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Cognitive and Neurolinguistics: Between the Necessity of Cognitive Integration and the Option of Differentiation

اللسانيات العرفانية والعصبية
بين حتمية التكامل وخيار التمايز المعرفي

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Abstract:

The contemporary linguistic research in the twenty-first century has undergone methodological and epistemological transformations marked at once by acceleration, contestation, integration, and cognitive differentiation. Scientific approaches have become increasingly diverse and open to interdisciplinary fields characterized by the convergence of multiple specializations. This has given rise to a new linguistic perspective that is at once integrative and differentiating: cognitive linguistics, with its mental dimension, on the one hand, and neurolinguistics, This perspective seeks to foreground the role of linguistic inquiry in understanding the relationship between language and the human brain in both comprehension and production, viewing language as a mental faculty and as a means of uncovering patterns of thought and the neural mechanisms underlying its operation. .

Accordingly, this research paper attempts to elucidate the concepts and methodologies of cognitive linguistics and neurolinguistics by selecting two models from the contributions of contemporary Arab linguists: Abduh al-‘Azīzī and ‘Abd al-Raḥmān Ṭu‘mah. Their analytical models are presented and discussed in order to clarify the nature of the integrative cognitive-linguistic procedure and the biologically neurological procedure that is distinct from it, despite the intense overlap and methodological complexity between them. For both scholars, these approaches function as a movement or project grounded in concepts, hypotheses, principles, foundations, and theories that are at once integrated and cognitively differentiated.

Keywords: Cognitive Linguistics; Neurolinguistics; Language; Brain; Neural Mechanisms.

ملخص:

عرفت الخارطة البحثية اللسانية المعاصرة في القرن الواحد والعشرين تحولات منهجية وابستمائية وُسمت بين التسارع والتصارع والتكامل والتمايز المعرفي؛ إذ تتفاوت الطروحات العلمية لتنتج على حقول معرفية بينية متضافرة الاختصاصات مما أسفر عن ظهور مقاربة لسانية جديدة علمية تكاملية تمايزية الأولى في اللسانيات العرفانية ذات البعد الذهني والثانية في اللسانيات العصبية ذات البعد البيولوجي العصبي.

و عليه سنحاول في هذه الورقة البحثية تجلية مفاهيم اللسانيات العرفانية والنورولسانية مفهومًا ومنهجًا فاخترنا نموذجين لإسهامات لسانين عرب معاصرين هما: "عبد العزيز وعبد الرحمن طعمة" عرضنا نماذجهم التحليلية و ناقشناها لأجل فهم طبيعة الإجراء اللساني العرفاني التكاملي والبيولوجي العصبي المتمايز عنه الشدائد التداخل والتعقيد المنهجي باعتبارهما حركة أو مشروع -لديهما- يقومان على مفهومات وفرضيات ومبادئ وأسس ونظريات متكاملة ومتمايزة معرفيًا.

الكلمات المفتاحية: اللسانيات العرفانية، اللسانيات العصبية، اللغة، الدماغ، الآليات العصبية.

• Introduction

The research in cognitive linguistics and neurolinguistics has become one of the most promising interdisciplinary fields of inquiry, for the two approaches are at once cognitively integrated and

methodologically differentiated, and they intersect with such disciplines as linguistics, neuropsychology, and related sciences. Arab scholarship, whether through translation or original authorship, has attempted to clarify the paradigms and concepts of these two

fields—the cognitive-linguistic field and the biological-neurological field—in the study of language. The results yielded by these efforts have been fruitful insofar as Arab linguistic knowledge has benefited from major developments in Western scholarship; Yet a close examination of this area in contemporary Arab culture reveals that it has not become sufficiently established to enable an adequate grasp of its data, concepts, and methods, particularly in the case of neurolinguistics, where research remains limited. A mature methodology is often lacking because of the field's relative novelty, the complexity and dispersion of its topics, the scarcity of specialists, and its differentiation from cognitive linguistics.

Thus, in this research paper, we shall attempt to survey the most significant contemporary Arab contributions that have laid the groundwork for an Arab cognitive perspective and have made available to the Arab reader this new kind of integrative mental approach and biological-neurological approach, the latter being distinguished from the former. Among the most significant of these contributions are "The Nature of Cognitive Linguistics" by Vyvyan Evans and Melanie Green, translated by Abduh al-'Azīzī, and "Language and Brain" by Kathryn Bayles, translated by 'Abd al-Raḥmān Ṭu'mah. It should be noted that, in what follows, the terminology adopted by these contemporary Arab linguists themselves will be retained where relevant.

The core problematic raised in this study is as follows:

-To what extent have contemporary Arab linguists comprehended these two cognitively integrated and differentiated trends "Cognitive and Neurolinguistics" in concept and methodology?

- How have contemporary Arab linguists represented and presented the fundamental concepts of these two approaches? And what effect has this representation had on the formation of a mature, coherent, and differentiated contemporary Arab discourse in cognitive linguistics and neurolinguistics?

I. The Formation of the Paradigms and Concepts of Cognitive Linguistics in the Work of Abduh al-'Azīzī

In "The Nature of Cognitive Linguistics," Vyvyan Evans and Melanie Green seek to explain and interpret the two fundamental principles of cognitive linguistics: the commitment to generalization and the cognitive commitment. These two principles, as presented in Abduh al-'Azīzī's Arabic translation, constitute the basis upon which the project of cognitive linguistics is built. They also correspond to the two principal tendencies within the field, namely cognitive semantics and cognitive approaches to grammar. After examining these two commitments, the two authors move to the relation between mind, cognition, and experience, on the grounds that cognitive linguistics cannot study language in isolation from the human mind and from human experience. It is also worth noting that the notion of *idrāk*, the term preferred by Abduh al-'Azīzī in place of *'irfān* in certain contexts, occupies a central place in this line of research.

1. The Nature of Cognitive Linguistics

The term "cognitive linguistics" designates the conjunction of linguistics and cognition. It is a recent linguistic current concerned with the study of the relation between human language, mind, and experience, including the social,

material, and environmental dimensions of that experience, and it emerged in opposition to the formalist tendency that had long dominated linguistics and much of the humanities.¹ ‘Abd al-Raḥmān Ṭu‘mah likewise holds that this orientation is concerned with examining the nature of mental relations involved in the acquisition of knowledge and language, the modes of their use, the structure of the mind, the ways in which information is organized and stored, and the methods by which language is processed in both production and comprehension.² He also defines cognitive linguistics as an analytical orientation within a wider set of studies devoted to mental use and its general processes, taking language as a central mental faculty within the domain of cognition and in relation to signification, coding, decoding, management, and thought.³ Al-Azhar al-Zannad, for his part, defines cognitive linguistics as a broad designation for a movement bringing together a number of theories that share common foundations and premises while differing, diversifying, and overlapping in their structures, concerns, orientations, and fields of inquiry. In his view, this movement stands in relation to other cognitive sciences through its general program, operative concepts, and critique of what lies outside the cognitive domain.⁴

2.Principles of Cognitive Linguistics

Abduh al-‘Azīzī begins with the two major commitments outlined by George Lakoff: the commitment to generalization and the cognitive commitment. Arab scholars have discussed these commitments in a number of studies and books on cognitive linguistics, including al-Zannad’s *Cognitive Linguistic Theories*, Ibrahim al-Shammari’s study on the

foundations and general principles of cognitive linguistics, Samira ‘Abi’s discussion of general principles and foundations, and Omar Ben Dahman’s work on meaning from a cognitive-semantic perspective.

A.The Commitment to Generalization

The commitment to generalization is the commitment to describing the general principles responsible for all aspects of human language.⁵ In other words, it seeks to identify common principles that apply to the various manifestations of human language. In this connection, Abduh al-‘Azīzī discusses the difference between formal approaches to language study and the orientation of cognitive linguistics in light of the principle of generalization. Formal theory strengthened the division of language into separate subdisciplines—semantics, phonology, morphology, and syntax—whereas cognitive linguistics rejects the treatment of language as a set of autonomous systems and instead studies it as a unified whole. Evans and Green emphasize that the division of language study into subfields in modern linguistics is not merely a practical arrangement but is also tied to the assumption that linguistic components are distinct in their organization. Cognitive linguists, however, do not accept that the units or subsystems of language are organized in radically different ways; indeed, they question whether such sharply distinct subsystems exist in the first place.⁶ Samir ‘Abi similarly notes that cognitive linguists hold that there are principles extending across all manifestations of language and therefore reject the strong compartmentalization that dominates modern linguistic description.⁷

To illustrate the organizational features

shared across apparently different linguistic components, the article turns to three domains: categorization, polysemy, and metaphor.

a. Categorization

Recent findings in cognitive psychology indicate that categorization is not based on rigid and absolute criteria. Human categories are often vague by nature; some members are more central, whereas others occupy marginal positions, and the degree of centrality depends on the way a given category functions in a specific context and at a specific moment.⁸ What follows from this is that categories are not fixed mental boxes of equal status. Rather, they may vary in salience and function according to the individual's interaction with them. Muhammad al-Salih al-Bu'amrani defines categorization as a mental process through which diverse entities are grouped into a class that unites them. In this sense, our ideas, sensory perceptions, movements, and speech all rest upon categorization.⁹ Categorization thus resembles mental classification, ordering, and arrangement, much as colors may be classified according to visual form or according to semantic value. From this perspective, the classification of things is shaped by the manner in which human beings interact with them. Cups, for example, may belong together by virtue of family resemblance even though one type may be regarded as more prototypical than another in a given context. It follows that human beings classify, order, and arrange their world because things are not wholly independent of one another; rather, they resemble other things and therefore belong to classes and types.¹⁰ Cognitive linguists also maintain that vagueness and family resemblance are not confined

to physical objects alone, but apply equally to linguistic categories such as morphological patterns and words. Although these categories are linked by clear relations, they do not necessarily behave in identical ways.¹¹

b. Polysemy

Evans and Green define polysemy as the phenomenon whereby a linguistic unit has several different meanings that may nonetheless be related to one another.¹² Saber al-Habasha similarly defines it as a phenomenon in which a linguistic unit possesses multiple independent yet interconnected meanings.¹³ From this perspective, cognitive linguistics grants legitimacy to lexical multiplicity: the word may develop conceptually different yet semantically linked uses, and such diversity is not reduced merely to contextual variation.

B. The Cognitive Commitment

Abduh al-'Azīzī defines the cognitive commitment as the requirement that the principles of linguistic structure should reflect what is known about human cognition in other disciplines, such as philosophy and artificial intelligence.¹⁴ The implication is that linguistic principles must be aligned with broader knowledge of human cognitive functioning. Language, in this sense, forms part of general human cognition, and cognitive linguistics therefore holds that the linguistic system reflects the same principles upon which cognitive functions in general are built.¹⁵ Al-Azhar al-Zannad endorses this view when he writes that the cognitive commitment consists in seeking to establish linguistic facts that accord with the established facts of other sciences.¹⁶ Evans and Green further argue that cognitive linguistics rejects the standard mentalist theory embraced by formal approaches, which treat language as a

system detached from cognition. They adduce three major kinds of evidence in support of the cognitive-linguistic position: attention, metaphor, and the categorization of vague categories.

a. Attention and Profiling in Language

Langacker uses the term “profiling” for this phenomenon, while Talmy refers to it as the “window of attention.” In psychology, attention is defined as a fundamentally conscious process through which awareness is directed toward one stimulus rather than another.¹⁷ In language, this selective orientation appears in the form of profiling, within the range of grammatical constructions available to the speaker, each of which helps foreground different aspects of one and the same scene or event.¹⁸

b. Vague Categories

Evans and Green return, in their account of categorization, to the example of cups in order to show how categories may remain vague because of differences in shape despite a shared function. Thus, vagueness is not a defect but a feature of linguistic categorization itself. Even where members of a linguistic category share important similarities, they often display different patterns of behavior.¹⁹ This leads us to conclude that vague categories are a constitutive feature of language: similarity does not eliminate variation in use or behavior.

c. Metaphor

Evans and Green also invoke metaphor as evidence for the cognitive commitment, since metaphor permeates multiple linguistic levels. In their account, metaphor is not merely a decorative or purely linguistic phenomenon; rather, it is imagistic and conceptual. George Lakoff and Mark Johnson argue that many of the ways in which we think and act are

fundamentally metaphorical in nature.²⁰

Conceptual metaphor therefore reveals that categorizing operations are deeply embedded in the mind and are not external rhetorical ornaments added after the fact.

d. The Embodiment of Mind

Abduh al-‘Azīzī indicates that the embodiment of mind is a central idea in cognitive linguistics. In our reading, this means that language cannot be separated from either mind or body. It entails an emphasis on the importance of human experience and on the centrality of the human body and its species-specific cognitive structure.²¹ ‘Abd al-Majid Jihfa confirms this point by stating that the mind is not free from the body; rather, it arises from the nature of our brains and bodies and from our bodily experience.²² Al-Azhar al-Zannad likewise affirms that we are beings who understand language through the body, so that language and the body are either one thing or two things inseparably bound to one another.²³ Language, in turn, is grounded in human concepts that are themselves justified by human experience.²⁴ It follows that language and mind cannot be studied independently of embodied existence, contrary to many modern linguistic approaches that privileged the mind in abstraction from bodily life.

e. Embodied Experience

According to Evans and Green, the concept of embodied experience means that human beings possess a species-specific point of view because of the unique nature of their bodies.²⁵ Human experience of the world is therefore conditioned both by the kind of beings we are and by the concrete physical structure of our bodies.

f. Perception through the Body and Image Schemas

The fact that experience is embodied means that it is grounded partly in the nature of our bodies and partly in our neural organization, and that this grounding gives rise to perception.²⁶ What we think, speak about, imagine, perceive, and do arises from the nature of our bodies and nervous systems and from bodily experiences processed by the mind. One of the principal ways in which embodied experience manifests itself is through image schemas—primitive concepts such as contact and container that are rooted in human experience.²⁷ In this context, ‘Abd al-Raḥmān Majid notes that embodied experience appears in the form of image schemas, that is, primary conceptual structures filled out by sensory and perceptual experience.²⁸

g. Experiential Realism

In this section, Evans and Green examine the difference between formal semantics and cognitive linguistics with regard to the influence of embodied conceptions and experience on our apprehension of reality. Formal semantics tends to assume that language describes states of affairs in an external world; the function of language, in this view, is to describe what exists “out there” in the world.²⁹ Cognitive linguists, by contrast, do not deny the existence of a physical world independent of human beings, but they maintain that our specifically human understanding of that world is shaped through embodiment. They therefore speak of a “projected world,” one that acknowledges an external reality reflected in concepts and language, while recognizing that this reality reaches us only through our unique human experience, which inevitably shapes its form.³⁰ We may thus say that the projected world is the product of

embodiment and embodied knowledge, linking language and subjectivity, on the one hand, to the surrounding world, on the other.

3.The Formation of Meaning in the Mind and the Cognitive Approach to Grammar

Abduh al-‘Azīzī offers a concise overview showing that cognitive linguistics opens the way to a new semantic theory through which cognitive meaning and cognitive grammar are studied. A model of meaning—namely cognitive semantics—must, in his view, be determined before an adequate cognitive model of grammar can be developed.³¹ Cognitive semantics is therefore concerned with the system of linguistic meaning and with the relation of language to experience and embodied knowledge, whereas cognitive grammar is concerned with the symbolic units of language. The cognitive approach to grammar treats grammar as a full inventory of conventionalized linguistic units in which meaning and form are inseparably correlated.³² Accordingly, cognitive semantics and cognitive approaches to grammar cannot be separated, for their concerns are profoundly complementary. The analyses and observations presented above show that cognitive linguistics relies on the principles of generalization and cognitive commitment in analyzing linguistic phenomena; its primary aim is to study language as an integrated mental structure.

II. Paradigms and Concepts of Neurolinguistics in the Work of ‘Abd al-Raḥmān Ṭu‘mah

Kathryn Bayles, in her article translated by the Egyptian scholar ‘Abd al-Raḥmān Ṭu‘mah, entitled “Language and the Brain,” initiated her inquiry within the

framework of neurolinguistic studies, whose "starting points and topics are highly diverse, owing to the connection of the subject matter with nerves and neurons—from the speaker to the auditory area in the listener's brain via the auditory nerve—and subsequently, numerous and varied cases confront us in tracing and understanding the neural message when the process of converting conceptions into percepts takes place in the brain."³³ Accordingly, neurolinguistics is concerned with the processing of language by the neural apparatus—the brain—and with the way it functions and is produced.

If we pause to consider the significance of the title, we find it composed of two terms: *language* and *brain*. Language has been defined by Ray Jackendoff as encompassing "any organized system of animal communication systems, including computer languages."³⁴ That is, for Jackendoff language constitutes systems that achieve communication between people through organized vocal means; accordingly, it requires a speaker and an interlocutor for communication to occur (...) emanating from the center of thought between them, namely the brain. The brain, in turn, is (...) an organ located within the cranial cavity, upon which the linguistic process rests in its cognitive and performative system (...). It is a central mass within which a neural network representing the language system is distributed and by which it is governed.³⁵

On the basis of the foregoing, we conclude that language is closely related to the brain, and consequently the locus of language is the brain. On the basis of this relationship the title "Language and the Brain" was established. We find particularly apposite what 'Abd al-Raḥmān Ṭu'mah has indicated: "The

study of language and its relationship to the human brain constitutes an attempt to discover the Language Genome and to benefit from its findings in establishing new analytical mechanisms for the linguistic levels pertaining to semantic, grammatical, and lexical meanings, with a view to achieving greater awareness of human linguistic communication in its two phases: the mental linguistic creation within the brain, and the enunciation that leads to the transmission of language through codes from the speaker to the listener, and his perception and understanding of the meaning, from which communication arises."³⁶

We observe that 'Abd al-Raḥmān Ṭu'mah raises a set of questions in his article in order to determine the locus of language within the human brain. Before addressing these questions, he noted the idea that "progress in our understanding of brain functions was derived not so much from the study of normal, healthy individuals as it was, to a considerable extent, a product of the study of individuals who had sustained some form of brain injury."³⁷ This is the same idea indicated by Terrence W. Deacon in his book *The Symbolic Species: The Co-evolution of Language and the Brain*, translated by Shawqī Jalāl, where he states: "We know historically that the greater part of our information about the manner in which the human brain comprehends and produces language has been the product of insights afforded by the study of individuals with injuries in specific brain centers that affected language functions."³⁸

From this starting point we conclude that our understanding of the functions of language in the brain is built upon the study of healthy individuals, and that the locus of the brain injury led to a disturbance in the production,

perception, or processing of language. "It is worth noting that the loss of linguistic abilities due to brain injury is called aphasia (*al-ḥubsah* or *al-afāziyā*)."³⁹ Aphasia, according to 'Abd al-Raḥmān Ṭu'mah, "is a broad term that encompasses diverse symptoms related to communication or speech disorders. We have aphasic patients who struggle to utter a single word, while others, without any discernible effort, are able to produce long utterances that are, however, devoid of meaning."⁴⁰ Accordingly, the term aphasia "is used to refer to disorders of language and speech that occur as a result of damage to a specific site in the hemisphere of the brain in which the language centers are located."⁴¹ In this sense, bound up with the occurrence of brain damage, aphasia differs from speech defects addressed by (...) al-Jāḥiẓ (655 AH), such as lisping, *al-ratnah*, *al-lajlajah*, and other defects.⁴²

With some elaboration, 'Abd al-Raḥmān Ṭu'mah poses the following questions:⁴³ "Is human language and speech located within the brain? If so, where exactly? How does the neural system perform the functions of encoding and decoding specific to language and speech? Do the essential elements of language—sounds, syntax, and meaning—differ from the anatomical-neurological standpoint?" These questions bring to light the issue of the localization of language in the left hemisphere of the brain, which is among the preliminary studies referred to in the article. The matter is here merely raised and presented with its scientific history, because the localization of language in the left hemisphere in particular has become subject to considerable doubt in the light of radiological, tomographic, and functional magnetic resonance imaging. The prevailing view in

scientific circles has become that the brain operates as a single, integrated central unit.⁴⁴

In light of the foregoing analyses, it becomes clear to us that the researcher 'Abd al-Raḥmān Ṭu'mah was not a literal translator, but rather a critical, analytical, and meticulous linguistic scholar. He articulated a fundamental idea and emphasized its validity, namely that the human brain operates in an integrated manner across all its parts. Accordingly, we may discern the discussion that Kathryn Bayles elaborated: the issue of the true beginning of the localization of language and speech within the human brain dates back approximately a century and a half (...). In the 1960s, two schools emerged—the proponents of localization, who maintained that specific regions of the brain are responsible for language,⁴⁵ meaning that language has a specific center in the brain, such that the center of language production differs from the center of its comprehension.⁴⁶ The proponents of this position were the adherents of the localizationist or modular school. The other school, the connectionist school, rejected localization and advocated the operation of the brain in the production of language and speech as "a single, undivided unit."⁴⁷

In 1861, the anatomist Paul Broca described a patient (...) who suffered from difficulty in producing speech and found that he was injured in the posterior-inferior region of the left frontal lobe (...). He thereby demonstrated that brain injury results in a deficit in the capacity for speech (...) and showed that injury to the left hemisphere of the brain gives rise to speech aphasia, whereas injury to the right hemisphere does not affect linguistic abilities whatsoever.⁴⁸

Subsequent works confirmed the validity of Broca's findings, beginning with an article published by the German physician Carl Wernicke in 1874, which strongly supported Broca's claim that the neural structures of the left hemisphere are necessary for the speech process (...). This was further confirmed through the use of numerous research techniques; John Wada introduced one such technique in 1949 (...). A report was also published in 1909 by Wilder Penfield and Lamar Roberts, both neurologists (...). Penfield and Roberts succeeded in inferring the existence of three regions in the left hemisphere of the brain that play a vital role in the language and speech process: Broca's area, Wernicke's area, and the Supplementary Motor Area.⁴⁹ The researcher employed an illustrative diagram representing these areas.

In order to identify the localization regions, the researcher presented some of the fundamental concepts concerning the nervous system and its anatomical structure. The manner in which the brain functions in the production of language cannot be understood without knowledge of the components of the nervous system, as the system that governs the behavior of the human body. This was offered by both researchers in their studies concerning the localization of language in the brain, including Karīm Jabal in his book *A Study of Language and the Brain*. It should be noted in this article that Kathryn Bayles used scientific language in presenting these concepts, as they constitute, in the first instance, biological scientific terminology. These concepts were as follows:⁵⁰ the nervous system and excitatory/inhibitory synaptic networks; the levels of the nervous system; the cerebral cortex—general characteristics; and transmission across the cerebral

cortex, where Bayles showed that each hemisphere is responsible for the movement of the body's organs in the opposite direction. To illustrate this, Bayles drew upon the split-brain experiments conducted by Gazzaniga and his colleagues, which cannot be detailed in the present context; for further elaboration, the reader is referred to the article. These experiments demonstrated that the right hemisphere is not incapable, as "more recent research suggests that the right hemisphere participates in linguistic processing through limited means."⁵¹

In some detail, Bayles explains how the nervous system performs the functions of encoding and decoding. She holds that language arises from the integration between the cortical system and the subcortical system, and that there are no specific neural fibers that perform the production and processing of language and speech. She states: "Indeed, neurolinguists are still far from confirming the dominance of any neural structures necessary for the encoding process."⁵² She thereby affirms that the brain functions in an integrated and harmonious manner, and that its parts cannot be separated during the encoding or decoding of language and speech. Muná Ḥusayn Jamīl supports this view, holding that "language, with its various skills, is produced through the interaction of numerous anatomical regions distributed throughout the brain, appearing like a spider's web that performs the functions assigned to it in a sequential and balanced manner."⁵³

'Abd al-Raḥmān Ṭu'mah then answers the question of whether the essential elements of language—sounds, syntax, and meaning—differ from the anatomical standpoint, by stating: "Within the left hemisphere of the brain,

there is no form of uniform or regular neural representation of linguistic functions; injury to a small area does not result in the disruption of all linguistic abilities."⁵⁴ From this it is understood that the elements of language—sounds, structures, and meaning—do not differ anatomically. The researcher also points out that the symptoms of aphasia can be classified into four categories, a division that appears in Karīm Muḥammad Jabal's book *Language and the Brain* and in Muná Jamīl's doctoral dissertation entitled *Linguistic Discourse in Patients with Speech Aphasias*. Kathryn Bayles was well acquainted with the types of aphasia in presenting their categories.⁵⁵

1. Broca's Aphasia: This is an aphasia named after the physician Broca (...), also called motor or expressive aphasia. It arises from injury to the motor speech area (...). Among its symptoms are the patient's inability to speak fluently (...) due to the absence of function words (...), the omission of important parts of speech, and the distortion of sounds.

2. Wernicke's Aphasia: Also known as sensory or receptive aphasia, it results from injury to the auditory association cortex (...). The essential characteristic of this type of aphasia is the loss of the ability to comprehend spoken and written language.

3. Conduction Aphasia: This type of aphasia arises from focal injury to the temporo-parietal regions of the brain responsible for the formation of meaning and its operative forms (...). In this type, all modes and means of expression are affected.

4. Anomia: (...) Patients experience difficulty in retrieving words, whether in ordinary conversation or in naming tasks (...). These patients are capable of selecting the correct name if it is presented to them within a set of choices,

and their comprehension of speech is normal.

We conclude our commentary on the article with the observation that the important ideas contained therein express a general cognitive linguistic orientation, providing a comprehensive overview of neurolinguistics and the relationship between language and the brain.

The observer who attends to the precise and detailed nature of the presentation realizes that 'Abd al-Raḥmān Ṭu'mah was not a literal translator of Kathryn Bayles, but was thoroughly familiar with the subject, employing the mechanisms of analysis, interpretation, and critique. He emphasized that our knowledge of the workings and production of hearing, and of the cognitive-psychological and biological-neurological production and comprehension of language, may contribute to the treatment of numerous linguistic and articulatory disorders.

Conclusion

The discussion of the paradigms and concepts of cognitive linguistics and neurolinguistics leads to the following conclusions. First, the study of two approaches that are integrated yet differentiated

—one mental and cognitive, the other biological and neurological—is a necessity imposed by the scientific development of modern and contemporary linguistics. Second, cognitive linguistics, with its paradigms, concepts, principles, methodology, and applications, has acquired a clear, integrated, and relatively precise Arab scholarly representation. Third, 'Abd al-Raḥmān Ṭu'mah's article "Language and Brain" revisits some of the earliest cognitive and neurological questions by discussing, above all, the issue of the localization of language in the brain. Through translation, commentary, and

selective disagreement with the original author, Ṭu'mah transmitted these issues to the Arab reader in a richer form than a merely literal rendering would have allowed. The inclusion of explanatory illustrations of the brain and language areas further enhanced the value of the article and facilitated the communication of its ideas. Fourth and finally, the contemporary Arab neurolinguistic model has not yet yielded a fully integrated project, whether theoretical or applied. For this reason, Ṭu'mah's representation of its concepts, method, and topics still appears preliminary and incomplete, and remains in need of greater elaboration and deepening; his contribution therefore remains limited, in the final analysis, to an introductory and definitional framework.

Notes

¹ Al-Azhar al-Zannād, al-Naṣṣ wa-al-Khiṭāb: Mabāḥith Lughawiyah 'Arabiyyah [Text and Discourse: Cognitive Linguistic Studies], Dār al-Nashr al-Jāmi'i Muḥammad 'Alī lil-Nashr, n.d., p. 21.

² See: Abd al-Raḥmān Ṭu'mah and others, Dirasat fī al-Lisaniyat al-'Irfaniyah: al-Dhihn wa-al-Lughah wa-al-Wāqī' [Studies in Cognitive Linguistics: Mind, Language, and Reality], edited by Ṣabir al-Ḥabbashah, Dar Wujūh lil-Nashr wa-al-Tawzī', 1st ed., 2019, Riyadh, Saudi Arabia, p. 6.

³ Abd al-Raḥmān Ṭu'mah, al-Binā' al-'Aṣabī lil-Lughah: Dirāsah Bayūlūjiyyah Taṭawwuriyyah fī Itār al-Lisāniyat al-'Irfaniyah al-'Aṣabiyah [The Neural Structure of Language: An Evolutionary Biological Study within the Framework of Cognitive Neurolinguistics], Dār Kunūz al-Ma'rifah al-'Ilmiyyah, 1st ed., 2017, p. 231.

⁴ Al-Azhar al-Zannād, Nadhariyāt

Lisaniyah 'Irfaniyah [Cognitive Linguistic Theories], p. 27.

⁵ 'Abd al-Karīm Jaydūr, "al-Lisaniyat al-'Irfaniyah wa-Mushkilat Ta'allum al-Lughah wa-Iktisabiha" [Cognitive Linguistics and the Problems of Language Learning and Acquisition], Majallat al-'Alāmah, Markaz al-Baḥth al-'Ilmī wa-l-Shakhṣī li-Taṭwīr al-Lughah al-'Arabiyyah, Waḥdat al-Baḥth al-Lisānī wa-Qaḍaya al-Lughah al-'Arabiyyah, Algeria, Wargla, Issue 5, 2017, p. 303.

⁶ Vyvyan Evans and Melanie Green, "Ṭabī'at al-Lisaniyāt al-Idrakiyyah" [The Nature of Cognitive Linguistics], trans. 'Abduh al-Gharirī, Majallat Fuṣūl lil-Naqd al-Adabī (Cognitive Studies), Vol. 25, No. 4, Issue 100, 2017, al-Hay'ah al-Miṣriyyah al-'Āmmah lil-Kitāb, Egypt, p. 38.

⁷ See: *ibid.*, p. 39.

⁸ See: Samir Abi, al-Lisaniyat al-'Irfaniyah: al-Mabadi' al-'Ammah wa-al-Usus [Cognitive Linguistics: General Principles and Foundations], p. 31 (for further reading and reference).

⁹ See: Vyvyan Evans and Melanie Green, "The Nature of Cognitive Linguistics," p. 39.

¹⁰ See: Muḥammad al-Ṣaliḥ al-Bu'umaranī, Dirasat Nadhariyyah wa-Taṭbiqiyyah fī 'Ilm al-Dalalah al-'Irfaniyah [Theoretical and Applied Studies in Cognitive Semantics], Dār Nahḍat Ṣafāqis, 2002, Tunisia, p. 14 (for further reading and reference).

¹¹ See: *ibid.*, p. 41.

¹² Ṭāhir Muḥammad ibn Ṭāhir and Thuraya Muḥammad al-Shaftī, "al-Maqlah wa-al-Ṭiraz: Muqarabah fī al-Lisaniyāt al-'Irfaniyah—Zurabib al-'Ubayd li-Najwā Shitwān Unmūdḥajan" [The Category and the Model: An Approach in Cognitive Linguistics—The Crowds of Slaves by Najwā Shitwān as a

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¹³ See: Samīr 'Ābī, al-Lisaniyat al-'Irfaniyah: al-Mabadi' al-'Ammah wa-al-Usus, p. 34 (for further reading and reference).

¹⁴ Vyvyan Evans and Melanie Green, "The Nature of Cognitive Linguistics," p. 42.

¹⁵ Šābir al-Ḥabbashah, "Muqaddimāt al-Ishtirak al-Dalali bayna al-'Irfan wa-al-Tadawul" [Introductions to Semantic Polysemy between Cognition and Pragmatics], Majallat al-Khiṭāb, Issue 14, Bahrain, p. 102.

¹⁶ Vyvyan Evans and Melanie Green, "The Nature of Cognitive Linguistics," p. 42.

¹⁷ See: *ibid.*, p. 38.

¹⁸ See: *ibid.*, p. 50.

¹⁹ Al-Azhar al-Zannād, Nadhariyat Lisāniyah 'Irfaniyah, al-Dar al-'Arabiyyah lil-'Ulum Nashirūn, p. 33.

²⁰ Rāfi' al-Naṣir al-Zughlul and 'Imad 'Abd al-Raḥim al-Zughlul, 'Ilm al-Nafs al-Ma'rifi [Cognitive Psychology], Dar Sharq lil-Nashr wa-al-Tawzī', Jordan, n.d., p. 97.

²¹ Vyvyan Evans and Melanie Green, "The Nature of Cognitive Linguistics," p. 50.

²² Vyvyan Evans and Melanie Green, "The Nature of Cognitive Linguistics," p. 52.

²³ See: *ibid.*, p. 52.

²⁴ Samīr 'Ābī, al-Lisaniyat al-'Irfaniyah: al-Mabadi' al-'Ammah wa-al-Usus, p. 35.

²⁵ See: George Lakoff and Mark Johnson, al-Falsafah fī al-Jasad—al-Dhihn fī al-Mujassad wa-Taḥaddiyat al-Fikr al-Gharbi [Philosophy in the Flesh—The Embodied Mind and Its Challenge to Western Thought], trans. 'Abd al-Majīd Jaḥfah, Dār al-Kitāb al-Jadīd al-Muttaḥidah, 1st ed., 2016, p. 83

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²⁶ Al-Azhar al-Zannād, al-Lughah wa-al-Jasad [Language and the Body], Markaz al-Nashr al-Jāmi'i, 2017, Tunisia, p. 13.

²⁷ Al-Azhar al-Zannād, Nadhariyat Lisāniyah 'Irfaniyah, p. 188.

²⁸ Vyvyan Evans and Melanie Green, "The Nature of Cognitive Linguistics," p. 52.

²⁹ Ghassān Ibrāhīm al-Shamarī, "An Usus al-Lisaniyat al-Ma'rifiyyah wa-Mabadi'iha" [On the Foundations and Principles of Cognitive Linguistics], p. 7.

³⁰ Vyvyan Evans and Melanie Green, "The Nature of Cognitive Linguistics," p. 54.

³¹ *Ibid.*, p. 54.

³² 'Abd al-Raḥmān Mujīd Maḥmūd, al-Lisaniyat al-Ma'rifiyyah: Dirasah Muqaribah min al-Manẓur al-Lisani al-Ḥadith wa-al-Naḥw al-'Arabī [Cognitive Linguistics: A Comparative Study from the Perspective of Modern Linguistics and Arabic Grammar], p. 68.

³³ See: Vyvyan Evans and Melanie Green, "The Nature of Cognitive Linguistics," p. 55.

³⁴ *Ibid.*, p. 56.

³⁵ *Ibid.*, p. 56.

³⁶ *Ibid.*, p. 57.

³⁷ Su'ād Businnasi, al-Lisaniyat al-'Aṣabiyyah [Neurolinguistics], Dar Kunuz al-Ma'rifah, Amman, 1st ed., 2025, p. 16.

³⁸ See: 'Aṭīyah Sulayman Aḥmad, al-Lisaniyat al-'Aṣabiyyah: al-Lughah fī al-Dimagh (Ramziyyah 'Aṣabiyyah 'Irfāniyyah) [Neurolinguistics: Language in the Brain (Neural Cognitive Symbolism)], p. 37 (for further reading and reference).

³⁹ See: Muná Ḥusayn Jamil Muḥammad, al-Khiṭāb al-Lughawi ladā Marḍa al-Ḥubṣat al-Kalamiyyah: Dirasah Waṣfiyyah Taḥliliyyah [Linguistic Discourse in Patients with Speech Aphasia: A Descriptive Analytical

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⁴¹ Kathryn Bayles, "al-Lughah wa-al-Dimagh" [Language and the Brain], trans. 'Abd al-Raḥmān Ṭu'mah, Majallat Fuṣūl lil-Naqd al-Adabī (Cognitive Studies), Vol. 25, No. 4, Issue 100, al-Hay'ah al-Miṣriyyah al-'Ammah lil-Kitāb, 2018, Egypt, p. 15.

⁴² Terrence W. Deacon, al-Insan—al-Lughah—al-Ramz: al-Taṭawwur al-Mushtarak lil-Lughah wa-al-Mukh [The Symbolic Species: The Co-evolution of Language and the Brain], trans. Shawqī Jalāl, al-Markaz al-Qawmī lil-Tarjamah, 1st ed., 2014, Cairo, Egypt, p. 508.

⁴³ Ibid., p. 509.

⁴⁴ Kathryn Bayles, "Language and the Brain," p. 15.

⁴⁵ 'Abd al-Karīm Muḥammad Jabal, "al-Lughah wa-al-Mukh: Dirasah fī 'Ilm al-Lughah al-'Aṣabī" [Language and the Brain: A Study in Neurolinguistics], Majallat Kulīyyat al-Ādāb, Supplement to Issue 57, 2007, University of Alexandria, Egypt, p. 19.

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⁴⁷ Kathryn Bayles, "Language and the Brain," p. 16.

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⁴⁹ Kathryn Bayles, "Language and the

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⁵⁰ Ibid., p. 19.

⁵¹ See: ibid., p. 19.

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