EVALUATING SOCIAL AND EMOTIONAL SKILLS: NEW ICT- BASED TECHNIQUES

MESURING EMOTIONAL SKILLS: NEW METHODS & PERESPECTIVES

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Abstract: Greatest past scientists (Aristotle, Charles Darwin, Konrad Lorenz) have declared the indissoluble link between motions and life, or biological objects psychological state. In this perspective, new technologies are a very powerful tool to measure emotional skills that refer to the abilities to regulate one's thoughts, emotions and behaviour. We develop a new approach to the identification of emotional skills based on description and analysis of the human energetic field and the recognition of frequencies specific to different emotional states. The objective of this paper is to propose and integrate a new technological based paradigm into a protocol/method to measure social and emotional skills that are relevant for any company, organization to select human resources and to facilitate the development of this type of abilities for employees once hired. The idea is to (i) measure the energy field and to trace its movements using appropriate measuring tools based on bio-photons movements, recorded using highly sophisticated and specific cameras; and (ii) to identify the key factors that represent the main areas of importance even as defined in recent studies by the OECD by means of the language of frequencies.

Keywords: emotional skills, measurement methods, bioelectromagnetic data.

1. INTRODUCTION

Social and emotional skills (ES) refer to the abilities to regulate one's thoughts, emotions and behaviour. These skills differ from cognitive abilities such as literacy or numeracy because they mainly concern how people manage their emotions, perceive themselves and engage with others, rather than indicating their raw ability to process information. Development of these skills is important not only for the well-being of individuals but also for the functioning of wider communities and societies as a whole.

We think that this type of ES can be developed and improved day by day; a dynamic measure is then needed that represents a new opportunity to analyse the evolution and growth of this particular non cognitive abilities and competences.

To understand deeply a phenomenon is necessary to measure it. Then, a conceptual framework is needed to better understand the dynamics of skills formation and the impact of social and emotional skills on individuals' socio-economic outcomes. However the human emotional status is rather intangible and therefore cannot be directly measured; the emotions can be correlated to external and internal factors and are related to some specific perceptions and behaviors.

The detection of emotions based on the measured physiocological changes in the human body has received a significant attention in recent years. Recent studies have shown that the brain is able to improve its functions by growing new neurons and forming new connections between existing neurons. As a constantly working organ, the brain is in charge of various cognitive functions, from processing and perceiving sensory stimuli to motor control and memory storage. In an increasingly globalised and diverse world, the role of social and emotional skills is ever more important. This paper deals with the domain of the data acquisition systems and computing. The main idea is to propose a new method/protocol that can be implemented as a novel data acquisition system, in way to improve the computational aspects of the detection and the measurement of the social and the emotional skills but also human emotions.

The objective of this paper is to propose and integrate a new technological based paradigm into a protocol/method to measure emotional skills that are relevant for any company, organization to select human resources and to facilitate the development of this type of abilities for employees once hired. The idea is to (i) measure the energy field and to trace its movements using appropriate measuring tools based on bio-photons movements, recorded using highly sophisticated and specific

cameras; and (ii) to identify the key factors that represent the main areas of importance even as defined in recent studies by the OECD using the language of frequencies.

To achieve this goal the following sub-objectives will be followed:

- *Definition of experimental interactive methods and appropriate specific tools that overcome the limits of traditional measurement tools based on interviews.*

The proposed methods explore the measurements of the human energy field (bio-field) that is a complex electromagnetic field of the organism hypothesized to involve electromagnetic bioinformation for regulating homeodynamics. The biofield is a useful construct consistent with bioelectromagnetics and the physics of nonlinear, dynamical, nonequilibrium living systems.

- *Methods development for the analysis of the collected data*

This step is fundamental for the definition of the computational aspects since it provides tools able to experiment innovative statistical and psychometrical methods to analyse the collected data and to identify specific category of importance for the achievement of quality in any organization and enterprise.

The data will be a combination of images, electronic and electric measurements. The challenge here is to analyse the different type of data in way to understand the scientific basis of bioelectromagnetic data. Several studies have highlighted how bio-photons emission can be considered a reliable indicator of the status of energy and wellbeing.

2. MEASUREMENT PHASE: TECHNOLOGY BENCHMARK

The scientific improvement in the psychometric and psychological field connected with the use of adequate technologies is certainly connected with the use of new methodologies based on objective measures able to evaluate the emotional capacities, providing a huge value-add in terms of useful information for better support people and learn how to enhance emotional skills even in different contexts.

The OECD (best known for its global standard tests), for example, has established a 'Skills for Social Progress' project to focus on 'the power of social and emotional skills' (OECD-CERI, 2015). Its central assumption is that SEL skills can be measured meaningfully and that such measures can be instrumental to help decision makers assess children's current skill sets and future needs in order to improve their life prospects and contribute to societal progress.

Another international organization, the World Economic Forum, has projected its own 'New Vision for Education' which involves 'fostering social and emotional learning through technology.' Its vision is that SEL proficiency will equip students to succeed in a swiftly evolving digital economy, that digital technologies could be used to build 'character qualities,' and that artificial intelligence and multimodal social computing could help improve cognitive, social and emotional skills (WEF 2016).

New influential organizations have been formed to promote SEL practice and assessment, such as the Collaborative for Academic, Social, and Emotional Learning (CASEL), which aims to make evidence-based SEL an integral part of state education. CASEL has supported 'meta-analyses' of SEL interventions (CASEL, 2017) and leads efforts to innovate in SEL practices and its measurement (McKown, Read & Bookman, 2017). Likewise, the National Commission on Social, Emotional, and Academic Development (NCSEAD), coordinated by the Aspen Institute, has produced an 'evidence base'—drawing from psychology, neuroscience, economics and medicine—that SEL should be integrated with academic instruction (Jones & Kahn, 2017).
New techniques are here proposed for the measurement phase.

- The experimental tests can be carried out using the technology of Gas Discharge Visualization (GDV) which uses the EPI method (Electr Photonic Imaging) to visualize the human energy field. GDV technology, developed by Dr. Konstantin Korotkov, consists of a desktop camera and accompanying

software, which allows a user to quickly and easily conduct human energy scans. The GDV technology allows the acquisition of proton emission that occurs when the fingers, placed on a quartz electrode, they are stimulated by a high voltage electric impulse. The spatial distribution of this proton emission is captured by a special chamber located underneath the quartz electrode. The elaboration of these spatial distributions of the protons emitted relative to the ten fingers of the hands, using a dedicated software, allows to obtain images of the whole energy field of the subject. The processing of the acquired data consequently allow to highlight and evaluate the variations of the energy status of the subject in the different experimental conditions. Accessory attachments are also available to conduct environment and object scans. The images are then mapped to different organs and systems of the body. The images created using the GDV system are based on the energy centers. The GDV technology utilizes a weak, completely painless electrical current applied to the fingertips for less than a millisecond. The body's response to this stimulus is the formation of a variation of an "electron cloud" composed of light energy photons. The electronic "glow" of this discharge (invisible to the human eye) is captured by an optical CCD camera system and then translated into a digital computer file. The data from each test is converted to a unique "Photonic Profile", which is compared to the database of hundreds of thousands of data records using 55 distinct parametric discriminates, and charted so that it is available for discussion and analysis. A graph of the findings is presented as a two-dimensional image.

- To detect the emotional state and its changes in human beings, the "*TRV technology" (Variable Resonance Camera*) may represent a good alternative (Park, Kim, Hwang, 2014). This method of image analysis is based on data of micro-mobility models and it introduces a new term, emotional vestibular reflex or "reflection of vestibular energy" (REV), which indicates that the coordination of the movement depends on the emotional and physiological state of mind. The energy field, corresponding to the wide range of states of consciousness of humans will be monitor using a TRV image analyzer system. This system is able not only to visualize the energy field by measuring its intensity and frequency, but is able, through a complex system of recording images and data, to visualize, through horizontal radiating lines of different colour and length, changes in this energy field in real time. It has been observed that such energetic vibrations emitted by a body continuously vary both in amplitude and in frequency. The TRV system measures the human's energy spectrum (amplitude and frequency) in real time using the Fast Fourier Transform (FFT). The energy spectrum, corresponding to the functional state of the subject, is related to the emotional state of the subject through a series of algorithms. Images are converted into a pseudo-color scale in relation to the frequency in HZ. In the images there is a distribution of colored horizontal stripes around the vibrating objects (the lines represent the single frequencies obtained with an FFT). They radially represent the spectral distribution of the vibration in a range between 0.1 Hz and 10 Hz according to a pseudo-color scale that goes from purple to red. To study these images, fractal, matrix, statistical techniques can be used with the aim to identify what factors affect the human energy field. More specifically the idea is to combine the existing technology with a multivariate analysis logic system to detect and identify the current main human emotions from a set of measured responses. This may represent a new innovative data acquisition system to measure social and emotional skills.

3. DATA ANALYSIS METHODS: INNOVATION POTENTIAL

The analysis and detection of human emotional skills using an innovative data acquisition system has a direct impact on different fields of human life such as health and well-being, safety, education, work, social networks, and others. When social and emotional development is favored this greatly affects (i) the improvement of the transition phase from school to the labor market, (ii) in professional satisfaction, health, levels of civic engagement, social integration, general well-being. This new protocol provides an objective evaluation of human emotions and it is a benefit for the society.
In this phase the idea is to provide a link to the Big Five dimensions of the OECD Study on Social and Emotional Skills, that is the recent international survey that assesses 10 and 15 year-old students in a number of cities and countries around the world.

This OECD study began in mid-2017 and will be carried out over a three-year period, with the main fieldwork taking place in 2019 and the findings released later in 2020.

The OECD study draws on a well-known framework in the field of social and emotional skills – the Big Five model – to provide a general outline of how these skills should be organised. Social and emotional skills in this model are arranged hierarchically, with five general skill categories that can be split into narrower, lower-order skills. The broad categories of the Big Five are:1

• openness to experience (open-mindedness) • conscientiousness (task performance) • emotional stability (emotional regulation) • extraversion (engaging with others) • agreeableness (collaboration).

Each of the dimensions or categories encompasses a cluster of mutually related social and emotional skills. For example, task performance includes achievement orientation, reliability, self-control and persistence. Apart from demonstrating their mutual similarity, these groupings also ensure systematic, comprehensive and balanced consideration of individuals' social and emotional skills. The study also includes the so-called "compound" skills. These skills represent combinations of two or more individual skills. For example, self-efficacy represents a combination of skills from the conscientiousness, emotional stability and extraversion categories of the Big Five. Compound skills are found to be useful for describing and understanding certain aspects of behaviour and in many cases they are shown to affect important life outcomes.

Many research teams have independently found a similar five-factor structure of personality characteristics, and this consistency in results has contributed to the widespread acceptance of the model. The Big Five model is also comprehensive enough to include the majority of social and emotional skills studied to date. There is also extensive evidence that the Big Five domains and sub-domains can be generalised across cultures and nations. Even though research has shown the presence of some culture-specific constructs, the common Big Five structure is present in most cultures and languages around the world. Furthermore, although the Big Five model was initially derived from research on adults, it has been well-documented that it is suitable for describing differences in social and emotional skills from childhood to old age.

4. CONCLUSIONS

The protocol proposed to measure emotional skills based on the GDV and TRV technologies represent an innovation if compared to the traditional statistical measurement methods based on interviews and has the advantages: (i) to be objective (not connected to perception of emotions as in interviews); (ii) easy to implement; and (iii) capable to promote social development through technologies.

A set of new instruments to identify social and emotional skills based on Electr Photonic Imaging technologies that combine measurement and statistical analysis of the human energy field are proposed.

The proposed protocol provides measures that improved understanding on the role of social

and emotional skills and the types of techniques that support the development of these skills.

For an industrial point of view, the benefits may resulted in detecting unproductive behaviors, decrease stress levels, and increase positive behaviors to achieve success, this will improve the productivity of the workers. These techniques can train the brain to adopt a healthy lifestyle, release undesired thoughts and habits.

Finally, specific software-powered acquisition data techniques and statistical algorithms can be used to identify standards of social-emotional learning, and target progress in the direction of desired forms and positive effects. Supporting computational psychology in education possess practical know-how to improve behaviors and emotions, creating technologies to both capture and nudge learners to exhibit and improve the non-cognitive qualities.

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