

**INTERNET OF THINGS AND SENTIMENT ANALYSIS****Dr Luis Santiago Garcia Merino**ORCID: <https://www.orcid.org/0000-0001-9392-2474>Universidad Catolica Los Angeles de Chimbote
Instituto de Investigación, innovación ciencia y tecnología**Dr Segundo Cesar Tapia Cabrera**ORCID <https://orcid.org/0000-0003-1798-2437>

Universidad Nacional de Tumbes

Mgtr. Felicitas Eumelia Tapia CabreraORCID <https://orcid.org/0000-0003-0483-446X>

Universidad Nacional de Tumbes

Dra. Blanca Yannet Avila ValdiviezoORCID: <https://orcid.org/0000-0001-9090-5070>yanneavila06@gmail.com

Universidad Cesar Vallejo

Dr. Alex Miguel Hernandez TorresORCID <https://orcid.org/0000-0002-5682-2500>alex.hernandez@upn.pe

Universidad Privada del Norte

Dra. Cecilia Eugenia Mendoza AlvaORCID <https://orcid.org/0000-0002-3640-2779>

Universidad Cesar Vallejo

ceciliae@ucvvirtual.edu.pe

ABSTRACT:

Emotions have become increasingly important in our time, in all realms of social reality. This revaluation of the affective dimension of the person is revealed in its common presence as subject of research in many fields of knowledge. Also in Media and Communications studies, and specifically in relation to the use of digital technology, there is an academic interest in emotions. This paper maps the field of study where emotions and digital technology converge, specifically in the use of the Internet. There appears a vibrant, wide and complex field of study in which come together approaches of different types, both on the theoretical plane and on the methodological one. The article provides an overview of research carried out in this subject, which includes the study of social media as spaces of interaction where emotions are displayed, the massivescale emotional contagion or the sentiment analysis in the digital platforms,

among other topics. We conclude that the Net not only arouses emotions in users and serves as a channel for the expression of affection, but also influences the way in which this affection is modulated and displayed, as well as the configuration of the personal identity of the users of the Internet.

Keywords: Emotion, Internet, technology, emotional contagion, emotional identification, social networks, multiscreen society.

INTRODUCTION

Unlike what happened in previous times, where the affective dimension of the person was usually displaced to a secondary plane and confined to the private sphere, today we live immersed in a strong emotional culture, which permeates all areas of social life (Bendelow & Williams, 1998). Although throughout the Western tradition the reflection on the nature of human affection has always been present – since the writings of Aristotle, and more recently in Descartes, Spinoza or William James among others (Solomon, 2003) – also in the academic world there has been in recent decades an "affective turn" (Clough & Halley, 2007); in the sense that emotions have become the object of study of different scientific disciplines (such as anthropology, economics, linguistics, computer engineering, etc.). Advances made in neuroscience have contributed to this, highlighting the role played by emotions in mental processes and their key role in the development of brain functions (Ferrés, 2014).

There are, therefore, various theoretical approaches to emotions, which are conceptualized and explained from both neurobiological and sociocultural approaches. In this sense, it does not seem feasible to understand emotions, their experience, expression and communication without taking into account the social context in which they are manifested, hence one of the most fruitful theoretical approaches is the one developed from the "sociology of emotions" (Turner & Stets, 2007). However, the complex reality of this facet of human nature makes it an object of interdisciplinary study, but on which there is still no comprehensive vision, capable of sharing and integrating all these various disciplines. There is also no conceptual and terminological consensus about the phenomena encompassed here, such as affect, emotions, feelings or passions.

Parallel to the rise of the affective dimension in social life and in the academic field, in the last two decades we have also witnessed the growing social implantation of information and communication technologies (ICT). Technology is already fully integrated into our daily lives; and the adoption, omnipresence and ubiquity of digital devices is not a mere quantitative issue, since, as Lasén (2014: 7) points out, "their wide dissemination, personalization and the possibility of permanent connection they create, contribute to reconfiguring numerous aspects of daily life and as well as contemporary processes of subjectivation and socialization".

There is no doubt, therefore, that nowadays people already interact both in the offline and online environment; Moreover, that social relations are already hybridized between both contexts. At the same time, the digital field presents its own peculiarities, which come from its electronic condition and which in turn affect the emotional dimension of the person. Traditional social life, which is slower and more localized, coexists with digital social life (faster and more rootless). Thus, they are two spatio-temporal regimes; and each one is accompanied by its corresponding emotional regime. The technological emotional regime is, above all, a regime of emotional intensities, in which the amount of emotion matters, while the traditional regime is above all a regime of emotional qualities. Although it is not feasible that the technological regime can one day annul the traditional one – since this is the condition of possibility of the former; there is no doubt, however, "that the coexistence of both emotional regimes generates interferences between the emotional logics of each one" (González, 2013: 13-14). This coexistence, on the other hand, causes the scope of analysis on digital technology and emotions to be broad and complex, since it has to attend to the implications that derive from it both in the face-to-face and in the digital level.

2. Material and methods

From a historical perspective, the Western world's relationship with technology has always been highly emotional. As technology is always situated in the realm of novelty, its irruption opens the question of how the new flows within the old, or the already known. This process, as Fortunati and Vincent (2009: 6) point out, "is played out in a binary path between the pole of curiosity, rarity, new risk and uncertainty, on the one hand; and, on the other hand, the old habits, stability, security, certainty." To this we must add the set of meanings, symbols and values that technology is associated with. That is why every technological novelty, especially in its beginnings, raises a debate between enthusiasts and skeptics or, to put it in terms of Eco (1964), between "apocalyptic and integrated".

Today, the growing importance of the affective dimension in social life, on the one hand; and, on the other hand, the role acquired by technology and specifically the Internet in everyday interactions has led to the field of research in which both realities converge being very fertile and varied, both at the level of the conceptual approaches and methodologies used and in that of the themes, emotions, social groups or specific technological devices that focus the various studies and publications to date.

With all this, the objective of this article is to provide, within the scope of communication studies, an overview of the field of research on the Internet and emotions, showing the different areas of study and the most relevant publications in each of them. We will not address here, as it exceeds the limits of this research, studies that examine the affective investment that people put into digital technology, embodied through various devices, especially mobile phones.

Thus, in the following pages and through an extensive bibliographic review, we will draw a map of this field, taking as reference the academic literature that has explicitly studied emotions in relation to the new field of socialization and emotional outcrop that is the Internet. To do this, we will first present a framework with the main theoretical and methodological issues involved in the study of the Network, and that have been addressed from various disciplinary traditions. Next, we will explore in more detail the expression of emotions in social networks, both at the micro level (of interactions between users) and at the macro level (considering the phenomenon of emotional contagion, also known in the field of neuropsychology as emotional identification).

CONCLUSIONS

An approach to the Internet from the point of view of emotions, understood as a predominant value of contemporary society, allows us to draw – as we have done throughout these pages – a vibrant, broad and complex field of research, in which approaches from different traditions and theoretical schools converge, from digital literacy to cultural studies. going through audiovisual communication or gender studies. Whether at the micro level of interactions through different platforms (social networks, blogs, forums, etc.) or at the macro level (through large-scale emotional contagion), it is clear that the Net is not only a channel for the manifestation of the various emotions and affections of users, but also contributes to shaping and amplifying them. From the methodological point of view, the challenge of combining qualitative and quantitative techniques that allow measuring and comparing emotions in parallel in the offline and online world remains.

This confluence of the face-to-face and digital spheres (with their own spatio-temporal and emotional regimes), the sociocultural practices associated with the use of the Web (together with the technical, legal and market constraints) or the peculiarities of computer-mediated interactions versus face-to-face encounters are some of the issues that articulate the studies in this matter. In this sense, the contributions of research from neuroscience continue to shed light for a better understanding of emotions.

Finally, and from a broader point of view, it is possible to venture that the growing extension of the so-called "Internet of things", making the presence of technology in daily life more ubiquitous and immersive, as well as the appearance of wearable devices – which represents a further step in the adaptation and physical integration of technology to the user, and advances in the design of social robots (facilitating a more natural interaction with humans), are some lines of future research that stand out as of interest in the study of emotions in the use of digital technology.

REFERENCES

- J. Hernández, M. J. Ramírez, C. Ferri "Introduction to Data Mining" © Prentice Hall / Addison-Wesley, ISBN 84 205 4091 9
- BW380 Data Mining "SAP Business Intelligence: Analysis Processes and Data Mining" SAPDOCS

- BW310 "Data Warehousing" SAPDOCS
- BW360 "SAP BI Performance & Administration" SAPDOCS Master Thesis "Evaluation of Data Mining Methods to support data warehouse administration and monitoring in SAP business warehouse" Narasimha Raju Alluri (and consequently, all his bibliography added)
- A presentation on data mining with SAP
- BW 3.5. SAPNET Lesley 2004
- L. García Merino "Digital Marketing" 2018 – editorial saxo yo publico PERU. ISBN 9788771431735
- Ben-Ze'ev, A. (2004). *Love Online. Emotions on the Internet*. New York: Cambridge University Press.
- Bendelow, G., & Williams, S.J. (Eds.) (1998). *Emotions in Social Life: Critical Themes and Contemporary Issues*. London: Routledge.
- Benski, T., & Fisher, E. (2014). Introduction: Investigating Emotions and the Internet. In T. Benski, & E. Fisher (Eds.), *Internet and Emotions* (pp. 1-14). New York: Routledge.
- Boyns, D., & Loprieno, D. (2014). Feeling through Presence: Toward a Theory of Interaction Rituals and Parasociality in Online Social Works. In T. Benski, & E. Fisher (Eds.), *Internet and Emotions* (pp. 33-47). New York: Routledge.
- Cefai, S. (2014). The Lesbian Intimate: Capacities for Feeling in Convergent Media Context. *Participations: Journal of Audience and Reception Studies*, 11(1), 237-253.
- Chiyoko-King-O'Riain, R. (2014). Transconnective Space, Emotions and Skype: The Transnational Emotional Practices of Mixed International Couples in the Republic of Ireland. In T. Benski, & E. Fisher (Eds.), *Internet and Emotions* (pp. 131-143). New York: Routledge.
- Clough, P. T., & Halley, J. (2007). *The Affective Turn: Theorizing the Social*. Durham: Duke University Press.
- Coviello, L., Sohn, Y., & al. (2014). Detecting Emotional Contagion in Massive Social Networks. *PLoS ONE*, 9(3), e90315. DOI: <http://dx.doi.org/10.1371/journal.pone.0090315>
- Dafonte, A. (2014). Keys to viral advertising: From motivation to emotion in the most shared videos. *Communicate*, 43, 199-207. DOI: <http://dx.doi.org/10.3916/C43-2014-20>
- Derks, D., Fischer, A.H., & Bos, A.E. (2008). The Role of Emotion in Computer-mediated Communication: A Review. *Computers in Human Behavior*, 24(3), 766-785. DOI: <http://dx.doi.org/10.1016/j.chb.2007.04.004>
- Dobeles, A., Lindgreen, A., Beverland, M., Vanhamme, J., & Van-Wijk, R. (2007). Why Pass on Viral Messages? Because They Connect Emotionally. *Business Horizons*, 50, 291-304.
- Eckler, P., & Bolls, P. (2011). Spreading the Virus: Emotional Tone of Viral Advertising and its Effect on For-warding Intention and Attitudes. *Journal of*

- Interactive Advertising, 11(2), 1-11. DOI: <http://dx.doi.org/10.1080/15252019.2011.10722180>
- Eco, U. (1964). *Apocalittici e integrati: comunicazioni di massa e teorie della cultura di massa*. Milan: Bompiani.
 - Ferrés, J. (2014). *Screens and the emotional brain*. Barcelona: Gedisa.
 - Fortunati, L., & Vincent, J. (2009). Introduction. In J. Vincent, & L. Fortunati (Eds.), *Electronic Emotion. The Mediation of Emotion via Information and Communication Technologies* (pp. 1-31). Bern: Peter Lang.
 - Fortunati, L., Pertierra, R., & Vincent, J. (2012). *Migration, Diaspora and Information Technology in Global Societies*. London: Routledge.
 - Fürst, H. (2014). Emotional Socialization on a Swedish Internet Dating Site: The Search and Hope for Happiness. In T. Benski & E. Fisher (Eds.), *Internet and Emotions* (pp. 99-112). New York: Routledge.
 - Garde-Hansen, J., & Gorton, K. (2013). *Emotion Online. Theorizing Affect on the Internet*. Basingstoke: Palgrave Macmillan.
 - Gómez-Cabranes, L. (2013). The emotions of the Internet user. In L. Flamarique, & M. D'Oliveira-Martins (Eds.), *Emotions and lifestyles: X-ray of our time* (pp. 211-243). Madrid: Biblioteca Nueva.
 - González, A.M. (2013). Introduction: emotions and social analysis. In L. Flamarique, & M. D'Oliveira-Martins (Eds.), *Emotions and lifestyles: radiography of our time* (pp. 9-24). Madrid: Biblioteca Nueva.
 - Hermida, A. (2014). *Tell Everyone. Why We Share & Why It Matters*. Toronto: Doubleday Canada.
 - Jakoby, N.R., & Reiser, S. (2014). Grief 2.0: Exploring Virtual Cemeteries. In T. Benski, & E. Fisher (Eds.), *Internet and Emotions* (pp. 65-79). New York: Routledge.
 - Jibril, T.A., & Abdullah, M.H. (2013). Relevance of Emoticons in Computer-mediated Communication Contexts: An Overview. *Asian Social Science*, 9(4), 201-207. DOI: <http://dx.doi.org/10.5539/ass.v9n4p201>
 - Kappas, A., & Krämer, N.C. (Eds.) (2011). *Face-to-face Communication over the Internet: Emotions in a Web of Culture*. Cambridge: Cambridge University Press.
 - Karatzogianni, A., & Kuntsman, A. (Eds.) (2012). *Digital Cultures and the Politics of Emotion: Feelings, Affect and Technological Change*. Basingstoke: Palgrave Macmillan.
 - Kato, Y.; Kato, S., & Akahori, K. (2007). Effects of Emotional Cues transmitted in E-mail Communication on the Emotions Experienced by Senders and Receivers. *Computers in Human Behavior*, 23(4), 1894-1905. DOI: <http://dx.doi.org/10.1016/j.chb.2005.11.005>
 - Kaufmann, J.C., & Macey, D. (2012). *Love Online*. Cambridge: Polity.
 - Knudsen, B.T., & Stage, C. (2012). *Contagious Bodies. An Investigation of Affective and Discursive Strategies in Contemporary Online Activism*. *Emotion*,

- Space and Society, 5(3), 148-155. DOI: <http://dx.doi.org/10.1016/j.emospa.2011.08.004>
- Kramer, A.D., Guillory, J.E., & Hancock J.T. (2014). Experimental Evidence of Massive-scale Emotional Contagion through Social Networks. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*, 111(24), 8.788-8.790.
 - Küster D., & Kappas, A. (2014). Measuring Emotions in Individuals and Internet Communities. In T. Benski, & E. Fisher (Eds.), *Internet and Emotions* (pp. 48-61). New York: Routledge.
 - Lasén, A. (2010). Mobile Media and Affectivity: Some Thoughts about the Notion of Affective Bandwidth. In J.R Höflich, G.F. Kircher, C. Linke, & I. Schlote, (Eds.), *Mobile Media and the Change of Everyday Life* (pp. 131-154). Frankfurt am Main: Peter Lang.
 - Lasén, A. (2014). Introduction. The digital mediations of the sentimental education of young people. In I. Megía Quirós, & E. Rodríguez-San-Julían (Coords.), *Jóvenes y comunicación. The imprint of the virtual* (pp. 7-16). Madrid: Fundación de Ayuda contra la Ddrugadicción.
 - Livingstone, S., Kirwil, L., Ponte, C., & Staksrud, E. (2014). In their Own Words: What Bothers Children Online? *European Journal of Communication*, 29(3), 271-288. DOI: <http://dx.doi.org/10.1177/0267323114521045>
 - Moeller, S., Powers, E., & Roberts, J. (2012). "The disconnected world" and "24 hours without media": media literacy for the critical awareness of young people. *Communicate*, 39, 45-52. DOI: <http://dx.doi.org/10.3916/C39-2012-02-04>
 - Muise, A., Christofides, E., & Desmarais, S. (2009). More Information than You Ever Wanted: Does Facebook Bring Out the Green-Eyed Monster of Jealousy? *CyberPsychology & Behavior*, 12(4), 441-444. DOI: <http://dx.doi.org/10.1089/cpb.2008.0263>
 - Pantti, M., & Tikka, M. (2014). Cosmopolitan Empathy and User-Generated Disaster Appeal Videos on YouTube. In T. Benski, & E. Fisher (Eds.), *Internet and Emotions* (pp. 178-192). New York: Routledge.
 - Papacharissi, Z. (2014). Toward New Journalism(s). Affective News, Hybridity, and liminal Spaces. *Journalism Studies*, 27-40. DOI: <http://dx.doi.org/10.1080/1461670X.2014.890328>
 - Papacharissi, Z., & Oliveira, F. (2012). Affective News and Networked Publics: The Rhythms of News Storytelling on #Egypt. *Journal of Communication*, 62(2), 266-282. DOI: <http://dx.doi.org/10.1111/j.1460-2466.2012.01630.x>
 - Perry, B., & Olsson, P. (2009). Cyberhate: the Globalization of Hate. *Information & Communication Technology Law*, 18(2), 185-199. DOI: <http://dx.doi.org/10.1080/13600830902814984>
 - Peyton, T. (2014). Emotion to Action? Deconstructing the Ontological Politics of the 'Like' Button. In T. Benski, & E. Fisher (Eds.), *Internet and Emotions* (pp. 113-128). New York: Routledge.

- Picard, R.W. (2003). Affective computing: Challenges. *International Journal of Human Computer Studies*, 59(1-2), 55-64. DOI: [http://dx.doi.org/10.1016/S1071-5819\(03\)00052-1](http://dx.doi.org/10.1016/S1071-5819(03)00052-1)
- Reestorff, C.M. (2014). Mediatised affective activism: The Activist Imaginary and the Topless Body in the Femen Movement. *Convergence: The International Journal of Research into New Media Technologies*, 20(4), 478-495. DOI: <http://dx.doi.org/10.1177/1354856514541358>
- Risi, E. (2014). Emerging Resentment in Social Media: Job Insecurity and Plots of Emotions in the New Virtual Environments. In T. Benski, & E. Fisher (Eds.), *Internet and Emotions* (pp. 161-177). New York: Routledge.
- Roeser, S. (Ed.) (2010). *Emotions and Risky Technologies*. New York: Springer.
- Sagioglou, C., & Greitemeyer, T. (2014). Facebook's Emotional Consequences: Why Facebook Causes a Decrease in Mood and why People Still Use it. *Computers in Human Behavior*, 35, 359-363. DOI: <http://dx.doi.org/10.1016/j.chb.2014.03.003>
- Sampson, T. (2012). *Virality. Contagion Theory in the Age of Networks*. Minnesota: University of Minnesota Press.
- Schofield-Clark, L. (2014). Mobile Media in the Emotional and Moral Economies of the Household. In G. Goggin, & L. Hjorth (Eds.), *The Routledge Companion to Mobile Media* (pp. 320-332). New York: Routledge.
- Solomon, R.C. (Ed.) (2003). *What Is an Emotion? Classic and Contemporary Readings*. Oxford: Oxford University Press.
- Spitzberg, B.H. (2014). Toward a Model of Meme Diffusion (M3D). *Communication Theory*, 24, 311-339. DOI: <http://dx.doi.org/10.1111/comt.12042>
- Svensson, J. (2014). Power, Identity, and Feelings in Digital Late Modernity: The Rationality of Reflexive Emotion Displays Online. In T. Benski, & E. Fisher (Eds.), *Internet and Emotions* (pp. 17-32). New York: Routledge.
- Turner, J.H., & Stets, J.E. (Eds.) (2007). *Handbook of the Sociology of Emotions*. New York: Springer.
- Vincent, J., & Fortunati, L. (Eds.) (2009). *Electronic Emotion. The Mediation of Emotion via Information and Communication Technologies*. Bern: Peter Lang.
- Wahl-Jorgensen, K. (2013). Emotional Architecture of Social Media: The Facebook 'Like' button. 63rd Annual Conference of the International Communication Association (ICA). London (UK), 17-21/06.
- Walter, T., Hourizi, R., Moncur, W., & Pitsillides, S. (2012). Does the Internet Change How We Die and Mourn? Overview and Analysis. *Omega: Journal of Death and Dying*, 64(4), 275-302.

INTERNET ADDRESSES

- <http://www.google.es>
- <http://www.witnessminer.com>
- <http://www.appstate.edu/~whiteheadjc/service/logit/>
- http://en.wikipedia.org/wiki/Main_Page

- <http://www.cs.waikato.ac.nz/ml/weka/>
- <http://old.nabble.com>
- <http://comments.gmane.org/gmane.comp.ai.weka/20508>
- <http://wekadocs.com/>
- <http://www.opentox.org/dev/documentation/components/m5p>
- www.canalvisualbasic.net/
- www.vb-mundo.com
- www.vbtutor.net/vbtutor.html
- www.lawebdelprogramador.com
- www.microsoft.com
- www.wordreference.com
- <https://www.redalyc.org/journal/158/15847441002/html/>
- <https://www.revistacomunicar.com/verpdf.php?numero=46&articulo=46-2016-02> (html)