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Neuropsycholinguistic Analysis of the Concepts "Kindness and Love"

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Abstract

This article presents a scientific discussion of the controversial conceptual features, neurological, psychological, and linguistic factors of the concepts of kindness and love. Theoretical ideas on this topic are presented within the framework of the requirements of the modern field of neuropsycholinguistics. In this article, the author addresses a pressing issue: translating neuropsycholinguistics from denominator to image — applying theory to practice across a broad range, scientifically explaining the influence of anger kindness and love on the human psyche, health, and physical activity.

Keywords: Kindness and love, hate, brain, amygdala, hypothalamus, oxytocin, vasopressin, dopamine, adrenaline, noradrenaline, neuromodulator, prefrontal cortex, insula, anger, amygdala, limbic system, cingulate gyrus, cortisol.

Introduction

Until recently, and still today, the science of neuropsycholinguistics has been studied separately within the framework of neurolinguistics and psycholinguistics. While neurolinguistics focused on the activity of brain regions associated with human speech, psycholinguistics focused on analyzing problems related to the human psyche. While neurolinguistics primarily studies the functioning of language in the brain, the neurophysiological foundations of speech processes, and the activity of language-related centers of the brain and nervous system, psycholinguistics analyzes the relationship between language and thought, the psychological mechanisms of speech processes, and how people perceive, understand, comprehend, and remember language.

Neurolinguistics is the diagnosis and treatment of various speech disorders, studying primarily three aspects: 1) mental preparation, 2) brain activity, and 3) speech skills. The subject of research is brain activity and the neural mechanisms of language, brain areas, Broca's and Wernicke's areas, nerve impulses, neural networks, as well as how language processes are encoded and processed in the brain. Recently, neurolinguistics has succeeded in identifying the brain functions mobilized during the cognitive processing of a specific component of the "functional" architecture of language. While P. Brock, K. Wernicke, E. Lenneberg, and A.R. Luria were engaged in

neurolinguistics, in psycholinguistics, scientists such as L.S. Vygotsky, A.A. Leontiev, N. Chomsky, and D. Slobin achieved fruitful scientific results [9].

Psycholinguistics sought answers to questions such as the relationship between human thought and language—perception, memory, emotions, temperament, imagination, word choice in the thinking process, and sentence construction. In searching for answers to questions such as "How is human speech activity formed?", "How does a person think?", and "How do they produce speech?" neurolinguistics and psycholinguistics intersected at one point. The ability to perceive thought and language, form discourse, develop speech, and reproduce it was a serious problem for both fields [10]. Over the years, both disciplines have managed to comprehensively study the scientific basis of neuropsycholinguistics—the denominator of science based on cognitive principles. Within these two disciplines, a new interdisciplinary discipline has emerged—neuropsycholinguistics. Currently, based on the social demands of society, this discipline seeks opportunities for the development of the linguistic personality in society by integrating such disciplines as personology, discourseology, communicology, speech culture, sociology, and political science. Our goal is to widely direct this discipline into public life to realize the inner potential of the linguistic personality, increase its usefulness coefficient, and consciously develop such positive qualities as self-awareness and the ability to actively lead in society. "Life is a state of matter characterized by processes such as metabolism, growth, and reproduction. Bodies in this state are called organisms. From a scientific perspective, life includes the ability of organisms to adapt to the environment and reproduce. In a philosophical sense, especially for humans, life is a process of self-awareness, the formation of one's identity through spiritual and material-practical activity, as well as understanding the essence of life." [1] If a person does not understand their body, they will not care for it. If they are uneducated, they will not be able to appreciate the results achieved. If they do not have their own opinions, they will not live their life. If they do not draw conclusions from the world around them, they will not understand the meaning of life. If they cannot understand, comprehend, and correctly perceive themselves, they are doomed. To understand this, it is necessary to study neuropsycholinguistics in a broad social context.

Main Party

Analyzing these feelings from a neuropsycholinguistic perspective, studying how they are formed in the brain, how they are expressed in speech, and how they influence human behavior is one of the most pressing scientific problems. The linguistic concepts of "love" and "affection" are revealed by studying their semantic, lexical, and cultural-cognitive properties within the linguistic system. The words "kindness" and "love" are linguistic concepts. A linguistic concept is a spiritual or emotional content formed in human thought and expressed through words. That is, the meaning of a word is not only lexical but also cultural, emotional, and cognitive. Consequently, the words "kindness" and "love" not only express feelings but also reflect the worldview and values of a people.

Based on their neuropsycholinguistic properties, these concepts are called "happiness hormones." The neurotransmitters that provide these hormones are: 1. Dopamine: creates motivation,

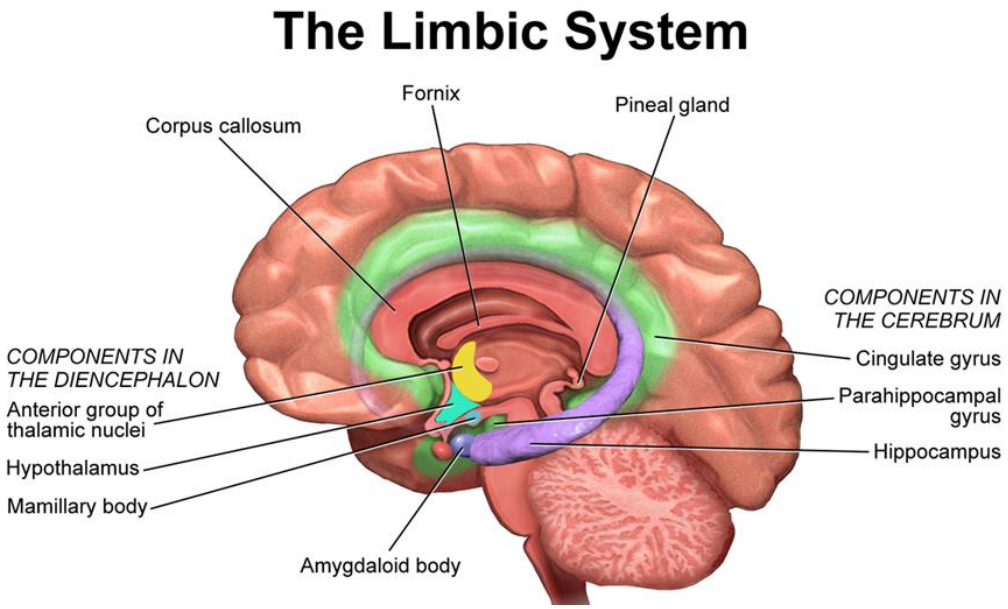
[1]Schrödinger Erwin What is Life? // Cambridge University Press. - 1944. Margulis Lynn, Sagan, Dorion What is Life? // University of California Press. - 1995.

inspiration, the feeling of "I want it"; 2. Oxytocin: evokes feelings of love, trust, and attachment; 3. Serotonin: creates a feeling of calm, a stable mood, and satisfaction; 4. Endorphin: reduces pain and enhances feelings of pleasure. Together, these substances form a system of human happiness, love, and emotional balance. First of all, it is appropriate to dwell on the neurophysiological foundations of the problem under consideration. The feeling of attachment and love is associated with certain neurobiochemical processes in the brain:

1. The limbic system (especially the amygdala, hippocampus, and hypothalamus) is the primary center for emotional control. The limbic system is the "emotional center" of the brain and the primary neurostructural system that shapes emotions, memory, and human motivation [2]. This system is a complex of brain structures that play a key role in controlling emotions, memory, motivation, behavior, and instinctive responses. This system is located between the cerebral cortex and the inner (subcortical) regions of the brain. It is also called the "marginal" or "midbrain" (from the Latin limbus, meaning "border") [3].

The most important structural parts of the limbic system that perform basic functions include: 1. The hippocampus (long-term memory - formation of spatial memory and memory of place); 2. The amygdala (the amygdala controls fear, anger, aggression and other emotional reactions); 3. The hypothalamus (controls vegetative functions - heart rate, body temperature, appetite, sexual behavior); 4. The cingulate gyrus (the cingulate gyrus, involved in attention, perception of emotional pain and control of emotions); 5. The papillae and fornix (involved in memory processes).

This system is involved in the following psychological and physiological processes and performs the following primary functions: 1. Generates emotions (joy, anger, fear, love, hate); 2. Manages the motivation and drive system; 3. Ensures the formation and retention of memory; 4. Manages stress responses; 5. Regulates instinctive behavior – feeding, protection, sexual behavior.



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From a neuropsychological perspective, the limbic system is also involved in emotional speech, affective states, and psycholinguistic processes. For example, the amygdala activates fear-based memory; the hippocampus is involved in the memorization of new words and concepts; and emotional stimuli shape the emotional tone of speech.

2. Oxytocin and vasopressin are neuropeptides that stimulate feelings of attachment, trust, and social closeness. Both are neuropeptide hormones produced by the hypothalamus and released into the bloodstream by the posterior pituitary gland. They are closely linked to the limbic system, emotions, and social behavior. Oxytocin is a hormone and neuropeptide produced in the brain that stimulates contraction of the myoepithelial cells of the uterine and mammary glands. It is also known as the "love hormone" or "cuddle hormone" because it plays a key role in forming social bonds, trust, and attachment. In medicine, it is used, among other things, to induce labor, stop bleeding, and contract the uterus. Oxytocin has a direct impact on mental health. This hormone has properties that reduce stress levels, alleviate anxiety, and have a calming effect. For this reason, oxytocin-based medications are being developed for the treatment of certain psychological problems. For example, in patients with autism spectrum disorders or social anxiety disorders, oxytocin sprays or injections can help improve social relationships. Furthermore, oxytocin enhances feelings of trust between people. When a person trusts someone, is friendly, and cooperative, levels of this hormone increase. Oxytocin plays a vital role in the human body and psyche. It is actively involved not only in biological processes but also in emotional and social relationships between people. This hormone underlies many positive feelings, such as love, trust, friendship, affection, and peace.

Biological functions of oxytocin: 1. Stimulates uterine contractions in women (during childbirth); 2. Activates the mammary glands, facilitating breastfeeding; 3. Participates in the process of sperm release in men. Psychological and neuropsychological functions of oxytocin: 1. Oxytocin is called the "love hormone" - it enhances feelings of kindness, affection, trust, devotion and closeness; 2. Reduces stress, lowers heart rate; 3. Enhances empathy, social communication and the relationship between mother and child; 4. Calms the activity of the amygdala in the limbic system, that is, it reduces fear. For example, oxytocin is released when a mother holds her child in her arms or when a person sees his or her lover. Thus, oxytocin is the "love hormone," enhancing love, trust, and social intimacy, while vasopressin is the "commitment hormone," regulating loyalty, protection, and competition. Both are directly linked to the activity of the limbic system, which forms the neurobiological basis of human emotions and social behavior.

Vasopressin (Latin: vas - vessel, and presso - to press), an antidiuretic hormone, is a neurohormone produced in the hypothalamus. This hormone is produced by the posterior pituitary gland. Chemically, it is a polypeptide. It acts on vascular smooth muscle, constricting them and increasing blood pressure, increasing water reabsorption in the renal tubules, and decreasing diuresis, thereby exerting an ant diuretic effect. Vasopressin is produced in the neurosecretory cells of the anterior nuclei of the hypothalamus and is transported via nerve fibers to the pituitary gland, from where it is secreted into the blood. Due to its antidiuretic effect, vasopressin maintains water-salt metabolism in vertebrates and humans at virtually the same rate. A deficiency of this hormone can lead to diabetes insipidus. Medications containing vasopressin are derived from the posterior pituitary gland.

The main biological functions of vasopressin are: 1. Increases water reabsorption in the kidneys (i.e., reduces fluid loss from the body); 2. Increases blood pressure and constricts blood vessels.
Psychological and neuropsychological functions of vasopressin: 1. Plays a role in behaviors such as social competition, aggression, and territorial defense; 2. Associated with loyalty and protective instincts in males; 3. More closely associated with dominance and volitional behavior than oxytocin; 4. Forms social memory via the amygdala and hippocampus of the limbic system. For example, when a male defends a female or marks his territory, vasopressin levels increase. The differences between oxytocin and vasopressin are presented in the table below:

Characteristics	**Oxytocin**	**Vasopressin**
Main Emotional Effects	Love, affection, trust	Protection, competition, loyalty
Role in Sexual Behavior	Mother-child and couple bonding	Protection and loyalty in men
Effects on the Limbic System	Reduces amygdala activity (calmness)	Activates amygdala activity (vigilance, protection)
Physiological Effects	Uterine contractions, milk release	Fluid balance, blood pressure

The hypothalamus is a part of the brain, an important control center that maintains the body's internal balance (homeostasis). It regulates processes such as metabolism, body temperature, hunger, thirst, sleep-wakefulness, and emotions, and controls hormone production through the endocrine system. The hypothalamus acts as a link between the nervous and endocrine systems.
Dopamine—during love—activates the brain's reward system, enhancing feelings of joy, satisfaction, and attachment. Dopamine is a "neuromodulator of motivation." Dopamine is a neurotransmitter, a chemical that transmits signals between nerve cells, and plays a central role in regulating brain activity, emotions, motivation, and action. It not only brings pleasure but also motivates a person to take action, giving them the strength to move toward goals. The dopamine system underlies emotions, memory, social communication, and learning. Its neurophysiological, psychological, and behavioral aspects: Dopamine is a neurotransmitter from the catecholamine group, formed from the amino acid L-tyrosine. It is produced by nerve cells (neurons) of the brain, primarily in the following centers: 1. Substantia nigra; 2. Ventral tegmental area (VTA); 3. Hypothalamus.
Dopamine's connection with emotions: 1. Falling in love: dopamine, oxytocin, and serotonin work together to create romantic feelings; 2. Dopamine provides motivation: dopamine creates the feeling of "I want it," not "I like it"; 3. Addiction: drugs, games, or social media artificially activate the dopamine system, causing a person to become dependent on the "reward" — artificial stimulation.
The main functions of dopamine: 1. Motivation and reward system: "reward hormone": dopamine is released in response to pleasant experiences (e.g., achieving a goal, food, music, love); 2. Emotions and joy: causes feelings of joy, satisfaction, euphoria; 3. Learning and memory: improves learning processes through positive outcomes ("learning through stimulation"); 4. Motor

control: controls motor coordination (dopamine deficiency is observed in Parkinson's disease); 5. Love and Social Connections: In the early stages of romantic love, dopamine levels are high, producing a feeling of "excitement."

A dopamine imbalance, or levels that are too high or too low, can lead to various conditions: 1. A dopamine deficiency results in apathy, depression, and a slight predisposition to Parkinson's disease. 2. An excess of dopamine, with high levels, results in symptoms of hyperactivity, mania, and schizophrenia. 3. Normal dopamine levels increase energy, motivation, and stability in social activity.

Serotonin maintains emotional stability and maintains the emotional balance of love. Serotonin is a neurotransmitter that plays a key role in regulating brain activity, mood, sleep, appetite, and emotional balance. It is often called the "happiness hormone," but in reality, it doesn't bring happiness, but rather a feeling of peace and tranquility. Serotonin is a neuromodulator of "calm and balance." It controls mood, sleep, appetite, and social behavior. Serotonin calms emotions through the limbic system and ensures mental stability. Serotonin is a chemical formed from the amino acid tryptophan and is found primarily in the central nervous system (brain), intestine (gastrointestinal tract) (approximately 90%), and platelets. This makes serotonin an important biochemical mediator that links the brain and intestines. The main functions of serotonin: 1. Maintaining mood balance: providing feelings of peace, happiness, and stability. Serotonin deficiency is associated with depression, anxiety, and despair; 2. Improved sleep: regulates sleep-wake rhythms (biological clock); 3. Improved appetite: controls eating and creates a feeling of satiety. 4. Stabilization of social behavior: increases calmness and tolerance in social interactions; 5. Pain control: has an analgesic effect; 6. Increased physical activity: balances blood pressure, body temperature, and heart rate.

Serotonin is synthesized primarily in the raphe nuclei of the brainstem (pons and medulla oblongata) and from there is transmitted to the cerebral cortex, limbic system, and hypothalamus. Thus, serotonin directly influences limbic system activity: it reduces fear and anxiety through the amygdala and strengthens memory and positive emotions in the hippocampus.

The psychological significance of serotonin lies in maintaining neuropsychic stability. Its deficiency is observed in the following conditions: 1) depression (low serotonin levels); 2) obsessive-compulsive disorder; 3) anxiety; 4) affective instability. Therefore, many antidepressants increase serotonin levels

Low serotonin levels are associated with depression, anxiety, insomnia, loss of appetite, and aggression. Excessive or high levels can sometimes lead to serotonin syndrome, which leads to increased heart rate and temperature, as well as a state of extreme silence and passivity. A stable, normal serotonin balance is associated with calm, a positive mood, good sleep, and social stability.

Kindness and love are not only emotional processes but also a complex neurochemical one. From a neuropsycholinguistic perspective, the mechanisms of expressing these feelings through language are studied jointly and comprehensively. 1. The word "affectation" typically denotes warmth, care, compassion, and tolerance. These lexical units have emotionally positive connotations. Example: "to feed with affection," "kind mother." → These words evoke positive associations in affective-semantic networks. 2. The word "love" denotes deeper, romantic, or spiritual feelings. This is expressed through cognitive metaphors: for example, "Fire of Love" and "Sea of Love" are conceptual metaphors that figuratively express emotional experience. The

semantic connotation of the lexeme "kindness" refers to a positive semantic field: warmth, tolerance, sincerity. Connotatively, it is used in social relationships. The word "kindness" also has a metaphorical use: metaphors such as "sun of kindness," "in the arms of kindness," and "bridge of kindness" figuratively express human warmth.

In the linguistic system, these feelings are also conveyed through intonation, tone, pauses, and stress. For example, a soft tone expresses the strength of affection, while an emotional tone expresses the feeling and expression of love. A pause can indicate both positive and negative states, such as flirting, affection, grief, shame, disgust, humming, keeping a secret, and hatred. Stress, along with speech, conveys meanings of anger, insult, threat, condemnation, and emphasis.

When considering the linguistic characteristics of the concept of "kindness," its etymology and meaning are primarily considered. "Kindness" originally means "warmth, friendship, sunshine, care." In Uzbek, the word "mehr" (kindness) is used to denote warmth, compassion, mercy, and humanity. If you look at the linguistic ramifications of this word, you'll see a multitude of units derived from the word "kindness": "kind," "loving kindness," "loving eyes," and the antonym "unkind." These lexical units enhance the affective (emotional) and moral meanings.

The concept of "love," in its lexical properties and etymology, derives from the Arabic word for "love, devotion, intimacy." Its primary meaning is love, devotion, heartfelt intimacy, a passionate or divine connection. The lexeme "love" also has linguistic ramifications: with love, without love, making love, expressing love, and seeing the fruits of love. These units encompass romantic, spiritual, and emotional realms.

A neuropsycholinguistic analysis of the concept of "love" revealed that during "love," the hormones dopamine, norepinephrine, and vasopressin are actively produced. This process is associated with the reward system (ventral tegmental area, nucleus accumbens). Therefore, love is accompanied by euphoria, excitement, and motivation. The amygdala is somewhat weakened during love, suggesting a scientific basis for the popular expression "love is blind": emotions prevail over logic. According to its psycholinguistic expression, the word "love" is used in intense, emotional speech. In the linguistic system, units such as "heart," "soul," and "fire" express love—sincerity, devotion—and metaphorical lexemes such as "Fire of Love" create a powerful image and convey emotional power. Using metaphor, "Garden of the Heart" depicts the heat of love as a natural, life-giving feeling. According to its metaphorical usage, "Fire of Love," "Sea of Love," and "Garden of the Heart" are used to compare love to natural phenomena. These cognitive metaphors draw on human experience.

If we look at the cognitive foundations of this word, the concept of "love" is located in the brain as an intense emotional model, triggering strong activity in affective semantic networks. This means that when perceiving this word, the human brain can reproduce real emotions (affective priming).

The semantic connotation of the lexeme "love" also implies a positive, but deeper and more intense emotional coloring. This word is used in contexts related to interpersonal, divine, or spiritual communication. "Love" and "being in love" constitute the core of the lexical field of human emotions. Both are positive affective concepts reflecting moral and normative values. They are actively used in speech culture, fiction, proverbs, and sayings: "The treasure of love is language," "Love is magic in everything," "A loving person is loved." "A young man's love is in his eyes,"

"When gaze meets gaze, love awakens," "Where gaze is, there is love." There are linguistic differences and commonalities between the lexemes "kindness" and "love":

Aspect	Kindness (mehruboni)	Love (ishq, vafo)
Source	Persian-Tajik ("warmth", "care")	Arabic ("love," "loyalty")
Semantic Center	Compassion, care, humanity	Love, affection, devotion
Application Scope	Between parents, people, people	Couple, lovers, divine love
Semantic Tone	Warm, gentle, soothing	Deep, passionate, state of mind
Character of the Metaphor	Associated with the sun, generous, hot	Associated with fire, sea, heart

Suschchestvuyut cognitivno-linguisticheskie modeli privyazannosti i lyubvi, kotorye vklyuchayut: 1. Chelovek konceptualiziruet lyubov, osnovyvayas na opyte. That is, the concept of "love" is formed in the brain on a sensorimotor basis by such signals as heat, proximity, touch and visual contact. 2. Eti ponyatiya zatem verbalizuyutsya posredstvom language – in vide words, phrases or text. Primer: "Moya serdtse kolotitsya", "Moya golova v vikhre lyubvi". - this is the verbal expression of the physiological state.

In the social and cultural context, the words "kindness" and "love" have their cultural connotations. The word "lyubov" is used in the context of love and pare ili bozhestvennoy love. It creates different semantic motivations and neuropsychological networks.

Aspect	Kindness	Love
Neurobiological basis	Oxytocin, chuvstvo sostradania	Dopamine, romantic privyazannost
Yazykovoe vyrazhenie	Teplo, dobrota, zabota	Love, devotion, emotions
Cognitive metaphor	"Good Glaza", "Kormlenie dobrotoy"	"Ogon love", "More love"
Social context	Semya, humanity	Romanticheskaya ili dukhovnaya svyaz

Neuropsychological differences between " kindness " and "love":

Aspect	Kindness	Love
Key hormones	Oxytocin, serotonin	Dopamine, vasopressin
Area of activity in the brain	Hippocampus, prefrontal cortex	The ventral area is covered with a prilejashchee nucleus
Emotional stability	Spokoystvie, doverie, heat	Enthusiasm, passion, motivation
Yazykovaya expression	Myagkiy tone, tyoplye slova	Aromatic, strong, emotional words
Cognitive model	Stability, orientation and social connection	Dynamic, based on personal and romantic experiences

According to psycholinguistic forms of expression, the word "kindness" and related units (kind, affectionate, affectionate) activate gentleness, warmth, and a positive semantic field. In the linguistic system, "kindness" is also usually perceived through prosody (tone) – a soft, low tone indicates kindness. The concept of "kindness" is transferred into language through metaphorical

models. For example: "Kindness is the sun" → expresses a feeling of physical warmth; "In the arms of kindness" → indicates a feeling of security and peace. In cognitive interpretation, the feeling of "kindness" is encoded in the brain as a stable, calming concept. It is associated with the mechanisms of empathy (sensing the state of others).

Conclusion

1. Neuropsycholinguistics is the science that studies the relationship between the brain, psyche, and human language system. It analyzes how emotions and feelings are expressed in the brain, how they are encoded and expressed through language, and how emotional experiences take lexical and grammatical form.
2. A neuropsycholinguistic analysis of the concept of "love" revealed that this feeling is associated with the hormones oxytocin and serotonin. They enhance feelings of trust, care, peace, and tolerance in humans. In brain activity, the hippocampus, amygdala, and prefrontal cortex respond to "love," controlling positive emotions and empathy.
3. The integrative conclusion is that love is a socio-moral feeling controlled by neural networks of empathy and compassion. Love is a deeper affective feeling; it is linked to the reward system and motivational mechanisms. Language encodes these two concepts through metaphors based on human experience, so figurative expressions such as “heat,” “fire,” “chest,” and “heart” also have a neuropsycholinguistic basis.

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