A SOCIO-COGNITIVE REVISION OF THE ENTREPRENEURIAL PROCESS USING A MACHINE LEARNING APPROACH AND GEM DATA

Rosa M. Batista-Canino, U. of Las Palmas de Gran Canaria, rosa.batistacanino@ulpgc.es
Lidia Santana-Hernández, U. of Las Palmas de Gran Canaria, lidiasantanahernandez@gmail.es
Juan Luis Navarro-Mesa, U. of Las Palmas de Gran Canaria, juanluis.navarro@ulpgc.es

Área: I.1

Keywords: Entrepreneurial process; socio-cognitive traits; Machine Learning; Diversity and Relevance Map; Global Entrepreneurship Monitor; GEM.

Many voices are asking for interdisciplinary work for a better understanding of the phenomena that occur in our days (Millar, 2013), while the progress of some disciplines offers interesting opportunities for this purpose. In this regard, Obschonka & Audretsch (2019) reveal the importance of Artificial Intelligence (hereafter AI) for entrepreneurship, offering entrepreneurs an unbeatable opportunity to analyse reality, reduce uncertainty, and identify new opportunities; while researchers of entrepreneurship are provided with new tools capable of working with a greater volume of information. In this sense, it would allow advance to evidence invisible links to the researchers' eyes, while revealing new paradigms in the field of study and let entail "[...] reviewed research structures" (Obschonka & Audretsch, 2019:18). Although interest in the use of AI in our field of research is still limited, calls for papers in this interdisciplinary area are multiplying to address complex analyses that traditional statistical techniques are unable to solve properly.

This is particularly critical in longitudinal studies, and in those where large volumes of data need to be handled. This is the case in this research, in which one of the tools of AI, Machine Learning (hereinafter ML), supports us in our purpose. The ML techniques allow us to reveal hidden relationships to solve old problems and, it helps us to raise new research questions. AI let us work more efficiently in large data files as those available for researchers in the field: the Global Entrepreneurship Monitor-GEM.

In essence, we attempt to answer two questions that are still unsolved in the specialised literature using an AI technic: Could the socio-cognitive factors (Bandura, 1978, 1986; Fayolle & Liñan, 2014; Silva Martins, Biagi, & Silveira, 2018), commonly linked to EI, explain the entrepreneurial process in all of its phases? And if so, what factors, individually or jointly considered, have the best predictive power in each phase?

For this purpose, the unit of analysis continues being the individual, in the same way that our field of study begun (Chandra, 2018), but now in its temporal and spatial context and, with its socio-cognitive reference framework.

Therefore, this study tries to reveal the predictive capacity of the individual's socio-cognitive traits on the different phases of the entrepreneurial process, even in high economic uncertainty. To this end we use Machine Learning techniques over 14 years and almost 300,000 individuals involved in different entrepreneurial phases.

We should not lose sight of the fact that innovation, job creation, and economic growth are, presumably, the most appreciated outcomes of entrepreneurial activity. A better understanding of what, how, and why of the entrepreneurial behaviour (Stevenson & Jarillo, 1990) is still alive in our field of study, and this paper tries to contribute to the why question.

We consider here the feasiblility of developing a retroactive theory of entrepreneurship, *i.e.* one that could be tested on the basis of historical data, in the way that Mark Casson (1982) outlined. Thus, using the database generated by GEM in Spain during 14 years of monitoring the entrepreneurial phenomenon and, more than 300,000 individuals interviewed, we wonder what the myth hides in order to explain part of its essence through the socio-cognitive factors that underlie their actions. In this attempt, the paper provides a Diversity and Relevance Map that discriminates the stages of the entrepreneurial process through the socio-cognitive features of the individuals. This Map is proposed to reveal that self-efficacy is associated with all stages of the entrepreneurial process, while fear of failure better represents the non-entrepreneurial population. Jointly, self-efficacy, and perception of social capital and of opportunities are important predictors of the entrepreneurial activity in any entrepreneurial phases.

REFERENCES

BANDURA, A., 1986. Social Foundations of Thought and Actions: A Social Cognitive Theory. Prentice Hall, New Jersey.

BANDURA, A., 1978. Social Learning: Theory of Aggresion. J. Commun. 28, 12–29. https://doi.org/https://doi.org/10.1111/j.1460-2466.1978.tb01621.x

CASSON, M., 1982. The Entrepreneur: An Economic Theory. Barnes & Noble Books, New Jersey.

CHANDRA, Y., 2018. Mapping the evolution of entrepreneurship as a field of research (1990–2013): A scientometric analysis. PLoS One 13, 1–24. https://doi.org/10.1371/journal.pone.0190228

FAYOLLE, A., LIÑÁN, F., 2014. The future of research on entrepreneurial intentions. J. Bus. Res. 67, 663–666. https://doi.org/https://doi.org/10.1016/j.jbusres.2013.11.024

MILLAR M. (2013). Interdisciplinary research and the early career: The effect of interdisciplinary dissertation research on career placement and publication productivity of doctoral graduates in the sciences, Research Policy, 42(5):1152-1164.

OBSCHONKA, M., AUDRETSCH, D., 2019. Artificial intelligence and Big Data in Entrepreneurship: A New Era Has Begun. Small Bus. Econ. 1–11. https://doi.org/10.1007/s11187-019-00202-4

SILVA MARTINS, F., BIAGI, E., SILVEIRA, A., 2018. Entrepreneurial Intention: Categorization, Classification of Constructs and Proposition of a Model. Brazilian Bus. Rev. 16, 46–62. https://doi.org/10.15728/bbr.2019.16.1.4

STEVENSON, H., JARILLO, J., 1990. A Paradigm of Entrepreneurship: Entrepreneurial Management. Strateg. Manag. J. 11, 17–27. https://doi.org/10.1007/3-540-48543-0_7