into lustra (5-year units), decades (10-year units), and generations (30-year units). The outermost cycle categorizes the lifespan into three maturity stages: S1-S3. S1 represents dependence stage of maturity (1-15 years; green). S2 represents the independence stage of maturity (16-30 years; blue). S3 represents the interdependence stage of maturity (31-120 years; purple), with hues intuitively signaling developmental transitions. By dividing the lifespan into 24 lustra, this framework offers a holistic and systematic approach to assessing and supporting human development, emphasizing the interconnectedness of growth and maturation at every stage [14].

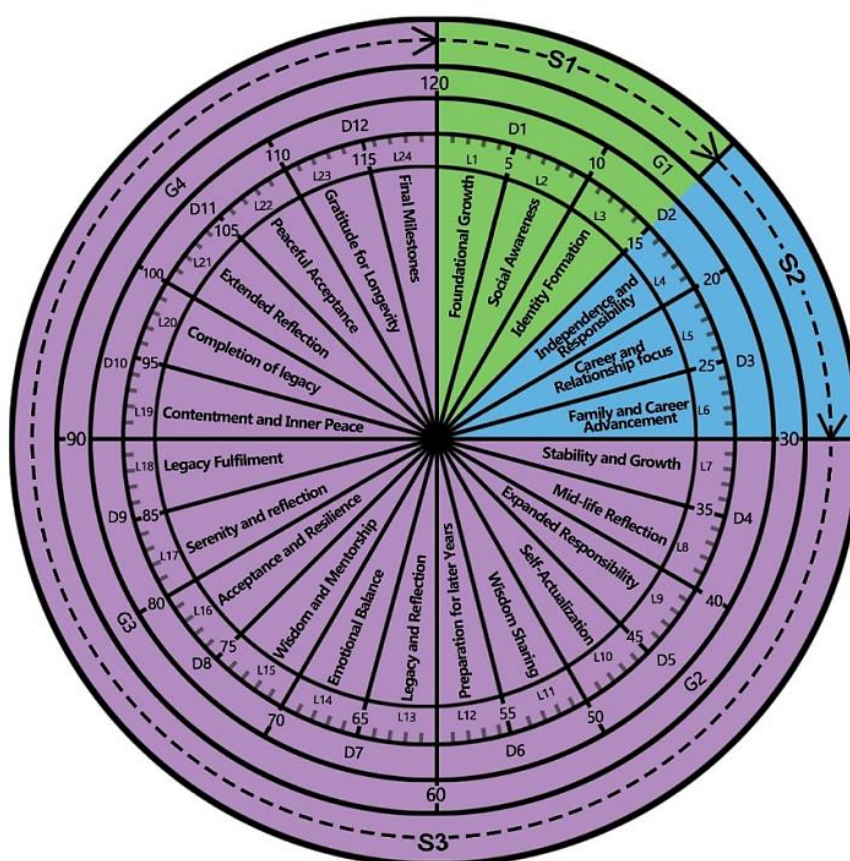


Figure 1. Human Maturogram (hMTG): A tool for assessment of human development and maturity across a lifespan.

L1- L24: 1st to 24th lustrum; D1- D12: 1st to 12th decade; G1-G4: 1st to 4th Generation, S1-S3: 1st-3rd Stage of Ma-

turity. N. B. An age at the boundary belongs to the preceding sector.

3. Quantitative Framework for Assessment of Human Maturity Using hMTG

3.1. Maturity Time Expression and Ogunlade Maturity Equation

Maturity Time Expression (MTE) is derived from the Human Maturogram (Figure 1) and is stated as:

$$T_{\text{maturity}} = L_a D_b G_c S_d$$

Where,

L = Lustrum (5-year period)

D = Decade (10-year period,

G = Generation (30-year period)

S = Stage of Maturity (a predefined developmental level)

And the subscripts represent maturity indices:

$a \in [1, 24]$

$b \in [1, 12]$

$c \in [1, 4]$

$d \in [1, 3]$

These indices correspond to an individual's specific position within each time unit of maturity progression.

Ogunlade Maturity Equation (OME) provides a mathematical formulation for estimating Human Maturity (hM) by combining chronological age with temporal maturity indices:

$$hM = (A - 1) + (a \cdot b \cdot c \cdot d)$$

Where:

hM = Human Maturity

A = Chronological Age (in years)

a, b, c, d = Maturity Time Indices corresponding to Lustrum, Decade, Generation, and Stage of Maturity, respectively

The term (A-1) reflects age-adjusted baseline while the multiplicative component (a b c d) captures the compounded developmental influence of time-based maturity dimensions. This equation enables a standardized and scalable quantification of maturity that is adaptable to various contexts in developmental science, education, psychology, and personalized maturity assessment.

3.2. The Fundamental Unit of Human Maturity

The *maturon* (mat) is the base unit of human maturity in the emerging science of *Maturology*. It is defined as the expected level of developmental maturity-across cognitive, emotional, and behavioral dimensions-of a standard 1-year-old human being.

According to the Human Maturogram (hMTG) and the Maturity Time Expression (MTE), maturity time is expressed as:

$$T_{\text{maturity}} = L_a D_b G_c S_d$$

For a 1-year-old individual, the developmental position corresponds to:

First Lustrum $\rightarrow L_1$

First Decade $\rightarrow D_1$

First Generation $\rightarrow G_1$

First Stage of Maturity $\rightarrow S_1$

Thus, $a=1, b=1, c=1, d=1$ and:

$$T_{\text{maturity}} (1 \text{ year}) = L_1 D_1 G_1 S_1$$

Using the Ogunlade Maturity Equation (OME):

$$hM = (A - 1) + (a \cdot b \cdot c \cdot d)$$

Where:

A=1 (chronological age in years)

$a = b = c = d = 1$

Substituting the values:

$$hM = (1 - 1) + (1 \times 1 \times 1 \times 1) = 0 + 1 = 1 \text{ mat}$$

Therefore, the human maturity score at age 1 is defined as 1 maturon (1 mat), serving as the fundamental unit for measuring and comparing human maturity across the lifespan.

3.3. Estimation of Percentage of Human Maturity (%hM)

The *Percentage of Human Maturity (%hM)* provides a quantifiable measure of an individual's maturity level relative to the expected standard for their chronological age (Figure 2). It requires the integration of two core parameters:

- 1) *Observed Human Maturity (OhM)*: This represents the individual's actual level of maturity as assessed through developmental milestones. It is derived from the Human Maturogram (hMTG), Maturity Time Expression (MTE), and computed using the Ogunlade Maturity Equation (OME).
- 2) *Predicted Human Maturity (PhM)*: This denotes the theoretically expected maturity level for an individual of a given chronological age. It is also derived using the hMTG, MTE, and OME.

The %hM is then calculated using the formula:

$$\%hM = \frac{OhM}{PhM} \times 100$$

The final value is expressed as a whole number, rounded to the nearest integer. This metric offers a standardized approach to assess and compare the relative maturity status of individuals or cohorts across different developmental stages, settings, or interventions.

3.4. Categorization of the Percentage of Human Maturity (%hM)

The concept of human maturity, while universally

acknowledged as a desirable developmental outcome, remains a complex and multifaceted construct within psychological and sociological discourse. Moving beyond simplistic age-based definitions, a more nuanced understanding is critical for effective individual development, societal well-being, and therapeutic interventions [15]. This article proposes and explores the Percentage of Human Maturity (%hM) as a quantitative framework for assessing human maturity, as illustrated in Table 1. This maturometric aims to provide a structured, albeit dynamic, assessment of an individual's developmental progress across various domains, moving from foundational skills to profound philosophical insight.

The %hM framework posits human maturity not as a fixed state, but as a continuous journey, encompassing several distinct Maturity Zones (Red, Yellow, Green, Blue and Violet), each with specific characteristics and implications. This approach recognizes that human maturity is not merely the absence of immaturity but a proactive process of integration, growth, and contribution [16].

At the nascent end of the spectrum is the Pre-maturity state, defined as %hM = 0 when an individual is less than one year of age. This period is characterized by foundational development, largely biological and rudimentary in terms of cognitive and emotional regulation [17].

Table 1. Classification of Percentage of Human Maturity.

Category	Percentage of Human Maturity (%hM)	Maturity Zone	Implication
Cosmotic Maturity	≥ 101	Violet	Individuals at this zone demonstrate extraordinary philosophical or intuitive insight that transcends personal, cultural, and temporal boundaries. They function as universal exemplars-tapping into cosmic consciousness and symbolizing the evolution of human potential toward planetary or cosmotic wisdom.
Transcendent Maturity	95 -100	Blue	Rare maturity zone marked by deep wisdom, peace, legacy consciousness, and often intuitive or philosophical insight appropriate for their age.
Fulfilled Maturity	85 - 94	Green	Individual at this zone demonstrates reflective integration of life experiences, mentoring others, ethical leadership, and transgenerational thinking.
Functional Maturity	50 - 84	Yellow	This is capability-driven zone with self-regulation, social responsibility, career productivity, and evolving life purpose.
Formative Maturity	1- 49	Red	Foundational development of body, emotion, intellect, and interpersonal skills. Identity is forming but not fully autonomous.

%hM = 0 when an individual is less than one year of age. This is the Pre-maturity state

3.4.1. Formative Maturity: Laying the Groundwork (%hM 1-49, Red Zone)

The Formative Maturity (Red Zone), spanning %hM values from 1 to 49, represents the initial stages of conscious self-development. Individuals in this Zone are primarily engaged in the foundational development of their physical, emotional, and intellectual capacities, alongside the burgeoning of interpersonal skills [18]. Identity formation is a key characteristic, though it remains largely inchoate and dependent on external influences. During this phase, individuals are learning basic self-regulation, understanding social cues, and developing a preliminary sense of self. Early childhood and adolescence predominantly fall into this cate-

gory, where experiences significantly shape future trajectories [19]. The vulnerability inherent in this stage necessitates supportive environments that foster exploration, learning, and secure attachment, as disruptions here can have lasting impacts on subsequent maturity levels [20]. Adults observed to be in this zone need medical, psychological and social interventional measures.

3.4.2. Functional Maturity: Capability and Contribution (%hM 50-84, Yellow Zone)

Progressing to the Functional Maturity Zone (%hM 50-84), individuals enter a phase marked by increased capability and active engagement with the world. This Yellow Zone signifies a shift towards self-regulation, social responsibility, and sig-

nificant career productivity [21]. The focus here is on developing and utilizing skills for practical application, contributing to society, and establishing a stable personal and professional life. Individuals at this grade demonstrate the ability to manage their emotions effectively, navigate complex social situations, and pursue meaningful life goals. Furthermore, a nascent sense of life purpose begins to evolve, guiding their decisions and actions. This Zone is often associated with early to mid-adulthood, where individuals are establishing their careers, building families, and actively participating in their communities [22]. While still evolving, their sense of self is more autonomous, and their contributions become more tangible.

3.4.3. Fulfilled Maturity: Integration and Leadership (%hM 85-94, Green Zone)

The Fulfilled Maturity Zone (%hM 85-94) represents a

significant leap in developmental integration. In this Green Zone, individuals demonstrate a profound capacity for reflective integration of their life experiences [23]. This is not merely about accumulating experiences but about extracting wisdom from them, understanding patterns, and using these insights to inform future actions. A defining characteristic of this Zone is the emphasis on mentoring others and ethical leadership. Individuals at this level are not only self-sufficient but are actively invested in nurturing the growth of those around them. Their thinking extends beyond personal gain to encompass transgenerational thinking, where decisions are made with an awareness of their long-term impact on future generations [24]. This Zone often aligns with mid-to-late adulthood, where individuals have accumulated a wealth of experience and are poised to share their wisdom and guide others.

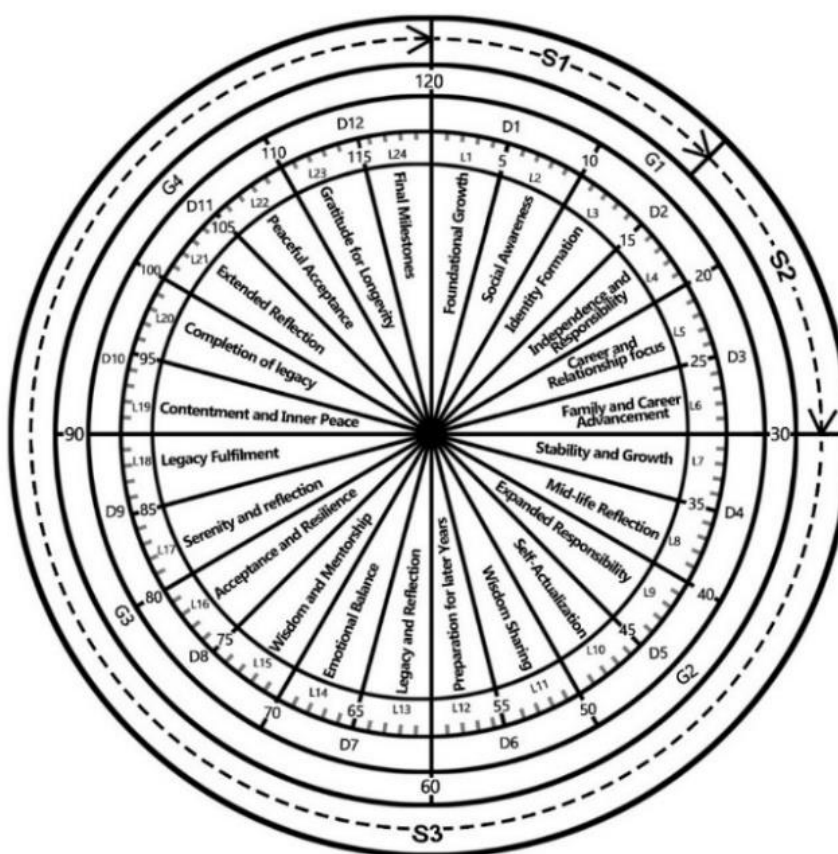


Figure 2. Human Maturogram (hMTG).

3.4.4. Transcendent Maturity: Wisdom and Legacy (%hM 95-100, Blue Zone)

Reaching the Transcendent Maturity Zone (%hM 95-100) is a rare achievement, signifying a profound level of wisdom and inner peace. Occupying the Blue Zone, individuals ex-

hibit a deep understanding of life's complexities, often coupled with intuitive or philosophical insights that are remarkably appropriate for their age and experiences [25]. A strong sense of legacy consciousness emerges, where individuals are deeply aware of their place in the larger human narrative and strive to leave a positive and lasting impact. This Zone of maturity is characterized by a serene acceptance of life's

challenges and a focus on enduring values beyond personal gratification. While often associated with elder statesmanship, it is not solely age-dependent but rather a culmination of lifelong learning, reflection, and a dedication to truth and human flourishing.

3.4.5. Cosmotic Maturity: Universal Exemplars ($\geq 101\%hM$, Violet Zone)

At the pinnacle of the hM framework lies Cosmotic Maturity ($\geq 101\%hM$), an extraordinary and exceptionally rare state. Individuals in this Violet Zone transcend typical human boundaries, demonstrating philosophical or intuitive insight that extends beyond personal, cultural, and temporal constraints [26]. They function as universal exemplars, embodying a level of understanding that taps into what might be termed "cosmic consciousness." This Zone symbolizes the ultimate evolution of human potential, moving towards planetary or cosmotic wisdom. These individuals are not merely leaders or mentors but serve as beacons, guiding humanity towards a higher collective consciousness. Their contributions are often revolutionary, challenging existing paradigms and inspiring profound shifts in thought and action. While difficult to quantify or commonly observe, this category acknowledges the potential for human development to reach truly exceptional, almost archetypal, levels of insight and influence [27].

3.5. Hypothetical Illustrations of the Use of Human Maturogram to Determine the Percentage of Human Maturity and the Maturity Zones

To enhance the utility and application of the Maturity Time Expression (MTE) and the Ogunlade Maturity Equation (OME) in conjunction with the Human Maturogram (hMTG), this section presents hypothetical illustrations. It demonstrates how the hMTG (Figure 2) can be used to compute the Percentage of Human Maturity ($\%hM$) across various maturity zones.

By applying scenarios within the structured framework of Lustra, Decades, Generations, and Stages of Maturity, the dynamic, nonlinear progression of maturity over time can be objectively analyzed. These illustrations serve to bridge theory and practice in maturology, offering a quantitative method for assessing human developmental complexity and providing insights into individual growth trajectories.

Example 1: A 49-year-old individual who is at the stage of career development and relationship focusing. Estimate the percentage of human maturity and determine the maturity zone.

Solution: Use hMTG (Figure 2).

Scenario: A 49-year-old individual at the stage of career development and relationship focus.

1) **Observed Human Maturity (OhM)**

Given: $T_{maturity} = L_a D_b G_c S_d$ (Observed) = $L_5 D_3 G_1 S_2$

Using the Ogunlade Maturity Equation (OME):

$hM = (A - 1) + (a \times b \times c \times d)$, where A = age in years

$OhM = (49 - 1) + (5 \times 3 \times 1 \times 2)$

$OhM = 48 + 30 = 78 \text{ mat}$

2) **Predicted Human Maturity (PhM)**

Given: $T_{maturity} = L_a D_b G_c S_d$ (Predicted) = $L_{10} D_5 G_2 S_3$

Using the Ogunlade Maturity Equation (OME):

$hM = (A - 1) + (a \times b \times c \times d)$, where A = age in years

$PhM = (49 - 1) + (10 \times 5 \times 2 \times 3)$

$PhM = 48 + 300 = 348 \text{ mat}$

3) **$\%hM$ Calculation:**

$$\%hM = \frac{OhM}{PhM} \times 100 = \frac{78}{348} \times 100 = 22\%$$

Maturity Zone = 22% (Red Zone)

Example 2: A 78-year-old individual who is manifesting wisdom and mentorship. Estimate the percentage of human maturity and determine the maturity zone.

Solution: Using hMTG (Figure 2).

Scenario: A 78-year-old individual manifesting wisdom and mentorship.

1) **Observed Human Maturity (OhM)**

Given: $T_{maturity} = L_a D_b G_c S_d$ (Observed) = $L_{15} D_8 G_3 S_3$

Using the Ogunlade Maturity Equation (OME):

$hM = (A - 1) + (a \times b \times c \times d)$, where A = age in years

$OhM = (78 - 1) + (15 \times 8 \times 3 \times 3)$

$OhM = 77 + 1,080 = 1,157 \text{ mat}$

2) **Predicted Human Maturity (PhM)**

Given: $T_{maturity} = L_a D_b G_c S_d$ (Predicted) = $L_{16} D_8 G_3 S_3$

Using the Ogunlade Maturity Equation (OME):

$hM = (A - 1) + (a \times b \times c \times d)$, where A = age in years

$PhM = (78 - 1) + (16 \times 8 \times 3 \times 3)$

$PhM = 77 + 1,152 = 1,229 \text{ mat}$

3) **$\%hM$ Calculation:**

$$\%hM = \frac{OhM}{PhM} \times 100 = \frac{1157}{1229} \times 100 = 94\%$$

Maturity Zone = 94% (Green Zone)

Example 3: A 52-year-old individual who is manifesting wisdom sharing with great impact in the community. Estimate the percentage of human maturity and determine the maturity zone.

Solution: Use hMTG (Figure 2).

Scenario: A 52-year-old individual actively sharing wisdom with significant community impact.

1) **Observed Human Maturity (OhM)**

Given: $T_{maturity} = L_a D_b G_c S_d$ (Observed) = $L_{11} D_6 G_2 S_3$

Using the Ogunlade Maturity Equation (OME):

$hM = (A - 1) + (a \times b \times c \times d)$, where A = age in years

$OhM = (52 - 1) + (11 \times 6 \times 2 \times 3)$

$OhM = 51 + 396 = 447 \text{ mat}$

2) **Predicted Human Maturity (PhM)**

Given: $T_{maturity} = L_a D_b G_c S_d$ (Predicted) = $L_{11} D_6 G_2 S_3$

Using the Ogunlade Maturity Equation (OME):

$hM = (A - 1) + (a \times b \times c \times d)$, where A = age in years

$$\text{PhM} = (52 - 1) + (11 \times 6 \times 2 \times 3)$$

$$\text{PhM} = 51 + 396 = 447 \text{ mat}$$

3) %hM Calculation:

$$\%hM = \frac{\text{OhM}}{\text{PhM}} \times 100 = \frac{447}{447} \times 100 = 100\%$$

Maturity Zone = 100% (Blue Zone)

Example 4: A 33-year-old individual who is manifesting wisdom sharing with great positive influence in the community. Estimate the percentage of human maturity and determine the maturity zone.

Solution: Use hMTG (Figure 2).

Scenario: A 33-year-old individual already demonstrating wisdom sharing and positive societal impact.

1) *Observed Human Maturity (OhM)*

$$\text{Given: } T_{\text{maturity}} = L_a D_b G_c S_d (\text{Observed}) = L_{11} D_6 G_2 S_3$$

Using the Ogunlade Maturity Equation (OME):

$$hM = (A - 1) + (a \times b \times c \times d), \text{ where } A = \text{age in years}$$

$$\text{OhM} = (33 - 1) + (11 \times 6 \times 2 \times 3)$$

$$\text{OhM} = 32 + 396 = 428 \text{ mat}$$

2) *Predicted Human Maturity (PhM)*

$$\text{Given: } T_{\text{maturity}} = L_a D_b G_c S_d (\text{Predicted}) = L_7 D_4 G_2 S_3$$

Using the Ogunlade Maturity Equation (OME):

$$hM = (A - 1) + (a \times b \times c \times d), \text{ where } A = \text{age in years}$$

$$\text{PhM} = (33 - 1) + (7 \times 4 \times 2 \times 3)$$

$$\text{PhM} = 32 + 168 = 200 \text{ mat}$$

3) %hM Calculation:

$$\%hM = \frac{\text{OhM}}{\text{PhM}} \times 100 = \frac{428}{200} \times 100 = 214\%$$

Maturity Zone = 214% (Violet Zone)

4. Discussion

The Human Maturogram (hMTG) and its accompanying quantitative framework, including the Maturity Time Expression (MTE) and Ogunlade Maturity Equation (OME) represent a significant paradigm shift in the assessment of human maturity. By moving beyond traditional, fragmented approaches, this work introduces a holistic and quantifiable system for understanding the multifaceted nature of human development across the entire lifespan. This discussion will delve into the novelty and implications of the hMTG, its theoretical underpinnings, practical applications, potential challenges, and future research directions, drawing upon contemporary literature to underscore its scientific merit and transformative potential.

4.1. The Imperative for a Unified Maturity Framework

For decades, the study of human development has been compartmentalized, with distinct disciplines focusing on biological, psychological, or social aspects of maturation [15]. While specialized assessments like the Tanner Scale for pubertal development [2] or the Vineland Social Maturity Scale

for social competence [3] offer valuable insights within their respective domains, they inherently provide a fragmented view. The absence of an overarching, quantifiable framework has hindered comprehensive understanding, effective interventions, and the ability to track holistic developmental trajectories across the lifespan. The hMTG directly addresses this critical gap by proposing a unified language for maturity assessment, effectively establishing the foundation for the burgeoning field of maturology.

The concept of "maturity" itself has often been loosely defined, conflated with chronological age, or reduced to the acquisition of specific skills [28]. This imprecise understanding limits its utility in both research and clinical practice. By defining maturity in "maturon" (mat) and quantifying it through the OME and MTE, the hMTG provides a precise, measurable unit. This formalization aligns with efforts in other complex fields, such as intelligence [9] or emotional regulation [29], where quantifiable metrics have paved the way for rigorous scientific inquiry and application. The hMTG's twenty-four lustra, five concentric cycles, and three distinct maturity stages offer an unprecedented level of granularity and structure, allowing for nuanced tracking of developmental progress that transcends mere age [16]. A recent review on maturity assessment models across various fields highlights the persistent need for integrative approaches, reinforcing the hMTG's timely contribution [6].

4.2. Theoretical Foundations and Integration

The hMTG draws upon and integrates various established developmental theories, synthesizing their strengths into a cohesive framework. Erikson's psychosocial stages [18] find resonance within the hMTG's progression through dependence, independence, and interdependence, highlighting the social and emotional challenges inherent at each stage. Similarly, Havighurst's developmental tasks [7] are implicitly captured within the milestones expected at each lustrum, providing a framework for observable achievements. The concept of lifespan development, championed by scholars like Baltes [16], is central to the hMTG's 120-year span, acknowledging that growth and adaptation are continuous processes, not merely confined to childhood or adolescence. Recent work continues to explore the dynamic interplay of individual and contextual factors in shaping development across the lifespan [30].

Furthermore, the hMTG's multi-dimensional approach echoes the ecological systems theory proposed by Bronfenbrenner, where development is seen as a product of continuous interaction between the individual and their environment [15]. By encompassing biological, psychological, and social dimensions within its qualitative and quantitative assessments, the hMTG offers a tool that can theoretically account for the complex interplay of these factors. This allows for a more holistic understanding of developmental trajectories, acknowledging that deviations or accelerations in one

domain can influence others. This integrated perspective is crucial for developing targeted interventions, particularly in cases of developmental delay or atypical progression [20]. The complex systems approach to understanding human development is gaining increasing traction, underscoring the hMTG's alignment with contemporary theoretical advancements [31].

The Cosmotic Maturity category ($\geq 101\%hM$) introduces a novel dimension that extends beyond traditional developmental psychology. While concepts of self-actualization [27] and transcendent experiences [26] have been explored in humanistic psychology, the hMTG formally quantifies and categorizes this pinnacle of human potential. This acknowledges the existence of rare individuals who achieve a level of wisdom and insight that transcends conventional societal norms, contributing to universal understanding and inspiring collective evolution. This aspect of the hMTG challenges researchers to consider the upper limits of human development, potentially opening new avenues for studying extraordinary human capabilities and contributions, including those related to planetary and global consciousness [32].

4.3. Practical Applications Across Domains

The practical implications of the hMTG are vast and extend across numerous sectors. For clinical psychologists, the hM provides an objective, quantifiable metric to assess developmental status, identify potential delays or accelerations, and monitor the efficacy of therapeutic interventions [33]. It can help differentiate between chronological age and actual maturity, allowing for more precise diagnostic formulations and personalized treatment plans. For instance, understanding why a 49-year-old individual exhibits a lower hM (e.g., 22% in Example 1) can guide interventions focused on self-regulation or career development, moving them towards Functional maturity [21, 22]. Conversely, identifying a 33-year-old with a remarkably high hM (e.g., 214% in Example 4), indicative of Cosmotic maturity, can inform strategies to nurture their exceptional potential and societal contribution [25, 26].

In the realm of education and pedagogy, systems often rely on age-based curricula that may not align with individual maturity levels. The hMTG can revolutionize personalized learning by enabling educators to tailor instruction to a student's actual developmental readiness, fostering more effective learning outcomes and reducing academic frustration [34]. It could also inform career guidance and talent development programs, identifying students who are "ahead of their curve" and those who require additional support, a concept increasingly vital in modern educational reforms [35]. Within organizational development and human resources, beyond existing organizational maturity models like PCMM [5], the hMTG offers a granular assessment of individual maturity within a workforce. This can inform leadership development, team formation, conflict resolution, and succession planning.

Identifying individuals with higher hM , particularly in the Fulfilled or Transcendent zones, can help organizations leverage ethical leadership, mentorship, and transgenerational thinking for sustained success [24, 36]. The hMTG could become a vital tool for talent management and fostering a mature, responsible organizational culture, aligning with contemporary trends in human capital development [37].

For public health and policy, the framework could contribute by providing data on population-level maturity trends, informing policy decisions related to youth development, elder care, and social support systems [38]. Understanding the factors that contribute to higher hM across different demographics can guide resource allocation and intervention design to promote overall societal well-being, especially as health systems increasingly focus on life course approaches [39].

Finally, for research and maturology, the hMTG provides a robust quantitative tool for empirical research into the factors influencing human maturity. Researchers can use it to conduct longitudinal studies, investigate the impact of environmental factors, genetic predispositions, and cultural contexts on developmental trajectories. This could lead to a deeper understanding of resilience, vulnerability, and the mechanisms of positive human development [15, 20]. The explicit mathematical foundation (OME, MTE) facilitates rigorous statistical analysis and hypothesis testing, pushing the boundaries of developmental science, particularly with advances in longitudinal data analysis techniques [40]. Furthermore, the computational complexity of the OME and MTE, while theoretically sound, might present practical difficulties for routine application without user-friendly digital interfaces. The accessibility and ease of use for practitioners in various settings, from clinical offices to educational institutions, will be vital for its widespread adoption [11]. Investing in the development of intuitive software and training programs will be necessary, building on the increased focus on digital transformation in healthcare and education [41]. Finally, like any developmental model, the hMTG must acknowledge the non-linear and sometimes regressive nature of human development. While the framework generally posits progression, life events, trauma, or illness can lead to temporary or sustained decreases in observed hM . The framework's ability to account for such fluctuations and provide insights into resilience and recovery will be important for its clinical utility, especially considering the growing literature on adaptive processes in the face of adversity [37].

4.4. Future Directions and the Evolution of Maturology

The introduction of the hMTG marks the nascent stage of maturology as a distinct scientific discipline. Future research must prioritize the empirical validation of the hMTG. This involves large-scale longitudinal studies across diverse populations to establish the reliability, validity (concurrent, pre-

dictive, and construct validity), and generalizability of the hMTG across different cultural contexts, socioeconomic statuses, and developmental trajectories [38]. Specific research questions might include: Do individuals consistently progress through the %hM categories as predicted? How do environmental factors (e.g., education, nutrition, social support) influence %hM? Can %hM predict future life outcomes (e.g., career success, relationship stability, well-being)? Are there specific genetic markers associated with variations in %hM progression?

Further refinement of the milestone assessment tools is also critical. This could involve leveraging advancements in artificial intelligence and machine learning to analyze behavioral patterns, language use, and even physiological data to provide more objective and less intrusive measures of observed hM [42]. The integration of neurobiological markers, such as advanced brain imaging techniques reflecting structural and functional brain maturation [43], could further enhance the precision and scientific rigor of hMTG assessments, providing objective biological correlates for the different maturity zones.

Moreover, the hMTG provides a foundation for the development of normative data for %hM across different age groups and populations. This will enable practitioners to compare an individual's observed maturity against a relevant peer group, providing more meaningful interpretations of their developmental status [41]. This normative data will also be essential for identifying outliers—both those with developmental delays and those exhibiting precocious maturity—and understanding the factors contributing to these deviations.

The application of the hMTG in intervention science is another promising area. Developing and testing targeted interventions designed to facilitate progression through the maturity zones, especially for individuals with lower %hM, could yield significant societal benefits [42]. For example, programs aimed at fostering emotional regulation or ethical leadership could be evaluated based on their impact on an individual's %hM. Finally, the philosophical and societal implications of a quantifiable maturity metric warrant deeper exploration. How might a universal assessment of maturity influence societal structures, educational policies, or even legal frameworks? Addressing these ethical considerations proactively will be vital as maturology gains prominence [28].

5. Conclusion

The Human Maturogram (hMTG) represents a groundbreaking leap in the scientific understanding and assessment of human maturity. By introducing a novel quantitative framework, complete with the Maturity Time Expression, Ogunlade Maturity Equation, and a clear Percentage of Human Maturity (%hM) categorization, this work lays the essential groundwork for maturology as a rigorous, interdisciplinary field. The hMTG's ability to holistically assess human development across the lifespan, from foundational skills to

the rare heights of cosmic insight, provides an unprecedented tool for researchers, clinicians, educators, psychologists and organizations. The implications are profound: enabling personalized developmental roadmaps, optimizing interventions, fostering ethical leadership, and unlocking the full potential of human capital. While challenges in operationalization and cultural validation remain, the hMTG's theoretical robustness and practical utility pave the way for a future where human maturity is not merely observed but precisely measured, understood, and actively cultivated. This framework offers a new unified lens through which to view the dynamic process of human growth, promising to revolutionize our approach to individual well-being and collective societal progress.

Abbreviations

hMTG	Human Maturogram
hM	Human Maturity
MTE	Maturity Time Expression
OME	Ogunlade Maturity Equation
OhM	Observed Human Maturity
PhM	Predicted Human Maturity
%hM	Percentage of Human Maturity

Acknowledgments

The author would like to extend appreciation to Adedayo I. Grillo, a talented artist, for his exceptional skill and expertise in refining the original framework of Human Maturogram.

Author Contributions

Oluwadare Ogunlade is the sole author. The author read and approved the final manuscript.

Funding

This work is not supported by any external funding.

Conflicts of Interest

The author declares no conflicts of interest.

References

- [1] Taranger J, Karlberg P. VII. Graphic analysis of biological maturation by means of maturograms. *Acta Paediatr Scand Suppl.* 1976; (258): 136-46.
- [2] Marshall WA, Tanner JM. Variations in the pattern of pubertal changes in boys. *Arch Dis Child.* 1970; 45(239): 13-23. <https://doi.org/10.1136/ad.45.239.13>

- [3] Doll EA. *The Measurement of Social Competence: A Manual for the Vineland Social Maturity Scale*. New York: Educational Test Bureau; 1953.
- [4] Greenberger E, Josselson R, Knerr C, Knerr B. The measurement and structure of psychosocial maturity. *J Youth Adolesc*. 1975; 4(2): 127-43. <https://doi.org/10.1007/BF01537437>
- [5] Curtis B, Hefley WE, Miller SA. *The People Capability Maturity Model: Guidelines for Improving the Workforce*. Boston: Addison-Wesley; 2002.
- [6] Tarhan AK, Garousi V, Turetken O, Söylemez M, Garousi S. Maturity assessment and maturity models in healthcare: A multivocal literature review. *Health Inform J*. 2020; 26(2): 1088-114. <https://doi.org/10.1177/2055207620914772>
- [7] Havighurst RJ. *Developmental Tasks and Education*. New York: McKay; 1952.
- [8] Max-Neef MA. *Human Scale Development: Conception, Application and Further Reflections*. New York: Apex Press; 1991.
- [9] Mellenbergh GJ. A unidimensional latent trait model for continuous item responses. *Multivariate Behav Res*. 1994; 29(2): 223-36. https://doi.org/10.1207/s15327906mbr2902_5
- [10] Egberongbe HS, Sen B, Willett P. The assessment of quality maturity levels in Nigerian university libraries. *Libr Rev*. 2017; 66(6/7): 399-414. <https://doi.org/10.1108/LR-06-2017-0056>
- [11] Zou S, Tseng YC, Zare A, Rowland D, Tillman B, Yoon SC. Peanut maturity classification using hyperspectral imagery. *arXiv preprint arXiv: 1910.11122*. 2019.
- [12] Edmonds J, Gray K. Assessing human factors maturity. *Chem Eng Trans*. 2019; 77: 481-6. <https://doi.org/10.3303/CET1977081>
- [13] Bogin B. Measuring maturity. In: Cameron N, editor. *Human Growth and Development*. San Diego: Academic Press; 2002. p. 107-40. <https://doi.org/10.1016/B978-012155090-2/50006-5>
- [14] Ogunlade O. Maturogram (MTG): A Twenty-Four-Lustra Framework for Assessment of Human Development in Maturology. *Psychology*. 2025; 14(3): 80-5.
- [15] Lerner RM, Busch-Rossnagel NA. Individuals as producers of their own development: An ecological perspective. In: Lerner RM, Hetherington EM, editors. *Handbook of Child Psychology: Volume 1, Theoretical Models of Human Development*. 5th ed. New York: Wiley; 1998. p. 45-98.
- [16] Baltes PB, Staudinger UM, Lindenberger U. Lifespan psychology: Theory and application to intellectual functioning. *Annu Rev Psychol*. 1999; 50: 471-507. <https://doi.org/10.1146/annurev.psych.50.1.471>
- [17] Shonkoff JP, Phillips DA, editors. *From Neurons to Neighborhoods: The Science of Early Childhood Development*. Washington, DC: National Academies Press; 2000.
- [18] Erikson EH. *Childhood and Society*. 2nd ed. New York: Norton; 1963.
- [19] Bowlby J. *Attachment and Loss: Volume 1, Attachment*. 2nd ed. New York: Basic Books; 1982.
- [20] Cicchetti D, Rogosch FA. Equifinality and multifinality in developmental psychopathology. *Dev Psychopathol*. 1996; 8(4): 597-600. <https://doi.org/10.1017/S0954579400007318>
- [21] Vaillant GE. *Adaptation to Life*. Boston: Little, Brown; 1977.
- [22] Super DE. A life-span, life-space approach to career development. *J Vocat Behav*. 1980; 16(3): 282-98. [https://doi.org/10.1016/0001-8791\(80\)90056-1](https://doi.org/10.1016/0001-8791(80)90056-1)
- [23] Mezirow J. Learning to think like an adult: Core concepts of transformation theory. In: Illeris K, editor. *Contemporary Theories of Learning: Learning Theorists... in Their Own Words*. London: Routledge; 2009. p. 27-44.
- [24] Kotre J. *Outliving the Self: Generativity and the Interpretation of Lives*. Baltimore: Johns Hopkins University Press; 1984.
- [25] Wink P, Helson R. Personality change in women and men: Findings from a longitudinal study. *J Pers Soc Psychol*. 1997; 72(4): 910-23. <https://doi.org/10.1037/0022-3514.72.4.910>
- [26] Wilber K. *The Integral Vision: A Very Short Introduction to the Revolutionary Integral Approach to Life, God, the Universe, and Everything*. Boston: Shambhala Publications; 2007.
- [27] Maslow AH. *The Farther Reaches of Human Nature*. New York: Viking Press; 1971.
- [28] Arnett JJ. Emerging adulthood: A theory of development from the late teens through the twenties. *Am Psychol*. 2000; 55(5): 469-80. <https://doi.org/10.1037/0003-066X.55.5.469>
- [29] Gross JJ. The extended process model of emotion regulation: Elaborations and applications. *Psychol Inq*. 2015; 26(1): 1-26. <https://doi.org/10.1080/1047840X.2015.989751>
- [30] Lerner RM, Napolitano CM, Callina KS, Mueller MK, Hunter CJ, Abrams LR, et al. The relational developmental systems approach: A decade of extension, innovation, and application. *J Youth Adolesc*. 2021; 50(5): 859-73. <https://doi.org/10.1007/s10964-021-01402-y>
- [31] Lewis MD, Todd RM. The complex systems approach to emotional development. In: Barrett LF, Lewis MD, Haviland-Jones JM, editors. *Handbook of Emotions*. 4th ed. New York: Guilford Press; 2016. p. 239-55. <https://doi.org/10.1093/oxfordhb/9780198737838.013.10>
- [32] Slife BD, Reber JS, Richardson FC. *Self, Soul, and Science: New Perspectives on Human Nature*. New York: Springer; 2020.
- [33] American Psychological Association. *Clinical Practice Guidelines* [Internet]. Washington, DC: American Psychological Association; 2023 [cited 2023]. Available from: <https://www.apa.org/practice/guidelines/>
- [34] Darling-Hammond L, Hyler ME, Gardner M. *Effective Teacher Professional Development*. Palo Alto, CA: Learning Policy Institute; 2017.

- [35] Scherer R, Tondeur J, Siddiq F, Baran E. The future of educational technology: A systematic review and research agenda. *Comput Educ.* 2022; 188: 104578. <https://doi.org/10.1016/j.compedu.2022.104578>
- [36] Schein EH, Schein PA. *Humble Leadership: The Power of Relationships, Openness, and Trust*. Oakland, CA: Berrett-Koehler Publishers; 2018.
- [37] Ulrich D, Dulebohn JH. Human capital and organizations: Exploring the connections. *Annu Rev Organ Psychol Organ Behav.* 2022; 9: 369-90. <https://doi.org/10.1146/annurev-orgpsych-120920-050410>
- [38] World Health Organization. *Social Determinants of Health: The Solid Facts*. 2nd ed. Copenhagen: World Health Organization; 2003. Available from: <https://www.who.int/publications/i/item/9789241503406>
- [39] Marmot M, Allen J, Bell R, Bloomer E, Goldblatt P. *Health Equity in England: The Marmot Review 10 Years On*. London: Institute of Health Equity; 2020.
- [40] Little TD. *Longitudinal Structural Equation Modeling*. 2nd ed. New York: Guilford Press; 2023.
- [41] Topol EJ. High-performance medicine: the convergence of human and artificial intelligence. *Nat Med.* 2019; 25(1): 44-56. <https://doi.org/10.1038/s41591-018-0300-7>
- [42] Dadi H, Marwala T. Machine learning applications in predicting developmental stages. *Annu Rev Biomed Eng.* 2018; 20: 175-97. <https://doi.org/10.1146/annurev-bioeng-062117-123403>
- [43] Cao M, Li X, Schirda B, Zhao Y, Zhang W, Sowell ER, et al. Brain structural and functional development in adolescence: Insights from the Human Connectome Project-Development. *Child Dev.* 2023; 94(5): 1299-316. <https://doi.org/10.1111/cdev.13968>