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ORIGINAL REVIEW PAPER

Psycho-Cultural Process of Language Acquisition and Development: A Critical Review

Dr Husain Abdulhay[1]
PhD in Applied linguistics, Lecturer at Arak University, Department of Language and Literature, Faculty of Humanities Arak University, Arak, Iran.

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This study endeavors to critically canvass the cultural processes involved in language acquisition from the psychological point of view. To discern how the culture enacts and interacts with mind in shaping and sculpting of the language is the focus of the present review. An overview of the studies on the mutual interplay between culture and thought process and their reciprocal interactions will be, in detail, presented to signpost the path to the determining players. The evidences from all walks of cultures across different contexts yielded to corroborate the claims provided for the actual differences and semblances. A broader discussion of the empirical and theoretical evidences with the provision of implications and applications of the study will also ensue.

Keywords: Language Development, Linguistic Experience, Culture, Cognition, Brain.

[1] E-mail: husainabdolhay@yahoo.com

Introduction

Language, as an exterior facade of cognitive behavior, serves a person's psychological status and wellbeing, governed by the thought processes and influenced by the cultural context, per se. The more culturally developed a society is, the more polite and polished language is witnessed to be exchanged there. Chiao and Ambady (2007) proclaim that, brain structure and function both vary cross-culturally due to culture-specific early experiences. Neural system levels differ across sundry languages (Chen et al., 2009).

Culture is a determining factor of behavior. According to Schumann (1986), the degree a person acculturates determines the extent of language acquisition. However, the term acculturation implies the way a learner socially and psychologically integrates with the target language (TL) group. Not only does culture not occur in a vacuum, but it also is consonant with the environment in which a person raised. Thence, one can proclaim that culture habituates person in certain behaviors. When it comes to language learning and development, the behaviorist assumption in actualization of language behavior in response to experiencing the surrounding milieu should come into focus. In multilingual contexts, the choice of language adoption can be a matter of value dominance in the community that languages practiced. It affects thought processes and the potency in language acquisition and dominance, determined by the factors that psychologically shape a person's language behavioral.

Cultural neuro-linguistics, an emerging discipline, though in its fetus, has commenced to study the effects of cultural aspects on the language and brain. Lyons (1981) asserts that as much as language success is contingent upon transmission of biological and universal features so is on the cultural transmission. As Chen et al. (2009) claim, language is not isolated from other content areas. Brain mechanisms can be influenced by sociolinguistic, socio-psychological, or language use in other cognitive activities (e.g., arithmetic).

Children appropriation of cultural artifacts of their communities is via socialization processes, structured by caregivers (Wertsch, 1998). Play is a conspicuous instance of socialization activity witnessed in preschool children. However, adults learn more directly and explicitly like their formal learning at school. Explicit knowledge can also turn into automatic procedural knowledge because of internalization, with internalization in SCT understood as the process whereby individuals appropriate and integrate cultural artifacts, making them their own (Wertsch, 1998).

According to Han and Northoff (2008), experiences, vastly in the context of the culture, which human being develops and lives by, shape brains and minds. Albeit psychologists cross-culturally give evidence for diversity of human cognition and

behavior, whether the neural mapping of human cognition is, likewise, culture-dependent or not, has been neglected by neuroscientists. Trans-cultural neuro-imaging researches have shown that cultural background can affect the neural activity that underpins both high- and low-level cognitive functions. Cultural neuroscience seeks to answer to what extent genetic background (nature) or the experiences (nurture) of human beings determine the function of their brains (Han & Northoff, 2008).

According to Kuhl et al. (2001), linguistic experience transforms speech perception in infants using unexpected and unpredicted learning strategies like statistical, probabilistic, distributional, and other computational skills. Cultural anthropologists pinpointed the universality of adult speech behavior. However, cultural anthropologists study cross-culturally the role of adults in triggering language in the child. Neuroscientists, using the modern brain imaging techniques, disclose the temporal and structural aspects of language processing by the brain proposing new perspective on the critical period for language. Computer scientists by modeling the computational aspects of language acquisition of children using biologically inspired neural networks come into effect (Kuhl et al., 2001).

Vygotsky (1978) believed in simultaneous mental, cultural and linguistic processes which are dynamic which realized itself under rubric *"talking to learn"* which implies that children use language to internalize and organize their thoughts as they verbally interact with others. Vygotsky (1978) proclaims that culture is a determining factor in guiding cognitive activity even in infancy. Vygotsky's (1978) socio-cultural theory underscores the robust impact of social and cultural aspects on both cognitive and language development. It zeros in on the significance of the context, construed as the interplay of cultural determiners and the meaning derived from groups. It builds on if and how learners develop the ability to apply the new language to mediate (i.e., regulate or control) their mental and communicative activity. Socio-cultural theory propones that, social, cultural, and historical contexts contribute to learning and development via individuals' joint and active engagement into meaningful and purposeful activities. Socio-cultural theory counts activity as dynamic not outwardly compelled upon the interlocutors (Atkinson, 2011).

As Kuhl et al. (2001) put it, parents across different cultures use a special style of speaking to address their infants and young children, which is coined as "motherese" or "parentese" (Ferguson, 1964; Blount, 1990). Cross-cultural studies evidence that infant-directed speech produced with a higher fundamental frequency (pitch), exaggerated intonation contours, and a slower cadence (Fernald & Simon, 1984). Kuhl et al. (1997) ascertain that language input to infants contains culturally universal characteristics aimed to promote language learning. Kuhl et al. (1997)

examined language input to young infants in the United States, Russia, and Sweden for the acoustic features of phonetic units. Acoustically more extreme vowels generated by mothers addressing their infants in all three countries, than the times when addressing adults, culminating in a "stretching" of vowel space. The findings demonstrated that language input provides exceptionally well-specified information about the linguistic units that sculpt and mold the building blocks for words.

This review adopts a dynamic interactionist perspective based on socio-cultural theory (Vygotsky, 1978), recognizing bidirectional influences between language, culture, and thought, while avoiding strong deterministic or relativistic claims. Vygotsky (1978) proposes a monistic dialectic view of the mind in which people's interaction with the world is not direct, but mediated through cultural tools (physical and psychological). Development of thinking is dependent upon interaction and interplay of language, cognition, and culture. Vygotsky (1978) believes that human life is quintessentially cultural in which culture mediated by linguistic functioning like language game implicated in nonlinguistic activities. Language serves as a communicative tool and resource through which collaborative mental activities and developments mediated and appropriated dialogically in interactional and participatory situated cultures that construct concepts and meanings to which participants pervasively have access to make sense of the world, which are expected to be psycho-linguistically discrepant as mediations are different.

Methods

The method used in this review consisted of conducting the search in databases on Google using the combination of the search terms cognition, thought, language, and culture together to identify the most relevant pieces of studies and to map their contents for extracting information. The selection criteria set up for choosing of the scholarly literature comprised the inclusion of any type of available published research (peer-reviewed or not) written in English language with no constraints made for the year of article publication and the exclusion of those literature which did not cover the relevant scope of the study. After screening, the relevant studies selected retained for full-text review. All obtained studies underwent thorough perusal as to determine the parts potentially eligible for the inclusion in this review. The initial search yielded 487 potentially relevant records. After screening titles and abstracts, 92 full-text articles were assessed for eligibility. Ultimately, 68 studies met the inclusion criteria and were included in this review. Data extraction focused on the key findings related to the interplay between culture, cognition, and language processing.

Overview of the Relevant Studies

Language is believed to orient, con, and steer the conceptual development (Gopnik & Meltzoff, 1997; Waxman & Braun, 2005). Gender attributes manifest

themselves culturally in grammar. A salient dissimilarity in the way individuals from sundry cultures discern the world around them has been documented in myriad studies (Gutchess & Indeck, 2009).

Cultural Differences in Perception and Cognition

In Western cultures, people predispose to zero in on object-dependent details, which are literally pertinent or self-relevant while in Eastern cultures people tend to concentrate more on contextual details, similitude, and group-related information. These sundry manners of discerning the world imply that culture acts as a guide that direct attention and filters the environment processing into memory (Gutchess & Indeck, 2009).

Ross et al. (2002) evidenced that bilinguals varied in the number of collective self-statements, self-esteem scores, and cultural perspectives when reacting with their two languages. Marian and Fausey (2006) evidenced that bilinguals reported better remembering of information in academic writing (for instance on history, chemistry, etc.) when examined in the same language originally the material was taught (however, language proficiency mediated the effects). Not only the effects of language-dependency are observable in episodic memory, but also in the self-construal (see Ross et al., 2002) and in academic learning (see Marian & Fausey, 2006). The language-specific finding, that ascertain to neural underpinnings of language processing in healthy subjects implies that the neural mappings of language processing deficits might also vary between individuals from different cultural groups that speak different languages (Han & Northoff, 2008).

Park and Huang (2010) proclaim that continuous experiences influence both structure and function of brain and behavior. Continuous encounter to a set of cultural experiences and behavioral action would influence neural structure and function. To cultural psychologists, there are subtle differences in East Asian as collectivist and Western cultures as individualistic they differently process information especially in ventral visual cortex activations regions known to be responsible for perceptual processing. The cab drivers in London involved in continuous finding of path exhibit bigger gray matter of posterior hippocampi, with the effect magnitude was augmented as a result of experience, which taken to enjoy a causal mechanism (Maguire et al., 2000). Postal workers in Canada investing innumerable hours sorting postal codes by both letters and numbers together attain a single unitary module for these two symbolic systems (Polk & Farah, 1998).

In the matter of identifying formation relative to self and other, there is plethora of evidence that culture affects neural systems. Chiao et al. (2008) denoted that in Japan native Japanese and in the United States Caucasians exhibited higher activation of amygdala in response to fear expressed by their own cultural group's members implying that the automatic, culture mediates response to dreadful faces by

prepotent nature of the amygdale. Zhu et al. (2007) evidence that both East Asians and Westerners demonstrated strong activation of the medial prefrontal cortex (MPFC) and anterior-cingulate cortex when judged themselves, but when the same subjects judged their mothers, the East Asian participants demonstrated more activation of MPFC than did Westerners, suggesting a more collectivist outlook of self, in opposition to the representation of individualistic. Sui et al. (2009), carried out an event-related potentials study of British subjects, reacting to picture of their own face than those of a familiar face. They evidenced the greater anterior negative activity at 280–340 ms (for instance the face of a friend) than their Chinese counterparts demonstrating a converse pattern, suggesting the existence of differences in the neural mappings of self- and other-referencing stimuli across cultures. Chiao et al. (2009), likewise, evidenced MPFC neural activation when judging themselves or others depending on the potency of collectivistic or individualistic values. In a similar vein, Hedden et al. (2008) showed that the East Asian the more acculturated to Western individualistic culture, the more strongly they reported the Western manner of neural activation.

Cagigas (2008) examined the performances of 50 Chinese, 72 Caucasians, and 47 Latino students on the perceptual categorization exercises. The subjects taught to sort out stimuli into one of two predetermined categories supplied with corrective feedback after each try-out. In the phase one of the experiment, subjects learned a uni-dimensional rule demanding subjects to attend selectively to a single stimulus dimension. In the phase two of the experiment, subjects taught a conjunctive rule demanding an explicit conjunction of two stimulus dimensions. In the phase three of the experiment, the subjects instructed on an information-integration rule demanding that subjects integrate information from two stimulus dimensions at an implicit level. Additionally, mathematical models determined the kinds of categorization strategies subjects actually utilized when learning one of the tripartite categorization rules besides testing potential differences in accuracy employing repeated measures analysis of variance. In the last, a regression analysis employed to pinpoint differences in the possible underpinnings of observed ethnic group in categorization accuracy.

However, no differences evidenced between groups in experimental groups one and three, implying category learning activities that underscore selective attention and implicit learning processes are not amenable to the ethnic differences observed in erstwhile studies. In contrast to the expected presumption, in experiment two, Caucasians reported a better explicit sorting formation of rule combination with more than one stimulus dimension than both Chinese and Latino subjects. Hierarchical regression further disclosed that ethnicity is not the predictor of accuracy after taking into account the level of mainstream. In second phase of

analysis of the acculturation subscales, receptive language ability in English predicted the overall accuracy in learning a conjunctive rule-based activity over and above ethnic group membership. All told, the findings conveyed that cultural differences observed in previous studies seem to pertain more to factors other than ethnic group membership.

Language interacts with other processes, like memory, to enhance cultural differences through its stress on different aspects of information and its employment of divergent cognitive and social processes (Gutchess & Indeck, 2009). Marian and Kaushanskaya (2007) investigated the nexus between language and memory through examining the accessibility of general ken across two languages. Mandarin–English bilingual speakers were solicited for example to name a statue of somebody standing with a raised arm while looking into the distance were probable to name the Statue of Liberty when questioned in English and when questioned in Mandarin to name the Statue of Mao. Multivalent information (i.e., multiple possible answers to a question) and bivalent information (i.e., two possible answers to a question) were more amenable to language dependency than univalent information (i.e., one possible answer to a question). Veracity of retrieval denoted the impact of language-dependent memory in both languages, while velocity of retrieval exhibited effects of language-dependent memory only in bilinguals with more language proficiencies. These results implied that memory and languages are firmly related and that linguistic context can integrate into memory content at the course of learning.

Neural Correlates of Cross-Cultural Language Processing

According to Kessing (1974), culture, from a cognitive stance, is a compacted set of ken shared by the society members to much or less extent. However, cultures vary in self-construal and memory patterns (e.g., Leichtman et al., 2003). According to Han and Northoff (2008), different thought styles sprout from different socio-cultural systems. Westerners think wholly in an analytical manner, while East Asians wholly think in a more holistic way (Nisbett et al., 2001; Nisbett, 2003).

Bolger et al. (2005) propone that despite similarity of sundry languages (like Chinese, English, and Japanese) in some of the brain regions which are activated during language processing, like the left superior posterior temporal gyrus and the inferior frontal gyrus, several brain regions are language-specific (Han & Northoff 2008). For example, the superior temporal gyrus is activated when native English speakers read English words (Bolger et al., 2005) but the dorsal extent of the inferior parietal lobe is activated when native Chinese speakers read Chinese characters (Tan et al., 2005). Positron emission tomography (PET) examination of English and Italian subjects showed that, English readers, reading non-words stimulated highest activation (proportionate to a resting state) in the left posterior inferior temporal area and in the inferior frontal gyrus (Paulesu et al., 2000). Conversely, Italian readers

reading non-words produced highest activation (relative to the resting state) in the left temporoparietal junction (TPJ) (Platek et al., 2004).

It has been evidenced that dyslexia in English monolinguals, which is a reading problem in people with normal intelligence and schooling, is pertained to dysfunction of the left temporoparietal cortex and the left inferior frontal gyrus (Shaywitz et al., 1998; Temple et al., 2003), whereas with dysfunction of the left middle frontal gyrus in Chinese monolinguals Siok et al. (2004). Moreover, English dyslexic children demonstrated decreased grey-matter volume in the left parietal area, relative to healthy controls, (Hoeft et al., 2007) but Chinese children with reading problems demonstrated declined grey matter volume in the left middle frontal gyrus (Siok et al., 2004). These findings imply that both functional and anatomical abnormalities in language processing structures can be language-dependent.

Extensive cultural disparity documented in human cognition, thought and behavior (Markus et al., 1996; Peng & Nisbett, 1999). Discrepancies in perceptual and attentional processing evidenced in European Americans (who are Westerners) and East Asians (Nisbett & Masuda, 2003; Nisbett & Miyamoto, 2005). Westerners appear to be predisposed to heed more attention to salient objects than to contextual background, while East Asians appear to attend to relations and contexts more than to salient objects (Ji et al., 2000; Masuda & Nisbett, 2006).

Culture like language is amenable to five senses and can be received and produced in differential coding. It is imparted in many different ways and styles cross-culturally which are coined as motherese. Motherese is a kind of hyperbole of some crucial elements of speech to make understanding more feasible. The way a shepherd communicates objects and addresses the infants differ from the way a literate person addresses his child. In Kawara'ae of the Solomon Islands indirect speaking of mothers to infants only is being witnessed (Watson-Gegeo et al., 1986). However, there is a consensus in the acceptation the universality of cultural constraints. Women from different walks of cultures demonstrated that they utilize an expanded vowel triangle when speaking to their infants.

To cultural psychologists, like Markus and Kitayama (1991), Markus et al. (1996), and Shweder and Sullivan (1990), culture is a system of shared meaning agreed upon by members of a group to see the world, build cultural artifacts, guide constituents of the environment, and invoke certain feelings. D'Andrade (1984) propones that cultural meaning system is a cohesive organization of interrelated wards, which is composed of a big, variant basket of shared ideas, values, beliefs and mutual knowledge which constrain the meanings people construct and the inferences they draw (e.g., Miller, 1984; Morris & Peng, 1994).

Language-Specific Neural Mechanisms

Differences in scripts, orthography, and tonality across different cultures affect significantly the neural mechanisms of processing of language (Chen et al., 2009). Different writing systems or scripts predispose to configure different visualization. Chinese symbols (a typical logographic system) are several complex strokes that come into a square form, while the alphabetic systems are a linear mixture of letters. Visuo-spatial analysis put to exercise for processing of Chinese characters more than alphabetic writings (ibid). As Grill-Spector (2001) and Rossion et al. (2000) mention, visuospatial analysis (like whole-part nexuses) is either bilateral or right brain dominant. Tan et al. (2000) contrasting laterality between single Chinese characters and words evidenced significant activation in the right occipital cortex for both types of materials which is in opposition to the processing of alphabetic languages dominant with left-brain (e.g., Price et al., 1996; Vigneau et al., 2005).

Tone processing seems to be specific to a language (Chen et al., 2009). Neural patterns of tone processing do not appear to transfer from one tonal language to another tonal language (ibid). Native Chinese speakers, albeit with years of experience in Chinese tones while processing Thai tones exhibited different neural patterns from those of native Thai speakers (Gandour et al., 2002, 2003). The impact of linguistic factors or language experience on lexical tone processing is solicited more through cross-linguistic/cross-cultural research (Chen, et al., 2009). Neural mechanisms of tone processing in speakers of a tonal language (e.g., Chinese & Thai) denoted more left-lateralized activations in the frontotemporal areas in contrast with the speakers of the tonal language (e.g., English), (Gandour et al., 2003, 1998; Klein et al., 2001; Wong et al., 2004; Xue et al., 2006). Wong et al. (2007) evidenced that, left hemisphere has a more drastic and constructive role in learning lexical tones than the right one.

Tonality rate differs across language systems (Chen et al., 2009). However, English language deemed to be atonal in which tones not used to signal the word meaning (Chen et al., 2009). According to Wong et al. (2004), Pitch imparts a number of different information, viz., speaker's identity, affection, intonation, phonemic stress, and word meaning. Tonality is a yardstick to distinguish lexical variety. The sound /ma/ in Chinese language, uttered in a high pitch conveys' mom," but the same sound vented in a low falling–rising pitch imparts the word "horse."

Albeit it seems to be a dearth of research on brain functioning of language processing in Iranian context, there is a plethora of research on cross-cultural differences in neural mechanism of language processing in all facets of language learning skills in other contexts. Petersen et al. (1989) evidenced that the English speakers and other Indo-European languages typically represent the verbs in the frontal region (e.g., the left prefrontal cortex), while represent nouns in the posterior

regions (the temporal-occipital regions). However, Li et al. (2004) showed that in Chinese a wide range of overlapping brain regions in distributed networks, in both the left and the right hemispheres activated for nouns and verbs language. Chen et al. (2009) give the reason for this cross-cultural difference for this that probably is less there is a lack of clear-cut categorization of words into different grammatical classes in Chinese than in English. In Chinese language, many individual words cannot be easily distinguishable from nouns and verbs vastly due to a dearth of inflectional morphology in Chinese. Most words act several grammatical roles, culminating in a plethora of class-ambiguous words that can come into use as either nouns or verbs.

The research on the bilingual neural systems for the effect of native language in second language acquisition expected to implement. The earlier studies limited to neural scission between native and second language (Dehaene et al., 1997; Kim et al., 1997; Perani, 1998). However, a shared neural network in both native and second-language processing, even for two patently different languages like Chinese and English found (Chee et al., 1999a, b, 2000; Klein, 2003; Klein et al., 1995, 1999; Xue et al., 2004a, b). Chen, et al. (2009) explained the reason why there is an overlap between native and second language's neural networks in that native language experience shape the neural mechanisms for second-language processing (Chen et al., 2007; Dong et al., 2008; Mei et al., 2008; Xue et al., 2006a).

Implications for Theory and Practice

Perfetti et al. (2007) have mooted a peculiar model including two processes in Piagetian sense, viz. assimilation and accommodation, to explain the effects of the native language on second language learning neural mechanisms. The assimilation assumption presumes that the brain will take reading of second language as that of the native one and utilizes the native language network to back up the second language. Conversely, the accommodation assumption presumes that the reading in brain network must accommodate to features of the new writing system to the extent that those features need different reading procedures. Tan et al. (2003) endorsed neural assimilation; that is, the superior temporal gyrus in Chinese learners learning English as second language not activated while reading English whereas this area activated for native English readers. Furthermore, the bilateral visual form and left MFG activated for English speakers learning Chinese when processing Chinese, which corroborates the accommodation hypothesis (Liu et al., 2007; Nelson et al., 2009). Chen et al. (2009) assert that it is more probable for Chinese speakers to assimilate, but for English speakers to accommodate. Nontransparent and opaque logographic language requires accommodation, while transparent alphabetic language permits accommodation (ibid).

Fabrega (1977, 1982) delineates triads of distinct passages; happening at different stage of development, in which cultural features can assess as to shape the human brain. Firstly, the ecological surroundings coming with a certain culture might selectively activate or adjust apposite neuronal connections. Secondly, in early child learning, cultural factors differentially and dynamically change brain development. Lastly, life-long accommodation permits the brain of an adult to adapt consistently to new contexts. Dehaene and Cohen (2007) proposed a model of a cultural recycling, in which preexisting brain circuitry constrains structurally the brain-cognition mapping (e.g., cross-culturally mapping of visual words onto the left fusiform gyrus), but brain plasticity permits flexibility in the specifics of the mapping. Bolger et al. (2005) quantitatively contrasting the results of 43 research on sundry languages (25 with alphabetic languages, 9 with Chinese, 5 with Japanese Kana, and 4 with Japanese Kanji) found that the different languages share the activations in the frontotemporal, occipitotemporal, and occipital areas. Significant cross-language discrepancies evidenced in the left middle frontal gyrus (MFG), temporoparietal area, and right fusiform cortex.

According to Vygotsky (1986), language is the gadget of cultural representations. Universally, infants, at birth, have capability to distinguish phonetic contrasts in all languages but with experiencing native language (or "tuning"), the capability to differentiate nonnative phonetic contrasts is dramatically dwindled as early as 6 months and non-native phoneme sensitivity is lost (Kuhl & Rivera-Gaxiola, 2008; Kuhl et al., 2006; Werker & Tees, 1992). According to Kuhl et al. (2001), Japanese infants by 11 months of age cannot differentiate /ra/ from /la/ any longer, and American infants cannot differentiate Chinese sounds /chi/ and /ci/. Sharma and Dorman (2000) assert that speakers of English cannot recognize Hindi phonetic contrasts that vary in voice onset time from 90 to 0 ms.

Han and Ma (2014) examined functional MRI studies of 35 individuals from East Asian and Western societies through quantitative meta-analysis to measure cultural differences in brain activity involved in social and non-social processes. The findings evidenced that East Asians exhibited a stronger activity in the dorsal medial prefrontal cortex, lateral frontal cortex and temporoparietal junction in social cognitive processes whereas Westerners showed stronger activity in the anterior cingulate, ventral medial prefrontal cortex and bilateral insula. East Asians exhibited stronger activity in the right dorsal lateral frontal cortex in social affective processes while Westerners exhibited greater activity in the left insula and right temporal pole in. Non-social processes in East Asians stimulated stronger activity in the left inferior parietal cortex, left middle occipital, and left superior parietal cortex but in Westerners greater activations in the right lingual gyrus, right inferior parietal cortex, and precuneus evidenced. The findings imply that distinct neural networks

mediate cultural differences in social and non-social processes. Additionally, East Asian cultures is known to include augmented neural activity in the brain areas pertaining to inference of others' mind and emotion regulation whereas Western cultures are believed to have enhanced neural activity in the brain regions pertinent to self-relevance encoding and emotional responses in the course of social cognitive/affective processes.

Concluding remarks

According to Park and Huang (2010), cultural values, practices, and experiences mold neuro-cognitive processes and affect neural activation patterns while may even influence neural structures. However, the researchers should not be remiss in the fact of cultural barrier as Urabe (2006) points out, however unconsciously culture affects the way a person thinks and feels. Iranian context also seeks to subjected to study for cultural aspects of language processing and to be distinguished brain function for male and female and ethnicity background for bilingual and multilingual learners. However, caution needs to be exercised when it comes to controlling of the effect of socio-economic, sanitation, education, knowledge bases, technology, communication style, cultural orientation, or ethnicity variables in the study of language, culture, and brain.

Synthesizing the findings across the reviewed studies, several consistent patterns emerge. First, cultural experiences systematically shape both the neural substrates and behavioral manifestations of language processing. Second, these effects are observable across multiple levels of analysis, from early phonetic perception in infancy to complex semantic processing in adulthood. Third, the bidirectional relationship between language and culture suggests that neither can be fully understood in isolation from the other.

The implications of these findings extend beyond theoretical understanding. For language educators, recognizing the cultural embeddedness of language learning can inform more culturally responsive pedagogical approaches. For clinicians, understanding culture-specific neural patterns in language processing may improve diagnostic accuracy in multilingual populations. Future research should further investigate the interaction between biological universals and cultural particularities in language development, particularly in understudied populations such as Persian-speaking learners.

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فرآیند روانی-فرهنگی فراگیری و رشد زبان: مروری نقادانه

دکتر حسین عبدالحی[1]

دکترای زبان‌شناسی کاربردی، مدرس دانشگاه اراک، گروه زبان و ادبیات، دانشکده علوم انسانی، دانشگاه اراک، اراک، ایران.

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این مطالعه تلاش می‌کند تا فرآیندهای فرهنگی دخیل در فراگیری زبان را از دیدگاه روانشناختی به طور انتقادی بررسی کند. شناخت نحوهٔ عملکرد و تعامل فرهنگ با ذهن در شکل‌دهی و ساماندهی زبان، محور بررسی حاضر است. مروری بر مطالعات انجام شده در مورد تعامل متقابل بین فرهنگ و فرآیند تفکر و تعاملات متقابل آنها، به تفصیل ارائه خواهد شد تا مسیر را به سمت بازیگران تعیین‌کننده نشان دهد. شواهد حاصل از فرهنگ‌های گوناگون در زمینه‌های مختلف، ادعاهای ارائه شده برای تفاوت‌ها و شباهت‌های واقعی را تأیید می‌کند. همچنین، یک بررسی گسترده‌تر، بحث در مورد شواهد تجربی و نظری با ارائه پیامدها و کاربردهای مطالعه، ارائه خواهد شد.

واژه‌های کلیدی: رشد زبان، تجربهٔ زبانی، فرهنگ، شناخت، مغز.

[1] E-mail: husainabdolhay@yahoo.com