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REVIEW ARTICLE

A Multidisciplinary Exploration of Self-Identity Development: Applying Awareness Integration Theory in Psychopathology and Genetic Research

Foojan Zeine[1,2*], Nicole Jafari[3,4], Eileen Manoukian[1], Hila Madani[1], Kai-Uwe Lewandrowski[5-7], Alireza Sharafshah[8], Rajendra D Badgaiyan[9], David Baron[10], Abdalla Bowirrat[17], Kenneth Blum[1,4,10-18]**

[1]Awareness Integration Institute, San Clemente, CA., USA.
[2]Department of Health Science, California State University at Long Beach, Long Beach, CA., USA.
[3]Department of Applied Clinical Psychology, The Chicago School of Professional Psychology, Los Angeles, CA., USA.
[4]Division of Human Development, Global Growth Institute, Inc., San Clemente, CA.
[5]Department of Orthopaedics, Fundación Universitaria Sanitas Bogotá D.C. Colombia.
[6]Division of Personalized Pain Therapy Research & Education, Center for Advanced Spine Care of Southern Arizona, Tucson, AZ, USA.
[7]Department of Orthopaedics, Universidade Federal do Estado do Rio de Janeiro, Brazil.
[8]Division of Genetics, Department of Cell and Molecular Biology and Microbiology, School of Science and Biotechnology, University of Isfahan, Iran.
[9]Department of Psychiatry, Case Western Reserve University, School of Medicine, Cleveland, OH, USA.
[10]Division of Addiction Research & Education, Center for Exercise Sports, Mental Health, Western University Health Sciences, Lebanon OR., CA, USA.
[11]Institute of Psychology, Eötvös Loránd University Budapest, Hungary.
[12]Department of Psychiatry, Boonshoft School of Medicine, Wright University. Dayton, OH, USA.
[13]Department of Psychiatry, Human Integrated Services Unit, University of Vermont Center for Clinical & Translational Science, College of Medicine, Burlington, VT, USA.
[14]Division Of Personalized Medicine and Neuromodulation, Sunder Foundation, Palm Springs. CA, USA.
[15]Division of Personalized Neuromodulation, PEAKLOGIC, LLC., Del Mar, CA, USA.
[16]Division of Nutrigenomics, The Kenneth Blum Institute of Neurogenetics & Behavior, Austin, TX, USA.
[17]Department of Molecular Biology, Adelson School of Medicine, Ariel University, Ariel, Israel.
[18]Division of Personalized Neuromodulation, PEAK LOGIC, LLC., del Mar, CA, USA.

*Corresponding: foojanzeine@gmail.com
**co-corresponding: drd2gene@gmail.com

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ABSTRACT

Self-awareness and identity development are fundamental aspects of human cognition, shaping an individual's perception of self and their interaction with the world. Awareness Integration Theory (AIT) offers a structured approach to fostering self-awareness and identity formation by integrating cognitive, emotional, and behavioral processes. This paper explores the multifaceted nature of self-awareness as a developmental milestone influenced by psychological, cultural, and neurobiological factors. Drawing from Erikson's psychosocial development framework and contemporary research, we examine how self-identity evolves across the lifespan and the role of introspection in identity consolidation. We discuss the impact of social and cultural influences on self-concept, emphasizing the interplay between personal beliefs and external societal expectations. Furthermore, we investigate the neurobiological underpinnings of self-awareness, exploring genetic factors and the role of neural networks such as the Default Mode Network (DMN) in self-referential thought processes. The article also discusses different concepts of self as defined based on philosophical accounts, psychological, and cognitive as well as neuroscientific data on self and self-reference is complementary to AIT's approach. Additionally, we introduce AIT as a comprehensive psychotherapeutic model that facilitates self-exploration and integration. By synthesizing insights from cognitive-behavioral therapy, existential therapy, and neuroscience, AIT provides a pathway for individuals to achieve self-cohesion and personal growth. Understanding the mechanisms underlying self-awareness and identity formation has profound implications for psychological well-being, therapeutic interventions, and overall life satisfaction. This paper calls for continued interdisciplinary research to refine our comprehension of self-awareness and its potential applications in mental health and human development.

Keywords: Self-identity, Awareness Integration Theory (AIT), molecular neurobiologic correlates, genes, dopamininergic pathwys, GWAS, pharmacogenomics.

Introduction

Self-awareness is the human capacity to become one's object of attention, actively identifying, processing, and storing information about oneself[1] opening the path for developing identity, a sense of self, and an amalgamation of one's experiences, relationships, values, and beliefs[2]. Developing identity and self-awareness is a *homo sapiens* characteristic that involves complex processes of physical, cognitive, and psychosocial domains. Unique to the human species, these developmental markers are impacted by contextual influences such as culture, social norms, mental cognition, and neurobiological evolution, timelining from infancy with the potential to continue through life. Multifunctionality of self-identity and self-awareness play an integral part in life, vital in building life skills, processing and regulating emotions, sensing a feeling of belonging and sources of meaning, optimizing functioning in society, and ultimately helping the individual navigate life's challenges with minimized harm.

Development and maintenance of self-awareness are crucial for preserving human agency capacities such as body and mind equilibrium, autobiographical memory preservation, and emotional regulation, even in the face of impairments in higher-level cognitive processes. Although limited, current research hints at the possibility that self-awareness resilience may be a preventative measure against developing dementia, underscoring the urgent need for further research[3]. Recognizing the importance of such developmental milestones and their lingering impact on one's optimum functionality throughout life necessitates scientific efforts to investigate the inner structure and intricate parts better to understand its nuances and challenges in achieving an optimal state of being.

Identity development, a multifaceted developmental process, comprises forming a sense of self and understanding their place in the world. It begins with self-awareness during the early years of a child's life and progresses through adolescence. Notably, Erikson's bio-psychosocial approach has influenced many fields of investigation, including gerontology, personality development, identity formation, life cycle development, and others. Development of strong self-worth between the ages of 6 and 12 contributes to positive identity formation, highlighting that children develop competence and a sense of self-worth through mastering tasks[2]

The Psychological construct of self-identity is a spectrum heavily influenced by culture, which fundamentally and inherently stands at its core. The conception of 'self' is distinctly western, which means defining oneself in terms of one's internal thoughts, feelings, and actions and not in terms of the thoughts, feelings, and actions of others. As conceived by theorists since[4] this includes an ongoing sense of self-awareness (the 'I' self) and the capacity for complex self-representations (the 'me' self or the mental representations) that constitute one's identity. Together, these self-contents and processes make self-evaluations possible; in other words, the 'I' is needed to evaluate the 'me,' highlighting the significance of introspection in forming an identity.

Cognitive processes in humans serve as multifunctioning tools to help the survival of the fittest, keeping humans alive while self-regulating themselves as demanded by evolution. Continuously upgrading emotions heightens perspectives, beliefs, and emotions to handle newfound unknown elements and achieve self-satisfaction. Because cognitive processes are such important survival and progressive tools, it is vital that scientists intensely examine and explore various aspects of self-awareness and self-identity processes[5]. The need for a deeper understanding of the mechanistic and subjective perspectives underscores this urgency.

PURPOSE OF THE STUDY: From a multidisciplinary perspective, our study investigates the profound impact of social and cultural influences on self-concept, highlighting the dynamic interplay between personal beliefs and external societal expectations while investigating the neurobiological underpinnings,

genetic factors, and the role of neural networks in its formation. Further investigation will include the philosophical perspectives, psychological, biocognitive, and neuroscientific evidence, and how the components of self, such as awareness, referencing, and identity, experience evolutionary imprints in developmental adaptation. Finally, through perspective mapping, the authors will explore the AIT's perspective on how healthy integration of various components of self can enhance the adaptability and integrity of this vital transformation.

SCOPE OF THE STUDY: This investigative perspective integrates various components of disciplines and scientific research evidence to discuss several important aspects of self-awareness, self-identity, evolutionary introspection, and applying the Awareness Integration theory as a theoretical and conceptual framework of this jigsaw puzzle. The scope will also include an attempt to explain that all these diverse processes in forming self-identity are indeed the works of interoception and metacognition under the umbrella of self-awareness. Part of this scientific endeavor involves breaking reality into smaller components to understand its mechanisms better and then reassembling its pieces. However, the approach indicated here does not replace the need to examine individual self-awareness processes separate from self-identity to understand its role in other developmental mapping better. Exploring these together may reveal shared mechanisms and interactions that could be harder to identify in isolation. A critical limitation of the current review is the lack of substantiation of evidence from across disciplines, with few studies directly comparing the degree and timing of each contributory factor. Although such studies are scarce, we hope the current work will motivate researchers to pursue this further. Importantly, this transdiagnostic approach may also have significant implications for clinical practice, inspiring hope for improved mental health patient outcomes when challenged with deficits or distortions.

METHODOLOGY: Conducting a comprehensive review of related peer-reviewed articles using standardized search engines such as PsychINFO, PubMed, Google Scholar, and Web of Science Databases, we identified relevant articles on topics, including the "Awareness Integration Theory," "Biocognitive psychopathology of self-identity formation," Genetic foundation of self-awareness and self-identity," and "Biomarkers and evolutionary components of identity development" were reviewed and synthesized to compile this perspective paper. To eliminate duplicity and maintain uniformity in the definition of SES, academic achievement, and various contributory factors, the authors exercised extreme caution to prevent unintentional bias. The initial search for scientific peer review relevant to research produced 120 articles, which were screened again for inclusion and exclusion criteria. The authors concluded the search by selecting 92 articles that met the scope and objective of this multidisciplinary compilation of scientific evidence.

Literature Review: A Multidisciplinary Substantiation

Human development comprises many complex milestones that optimally should come together, helping the individual with improving conditions while ensuring optimal survival. Among all the developmental milestones, self-identity and self-awareness are intertwined and essential parts that start in early infancy and continue thereafter. Although both concepts have been the subject of many great philosophical and psychological research investigations, there has not been an adequate amount of neurological and clinical studies that could shed brighter light on the internal mechanism and relevance to the human psyche. This paper highlights the importance of such investigation as both developmental milestones are essential in overall human development.

Self-awareness enables the individual to objectively observe the inner self as an objective source to become more aware of its implicit and explicit messages, rendering it even more complex and enigmatic since religion, philosophy, and, more

recently, science provide different answers to objective questions. The recent interest in the scientific understanding of these developmental milestones has revealed this process as an emergent phenomenon occurring in different complex cognitive and neuro-coded templates. This complexity is encouraging, suggesting a promising future for scientific discussions and the creation of alternative frameworks to gain a deeper understanding of this phenomenon in health and psychopathology[6]. The potential for future research to fill current gaps in the literature is a reason for optimism in the field. This paper delves into the complexity of these milestones and emphasizes the importance of such research, as both developmental milestones are vital for overall human development.

PSYCHOLOGICAL ASPECT OF IDENTITY FORMATION

There are a number of ways people learn about themselves to answer the age-old question, "Who am I?" To answer the question, "Who Am I?", an individual can 1) consult the physical world, 2) compare themselves with others (social comparison), 3) incorporate the opinions of others toward them (reflected appraisals), 4) look inward (introspection), and 5) examine their behaviors within the context in which it occurs and draw an appropriate inference (self-perception and attribute). The self is fluid and ever-changing, flourishing despite core beliefs we create for each other, which appear to be the self from which we operate. As pointed out by Brown[7], *homo sapiens* search for self-knowledge and begin to understand the role of culture in our social identities.

Erik Erikson's theory of psychosocial development defines development in eight stages of social interaction, mired by conflict and competency challenges, yielding either success in achievement or failure in crisis. The initiation of exploring different elements of identity development may start in middle childhood; however, according to Erikson's fifth stage of development, the primary task of adolescents is to work through the process of identity development as an individual and social phenomenon—understanding self and participation in their social systems. Adolescents become more self-conscious about the changing patterns in their identity formations as they tinker with various identities and ideas about self. Identity formation is a lifelong process that starts as a focus for adolescents when they autonomically start to explore the various options for life's goals, values, and beliefs to which they are willing to commit. The process will reach consistency by the person and others over time[8].

CONTEXTUAL FACTORS

Cultural and societal norms play an essential role in how an individual perceives life experiences and uses them as various sources of identity[9]. It is essential to an individual's survival to explore an identity formation that best defines and accepts them, as belonging is vital to the human psyche. Through heightened self-awareness, one can assess the ability and willingness to model themselves to be accepted in the environment where they choose to dwell and thrive. Ultimately, culture and social standards interconnect to the individual's self-awareness of how the culture and context impact their thoughts, behaviors, and values[10]. Conscious cultural conformity is key to acceptance, leading to self-identity that reflects the facts collected through self-awareness.

Urie Bronfenbrenner's Ecological Systems Theory[11] is pivotal in understanding child development. It delineates how various ecological systems (microsystem, mesosystem, exosystem, macrosystem, chronosystem) play a crucial role in shaping a child's growth. These systems, by exposing children to diverse values, cultures, and experiences, significantly influence their identity development. A crucial part of this development is the journey of self-discovery, questioning, and testing that children often navigate. This journey helps them integrate various aspects of themselves into a unified whole, establishing a cohesive sense of identity. The authors also introduced the complexities of the "I" and "me" selves as a

cognitive phenomenon from which humans operate. The narrative further explored the fluid and ever-changing concepts of self, including self-identity, self-awareness, and self-consciousness. The processes involved in understanding the self depend on reflexivity and involve self-reflection on influences outside the self.

Lawrence Kohlberg's Theory of Moral Development[12] emphasizes moral reasoning development, which is interconnected with identity development and has heuristic value across our lifespan. As children progress through stages of moral reasoning, their understanding of right and wrong influences their sense of self and values. Tajfel and Turner[13], the originators of the social identity theory, state that group membership influences a child's identity. Children explore the possibility of different roles, interests, and values to establish their identity, and they develop a social identity based on belonging to specific groups (e.g., gender, ethnicity, religion), which can significantly shape their self-concept and interactions with others. Moreover, family, culture, community, religion, peers, and experiences, in their diverse forms, shape this process, underscoring the complexity of identity development[14].

NEUROBIOLOGY FACTORS

Despite a noticeable gap in the clinical research literature on the specification of the multi-faceted nature of self-awareness and self-identity formation, recent scientific discoveries have pointed to its function as a mental process using neuro-cognition. Such a process requires the individual to self-examine thoughts, beliefs, and behavior, suggesting the presence of a biological and neurocognitive activity. Thus, these mechanisms must have experienced some elaboration through the evolutionary processes. The necessity for this evolutionary elaboration is particularly relevant to understanding the evidence for self-awareness across different species. Even the simplest organisms can self-monitor for regulatory purposes, but more complex nervous systems potentially allow higher-order, recursive self-awareness abilities[15]. The cross-species pattern of self-regulation may also hint at its emergent property observed in different cognitive complexity, requiring a complex coding mechanism. The mere hint that the path to this hierarchical neurobiology evolution of self-awareness formation is convincing enough to encourage new conversations in the future and psychopathology fields to fill the existing research gap and shed a deeper understanding of this mechanism of such development.

Awareness Integration Theory and Components of Self

Awareness integration theory (AIT) is a multi-modality psychotherapeutic and educational model that enhances self-awareness, releases past traumas and psychological blocks, and promotes clarity and positive attitudes[16]. AIT was created by synthesizing information and techniques from previous therapeutic models such as cognitive behavioral therapy (CBT), existential therapy, person-centered therapy, emotion-focused therapy (EFT), and mind-body therapy (MBT), as well as eye movement desensitization and reprocessing (EMDR) and hypnosis. AIT incorporates various aspects of these treatments into one efficient, open-structured model encompassing all human experience to maximize its effectiveness and create enduring results[17].

Butterworth[18] suggested that self-knowledge begins early in life, the various aspects of self are within an individual, and the information overlaps. The three aspects of self-awareness that apply to AIT, as articulated by Butterworth, are (1) differentiation between self-nonself, (2) a sense of volition, and (3) the perceived continuity of the self over time. These aspects represent the beginning of the creation of the self and the self-awareness that one is a distinct and unified entity, continuous over time, capable of willful action. Likewise, object relations theorists such as Bowlby[19] proposed that without interpersonal experiences, the formation and development of the self are not possible.

Self-development depends on others; without others, the self does not exist. Discovering one's

uniqueness while acknowledging similarities and important bonds with others is essential to identity development[20]. Both aims require understanding the self in a social context where one comes to know oneself from relational feedback while using this information to guide behaviors intended to build and maintain interpersonal bonds[21]. Due to this fact, AIT aims to explore one's self-identity in every area of life, including relationships with strangers, acquaintances, friends, colleagues, finance, past intimate relationships, sexuality, current relationship/ marriage/ divorce, children, sibling, mother, father, significant person in life, self, body, illness, addictions, nature/universe, God/spirituality, and death[17].

THE AWARENESS INTEGRATION THEORY NINE FOUNDATIONAL PRINCIPLES

The AIT model is based on nine comprehensive principles that create a foundation for its structure, mechanism, applicability, and execution. These principles explain and support why the design of AIT as a theoretical learning model is practical, universal, versatile, and applicable to any area of human development and self-improvement. By following these principles, individuals can learn life skills and empower themselves with proficiencies, feeling motivated and inspired. Here is the narrative of the nine principles[17].

1. Reality is the experience of the observer.
2. Humans have the capability and potential to learn skills.
3. Skills humans need to enjoy happy and successful lives are learned.
4. The human mind perceives and creates meaning internally for all external stimuli.
5. Human beings store experiences that are unintegrated and awaiting integration.
6. The unintegrated belief-emotion-body state has the potential to be positively integrated.
7. One can choose a positive attitude to create a new, positive reality.
8. New skills can be learned and practiced in a neutral and positive environment.
9. Conscious intentionality increases achieving desired outcomes across all areas of life.

REALITY IS THE EXPERIENCE OF THE OBSERVER. Reality is the experience of the observer. Every human being perceives and creates their reality based on their state of being -- beliefs, emotions, and behaviors. Human beings are the co-creators of reality. Information received becomes personal and, if perceived as related to reality, is fundamentally shaped by each observer's experiences. Every individual crafts their unique reality, influenced by their beliefs, emotions, and behaviors. We are all co-creators of our realities. The information we encounter becomes personal, gaining significance when related to our sense of self, leading us to store it in our minds. Our interactions with others directly affect how we construct our mental landscapes[17].

The experiences tied to self-concept determine what information we accept and how we process that information. Our evolving identity—constructed from past experiences—plays a critical role in interpreting the present moment, equally weighing in alongside the present itself. The concept of "self" embodies a warm sense of connection, suggesting that something resonates as "about me" or "about us." Engaging in self-reflection is both a routine practice and a profound mental exercise. It requires the presence of an "I" that can contemplate an object that is "me." This concept of self includes both the thinker ("I am thinking") and the object of thought ("about me")[17].

To elucidate these three dimensions—thinking, awareness of that thinking, and self-reflection—we can refer to them as reflexive capacity[22]. Instead of distinguishing between the substance of thought (the "me") and the cognitive process (the "I"), contemporary discussions embrace a unified concept of self that integrates both the "I" and the "me." Embracing this understanding can empower us to deepen our insights and enhance our personal growth. "I" self becomes significant and stored. Interpersonal experiences directly influence how we mentally construct reality. Experience, as related

to the "I" self, can shape not only what information enters the mind but how the mind develops the ability to process that information. The identity we have stored as a continuum identity from the past dictates how we perceive the present as much as the present itself. The term self often refers to a warm sense or a warm feeling that something is "about me" or "about us." Reflecting on oneself is both an everyday activity and a mental feat. It requires that there is an "I" that can consider an object that is "me." The term self includes both the actor who thinks ("I am thinking") and the object of thinking ("about me"). Another way to denote these three aspects (thinking, being aware of thinking, and taking the self as an object for thinking) is to use reflexive capacity[22]. Rather than distinguish between the mental content (me) and the aspects of the mental capacity of thinking (I), contemporary use of the term self includes the "I" and "me."

Human Potential and Capability to Learn Skills

Every human being has the capability and potential to learn the skills to live an enjoyable, happy, functional, and successful life. The "self" is an open and dynamic system constantly exchanging information with a changing environment, allowing change to be possible—and because change is possible, improvement is possible.

SKILLS HUMANS NEED TO LIVE FULFILLMENT AND HAPPINESS

The skills humans need to enjoy happy and successful lives are learned through physical, psychological, and social development, one's own experiences, mirroring parents, teachers, peers, media, and culture. If the operating mechanisms of the Self are to be better understood, it will be necessary to keep sight of the Self's intrinsically social nature. The Self is the product of experiences acquired through interaction with others. The Self summarizes, stores, and makes accessible information about the interpersonal world and one's place in it. The Self guides our movement throughout and activities in the social world to be expeditious and satisfy basic motives and goals; the fundamental adaptation of human evolution has been the ability to live and work in relationships with others[17].

From an evolutionary perspective, the functions served by social relationships have been central to the design of the human mind. So, first, there is the creation of the Self, followed by awareness and development of the Self. An infant distinguishes between himself and the world. In early childhood, he applies age and gender to the Self and thinks of themselves regarding their observable and verifiable characteristics. In middle childhood, he describes the Self more broadly and refers to more social characteristics[23].

As Mead[24] proposed in the symbolic interactionism theory (SIT), how others view the Self becomes a vital ingredient of the Self. This view of self-development occurs throughout the lifespan (infancy, early childhood, middle childhood, adolescence, and adulthood), as evidenced by the perspective on how the Self is perceived in the existing literature.

The following highlights theoretical perspectives on the Self and its implications:

- Adolescence is when one begins to evaluate and distinguish the Self that might be different from the Self he created based on his parents or society.
- Going toward young adulthood, one begins to commit to a created self.
- The fundamental premise of attachment theory is that mental models of Self, which operate inside and outside of awareness, are shaped by experiences with caregivers[19].
- A firm understanding of the Self is complex without relating it to others.
- Piaget's stages of cognitive development further explain the development of the Self as the child develops a representational thought process, plays different roles, which becomes central to the development of the Self, becomes more logical in thinking, and sees perspectives that are different from their own.

- Erikson's eight sequential stages build a psychological and emotional need that must be met as one develops. When needs are unmet, individuals separate, get stuck, and learn coping mechanisms to fulfill them.
- Cooley[25] explained the perspective-taking process, which is based on how data are collected from the behavior of others toward us. We introject and base our self-perceptions on others' behaviors.
- Mead[24] proposed that the acquisition of the Self is directed by verbal and non-verbal communication with others; thus, social interactions are essential to the emergence of the Self.
- Mead[24] insisted that to be socialized, one must adopt a societal view of oneself and create multiple perspectives for others.

THE HUMAN MIND PERCEIVES AND CREATES MEANING INTERNALLY FOR ALL EXTERNAL STIMULI.

The human mind constructs and assigns meaning to all external stimuli, leading to a subjective reality that may differ from the actual events and the realities of others. This subjective reality gives rise to formulas, beliefs, and personal identities that connect to self, others, and the universe and are established in the early stages of life[26]. These self-constructed identity markers encompass traits, characteristics, social relations, roles, and social group memberships allied with an individual's reactions to an experience in a cognitive process regulated by dopaminergic activation, which makes up the person's narration of who they are. Identities can be rooted in the past (what was once perceived as accurate), the present (what is currently true), or the future (the person one expects or wishes to become, or tries to become, or fears one may become)[17].

THE HUMAN MIND PERCEIVES AND CREATES MEANING INTERNALLY FOR ALL EXTERNAL STIMULI.

Human beings store experiences cognitively, emotionally, and somatically as unintegrated experiences awaiting integration. Shapiro[27] stated that most pathology stems from earlier life experiences, which set in motion a continued pattern of affect, behavior, cognitions, and consequent identity structures. The pathological structure is intrinsic to insufficiently processed information stored during the disturbing event. Negative core beliefs, including the emotions they produce and the area of the body that experienced the emotions during the original incident, repeatedly resurface in automatic thinking. Siegel[28]demonstrated that repeated neural activation patterns may become engrained and more likely to be reactivated. These negative core beliefs create a withholding and survival-based attitude. Triggered by an event, this attitude prohibits individuals from achieving optimal potential beyond survival, even when there is no real threat, holding them back from living a fulfilled life. While theories converge on the notion that reflexive capacity is critical to having a self, theories diverge in how memory is considered in service of sustaining the self.

On the one hand, the self can be considered primarily a memory structure, such that an aspect of the self exists outside of particular contexts and social structures. In contrast, the self can be considered primarily a cognitive capacity such that what constitutes an aspect of the self is created and embedded within moment-to-moment situations. From the latter perspective, what is stable is not recalled content but rather the motivation to use the self to make meaning; memory is used, but the self is not stable. What is the origin of the divided self? How do individuals develop identities so differentiated across roles that they do not form a coherent and unitary self? Many theories of the self postulate that the self-concept emerges and is shaped through social interaction with significant others. Thus, the origin of the divided self may lie in conflicted or disrupted relationships within the family. In particular, children and adolescents who experience continual conflict and distress within the family system may fail to integrate their various relationship experiences into a coherent self. College students grapple with their identities and are known to experience stress and high levels of

anxiety[29,30]. A study on divorced and separated individuals showed that integration of self through the AIT intervention theoretical model helped reduce depressive moods by 27.5%, feeling less anxiousness by 37%, increased self-esteem by 15%, and boosted self-esteem by 13%, demonstrating the importance of a coherent self[31].

THE UNINTEGRATED BELIEF-EMOTION-BODY STATE HAS THE POTENTIAL TO BE POSITIVELY INTEGRATED.

As the unintegrated belief-emotion-body state is attended to, released, and integrated into the whole system, neutral and positive attitudes, beliefs, and emotions can be experienced. Siegel[28] believes that small changes in perspective, beliefs, or associations of particular forms of information processing can lead to significant changes in state of mind and behavior. The principle of EMDR also shares Siegel's perspective that an adaptive resolution may occur if the innate processing system in the mind is activated when a traumatic memory is accessed[27], indicating that the mind can adapt to traumatic events and change undesirable behavior and cognition. The self-complexity model assumes that knowledge about the self is represented in terms of multiple cognitive structures, referred to as self-aspects[32], consistent with various theories that view the self as multi-faceted. For instance, a woman might think of herself in terms of various social roles (lawyer, friend, mother), kinds of relationships (colleague, competitor, nurturer), types of activities (running, playing tennis, writing), superordinate traits (hard-working, creative), goals (career success), and so forth.

Each role, relationship, activity, goal, and superordinate trait in the self-representation may serve as a self-aspect, each with its features, propositions, and effects. These self-aspects are assumed to be structures in a more extensive associative network. Not all self-aspects are activated at any given time. Instead, specific self-aspects are activated depending on the context and associated thoughts, their relation to currently activated self-aspects, and their recency and frequency of activation. The self-complexity model assumes that the current effect is a function of the effect associated with recently activated self-aspects. These recently activated self-aspects include those activated by recent events and those activated by the spillover process or other cognitive processes such as recalling past experiences. Thus, the model leads to the self-complexity-affective extremity hypothesis: People lower in self-complexity will experience more significant swings in affect and self-appraisal in response to life events[32].

ONE CAN CHOOSE A POSITIVE ATTITUDE TO CREATE A NEW, POSITIVE REALITY.

An individual can choose a positive attitude to create a new reality through self-awareness, integrating experiences, and conscious choices regarding beliefs, emotions, and actions. The self is considered helpful because it feels like a stable choice anchor[33]. Horney[34] stated that the capacity for clear and conscious renunciation is rare because feelings and beliefs are muddled. Because AIT allows for personal growth and awareness, renouncing one's previous beliefs in favor of newly chosen beliefs is possible. To this point, we have considered behavioral and social factors that allow individuals to acquire and maintain positive self-views. Processes of a more psychological nature are also relevant. These processes center around the unbalanced way people deal with positive and negative self-relevant information[35].

NEW SKILLS CAN BE LEARNED AND PRACTICED IN A NEUTRAL AND POSITIVE ENVIRONMENT.

New skills can be learned and practiced in a neutral and positive environment to enhance one's capabilities, experiences, results, and relationships. AIT is not primarily skill-based or goal-oriented but emphasizes teaching clients the skills they need to survive and be happy[17]. People feel they know themselves since they have much experience with themselves and a vast store of autobiographical memories[36]. This feeling of knowing is essential even though the assumptions on which it is based are often faulty. Identities are not the fixed markers

people assume to be but are dynamically constructed now. The self is both a product of situations and a shaper of behavior in situations. Making sense of oneself, one is, was, and may become, and therefore, the path one should take in the world is a core self-project. Self and identity theories assume that people care about themselves, want to know who they are, and can use this self-knowledge to make sense of the world. Self and identity are predicted to influence what people are motivated to do, how they think and make sense of themselves and others, their actions, and their feelings and ability to control or regulate themselves[37].

CONSCIOUS INTENTIONALITY INCREASES ACHIEVING DESIRED OUTCOMES ACROSS ALL AREAS OF LIFE.

Conscious intentionality and envisioning a desired result, combined with effective planning and timely scheduled action plans, raise the probability of achieving one's desired results in all areas of life[17]. Pinker[38] defined intelligence as the ability to attain goals in the face of obstacles through decisions based on rational (truth-obeying) rules. An example that reflects the importance of self-planning is best reflected in the case of an eleven-year-old looking up into the ceiling from his bed and asking the age-old question,? He asked: *"What is the purpose of my life?" Oh, just three things -win the Nobel Prize in medicine, pen a Pulitzer award-winning book, and of course win an Oscar.* Whether or not all these accomplishments are met is a blueprint for success.

Internal Working Mechanism of AIT on Achieving Life Satisfaction

The goals of AIT and the directed reflective process are to foster awareness and to integrate all divided parts of the self from the past into the present. By this goal, one can become responsible and accountable for their way of thinking, perceiving, assuming, feeling, behaving, and their attitude's impact on their life and others. The primary method of AIT involves distinguishing between one's thoughts, feelings, behaviors, and the impact of one's attitude; identifying one's negative and/or irrational core beliefs; the formulas one has created to operate within one's life; and the self-identities they have created, sustained, and operated. AIT allows for the awareness and insight of how one's beliefs and behaviors might not be aligned with one's intention and, therefore, the created result. AIT also allows the release of emotional and somatic charges that remain from unintegrated experiences and memories and the dismantling of negative core beliefs[17].

Six phases direct and guide AIT; each has questions or instructions and an intent specific to that phase. Since the self differs in various roles, one is directed through all six phases, exploring different areas of life, including careers, relationships, families, childhood, body, nature/universe, death, God and spirituality, and other significant areas, primarily related to one's current life. As one becomes aware of a negative core belief and experiences high intensity of emotion whilst maintaining attachment to that belief, through phase four (4), one is guided through a connection to the original event that they created the core belief about themselves or others. Through this connection of mind, body, and emotions and releasing their obstructing emotions, traumas, and associated negative beliefs, one can have access to all available skills and resiliency in the present time, integrate all divided selves, and hold both vulnerabilities and strength as an important and valuable asset.

PHASE I: Designed to induce awareness of the client's perceptions, emotions, and behaviors regarding their external environment and relationships with others, and how those constructs impact their lives.

PHASE II: Encompasses three functions: (1) To create awareness of one's projections of others' opinions and feelings about them; (2) To enhance one's ability to observe others' behavior towards them and to observe the meanings they attribute to that behavior; (3) To identify ways in which these constructs impact one's life. Applicable to this phase can be supported by one of the early and comprehensive theories of the self by James[4], who

distinguished between the "I," the subjective knower, and the "me," the object that is known. Later, Cooley[25] emphasized the fundamentally social nature of the Jamesian self, asserting that any reference the "I" makes to the "me" inherently places the self in a social context as the object of perception, regardless of whether perceivers are specific or vague, real, or imagined. To Cooley, this "looking-glass self" had three components: (1) how we imagine others see us, (2) how we imagine them to judge what they see, and our feelings about what is seen, such as pride or embarrassment.

Mead[24] expanded Cooley's view, crediting the social environment with an even more significant role. He theorized that one comes to know the self through social interaction and that social experiences shape the self. (3) the self is inextricably relational. From birth, interactions with parents and other caregivers profoundly affect selfhood. Throughout development, the self becomes internalized and less malleable, but it still is influenced by and exerts influence on relationships with other people. This process will allow one to become aware and responsible for relating to others, living their life inside their assumptive bubble, and possibly never reality check. One can live a lifetime of low self-esteem due to assuming that their parents did not love them and never communicate to find out the true beliefs and emotions of their parents toward them.

PHASE III: Aims to foster awareness of one's beliefs, emotions, and behaviors about oneself concerning each area of life, considering the self-identity that interacts with and responds to various areas of life, which is the most critical phase because it is directed toward one's identity awareness in different roles. Questions asked to capture one's core beliefs about the self. Self and emotion are inextricably linked. The experience of self is shaped by a constant and ever-changing flurry of emotions, such as passion, and feelings of pride, shame, and other emotions could not exist without perceptions and evaluations of the self[39]. A special class of emotions (self-conscious emotions) critically involves the self (e.g., embarrassment, guilt, pride, and shame). It plays a central role in motivating and regulating people's thoughts, feelings, and behaviors[40,41]. These emotions drive people to work hard in achievement and task domains[42,43] and to behave in moral, socially appropriate ways in their social interactions and intimate relationships[44,45,46].

As a result, self-conscious emotions are vitally crucial to various social outcomes. Guilt is centrally involved in reparative and prosocial behaviors such as empathy, altruism, and caregiving[47,44,48]. Shame mediates the negative emotional and physical health consequences of social stigma[49] and is associated with depression, chronic anger, and narcissistic, antisocial, and borderline personality disorders[50,51,52,53]. Pride motivates moral and prosocial behaviors[54], and is the emotion (along with shame) that gives self-esteem its affective kick[39]. One theory that puts social relations at the core of the self is Leary and Baumeister's[55] sociometer theory. Building on the "need to belong," an evolved drive exists in the self to ensure that individuals avoid social isolation, proposing that self-esteem is an innate mechanism for checking one's social standing.

PHASE FOUR: Guides the individual to take a negative core self-belief from a divided self-identity, simultaneously experiencing the connection between thoughts, formulas, and schemas with emotions and the body areas that maintain and reflect intense emotions. This process also links the associated memories to the belief system. Irrational thoughts, decision-making, beliefs, formulas, and schemas can be challenged, reframed, and replaced with realistic and positive thoughts and beliefs. In this integration process, one allows the release of negative core beliefs, hidden intentions, shadows, and emotions locked in the body. This process also allows one to develop the ability to be with, tolerate, and manage emotions effectively. This phase is the most complicated area of AI because core beliefs may sometimes fit into a more complex formula.

This phase supports and teaches self-regulation, an act of self-control by which the self alters behavioral patterns to prevent or inhibit its dominant response. People may sometimes give in and perform forbidden behaviors because they lack the strength, energy, or other inner resources to restrain themselves. If acts of control deplete the resource until it is replenished, circumstances that require continuous self-control may also lead to a breakdown in self-control. Self-control is the exertion of control over the self by the self. Self-control occurs when a person (or other organisms) attempts to change how they would otherwise think, feel, or behave. Self-control involves overriding or inhibiting competing urges, behaviors, or desires [56,57,58]. Because the self already has specific characteristics, including thinking, feeling, and behaving, changing the self requires overriding those preexisting patterns and responses of thought, emotion, and behavior. The resource needed for self-control is a limited, consumable strength, much like a muscle's ability to work. Coping seems to involve processes that demand inhibition, such as blocking sensations, overriding thoughts, and stopping emotions[59], as well as shifting attention and denial[60].

Self-regulation is substantially impaired among people who have just received news of social rejection or future exclusion. Self-regulation was measured in terms of consumption, persistence, and attentional control, and the convergence across these very different types of self-regulation points to a general impairment of the capacity for self-regulation. Past work has shown that socially excluded individuals exhibit increased aggression, poorer intellectual performance, a loss of prosocial behavior, and susceptibility to self-defeating behavior patterns. At the societal level and multiple points in history, groups and categories of people who have felt excluded by the dominant culture have shown sadly similar patterns as reflected in high crime rates, underperformance in schools and intellectual life, withdrawal from positive contributions to the general societal good, and elevated rates of substance abuse, suicide, and other self-destructive patterns. The present findings suggest a common underlying process. Effective self-regulation allows individuals to control and alter their behavior to resist temptations, stifle socially undesirable impulses, follow rules, pursue enlightened self-interest despite short-term costs, and positively contribute to society. Individual self-regulation is essential to one's well-being and that of others. Messages of rejection or exclusion can cause people to be less willing to make the exertions and sacrifices needed for effective self-regulation, with potentially tragic results for themselves and others.

PHASE FIVE: Geared toward one's chosen values to create an individualized mission statement for themselves to sustainability. Encouragement of a commitment to think, feel, and behave to actualize a chosen value system brings forth a more adaptable attitude, evolving into a new identity. This new commitment identifies and schedules short- and long-term goals and tangible action plans for a desired outcome. One identifies acquired skills vs. skills that need improvement. Choices, large and small, feel identity-based and identity-congruent. Higgins's[61] self-discrepancy theory describes two significant components of self-evaluation. In one, the actual self (attributes one believes they possess) is compared to the ideal self (attributes a person would ideally wish to possess). On the other, the actual self is compared to the ought self (attributes that a person believes others want them to possess). One can also choose an ideal self by evaluating what works best.

PHASE SIX ENCOURAGES CREATING sustainable reminders such as collages, paintings, pictures, statues, graphs, and audio or video recordings. Participants can also obtain an accountability buddy to support them in actualizing their goals.

Molecular Neurobiology of Self & Identity and Self-Transcendence (Awareness)

With the ever-increasing catastrophes (climate change, foreign and domestic terrorism, war,

population displacement, quarantine for the viral pandemic), humanity is constantly facing prompts from the masses to seek ways to enhance one's coping mechanisms, such as religion and spirituality. Neurological connections between spirituality and reward genes, reward deficiencies (RDS) (hypodopaminergia), the mirror neuron system, and the default mode network have been examined[62]. One new area of interest involves genetic engineering, which posits the possibility of augmenting the human spiritual and religious experience, impacting one's daily challenge to survive and begging for new ways to induce happiness[63]. These days, everything from intelligence to developing superhero bodies can be a medical genetic engineering target. Tucker et al.[64] demonstrated the possibility of genetic editing to modulate motor activity, increase metabolism, decrease body weight adiposity, and alter longevity in rodents.

Even if scientific advancements allow for alterations in gene expression (influenced by ribonucleic acid, RNA) to enhance traits like self-awareness, the impact of environmental factors and changes in gene variant frequencies on shaping individuals cannot be overlooked. While genes are present in every cell throughout an individual's life, their functional expression depends on location- and time-specific triggers, which genes alone cannot provide. These triggers are often non-genetic, arising from internal developmental conditions or external environmental events. Consequently, although unrelated to genes, learned traits can still influence evolution. Like organic traits, socially learned traits can be selected positively or negatively, shaping survival, reproduction, and self-worth[65].

Consistent with dopaminergic gene function that increases pleasure and attenuates stress, Blum., et al.[66] pointed to Hamer's[67] suggestion that the ability of dopaminergic genes to promote innate optimism drives their responsibility for increasing self-worth. Studies have shown that optimism, the "feel-good" sense, relates to the will to keep living and procreating despite death's inevitability. Also, optimism promotes the positive selective value of better health and quicker recovery from disease[68]. In addition, Comings., et al.[69] identified the specific role of the DA D4 receptor (DRD4) gene in Self-Transcendence. The DRD4 gene is associated with Novelty-Seeking (NS), as He et al.[70] indicated. Along these lines, Cohen et al.[71] reported that personality characteristics are linked to dissociable connectivity streams in the human brain. They suggested that fiber tracts between a subcortical network involving the hippocampus and amygdala and the ventral striatum predicted subject differences in NS tracts between the prefrontal cortex. Moreover, the striatum predicted individual differences in reward dependence. These findings suggest that the strength of limbic-striatal connectivity may partly underlie human personality traits and the possibility of self-identity and even self-transcendence. Comings et al.[72] did find that those individuals who scored high on Self-Transcendence were less likely to abuse alcohol or drugs. Comings further suggested that the feel-good nature of dopaminergic neurochemistry may explain why most people derive happiness and comfort from belief in a god and why spirituality has a decisive role in the human condition; however, he asks the question: 'Did man create God?"[72].

Nilsson et al.[73] explored self-transcendence and its subscale spiritual acceptance in 200 people, which was matched for age, gender, and risk behaviors. Among boys, serotonin transporter polymorphism 5-HTTLPR was examined from blood samples. They found that Self-Transcendence and Spiritual Acceptance were negatively correlated with the short 5-HTTLPR genotype and positively correlated with the short AP2beta genotype. Notably, the significant interactive effects between 5-HTTLPR and AP-2beta genotypes concerning self-transcendence measures and spiritual acceptance were discovered among boys and girls. However, the homozygosity for the long AP-2beta genotype combined with the short 5-HTTLPR scored significantly lower on self-transcendence and spiritual acceptance. Moreover, Borg., et al.[74] showed a significant association of the serotonin1A

receptor gene with self-transcendence scale scores and with the substance of spiritual acceptance. Borg's group also reported reduced ethanol binding and increased serotonin levels in those with the highest self-transcendence scores. Bachner-Belman[75] proposed that in a few human studies, serotonergic neurotransmission seemed to mediate the human self-transcendence experience.

THE DEFAULT MODE NETWORK AS A DIRECTIVE

By using new genetic engineering tools in this realm, there could be a trade-off for enhanced self-identity (possibly even ego), such as individuals becoming less 'driven' to seek status, monetary rewards, and selfishness. Selfishness shows excessive concern for oneself and a lack of concern for others. Understanding others as 'ourselves' is a unique function of mirror neurons posited to interact with the default mode network (DMN)[76]. Notably, the mirror neuron system, an execution-observation matching system[77] is believed to be the neuronal basis of all social-cognitive processes. Schmidt et al.[76] revealed an activation in the inferior frontal gyrus, inferior parietal cortex, fusiform gyrus, posterior superior temporal sulcus, and amygdala when investigating fMRI of 75 healthy participants performing imitation, empathy, and theory of mind tasks. It is plausible that their observations supported the assumption that the mirror neuron system is the heart of humanity's interpersonal understanding.

The DMN, initially identified by Hsiao et al.[78] as low-frequency oscillations, is active when the brain is at rest; however, when the brain engages in a goal-directed task, the default network deactivates. The DMN includes but is not limited to the medial temporal lobe, which associates with memory; the medial prefrontal cortex, which affiliates with the posterior cingulate cortex involved in integrating different kinds of internal thoughts with empathy; and normal affect (the ability to recognize others as having thoughts and feelings similar to one's own);[79]. All life starts with biology, so why are humans driven to search for meaning and self-worth? It is unclear if humans are the only animals so driven, but the evolution of the brain capacities necessary for survival can provide some answers. Herculano-Houzel[80] posits that a simple explanation is that the massive augmentation in cognitive capacity has provided humanity with new connectivity patterns and new functions in the expanded brain areas. Notably, the DMN can magnify the romance with self to the point of interference with happiness and function.

Interestingly, the DMN is connected to, and may even result from, the development of language, which enables us to communicate about the non-present[81], the sense of self, mind wandering, mental time travel, remembering past events and of imagining future ones and the ability to share memories, plans, and ideas. The ability to futurethink, project the future onto the now, and perform mental simulations is definitional in a person's evolution. These capabilities are the function of the DMN, but unfortunately, if overactive, they can be affiliated with worry, anxiety, depression, and uncertainties. Thus, the activity of the DMN is reduced when someone is engaged in focused, intentional activity, and DMN activity is augmented when people are idle or at rest. This may be why persistent activity is the norm for humans, unlike animals, even after achieving survival and comfort[82]. Somewhat neglected, we know from the scientific literature that dopamine is connected with self-identity and/or self-transcendence[83]. For example, in the addiction medicine field, the concept of gene editing and subsequent engineering, easier said than done; however, we must wonder, while not as yet accomplished, should this be endorsed and is it indeed prudent in terms of reducing relapse and should it be supported during recovery?

Future Perspective

It is widely recognized that exploring the psycho-social-spiritual and neurobiological dimensions of Self, Identity, and even Self-Transcendence significantly advances our understanding of profound human experiences, such as personality

and the meaning of life. In this context, we emphasize the importance of integrating Awareness Integration Theory (AIT) into treatment programs, preventive strategies, and educational curricula at schools and universities[93]. This approach has the potential to enhance self-esteem and foster personal growth. However, it is important to acknowledge that several mental health conditions, including ADHD, Depression, Anxiety, and Addiction, are linked to heightened activity within the Default Mode Network (DMN). This increased activity is often associated with dysphoria[84,85,86]. Conscious self-awareness and intentionality, however, can influence and potentially regulate or override the DMN.

Anxiety and depression are involved indirectly with a decrease in dopamine tone in the Nucleus Accumbens (NAc) and Ventral Tegmental Area (VTA). However, Tomasi et al[86] have reported that blocking the dopamine transporter (DAT), resulting in an increased dopamine tone, is associated with reducing activity in the DMN and, as such, an accompanying potential reduction of ego. So, there is reason to believe that activities and medications that increase dopamine tone will attenuate the activity of the DMN. One neurobiological example of quitting the DMN is meditation. Clinical investigations have shown that yoga nidra meditation is affiliated with positive physiological changes, including improvements in several hematological variables, red blood cell counts, blood glucose levels, and hormonal status. Two neuroimaging studies have shown that yoga nidra produces changes in endogenous dopamine release and cerebral blood flow, a further confirmation that its effects on the CNS are objectively measurable[87].

Research has shown that Awareness Integration Theory (AIT) is highly effective in alleviating symptoms of depression, anxiety, and PTSD while enhancing self-esteem, self-efficacy, and overall well-being. The Personal Growth Institute evaluated AIT-based face-to-face therapy, reporting a 76% reduction in depression and a 60% reduction in anxiety, alongside a 43% improvement in self-esteem and a 20% increase in self-efficacy[16]. In another study, separated or divorced individuals who participated in a 6-hour AIT workshop demonstrated a 27.5% reduction in depressive moods, a 37% decrease in anxiety, a 15% improvement in self-esteem, and a 13% boost in self-efficacy[31]. With the rise of telehealth, particularly during the COVID-19 pandemic, AIT has proven adaptable to virtual care delivery. Studies on AIT delivered via telehealth reported a 50% reduction in anxiety and a 60% increase in self-esteem[88]. Another telehealth case study recorded decreases in depression and anxiety by 66% and 75%, respectively, and a 66% reduction in PTSD symptoms[89]. A study among American college students using AIT as a self-help model showed a 68% reduction in depression and a 21.72% reduction in anxiety[29].

The global approach to mental health care is shifting toward innovative solutions beyond conventional therapeutic practices. Mobile mental health apps present a unique opportunity to offer timely, cost-effective support while reducing the stigma of seeking help and improving treatment outcomes. In this evolving landscape, the Foojan app has emerged as a groundbreaking telehealth platform, applying AIT principles to deliver personalized, affordable, and accessible mental health support on a global scale. Data from Foojan app users highlights significant improvements of 57% to 62% across various areas of life[90].

We wonder if there was an easy way to control one's DMN via targeting dopaminergic tone, for example, utilizing information and novel techniques that might arise in the future, utilizing neuro links as previously suggested by Blum in his book 'Handbook of Abusable Drugs[91]. However, will reduced DMN activity alone improve one's perception of themselves, or would combining AIT be more beneficial? Such accomplishment may result in positive clinical outcomes. Finally, learning more about the neurobiological and genetic underpinnings of Self and identity seems like a

laudable futuristic approach. Would there be a concurrent increase in love, compassion, tolerance to life, and concomitant peripheral and mental pain?

Blum et al.[92], the research group, is earnestly conducting laboratory research to unravel long-standing neurobiological and genetic underpinnings imposed by today's high-tech world by performing in deep silico pharmacogenomic analyses to help reveal important unknown genetic and epigenetic links. Integrating pharmacogenomics into helping understand psycho-bio correlates of Self and Identity can be a transformative strategy in addressing these challenges. Understanding an individual's genetic profile may allow healthcare providers to tailor psychological management plans, choosing the type and dosage of psychiatric medication that best suits the patient's genetic predisposition. Therefore, pharmacogenomics is ushering in an era of precision medicine that promises to revolutionize how issues across the entire mental health spectrum are addressed. This evolution is driven by recognizing that the one-size-fits-all approach must be reconsidered.

Conclusion

The process of self-awareness is to study oneself as the object of awareness and exploration for multiple developmental purposes such as identity formation, life span self-actualization, and life satisfaction optimization. Although this definition may suggest the idea of a unitary self that acts as both observer and object of awareness, in reality, there is a multiplicity of self-processes included in this self-model, with different features being at the focus of awareness at any given time. Accordingly, self-awareness is not a single unified capacity but rather a variety of processes. These would include, for example, the representation of internal bodily states (i.e., interoception) and declarative personal information about oneself (i.e., autobiographical memory). This multiplicity of self-processes shows that self-awareness can be differentially affected by clinical conditions, with some features, but not others, showing alterations.

The primary aim of this perspective is to highlight the significance of Awareness Integration Theory (AIT) as a transformative tool for fostering an individual's relationship with self and identity. This paper explores how AIT offers a novel and strategic approach when integrated into clinical treatments, educational frameworks, and an accessible, affordable self-help program through the "Foojan" app. Additionally, we discuss how these applied concepts and theories of self-identity principles and phases can contribute to personal growth and well-being. A vital tenant herein posits that applying self-identity theory and concepts through the lens of AIT is an effective and efficient approach to becoming aware of our various self-identities and consciously generating a flexible, adaptable, and workable identity regardless of what life brings forth. As a dedicated clinical and scientific team to provide putative new clinically relevant targets incorporating AIT principles and embracing AIT's six phases to build self-identity, it fosters an effortless presentation of our identity when we are congruent and aims for integration with integrity.

Based on our preliminary pharmacogenomic research and initial findings, we encourage the scientific community to confirm further or refute these Genome-Wide Association Studies (GWAS)-based deep in silico PGx analyses for both self and identity and for personality disorders in general. The pharmacogenomic research shows that following these genetic pathways, most people do the following: (1) uncritically accept positive self-relevant feedback but carefully scrutinize and refute negative self-relevant feedback; (2) show better memory for positive self-relevant information than for negative self-relevant information; (3) recall their past in ways that allow them to lay claim to possessing desired attributes; and (4) engage in introspection about themselves in ways that enable them to confirm the possession of positive traits and disconfirm the possession of negative traits. Self-serving attributions are another factor that helps people maintain positive self-views. One of the most reliable findings in social psychology over

the last 20 years is the pervasive tendency for individuals to make asymmetric attributions for positive and negative outcomes.

The search for self-awareness has been a journey for our species, with answers to this question traditionally provided by religion and philosophy. Cognitive neuroscience of self-awareness has only been emerging in the past few decades. Still, growing evidence has been shedding light on the phenomenon, not least in the case of neuropsychiatric conditions, as reviewed here. The expansion of this field is expected to likely have implications for theoretical, clinical, and ethical perspectives.

Human development is a complex journey, with self-identity and self-awareness playing crucial roles from early infancy and continuing throughout our lives. Biology, adaptation, social norms, culture, and context influence this lifelong process of self-discovery. Humans have sought answers and guidance for our identity from religion and spiritual sources. However, recent but limited literature has shown a neurological and internal hierarchy of cognitive mechanisms that contribute to the development of the human psyche. By delving deeper into the mechanisms of self-awareness, we can gain a finer understanding of brain function and cognitive processing, helping us to answer the perennial question of who we are, both from a mechanistic and a subjective perspective.

Conflict of Interest:

Dr. Foojan Zeine is the originator of the Awareness Integration Theory. Dr. Kenneth Blum is the inventor and through his companies, owns worldwide patents related to both GARS and kkb220. He has licensed the kb220 patents to Victory Nutrition International (vi). There are no other conflicts.

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ORCID ID:

1. Foojan Zeine - 0009-0006-7709-5580
2. Nicole Jafari - 0000-0001-7762-9673
3. Kai-Uwe Lewandrowski - 0000-0001-7842-2914
4. Alireza Sharafshah - 0000-0001-8048-9587
5. David Baron - 0000-0001-7670-2613
6. Abdalla Bowirrat - 0000-0001-8185-0688
7. Kenneth Blum - 0000-0001-6727-803X

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