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Original Paper

Hot and Cold Cognition in Hybrid Communication

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Abstract

In the socioprofessional as well as the educational context, hybrid communication has experienced an explosion and exerted strong influence not only on our psychic but also on our physical existence. In this context, cybernetics makes it possible to exploit the mechanism of control and interaction among people in continuous motion. With the integration of digital media in all aspects of human life, the exchange of digital data is continuously spreading without neglecting that these new modes of communication and collaboration can also determine our senses as well as our behavior by exerting influence not only on our perceptions and thoughts but also on our mentality.

On the other hand, human capacities linked to psychomotor factors make it possible to cultivate critical thinking, sense of responsibility and cooperation. However, the risk of disturbances could lead to a gap of psychomotor investment. Above all, it is necessary to take into account social cognition and the role of memory in online interactions and learning techniques with the uses of computer systems, because the memorization of actual experiences becomes profound, if we perceive each situation in a state of strong emotional involvement.

Keywords

hot and cold cognition, social cognition, hybrid communication, media and digital platforms, memorization

1. Introduction

With the advent of artificial intelligence and the domination of digital technology in socio-professional life in an international context, it is time to focus on the strong influence exerted on our physical and mental health by cybernetics, a fact requiring a study of the processes of control and communication among human beings and machines. Bearing that in mind, it is necessary to become aware of the mental states of the participants, in order to engage and adjust them in the context of hybrid

communication. Within this framework, the sensory memory which is connected to mental representation as well as the short-term memory trigger the decoding and encoding of information, while associating the cognitive aspect with the affective dimension in the implementation of the tasks to be performed. From this point of view, we will first identify the contribution of hot and cold cognition in the context of synchronous and asynchronous communication at the same time. Afterwards, we will highlight the human skills of digital platforms users by inquiring their positive commitment or the risk of possible disruption. Finally, it would be essential to pinpoint the close relationship between hot and cold cognition as well as to underline the contribution of memory in online interactions and learning techniques with the uses of computer systems.

2. Hot and Cold Cognition in Digital Media

Immerging into the virtual world, temporality and spatiality alternate in the synchronous and asynchronous environment where hybrid communication takes place. Hyles (2016) emphasizes the reversibility of digital time and is deeply interested in how to co-evolve over the transformations of digital environments (Hayles, 2016). It is undeniable that information and the exchange of digital data is spreading with the new modes of communication and collaboration because these machines that are frequently re-formed at the pace of technological innovations and consumerist modes, these machines in turn in-train us, individually and collectively, by favoring certain particular modes of communication and collaboration rather than others (Citton, 2016).

Digital media can also form not only our sensations but also our behavior by exerting influence on our perceptions and thoughts, a matter which has consequences on the biological, neurological and psychological rhythm of users. Indeed, we find ourselves immersed in different media environments, always particular, frequently straddled and superimposed between them, which penetrate into us—in our “thought”—well beyond the only “information” that we derive from it punctually (Citton, 2016). Therefore, the technocratic invasion manages to penetrate human life and to modify the way we learn, inform ourselves, reflect, act and even react to external stimuli which invade the areas of our brain and our sensitivity.

The nature of the stimulation shapes the connections among neurons that create the neuronal networks necessary for thought and behavior. Wexler explores the social implications of the close and changing neurobiological relationship between the individual and the environment, with particular attention to the difficulties individuals face in adulthood when the environment changes beyond their ability to maintain the fit between existing internal structure and external reality (Wexler, 2006). Roose (2010) notes that problems arise when Wexler extends the paradigm of how internal structures of the brain shape the individual to how these same structures shape society. The number of variables in play at the societal level makes matters here so much more complex (Roose, 2010). In this way, technogenesis changes the way we think and act in a hybrid interactive environment while opposing the outside world to the virtual environment because what predominates is our brain shaken by digital technology. As

Serres points out, “Cognitive sciences show that the use of the Web, the reading or writing of messages by thumb” (hence the title Petite Poucette, Editor’s note), the consultation of Wikipedia or Facebook do not excite the same neurons or the same cortical areas as the use of books, slates or notebooks. They can manipulate multiple pieces of information at once. They do not know, integrate or synthesize like us. They no longer have the same head. (https://www.la-croix.com/Sciences-et-ethique/Sciences-et-ethique/Le-cerveau-bouscule-numerique-2019-05-28-1201025090). Clearly, Michel Serres with the publication of his book Petite Poucette (Le Pommier, 2012) believed that neuroplasticity, this new ability will have to be cultivated, in order to reinvent a way of living together, a way of being and knowing with the beginning of a new era dominated by the image and fascinated by new technological tools.

3. The Psychomotor Factors of Users Using Digital Platforms: Positive Engagement or Risk of Disruption?

In the field of education, it is essential to develop human capacities related to psychomotor factors in order to cultivate critical thinking, sense of responsibility and cooperation in divergent groups that interact in a multicultural society. Moreover, as Côté (2011) points out, “any desire for change is an extension of who we are, of our previous experiences, of the emotions and messages associated with our experiences and of the image of ourselves that results from them.” (Côté D., 2011, p. 115).

The decisive factor for the positive commitment of the learner in the act of learning is the motivation through active participation and personal involvement, which will determine his investment in the learning process by creating fruitful exchanges with his partners. Moreover, as Bogaards (1991) notes, “Other situational and personal factors, both physical and psychological, play their part, not only in the how of the process, but also in its determination and modalities” (Bogaards, 1991, pp. 50-51). From this perspective, learning, which takes into account psychomotor factors, may include the following path: a. to acquire and develop basic notions, b. to promote diversity, c. to foster creativity. Moreover, skills management emphasizes the emotional and evaluative dimension of the learner’s experience. (Efthimiadou, 2011, p. 170). With the implementation of online collaborative scenarios using digital platforms, it would be motivating to develop the social dimension of the participants through the use of communication and information management techniques. Thus, psychomotor investment is reinforced by self-management and self-regulation while remaining interdependent with the development of interactive metasocio-cultural strategies.

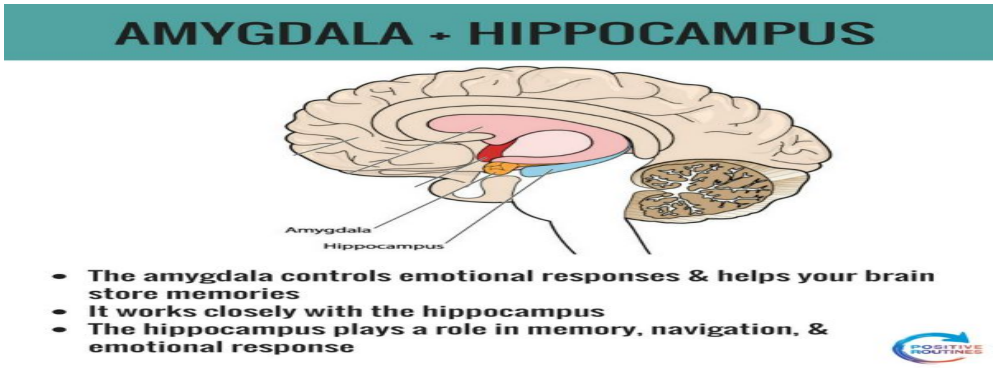
On the other hand, the loss of self-confidence, often followed by a deep sense of inferiority, leads the process to a halt. In addition, manifestations of physical insecurity are related to socio-emotional contacts. “In this aspect, anxiety is realized in stages and determines the inability to eliminate disappointed sensations. For sure, we feel this inhibitory mental rigidity, since we do not feel ready to take action”. It is true that some subjects do not manage to get rid of this psychological frustration and experience depression, which often reflects negativity in the face of an obstacle to be overcome

(Efthimiadou, 2011, p. 165). Moreover, "Major depressive disorder (MDD) is characterized by dysfunction in cognitive and emotional systems. However, the neural network correlates of cognitive control (cold cognition) and emotion processing (hot cognition) during the remitted state of MDD (rMDD) remain unclear and not fully probed, which has important implications for identifying intermediate phenotypes of depression risk." (Stange et al., 2018, p. 183). This is why there is the risk of disturbances, since "On the side of psychomotricity, this way of considering the link between the body state and emotional flows has led to the description of psychomotor disorders as disturbances of psychocorporeal balance, not responding to a single neurological impairment and expressing psychic suffering. Psychomotor disorder is not only caused by a neurobiological disorder, it is always related to functional and expressional disturbance. It can only be understood in the psychosocial context". (Boscaini & Saint-Cast, 2010, pp. 78-79).

4. Social Cognition and the Role of Memory in Online Interactions

"Cold cognition is defined by the term 'mentalizing system': the others (and their emotions) are perceived in a cold, rational way; it is the system that allows the theory of mind. This term is in contrast to the term 'mirror system' which refers to hot cognition (Spikman et al., 2013)". (Foucaud Contraire Ch., Montet de la Seiglière A., 2016, p. 5). The close relationship between hot and cold cognition highlights the primordial role of social cognition, which is self-regulating by the behavioral reaction of individuals in the environment that surrounds them because they remain influenced by their beliefs but also by their psychic life, including emotions, affective state, psychomotor functions. Ric and Muller (2017) in their book Social Cognition emphasize the definition of social cognition "proposed by Herbert Bless, Klaus Fiedler and Fritz Strack (2004) and Susan Fiske and Shelley E. Taylor (2008)", namely that cognitive productions are the result of psychological processes "by which people give meaning to themselves, to others, to the world around them, and to the consequences of these thoughts on social behaviour." (Boucher, 2018).

As far as sensory memory is concerned, it remains dependent on the amygdala of the brain, in order to examine very quickly and roughly the signals perceived by the natural environment. This storage of information is linked to emotional memorization by the hippocampus, which makes learning more effective. On the other hand, short-term memory associates the cognitive aspect with the affective. As Efthimiadou (2018) states: "In the process of memorization, short-term memory activates mental operations by maintaining, but also by processing the information retained by the reception of sensory data. (...) short-term memory retrieves the data recorded by long-term memory to move on to the analysis of information related to sensory memory." (Efthimiadou, 2018, p. 122).



Chelsey Taylor, March 30, 2018, ***Amygdala-hippocampus-stress-and-the-brain,***
https://positiveroutines.com/stress-and-the-brain/amygdala-hippocampus-stress-and-the-brain/

Certainly, the information received, exploited and decoded helps to assign meaning to the situations put in context because the operations of decoding and encoding of the information connect and highlight not only the cognitive aspect but also the affective dimension in the elaboration and management of the tasks to be performed. “This is why, in online communication, it is essential to take into account the factors related to hot or cold cognition, because different kinds of memories including sensory, short-term and long-term depend on the encoding and storage of cognitive, socioaffective and metacognitive decision-making in any learning situation.” (Efthimiadou, 2020, p. 48). It is essential to take into account the mental states of people in interaction, in order to translate their behavioral reaction and to predict their conduct and also their regulation during interpersonal exchanges. As a result, “the emotional dimension appears central to the design of today’s machines, and it has part to do with memory: both with human memory, in particular unconscious memory at work in recognition phenomena, and with its computer modeling, which includes machine learning techniques.” (Ganascia, 2016, p. 153).

In the educational framework, the interplay of interactions carried out in the process of online learning highlights the need for the empowerment of the subjects to perform effective tasks with regard to their learning and also for the adoption of values and positive reflexes to be able to be stored in memory as moments of discovery and creativity. As Asma (2017) puts it, “Any brainstorming activity must have a second editorial phase of throwing out the copious junk. But the performing brainstormer, the improviser, has no such convenience or comfort. This suggest that the imagination has a cold cognition and a hot cognition pathway.” (Asma, 2017, p. 168). Thus, memory is also used to retain information and activate the senses of sight and hearing first, while consolidating the information through judgment. Therefore, the assimilation of knowledge is built on a triple axis that can work in all directions: a. external and inner contemplation, b. judgment, c. action. Finally, the broadcasted message, actively stored in memory, can intervene in a reconstruction of information and give rise to divergent or even original interpretations.

5. Discussion

Eventually, hot and cold cognition are associated and remain complementary in the interrelations between trainees and both their virtual and physical environment. With the use of collaborative online tasks, participants become actors and co-actors by cultivating their cognitive, socio-affective and transversal skills. However, the manifestation of anxiety associated with the lack of self-confidence leads to a discrepancy in action while at the same time risking of disruption. It is therefore necessary to be aware of the mental states of the participants, in order to engage and readapt them in the hybrid learning context. In this context, the memorization of experienced facts becomes profound if one perceives each situation in a state of strong emotion. As Eustache (2016) points out, "The importance of the event, perceived at the outset, the effect of surprise and the emotional charge lead to memorizing the context of the learning: where we were, what we were doing when it happened, how we felt, how we reacted." (Eustace, 2016, p. 21). Finally, social cognition highlights the affective state with the triggering of emotions and takes into consideration the physiological, mental, but also behavioral changes of the human-environment interactions, in order to demonstrate divergence and creative imagination.

References

Asma, T. S. (2017). *The evolution of imagination*. Chicago, London: The University of Chicago Press.

Bless, H., Fiedler, K., & Strack, F. (2004). *Social Cognition: How Individuals Construct Social Reality*. New York, Psychology Press.

Bogaards, P. (1991). *Aptitude et affectivité dans l'apprentissage des langues étrangère*. Paris: Hatier-Didier.

Boscaini, F., & Saint-Cast, A. (2010). L'expérience émotionnelle dans la relation psychomotrice. *Enfances & Psy*, *4*(4), 78-88. https://doi.org/10.3917/ep.049.0078

Boucher, M. (2018). François Ric et Dominique Muller (2017). *La cognition sociale*, *Communication* [En ligne], *35*(2), 2018. https://doi.org/10.4000/communication.8169

Citton, Y. (2016). Préface. Humanités numériques et études de media comparés. In N. K. Hayles, *Lire et penser en milieux numériques: Attention, récits, technogenèse*. Grenoble: UGA Éditions.

Côté, R. (2003). *Apprendre-Formation expérientielle stratégique*. Québec: Presses de l'Université du Québec.

Efthimiadou, E. (2020). Multimodality And Digital Space: Cognitive And Socio-Emotional Factors In Online Communication. *Annals of the University of Craiova, Series Psychology, Pedagogy*, *42*(2), 47-58.

Efthimiadou, E. (2018). *Mémoire sensorielle VS mémoire affective et émotionnelle*. De la représentation

mentale à l'imagination créatrice. (n.d.). *Berdal-Masuy, F.(eds.) Emotissage—Les émotions dans l'apprentissage des langues* (pp. 119-128). Belgique: Presses Universitaires de Louvain.

Efthimiadou, E. (2011). Les facteurs psychomoteurs de l'apprenant dans la classe de FLE. *La jeunesse Francophone. Dialogue des langues et des cultures*. Cecilia CONDEI, Claire DESPIERRES, Cristiana TEODORESCU, Jolanta ZAJĄC, Mircea ARDELEANU, Luc COLLÈS (éds.), (pp.163-171). Maison d'édition : Universitaria. Craiova. Roumanie.

Eustache, F. et al. (Ed.). (2016). *Mémoire et émotions*. Paris, France: Editions Le Pommier.

Fiske, S. T., Taylor, E., & Shelley E. (2008). *Social Cognition: From Brains to Culture*. Londres: Sage.

Foucaud Contraire Charlotte, Montet de la Seiglière Anne. Création d'un protocole de rééducation de la cognition sociale pour adultes cérébrolésés. (2016). Sciences cognitives, dumas-01376726. HAL Id: dumas-01376726. Retrieved from https://dumas.ccsd.cnrs.fr/dumas-01376726

Ganascia, J.-G. (2016). Du côté de l'intelligence artificielle. In F. Eustache (Eds.), *Mémoire et émotions* (Chapitre 7, pp. 135-153). Paris : Éditions Le Pommier.

Hayles, N. K. (2016). *Lire et penser en milieux numériques: Attention, récits, technogenèse*. Grenoble: UGA Éditions. https://doi.org/10.4000/books.ugaeditions.379

Ric, F., & Muller, D. (2017). *La cognition sociale*. Grenoble: Presses universitaires de Grenoble. https://doi.org/10.3917/pug.mulle.2017.01

Roose, S. P. (2010). Book Review: Brain and Culture: Neurobiology, Ideology and Social Change. By Bruce E. Wexler. Cambridge: MIT Press, 2006, (p. 320). *Journal of the American Psychoanalytic Association*, *58*(5), 1044-1047. https://doi.org/10.1177/0003065110379486

Sergent, D. (28/05/2019). *Le cerveau bousculé par le numérique*. La Croix, Sciences et éthique. Retrieved from https://www.la-croix.com/Sciences-et-ethique/Sciences-et-ethique/Le-cerveau-bouscule-numerique-2019-05-28-1201025090

Spikman, J. M., Boelen, D. H. E., Pijnenborg, G. H. M., Timmerman, M. E., van der Naalt, J., & Fasotti, L. (2013). Who benefits from treatment for executive dysfunction after brain injury? Negative effects of emotion recognition deficits. *Neuropsychological Rehabilitation*, *23*(6), 824-845. https://doi.org/10.1080/09602011.2013.826138

Stange, J. P., Jenkins, L. M., Hamlat, E. J., Bessette, K. L., DelDonno, S. R., Kling, L. R., … Langenecker, S. A. (2018). Disrupted engagement of networks supporting hot and cold cognition in remitted major depressive disorder. *Journal of affective disorders*, *227*, 183-191. https://doi.org/10.1016/j.jad.2017.10.018

Wexler, B. (2006). *Brain and Culture: Neurobiology, Ideology, and Social Change*. Bradford book. Cambridge: MIT Press. https://doi.org/10.7551/mitpress/1658.001.0001