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BEYOND BRAIN-CENTERED COGNITION: A THEORETICAL FRAMEWORK INTEGRATING THE QUR'ANIC CONCEPT OF QALB WITH CONTEMPORARY COGNITIVE SCIENCE

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ABSTRACT

This theoretical study examines dominant brain-centered models of cognition in contemporary psychology and explores their limitations in accounting for moral, interpretive, and spiritual dimensions of human experience. While cognitive neuroscience explains perception, memory, and decision-making through neural mechanisms, it often provides limited frameworks for understanding meaning and inner ethical awareness. Using a qualitative theoretical design based on comparative conceptual analysis, the study integrates findings from cognitive neuroscience, moral psychology, and selected Islamic epistemological sources. It proposes a Brain–Qalb integrative model in which cognition is conceptualized as a multi-layered process involving sensory input, neural processing, affective-cognitive appraisal, and a higher-order interpretive dimension associated with the Qalb (heart).The model frames cognition not as a purely brain-based function but as a recursive system in which meaning and moral direction are shaped through interaction between neural processes and inner interpretive awareness. The study highlights the limitations of reductionist approaches and suggests the need for more integrative frameworks that can accommodate both empirical and interpretive dimensions of human cognition. Overall, the research contributes a conceptual framework for interdisciplinary dialogue between psychology and Islamic thought, offering a broader understanding of cognition that includes both biological mechanisms and moral-spiritual interpretation.

Keywords: *Cognition, Brain Centered Models, Cognitive Neuroscience, Cognitive-Affective Appraisal, Qalb, Brain-Qalb Integrative Model*

INTRODUCTION

At the core of modern scientific thought lies the materialist approaches of thinkers such as Auguste Comte, Ludwig Feuerbach, Émile Durkheim, Friedrich Nietzsche, Sigmund Freud, Karl Marx, and Charles Darwin, whose frameworks tend to prioritize material, empirical, and psychological explanations over metaphysical or spiritual ones. Consequently, in modern science, the spiritual aspect of human personality is frequently overlooked. Hence, we see the body-soul split in this age of materialism. This body-soul split led modern biomedicine and social sciences to carry out more research on the human brain while regarding the human heart as merely a pumping organ. Cognition is a central concept in

psychological research that refers to the mental processes involved in the acquisition and use of knowledge, including perception, memory, reasoning, and problem-solving (American Psychological Association). This dominant framework has been significantly influenced by the cognitive revolution, which redirected the focus of psychological research towards internal mental processes rather than external observable behaviour (Miller, 2003).

Within this framework, cognition is frequently understood through computer-based and information-processing models that equate the mind to a machine capable of encoding, storing, and retrieving information (Newell & Simon, 1972; Stanovich, 2011). Developments in the field of cognitive neuroscience have further supported this viewpoint by linking cognitive functions to specific neural structures and processes in the brain (Pessoa, 2013). However, despite these developments, scholars have increasingly noted that such approaches may be limited in their ability to account for subjective, ethical, and non-material dimensions of human experience (Varela et al., 1991; Pessoa, 2013).

Recent interdisciplinary developments have further scrutinized the entirely brain-centred model of cognition. Findings from neuro-cardiology and biological cognition suggest that regulatory and information-processing processes may not be restricted only to the brain, indicating a more distributed and multi-layered understanding of cognitive processes (Armour, 2003; Varela et al., 1991). This has also been supported by broader biological research indicating that cognition may exist across different levels of biological organization rather than being limited to human neural systems alone (Giurfa, 2003; Webb, 2012). Consequently, these developments raise important conceptual questions about whether cognition should be understood strictly as a neural function or as a broader phenomenon involving multiple interacting systems, thereby opening space for more integrated and holistic theoretical perspectives.

In comparison to the Western focus on the brain and mind, Islamic intellectual tradition offers a more holistic conception of cognition centred on the concept of *Qalb* (Al-Ghazali, original c. 1100; trans. 2013). The term *qalb*, often translated as 'heart,' extends beyond its physiological meaning to represent a central faculty that incorporates intellect, emotion, morality, and spirituality (Al-Ghazali, original c. 1100; trans. 2013). Classical Islamic scholars argue that the *qalb* functions as the central seat of understanding, intention, and ethical awareness, thereby extending the scope of cognition beyond purely mental or neural processes (Al-Ghazali, original c. 1100; trans. 2013).

This contrast between Western and Islamic viewpoints highlights deeper epistemological differences regarding the nature and sources of knowledge (Varela et al., 1991; Al-Ghazali, original c. 1100; trans. 2013). While Western models largely privilege empirical observation and rational analysis, Islamic epistemology integrates revelation and spiritual insight as vital sources of knowledge (Al-Ghazali, original c. 1100; trans. 2013). Accordingly, cognition in the Islamic framework is fundamentally linked to moral and spiritual development, rather than being regarded as a value-neutral and purely scientific process (Al-Ghazali, original c. 1100; trans. 2013).

Purpose of the Study

The aim of this theoretical research is to critically examine the dominant Western framework of cognition, which largely confines cognitive processes to the brain and mind, and to explore its limitations in accounting for the spiritual dimension of human personality. While contemporary neuroscience and psychology provide robust explanations of perception, reasoning, and behavior through brain-based models such as neural integration and cognitive processing systems, they offer limited engagement with the metaphysical or spiritual aspects of human experience.

In contrast, the Islamic epistemological framework presents a more holistic model of cognition in which the qalb (heart) is regarded as the central locus of moral awareness, understanding, and spiritual perception. Drawing upon the Qur'an and Hadith, as well as the works of classical

Muslim scholars and philosophers, this tradition conceptualizes cognition as a unified system in which the heart plays a foundational role in guiding intellectual, emotional, and ethical functioning. Within this framework, the brain is not denied its role but is understood as an instrument that operates in coordination with the deeper authority of the heart.

Furthermore, contemporary interdisciplinary research, particularly in neuro-cardiology and psychophysiology, has begun to challenge the strict brain-centered model of cognition. Studies indicating the presence of intrinsic neural networks in the heart and its bidirectional communication with the brain suggest that regulatory processes in the human body may be more distributed than previously assumed. While these findings do not empirically establish the metaphysical concept of the qalb as described in Islamic thought, they do open conceptual space for reconsidering the reduction of cognition exclusively to the brain.

This research therefore seeks to integrate insights from Islamic psychology and selected contemporary scientific findings to develop a more comprehensive understanding of human cognition. It aims to highlight points of conceptual convergence between Islamic teachings on the heart as the center of moral and spiritual cognition and emerging scientific perspectives that recognize complex heart-brain interactions. In doing so, it also critically evaluates the extent to which modern cognitive science can accommodate non-material dimensions of human experience.

METHODOLOGY

This study adopts a qualitative theoretical research design based on integrative literature review and comparative conceptual analysis. The primary objective is to examine Western and Islamic frameworks of cognition to develop a more inclusive and holistic model that integrates both empirical and metaphysical dimensions of human understanding. To achieve this, data has been drawn from two broad categories of sources. The first comprises Western peer-reviewed academic articles and scientific research spanning the fields of cognitive neuroscience, neuro-cardiology, moral psychology, and biological cognition, including works by scholars such as Armour (2003), Varela et al. (1991), Pessoa (2013), Jung and Haier (2007), and McCraty (2015) etc, among others. The second category comprises classical and contemporary Islamic scholarly sources, including the Qur'an, prophetic traditions (Hadith), and the works of major Muslim thinkers such as Al-Ghazali, Ibn al-Qayyim , Ibn al-Jawzi, and Ibn Rajab. A key primary source in bridging these two domains is “The Intelligent Heart, The Pure Heart: An Insight into the Human Heart in Light of Qur’an, Sunnah, and Modern Science” (Mushtaq, 2011), which synthesizes Qur’anic and Hadith-based insights on the heart with contemporary scientific findings. By drawing upon this range of Western scientific literature and Islamic scholarly works, this study aims to construct a comparative theoretical framework that identifies convergences, divergences, and complementary insights between the two traditions, ultimately contributing to a more comprehensive understanding of cognition that encompasses both the modern scientific approach and the spiritual dimensions of human personality.

DISCUSSION

Modern psychology explains human cognition through multiple specialized frameworks, each addressing a distinct aspect of mental functioning. Intelligence is commonly understood through the Parieto-Frontal Integration Theory (P-FIT), moral judgment through theories of moral cognition, bodily regulation through the Central Nervous System (CNS) and Autonomic Nervous System (ANS), and inner psychological conflict through Cognitive Dissonance Theory. In contrast, the Qur'anic concept of *qalb* presents a unified and holistic model in which understanding, moral awareness, decision-making, and spiritual accountability are all centred in the heart. This creates a fundamental distinction between the Western compartmentalized approach to cognition and the Islamic understanding of the human being as an integrated moral and spiritual whole. It is important to highlight that early Islamic scholars discussed the functioning of the

human heart and its connection with intellect with remarkable conceptual clarity, at a time when no advanced biomedical technologies or neurocognitive imaging tools existed. Their descriptions appear strikingly aligned with insights found in contemporary cognitive psychology and biomedical science, to the extent that their explanations resemble the work of modern biomedical researchers and cognitive scientists.

The Parieto-Frontal Integration Theory (P-FIT), proposed by Jung and Haier (2007), explains intelligence as the result of coordinated activity between the parietal and frontal regions of the brain. These areas are responsible for attention, working memory, reasoning, and problem-solving. According to this theory, intelligence is not localized in a single area but emerges through the integration of multiple neural systems. This model provides a strong neurological explanation for intellectual performance and cognitive efficiency. However, the Qur'anic perspective attributes true understanding not primarily to the brain but to the heart. The Qur'an states, 'They have hearts wherewith they understand not' (Qur'an 7:179), indicating that comprehension is fundamentally linked to the *qalb*. In this model, the brain may assist in processing information, but the heart remains the center of wisdom, reflection, and meaningful understanding. Thus, while P-FIT focuses on neural connectivity, the Qur'anic model emphasizes inner perception and moral consciousness as essential components of intelligence.

Ibn al-Qayyim , in his work *Miftah Dar al-Sa'adah*, stated:

"The truth, however, seems to be that the intellectual function starts at the heart, then finds its elaboration and fruition in the head."

This understanding is further elaborated in the contemporary explanation of Khan (2015) in his YouTube lectures, a prominent American Islamic scholar and founder of Bayyinah Institute. From his perspective, the heart functions as a higher-order cognitive faculty that transcends analytical reasoning by enabling meaning-making, moral reflection, and spiritual perception. He explains that the Qur'an attributes understanding not merely to the intellect but to the heart, as reflected in the verse describing people who "have hearts with which they do not understand" (Qur'an, 7:179). According to him, the mind may analyze information and produce logical conclusions, but the heart determines whether that knowledge leads to reflection, faith, and spiritual growth. For example, a botanist may explain the biological mechanisms through which a tree grows, but a person reflecting through the heart sees the same tree as a sign of Allah's power to bring life from death and as a reminder of resurrection and human mortality (Khan, 2015). This demonstrates that cognition in the Qur'anic sense is not limited to intellectual processing but includes existential and spiritual realization.

Khan (2022) further distinguishes between *al-'aql* (intellect) and *al-fu'ād* while explaining Surah Al-Mulk. The Qur'an states: "It is He who has produced you and made for you hearing and vision and hearts [i.e., intellect/understanding]; little are you grateful" (Qur'an, 67:23), He notes that al-'aql refers to rational and analytical understanding, whereas al-fu'ād refers to the deeper emotional and passionate dimension of human perception the intense feelings, inner conscience, and emotional awareness that influence decision-making. This suggests that human understanding is not purely logical; emotions and inner states shape how truth is received. Revelation, faith, and divine guidance are therefore connected not only to reasoning but also to the purification of the inner heart (Khan, 2022).

This interpretation closely aligns with Al-Ghazali's conceptualization of the qalb in Ihya Ulum al-Din, where the heart is described as the locus of true understanding and the center of human personality. Al-Ghazali explains that the essential reality of the human lies in the spirit, also termed *nafs* (soul), *qalb* (heart), or *'aql* (mind-intelligence), and that rational knowledge alone is insufficient without the "works of the heart" (Al-Ghazali). He further emphasizes that the heart is the seat of the soul and the place through which divine knowledge is internalized, making it the true center of cognition and spiritual awareness. Thus, cognition in Islamic psychology is not confined to the intellect alone but is completed and actualized

through the heart, which interprets reality in light of divine purpose and guides human behavior toward spiritual and ethical development.

Similarly, modern theories of moral cognition explain moral judgment as the interaction between emotion and cognition. Greene et al. (2001) and Moll et al. (2005) argue that moral decisions arise from the cooperation of emotional systems such as empathy, guilt, and affective evaluation with higher-order cognitive control systems responsible for reasoning and inhibition. Neuroimaging studies show that moral judgment activates both emotional regions, such as the amygdala and ventromedial prefrontal cortex, and executive regions, such as the dorsolateral prefrontal cortex. This suggests that morality is not purely rational but emerges from emotional and cognitive integration within the brain. In contrast, Islamic psychology understands morality as rooted in the spiritual state of the heart. The Qur'an identifies the heart as the source of moral clarity and spiritual blindness, stating that blindness is not of the eyes but of the hearts within the breasts (Qur'an 22:46). Moral failure, therefore, is not merely a problem of emotional regulation or cognitive imbalance but a corruption of the heart itself. This gives moral cognition a spiritual and ethical dimension that is largely absent in contemporary psychological models.

The CNS and ANS further support the Western assumption that the brain is the central governor of bodily functions. According to Kandel et al. (2013), the brain integrates sensory input and sends motor and autonomic commands to regulate movement, heartbeat, respiration, and other physiological functions. Homeostasis describes the brain's role in maintaining internal stability by continuously adjusting bodily systems in response to environmental demands (Guyton & Hall, 2016). The ANS, through its sympathetic and parasympathetic divisions, controls activation and relaxation without conscious awareness (Purves et al., 2018). These frameworks position the brain as the primary regulator of the human body. However, Islamic thought places the heart above bodily functions not only physically but morally and spiritually. In the well-known hadith, the Prophet Muhammad ﷺ stated that if the heart is sound, the whole body is sound, and if it is corrupted, the whole body becomes corrupted (Bukhari & Muslim, as cited in Al-Nawawi, *Riyad al-Salihin*). Ibn Rajab, in his *Jami' al-'Ulum wal-Hikam*, elaborated that the heart is like a king and all bodily organs are its obedient soldiers. This metaphor reflects the idea that the condition of the heart governs the actions of the entire body.

Al-Ghazali, in his foundational work *Ihya' 'Ulum al-Din* (Revival of the Islamic Sciences), wrote in detail about the human heart:

> *"Although the spiritual heart (qalb), which is the controlling center of the soul, is different from the physical human heart, its functioning is related and directed by it.... Every quality that appears in the heart will have its influence flowing to the organs so they act only in accordance with that quality. In the same manner, the effect of every action that is committed from the organs may reach the heart. And this keeps occurring in a circular fashion." (Al-Ghazali, original c. 1100; trans. 2013)*

Al-Jawzi, in his book *Minhaj al-Qasidin*, expressed the following views about the human heart:

> *"We should understand that the heart holds the supreme position in the human body. It is this organ that recognizes Allah and works to get close to Allah. Other organs are its subordinates. The heart by its nature quests for the path of righteousness. It is true that whoever has recognized his heart has recognized Allah." (Ibn al-Jawzi, Minhaj al-Qasidin)*

Cognitive Dissonance Theory, introduced by Festinger (1957), explains the discomfort that arises when a person's beliefs and actions are inconsistent. This psychological tension motivates the individual to restore consistency either by changing behaviour, modifying beliefs, or rationalizing actions. The theory focuses on internal conflict as a cognitive imbalance seeking resolution. In Islamic psychology, a comparable state is found in the concept of *nafs al-lawwamah*, the self-reproaching soul mentioned in the Qur'an (75:2). This reflects guilt, remorse, and inner accountability after wrongdoing. However, unlike cognitive dissonance, *nafs al-lawwamah* is not simply about reducing psychological discomfort. It

is connected to conscience, repentance, and accountability before Allah. The goal is not merely cognitive consistency but moral purification through *tawbah* (repentance). This makes the Islamic concept richer, as it incorporates spiritual consequences rather than only cognitive balance.

Another important difference lies in the relationship between the senses, the brain, and the heart. In modern neuroscience, knowledge begins with sensory perception and is processed through the brain, which produces cognition and behaviour. Intelligence is therefore understood as an emergent property of neural computation. In the Qur'anic model, hearing and sight are external windows that gather information and deliver it to the heart. Allah says in Surah As-Sajdah, "He gave you hearing, sight, and hearts" (Quran, 32:9) and similarly in Surah Al-Mu'minun, "It is He Who created for you hearing, sight, and hearts" (Quran, 23:78). This sequence suggests that the heart is the final centre of understanding. Muslim scholars such as Al-Ghazali (original c. 1100; trans. 2013) and Umaruddin (1951) explain that the *qalb* is a subtle spiritual reality whose physical counterpart is the heart in the chest. The heart processes meaning, reveals truth, and forms judgment, while the brain and nervous system function as instruments of implementation. This differs significantly from the Western model, where the brain is treated as the sole centre of cognition.

Recent developments in neuro-cardiology provide an important scientific perspective that partially challenges the traditional Western separation between heart and intellect. The field of neuro-cardiology, pioneered by Armour, demonstrates that the heart is not merely a mechanical pumping organ but possesses its own intrinsic nervous system. (Armour, 2003; Armour & Ardell, 1994). Armour described this as the "little brain on the heart" because the heart contains approximately 40,000 neurons comparable to those found in subcortical brain structures. These neurons can receive and process signals independently, adjust their responses, and send information back to the brain. In contemporary psychology and neuroscience, short-term memory is traditionally understood as a brain-based cognitive function primarily associated with prefrontal cortex and hippocampal interaction, where information is temporarily stored and manipulated for immediate reasoning, attention, and decision-making (Baddeley, 2012). This model assumes that memory processing is centred within neural structures of the brain. However, neuro-cardiology introduces an additional perspective by suggesting that the neurons of the heart also possess a form of short-term memory, allowing the heart to retain patterns of information and respond adaptively without complete dependence on the central nervous system. This indicates partial functional autonomy of the heart and challenges the strict assumption that memory-related processing belongs exclusively to the brain. This is further evident in heart transplantation, where nerve connections between the heart and brain are severed, yet the heart continues functioning because the source of the heartbeat exists within the heart itself rather than depending entirely on the brain (Childre & Martin, 1999).

Similarly, the research of Lacey and Lacey (1970, 1978) demonstrated a two-way communication system between the heart and the brain. They found that the heart does not blindly obey the brain's commands; rather, it appears to respond with its own regulatory logic. Sometimes, when the brain sends an arousal signal, the heart may slow down rather than accelerate. They also found that the heart sends signals back to the brain, which the brain follows (Lacey & Lacey, 1970, 1978). Rollin McCraty of the HeartMath Institute summarized these findings by stating that the heart often behaves as if it has "a mind of its own" (McCraty, 2015). Heart rate variability (HRV) research further supports this by showing that the heart influences emotional regulation, stress response, and decision-making (McCraty et al., 1995).

In addition, recent comparative biological research challenges the assumption that cognition belongs only to humans, large brains, or even organisms with nervous systems. Studies suggest that information processing, adaptive behaviour, and learning can emerge across multiple levels of biological organization, including simple organisms and even single cells (Giurfa, 2003; Webb, 2012). This challenges neuro-centric assumptions that cognition must depend entirely

on human-like neural architecture. If cognition can exist beyond centralized brains, then strictly brain-centred models of intelligence become conceptually limited.

These findings create an important point of convergence with the Qur'anic concept of *qalb*. While neuro-cardiology does not prove the spiritual heart described in Islamic thought, it does weaken the assumption that cognition and regulation belong exclusively to the brain. The Qur'anic model presents cognition as a broader faculty involving sensory input, moral awareness, spiritual perception, and divine accountability (Haq, 1981; Ansari, 1981). Contemporary biological findings suggest that cognition may be more distributed and layered than classical neuroscience assumed, which opens conceptual space for understanding the heart as more than a symbolic organ.

Furthermore, findings indicating that neural architecture and efficiency may be more important than absolute brain size suggest that neuron quantity alone is not a reliable predictor of cognitive capacity (Finlay, 2019).

The human brain operates in a predominantly linear and logical manner. Its fundamental functions include analysing, memorizing, compartmentalizing, comparing, and sorting sensory information. Based on prior experiences and stored memories, the brain interprets incoming sensory data and converts it into perceptions, thoughts, and emotions. Although this cognitive structure is essential for survival and adaptive functioning, it also has inherent limitations. The brain can become fixed in established cognitive patterns, whereby new information is unconsciously compared against pre-existing mental models, regardless of whether those models are accurate or inaccurate. As a result, novel information is often filtered through prior assumptions, which can restrict perception and understanding (Mushtaq, 2011).

Kant, in *The Critique of Pure Reason*, argued that human intellect is insufficient for comprehending the essence of God. This aligns with the Qur'anic declaration that "There is nothing like unto Him" (Qur'an 42:11). Since Allah is beyond all comparison, the brain lacks any referential framework through which His essence can be directly conceptualized. Consequently, intellectual cognition alone becomes limited in grasping divine reality. Instead, understanding of Allah is achieved indirectly through reflection upon His creation, which serves as signs pointing toward His existence.

In contrast, the concept of heart intelligence (*qalb*-based cognition) presents a non-linear, intuitive, and integrative mode of understanding. Heart intelligence functions in a manner comparable to a focused illumination that penetrates complexity and highlights essential meaning. Unlike the analytical and sequential processing of the brain, the heart processes information in a more immediate and holistic way. Many human experiences particularly emotional and moral ones cannot be fully explained through logical reasoning alone. For example, parental love involves profound sacrifice that is not reducible to rational calculation; rather, it is directly understood through the experiential and intuitive capacity of the heart. In this framework, *sujood* (prostration) symbolizes spiritual elevation, as it is described in Islamic tradition that a person is closest to Allah in this state, highlighting the supremacy of spiritual consciousness over purely cognitive processing.

Imam Malik's statement that "knowledge is a light which Allah places in the heart of a believer" further supports this perspective. This indicates that knowledge is not merely the accumulation of information but an inner illumination that enables recognition of divine truth. Similarly, Rumi emphasizes that true insight is heart-centred, stating that the intelligent person perceives outcomes from their beginning, whereas others only recognize them after occurrence (Rumi, trans. Helminski, 1999). From this perspective, cognition is not limited to temporal analysis but includes deeper spiritual foresight.

While the brain can function independently, it may operate without emotional depth or moral orientation if disconnected from heart-based intelligence. In such cases, cognitive ability may serve purely self-interested or utilitarian purposes. Individuals with highly developed analytical intelligence may achieve worldly success but lack

ethical grounding or emotional awareness. In contrast, the Qur'anic concept of *qalbun salim* (sound heart) emphasizes spiritual purity as the foundation of true success in the hereafter.

Traditional intelligence theory historically emphasized a singular cognitive capacity measured through IQ. However, Gardner's theory of multiple intelligences expanded this understanding by proposing diverse forms of intelligence, including linguistic, spatial, interpersonal, and intrapersonal capacities (Gardner, 1985). Similarly, Goleman introduced emotional intelligence as a critical determinant of life success, demonstrating that individuals with moderate IQ but high emotional regulation often outperform those with high IQ but poor emotional awareness (Goleman, 1995). These developments collectively support a broader understanding of cognition that extends beyond analytical reasoning.

Heart intelligence is closely associated with emotional regulation and prosocial orientation. It is not merely cognitive but deeply relational, emphasizing empathy, compassion, and ethical awareness. In contrast, brain-centred cognition may prioritize survival, analysis, and self-preservation. Thus, heart intelligence represents a more humanistic and integrative form of understanding.

Islamic teachings on *tazkiyah al-nafs* (purification of the soul) present a comprehensive framework in which the heart functions as the moral and spiritual center of the human being. The tongue, ears, and eyes are identified as primary gateways through which the heart is either corrupted or protected. Uncontrolled speech produces sins such as backbiting and mockery, and the Prophet ﷺ directly warned that excessive talking without the remembrance of Allah hardens the heart and distances a person from God (al-Tirmidhi, *Jami' al-Tirmidhi,* Hadith No. 2411). He further linked the soundness of faith to the soundness of the heart and tongue, stating that the faith of a servant cannot be upright until his heart is upright, and his heart will not be upright until his tongue is upright (Ahmad ibn Hanbal, *Musnad*, Hadith No. 13079). Modern research suggests that emotionally charged verbal expression, stress-related speech, and heightened interpersonal communication can influence physiological arousal, including changes in heart rate and blood pressure, although these effects are context-dependent (Lynch, 1985). Similarly, repeated auditory and visual exposure shapes emotional conditioning and behavioural patterns, as established by classical conditioning theory which demonstrates that organisms develop automatic emotional responses through repeated stimulus associations (Pavlov, 1927), and further supported by Bandura's (1977) social learning theory, which shows that observational exposure to auditory and visual stimuli directly influences the acquisition of attitudes, emotions, and behaviours. This aligns with the Qur'anic emphasis on accountability for hearing and sight (Qur'an 17:36; 24:30–31).

The spiritual diseases of the heart envy (*hasad*), arrogance (*kibr*), and unregulated anger (*ghadab*) are understood not merely as moral failures but as distortions of the heart's regulatory and perceptual capacity. The Qur'an identifies envy as a root of historical moral failure (Qur'an 113:5), and Islam redirects competitive impulses toward righteous deeds rather than material comparison, encouraging believers to compete in worship, generosity, and moral character rather than worldly possession, as the Prophet ﷺ permitted constructive envy (*ghibtah*) rather than destructive envy in two cases: a person given wealth who spends it in the way of Allah, and a person given knowledge who acts by it and teaches it (al-Bukhari, Sahih, Hadith No. 73). Schoeck (1969) independently identified envy as a central destabilizing force in human social behaviour that must be managed for societal stability. Arrogance, identified in the Qur'an as the primary cause of Satan's fall and Pharaoh's rejection of truth (Qur'an 7:12–13; 79:24–25), mirrors the narcissistic pattern described by Peck (1978), where threats to self-image produce defensive and destructive behaviour. Anger carries measurable physiological consequences, including elevated cortisol, immune suppression, and prolonged cardiovascular stress lasting up to six hours after a single emotional episode (Rein et al., 1995). The Prophet's ﷺ instruction to perform ablution or change posture when angry (Abu Dawud, *Sunan*,

Hadith No. 4784) corresponds directly to modern psychophysiological techniques for interrupting the body's arousal cycle and restoring equilibrium, including relaxation-based arousal reduction methods (Novaco, 1975; Deffenbacher et al., 1988) and the established finding that cold water applied to the face activates the parasympathetic nervous system, producing immediate reductions in heart rate and cortisol (Richer et al., 2022).

Islamic tradition prescribes four primary interventions for purifying the heart: prayer (*salah*), which builds God-consciousness and emotional stability (Qur'an 13:28); charitable giving (*infaq*), which reduces material attachment and strengthens empathy consistent with behavioural psychology's finding that prosocial spending increases subjective well-being (Dunn et al., 2008); fasting, which disciplines desire and strengthens self-regulation; and pilgrimage (*hajj*), which fosters humility and collective moral renewal. The Prophet ﷺ further established that the heart is the governing organ of the whole body, stating that if the heart is sound the entire body is sound, and if it is corrupted the entire body is corrupted (*Ṣaḥīḥ al-Bukhārī, Kitāb al-Īmān, Hadith No. 52; Ṣaḥīḥ Muslim, Hadith No. 1599*). Repentance (*tawbah*) functions as a continuous process of spiritual and psychological correction, realigning intention and behaviour toward divine awareness. Together, these practices converge on a central insight shared by both Islamic theology and contemporary psychoneuroimmunology: inner emotional discipline is foundational not only to spiritual health but to measurable psychological and physiological well-being (Rein et al., 1995; Lynch, 1985).

Proposed Integrative Model of Brain–Qalb Cognition

The model begins with Stimuli — external inputs from the environment that a person encounters through their senses. These stimuli first enter the Sensory System, which functions as the perceptual gateway, receiving and transmitting information inward without itself producing any interpretation or meaning.

From the Sensory System, the input splits into two parallel streams that operate simultaneously. On one side, the Brain processes the input through reasoning, analysis, memory, and emotional response — it determines what something is, how it works, and generates an affective reaction to it. On the other side, the Qalb processes the same input through moral and spiritual meaning-making — it determines what something means, whether it is right or wrong, and what it signifies in relation to one's purpose and awareness of Allah.

Importantly, the Qalb also receives Divine Light directly — a non-sensory input that bypasses the senses entirely and represents divinely bestowed moral and spiritual illumination. This is why the Qalb's perception goes beyond what the Brain can arrive at through analysis alone.

The Brain and Qalb do not operate in isolation from each other — they share a bidirectional interaction, continuously influencing one another. The state of the Qalb shapes how the Brain interprets reality, and the Brain's outputs in turn affect the condition of the Qalb.

The outputs of both streams then combine — reasoning and emotions from the Brain together with moral and spiritual meaning from the Qalb — to produce Behaviour and Physiology. This means every human action is not a purely neural event, but a whole-person response shaped by both cognitive and moral-spiritual processing simultaneously. An immoral act (stealing e.g.,) may give a temporary feeling of joy (neural processing) but a sense of discomfort at the same time (Qalb's warning signal). The continuous shunning of the inner voice may blind the heart and giving a dominant role to neural processing only.

Behaviour then generates Environmental Consequences — real outcomes in the world. It can be easily understood through the theory of instrumental conditioning; the consequences either strengthen the behaviour or weaken it. These consequences do not end the cycle. They feed back as new stimuli, re-entering the sensory system and restarting the entire process. This feedback loop is not merely cognitive — repeated behaviour over time shapes both the brain (how it perceives incoming stimuli) and also the very condition of the Qalb itself (the type of act or deed done), either strengthening its moral clarity or

diminishing it, making every cycle of experience a moment of ongoing acts with moral and spiritual formation or deterioration.

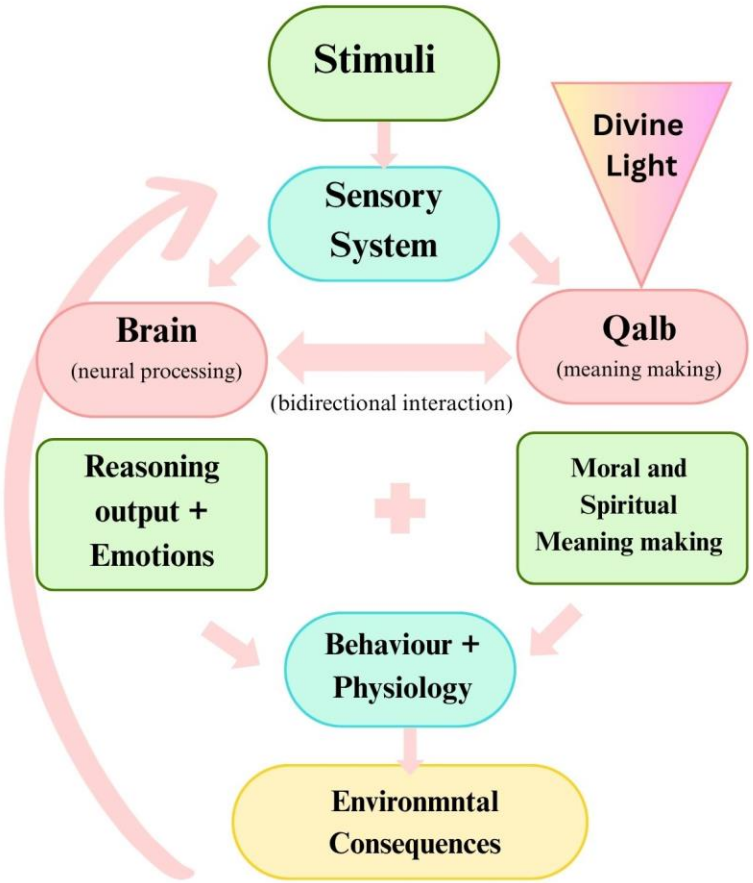

Figure 1 Integrated Model of Brain-Qalb Cognition

Note. Own work. The model should be reproduced by proper citation of the work.

Significance of the Study

This study contributes at a conceptual level by proposing a structured integrative framework (Brain–Qalb model) that reframes cognition as a multi-layered process rather than a purely neuro-centric phenomenon. Its primary value lies not in repeating established comparisons, but in offering a clear theoretical architecture that connects otherwise fragmented discussions across cognitive neuroscience, moral psychology, and Islamic epistemology.

A key contribution is the introduction of "qalb as a regulatory interpretive layer", which is not commonly defined in psychological literature in structured functional terms. While Islamic scholarship describes the heart spiritually, and neuroscience describes the brain biologically, this study positions the qalb as a conceptual bridge for meaning-formation and ethical interpretation of cognitive outputs, which is a relatively underdeveloped idea in existing literature.

Another contribution is the system-level framing of cognition as a feedback cycle, where cognition is not treated as a linear mental event but as a recursive system involving perception, interpretation, moral filtering, behavioral output,

and experiential reinforcement. This allows for a more dynamic understanding of human decision-making that goes beyond static models of cognition found in traditional cognitive psychology.

Additionally, the study contributes by reframing moral and spiritual constructs (e.g., accountability, repentance, purification of self) in terms that can be discussed alongside psychological regulation processes. This does not reduce religious concepts to psychology but creates a parallel conceptual vocabulary that allows interdisciplinary dialogue.

Limitations of the Study

This study has several important limitations that open directions for future research.

First, the model remains purely theoretical and conceptual, meaning it does not include empirical validation, clinical testing, or neuroscientific measurement. As a result, its explanatory power remains interpretive rather than experimentally verified. Future research could attempt to operationalize selected components of the model into measurable psychological constructs.

Second, the qalb is treated as a hybrid conceptual construct combining theological, moral, and psychological meanings. This creates interpretive richness but also introduces ambiguity in scientific contexts. Future studies may attempt to clarify whether the qalb should be understood as a symbolic, metaphysical, or functional construct within psychological theory, or whether it can be partially operationalized in behavioral science terms.

Third, the model assumes a level of shared metaphysical worldview, which may limit its cross-cultural applicability. While it is grounded in Islamic epistemology, individuals operating strictly within materialist or secular frameworks may interpret its constructs differently or find them non-translatable into their paradigms. Future research could explore comparative acceptance of the model across cultural and philosophical systems.

Fourth, although emerging research in neuro-cardiology and psychophysiology is referenced, the field is still in its early developmental stage, and findings remain limited, fragmented, and sometimes interpretatively contested. Future work should critically evaluate whether heart-brain interaction research can be meaningfully integrated into cognitive theory without overextension of current evidence.

Finally, the model does not resolve the ontological question of whether qalb is epistemological, psychological, or metaphysical in nature, but rather places it at the intersection of these domains. Future philosophical and interdisciplinary research is needed to more precisely define its status within academic psychology.

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