

# Software Employment for Automatic Emotion Recognition in Online Psychotherapy

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## ABSTRACT

Online therapy has been used in an increasing manner and is considered a powerful tool when it is used in addition to, or is adequately integrated with, the presence of a therapist. Nevertheless, it can replace face-to-face therapy in the following cases: a) when there is no access to psychological services; b) when people prefer to keep their anonymity in the beginning of the therapeutic process; and c) when people have problems in identifying the therapeutic benefits that they can obtain and therefore have the first contact with professionals through the Internet.

The present study in progress, proposes the implementation of monitoring systems for facial variables and the use of emotion recognition techniques during the psychotherapy on line session in order to evaluate expression emotions in repeated measures, emotions and feelings that will provide objectivity to patient evaluation, treatment strategies, and will serve as guidelines of the therapeutic gains obtained during and after treatment. Correlation between self-reports and automatic measures will be discuss.

For this purpose, will be compared two groups (N=24) of moderate non suicidal depressive adult patients who are not under psychiatric treatment. Each group will have 16 sessions treatment under a cognitive-behavior therapy approach, conformed by homework, daily records on behaviors, feelings and emotions. The first group (12 participants) will be assigned to psychotherapy via Internet sessions with daily manual recordings with videoconference, as well as self-reports questionnaires; the second group (12 participants) will be assessed through manual and electronic recordings by Analysis of Facial

Expression Emotions in order to measure the facial variables with *FaceReader*.

## Author Keywords

Facial expression emotion, E-therapy, cognitive-behavior treatment, depression.

## INTRODUCTION

Online Mental Health Services, which originate from the concept of Telehealth, arises due to the necessity to offer and receive treatment despite distances or conditions which would make the encounter between a professional and a patient impossible. Currently, online therapeutic practices, in addition to covering patient's needs living far from the psychologist's office or clinic and seeking for treatment, have become motivating spaces for receiving treatment, whether it be due to the comfort it represents or the familiarity some may have with technology, which plays a fundamental role in these treatment alternatives.

Whenever we speak of therapeutic practice we refer to different types of services. [1] classifies them in the following categories: *e-therapy*, *e-counseling*, *mental health information websites*, *self-guided treatment program websites*, *online support groups* and *online mental health screening and assessments*. We shall say that the feature all of these share is the use of Internet as a means to facilitate psychotherapeutic services. These authors define Internet therapy as the interaction between a consumer and a therapist through Internet in association with a Web based structured treatment program, supported by hardware such as: calls through Internet, videoconferences, use of cell phones to carry useful information for the patient's problem and even fulfill therapy itself.

Studies performed on effectiveness and dissemination [1-7] point at online therapeutic services as a tool that may benefit persons who otherwise do not have access to these services (due to physical or economic circumstances) or have an interest for a service under this modality given the familiarity they may possess with this electronic medium.

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Marks et al. [3] describe the development, application and effectiveness of three systems, of which two were acknowledged and recommended by England's National Institute for Clinical and Health Excellence, for depression disorders *Beating the Blues*; for anxiety disorders *Fear Fighter*, and a third one that has proved effectiveness in obsessive-compulsive disorders *OCFighter*. Finfgeld-Connett [8] carries on research concerning online treatments for alcoholism problems, where user therapists are nurses, advantages of Internet for intervening and favourable results of these applications are discussed. Likewise, the feasibility of using information retrieved from face to face interviews for the patient's benefit is posed.

Precisely in the necessity to reinforce assessment and planning, the question to be dealt with arising is the role played by nonverbal facial and bodily elements in online therapeutic relations, given that in online psychotherapeutic experiences patient and therapist may: a) not see each other's faces at any moment; b) encounter in person at some occasions, or; c) perform a treatment in person with Internet based support. In these three cases (exceptionally the third) the therapist has no steady information on the patient's facial expressions and the modifications that could occur in these during treatment. In therapeutic practice, emotions and their expression play a very important role, un a therapeutic session there exists a wide spectrum of information disposed not only in speech, but also in nonverbal language, where facial expression is crucial, and therefore since several years ago facial responses to emotions have been studied, either for adaptive biological matters or for reasons more of a socializing tint.

The introduction of FaceReader software as an automatic face recognition system is added (see Fig. 1) to an online treatment protocol for non suicidal depression with the aim of disposing of an additional measure to patient's records and determining whether this additional measure favours a better assessment, planning and success in online psychological therapy. The variables measured by this software are: happiness, sadness, anger, surprise, fear, repulse, "neutral" state.

We expect to possess new elements in elucidating an assessment and planning a treatment for therapists offering online therapeutic services.

## PROCEDURE

### Participants

24 participants of moderate non suicidal depressive adult patients who are not under psychiatric treatment.

- 12 participants will be assigned to psychotherapy via Internet sessions with daily manual recordings with videoconference, as well as self-reports questionnaires.
- 12 participants will be assessed through manual and electronic recordings by Analysis of Facial Expression Emotions in order to measure the facial variables with *FaceReader*.



Figure 1. FaceReader.

## ASSESSMENT INSTRUMENTS

- Depression Inventory of Beck
- Anxiety Inventory of Beck
- Questionnaire of Social Validity
- Inventory of Quality of Life

## Phases of Treatment

Phase 1. First contact and evaluation. The first contact through the Psychological Services Center of the Faculty of Psychology at National Autonomous University of Mexico; Phase 2. Implementation of treatment. The work of the treatment was carried out through specific cognitive-behavioral techniques (16 sessions) with facial emotion recognition and without facial emotion recognition; Phase 3. Evaluation after treatment. Implementation of the instruments used in the beginning, which provide qualitative and quantitative indicators about the patient's improvement, Phase 4. Follow the maintenance and improvement of the patient. Patients were contacted by mail and sent the assessments that were applied in the pre-evaluation, after 3, 6 and 12 months.

## CONCLUSION

We expect to see future growth in online psychological practice in Mexico. Additional empirical studies are needed in order to establish ethical regulations for practicing psychology under this modality of service, to assess results, cost-effectiveness, and to investigate the limits of distance intervention. These would lead to better practice of the emergent modalities in these changing times.

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