

Emotional Regulation in Psychological Counseling: An AI-based Multimodal Assessment

(La regolazione emotiva nella consulenza psicologica: una valutazione multimodale
basata sull'intelligenza artificiale)

Acronym: RegIA

Psychological wellbeing is considered to be the combination of experienced feelings of happiness and satisfaction with life, career role, self-realization, sense of utility and belonging (VanWel, Lissen, e Abma, 2000). Emotional regulation ability is an important factor for the adaptation to one's life context, and essential in the promotion of psychological wellbeing (Gross e John, 2003). More specifically, in the treatment of affective disorders (e.g., anxious-depressive syndromes), modern therapeutic approaches base their interventions on the understanding of patients' emotions and feelings and have the objective of supporting and developing the ability to regulate those feelings. In the therapeutic setting, the dynamics of the patient-professional (counselor, therapist) relationship are predictive not only of the success of the therapeutic alliance as an essential factor for the evaluation of the clinical process, but also of the outcome of the intervention; the patient receives feedback from the professional regarding the ideal level of adjustment to their everyday context and tasks, while the professional adopts a constructive and respectful stance towards the patient's emotional experience, offering opportunities for exploration and self-determination of paths towards change.

A specific context in which therapeutic work with emotions develops is university psychological counseling services. For university students, many dimensions of psychological wellbeing are subject to reorganization during the transition from school to university (Cassidy e Trew, 2004). Generally, psychological counseling has the objective of empowering the user's ability to deal with daily life situations. Basic counseling techniques are oriented towards encouraging an effective regulation of emotions and reinforcing efficient problem solving, conscious decision making and self-awareness, in an educational, preventive and supportive environment (Patterson e Eisenberg, 1988). These objectives are particularly relevant in the context of university counseling.

Despite the encouragement from clinical research in the consideration and management of emotions in therapeutic interventions, to date there are no instruments that provide an integrated evaluation of the various emotional components that come into play in the client-therapist relationship or in the context of counseling services. In fact, the widespread use of self-evaluation instruments does not take into account that this type of measurement assumes that potential users

are capable of adequately considering and representing their own emotions, and suffers from various important psychometric limitations (for example, sampling error, error variance ratio, etc.). The use of psychophysiological measurements contributes to overcoming the limits of self-evaluation because it employs indicators of autonomic nervous system (ANS) and peripheral (eye movement, skin conductance, heartrate, muscular contraction) activity. Among these measurements, the most frequently employed are electroencephalography (EEG), functional magnetic resonance imaging (fMRI), functional near-infrared spectroscopy (fNIRS), as well as ocular fixation, skin temperature, and heartrate. Physiological measurements can provide invaluable information, however their implementation is still rare in therapeutic contexts, because they require instruments that are often cumbersome and that require specialized training to use.

The use of physiological measurements in the recognition of emotional states (Jacques et al., 2015) has long been the object of study of an area of research known as *affective computing* (Picard, 1999). Intriguing research in this domain has been conducted on samples of knowledge workers (Girardi et al., 2020). These studies have shown that, using non-invasive, low-cost sensors (Girardi et al., 2017), it is possible to effectively measure physiological parameters such as heartrate or skin conductance response, allowing for automatic recognition of emotional states. Furthermore, one of the major limitations of measurement in therapeutic contexts is that the single patient is generally considered to be the unit of analysis rather than the patient-therapist (or counselor) dyad. To date, the focus on patient-therapist dyadic interaction in emotional regulation has been emphasized by emotion-focused therapeutic approaches and based on the involvement of the motor system (Shafir, 2016). Despite this, applications in this field are limited (Bar-Kalifa et al., 2019).

Finally, the relationship of psychological support develops through linguistic practices that structure the client-professional relationship and express the evolution of the emotional co-regulation process that occurs in the therapeutic setting. Modern computational linguistics, through the technique of *Sentiment Analysis*, allow us to automatically identify, extract, quantify, and evaluate affective states extracted from transcripts (Liu, 2012). Along with textual data, the analysis can be extended to prosodic patterns that emerge in voice data, although the applications of these methods to psychotherapeutic contexts are still in initial stages of development (Beebe e Lachmann, 2003, 2014).

The current project aims to define, at a theoretical and applicative level, the procedure for a multimodal evaluation of the processes of emotional regulation in client-therapist interactions in university psychological counselling sessions. More specifically, the project is configured as the planning of an evaluation system of therapeutic progress through the integration of self-evaluation, psychophysiological and linguistic measurements obtainable from client-counselor interactions. To

this end, theoretical-methodological competencies in the psychological and medical fields regarding emotions in patients vs controls will be integrated with linguistic-computational, informatic, and artificial intelligence competencies to develop analytical applications of multimodal data and to create personalized reports. The investigation and planning operations will be carried out on samples of students and their respective counselors who practice in a university counseling service, who are available to provide self-evaluation, psychophysiological and linguistic data during the five sessions of an ordinary psychological counseling program.

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