

Study of application and validation of the Ethological Coding System for Interviews (ECSI)

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Original article

ABSTRACT

Background

Psychotherapeutic diagnosis is largely based on verbal explorations and/or psychological tests. In contrast, the relevance of non-verbal communication is often disregarded. Here, we aim to provide a tool to measure and assess non-verbal behavior in clinical interviews, based on the Ethological Coding System for Interviews (ECSI), developed by Troisi (1999), which was translated and validated in Spanish. An ethogram is a catalog of behaviors or patterns of behavior, which are operationalized and grouped into categories such as affiliation, flight, assertiveness, relaxation and so forth.

Method

Study 1. The ECSI was translated into Spanish. Three "blind" observers recorded the frequencies of the patient's behavioral patterns. The recordings were made in 15-second intervals during the first and the last ten minutes of a clinical interview. An inter-observer reliability of $r=0.989$, $p<0.001$ was obtained.

Study 2. Based on the first study, it was considered pertinent to add behavioral patterns, as well as rearranging and redefining the proposed categories. The three "blind" observers performed the same task as in Study 1 with a second video recording. Aside from the frequency of the observed behaviors, the duration of the behavior was measured. An inter-observer reliability of $r=0.989$, $p<0.001$ was obtained.

Results and discussion

The ECSI has proven a reliable and valid tool for the examination of patients' non-verbal behavior during interviews. It is hoped that the ECSI can be added to the diagnostic process during psychotherapeutic sessions.

Key words: Human ethology, ethogram, clinical interview, nonverbal behavior.

RESUMEN

Antecedentes

El diagnóstico psicoterapéutico se fundamenta en exploraciones verbales y/o pruebas psicológicas. En contraste, a menudo se descuida la relevancia de la comunicación no-verbal. El objetivo del presente artículo es aportar una herramienta para medir y evaluar conductas no-verbales en entrevistas clínicas, basado en el Ethological Coding System for Interviews (ECSI), desarrollado por Troisi (1999), el cual se tradujo y validó en español. Un etograma es un catálogo de conductas o patrones conductuales, operacionalizados y agrupados en categorías, como afiliación, evasión, asertividad, relajación, entre otras.

Método

Estudio 1. El etograma ECSI fue traducido al español. Tres observadores "ciegos" registraron las frecuencias de los patrones conductuales del paciente. Los registros se realizaron en intervalos de 15 segundos durante los primeros y últimos 10 minutos de la entrevista clínica. Se obtuvo una validez interobservador de $r=0.989$, $p<0.001$.

Estudio 2. Con base en el primer estudio se consideró pertinente agregar patrones conductuales, así como reacomodar y redefinir las categorías propuestas. Los tres observadores realizaron el mismo procedimiento que en el estudio 1 con una segunda videograbación. Además de las frecuencias de las conductas observadas, se midió la duración de la conducta. Se obtuvo una validez interobservadores de $r=0.993$, $p<0.001$.

Resultados y discusión

Se probó que el ECSI es una herramienta confiable y válida para examinar la conducta no-verbal de pacientes durante entrevistas. Se espera que el ECSI se pueda incluir al proceso diagnóstico durante las sesiones psicoterapéuticas.

Palabras clave: Etología humana, etograma, entrevista clínica, conducta no-verbal.

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BACKGROUND

Psychiatric and psychotherapeutic diagnosis is based in the first instance on verbal explorations or psychological tests.^{1,2} However, in recent years, the central role of non-verbal communication in the therapist-patient relationship has been increasingly prominent. Non-verbal communication transmits information not only about the patient's emotional experiences, but also establishes the implicit therapeutic relationship. Hugely important psychological aspects such as mood, anxiety, emotion, affective tension, and motivation are expressed largely by means of non-verbal behaviors such as mimic, body posture, gesture, and movements by the patient.^{1,3}

In this sphere, there is often a lack of terms and methods to analyze the behavior patterns. In this way, human ethology can make important contributions to this problem in the area of clinical psychology.^{1,4} Firstly, it can contribute significantly to developing more precise and valid methods to measure non-verbal behavior of people with psychiatric disorders. Secondly, ethology, as the study of the evolution of behavior, provides theoretical frameworks as a reference for the integration of a functional perspective in defining and clinically assessing mental disorders.^{1,3,5-7}

An ethogram is an exact catalog which includes operationally-defined behavior patterns of interest.⁴ It is used to grade and quantify non-verbal behavior, which ranges from facial expressions and gestures to body movements. The social function of non-verbal behavior is to transmit communication signals involved in social interactions, such as motivation, in ambivalence or affirmation, manifested in subtle ways.^{8,9} There are also behavioral anomalies in psychiatric disorders at the non-verbal level which affect social interaction. These behaviors have been graded and quantified with the aim of having a greater predictive value in response to treatment.^{1,5,7} For this reason it is necessary to have tools to assess non-verbal behaviors in clinical interviews.

Troisi (1999) designed the ethogram Ethological Coding System for Interviews (ECSI) with the aim of assessing behavior patterns in patients with mental disorders such as depression, schizophrenia, and alexithymia, as well as differences in behavior patterns according to gender during clinical interviews.^{1,3} The ECSI is made up of 37 behavior patterns, mostly facial expressions and movements of the upper extremities, which are grouped into seven behavioral categories: affiliation, submission, pro-social behaviors, evasion, affirmation, shifting, and relaxation. They are also grouped into two behavior patterns: eye contact and movement. Due to the lack of a validated ethogram for clinical interviews in Spanish, the aim of the present study was to translate and validate the ECSI ethogram, such that it can be used to assess non-verbal behaviors in therapeutic sessions in clinical psychiatry or psychotherapy.

METHOD

Study 1

The ECSI ethogram was translated into Spanish by a person with suitable knowledge in the area of human ethology, and Spanish terminology was used which was representative of this area of study. The translation was then revised and discussed with experts in human ethology. At the end of this process, three "blind" observers recorded the frequency of the patients' behavior patterns with the ECSI ethogram translated into Spanish, using a video recording of the two-way therapeutic intervention between patient and therapist (Tables 1 and 2). Records were made at 15-second intervals during the first and last ten minutes of the therapeutic session giving a total of 80 intervals, with the prior consent of the patient.

With the aim of assessing inter-observer validity, the three records obtained were analyzed with an intraclass coefficient of correlation, considering a level of significance of $p < 0.05$. The results obtained were $r = 0.989$, $p < 0.001$.

Study 2

Based on the first study, it was considered pertinent to rearrange the proposed categories, as two of these had behaviors in common, which rules out the independence of the categories necessary to carry out recording and analysis. New behaviors were also added within said categories, as the video observation gave a higher number of behaviors which were considered important within the psychotherapeutic sessions and for the ethogram.

These modifications will be explained in further detail shortly.

The definitions of some behavior patterns were changed (Table 3) so that they were more understandable in the Spanish language, and the categories grouping said patterns were redefined based on specialized literature found for each concept.

In terms of the categories, eye contact is defined as meeting the other person's gaze, an essential aspect in social interaction.³ Affiliation is the social interaction that achieves the acceptance of other people and encourages positive interaction.^{3,10} The pro-social category was eliminated due to its similarity with the affiliation category, and to sharing most of its behavior patterns. On the other hand, submission refers to the attitude in which a person submits to another and allows themselves to be dominated, accepting the will of the other individual. This is done by means of pacifying signals in social interaction.³ Evasion is defined as spontaneous behaviors in reaction to social hostility and through which interaction is avoided.³ Assertiveness is manifested by means of behaviors which indicate low levels of aggression and hostility.³ They are behaviors that manifest convictions and rights, neither attacking or submitting to the will of other people. The category

Table 1. Ethological Coding System for Interviews” (ECSI)

Behavior	Definition
1. Look at	Direct the gaze at the interviewer.
2. Head to one side	Incline the head left or right towards the shoulders.
3. Bob	A swift upwards movement of the head, like a reverse nod.
4. Flash	Eyebrows briefly raise and lower.
5. Raise eyebrows	The eyebrows are raised and remain so for a time.
6. Smile	The corners of the mouth stretch upwards and outwards.
7. Nod	The normal gesture of agreement.
8. Pressed lips	The lips are lightly and inwardly pressed together.
9. Corners back	The corners of the mouth are stretched backwards, but not upwards as in a smile.
10. Looking away	Directing the gaze towards another part of the room away from the interviewer.
11. Looking down	Directing the gaze downwards looking at the feet, the lap, or the floor.
12. Eyes closed	The eyes are closed for more than two seconds.
13. Chin	The chin is directed towards the chest.
14. Huddle	The torso is inclined forward until the head is near the knees.
15. Still	A long pause of any movement, as though frozen.
16. Shake head	The normal gesture of negation.
17. Extending the head	A swift forward movement of the head towards the interviewer.
18. Lean	Leaning forwards from the hips towards the interviewer.
19. Furrowed brow	The inner parts of the eyebrows are lowered and brought closer together.
20. Shoulders	The shoulders are raised and allowed to fall.
21. Small mouth	The corners of the mouth come together so that the mouth appears smaller.
22. Wrinkled nose	Wrinkling of the skin on the nose.
23. Gesture	Various hand and arm movements during speech.
24. Grooming	Passing the fingers through the hair in a combing movement.
25. Hand to face	Hand(s) in contact with the face.
26. Hand to mouth	Hand(s) in contact with the mouth.
27. Scratching	Using the hands to scratch any part of the body.
28. Yawning	The mouth is opened widely and roundly and then slowly closed. This movement of the mouth is accompanied by a deep breath and frequently with closed eyes and lowered eyebrows.
29. Finger movement	Rapid and repetitive movement of the fingers touching a nail, a handkerchief, the other hand, the beard, etc.
30. Twisted mouth	The closed lips are pushed forwards and to one side.
31. Licking lips	Passing the tongue across the lips.
32. Biting lips	One lip, generally the lower one, is drawn in and bitten by the teeth.
33. Relaxation	An obvious easing of the muscles, such that the whole body relaxes into the chair.
34. Getting comfortable	A movement to find a more comfortable position in the chair.
35. Crossed arms	Crossing the arms at chest height.
36. Laugh	The corners of the mouth are drawn backwards and upwards, separating the lips, such that the upper and lower teeth are exposed.
37. Neutral face	Face without expression and particularly without muscle tension. Basic facial expression of being awake.

of “gesture” was changed to movement, due to terminology of human ethology. This behavior illustrates or expresses what is being spoken in a non-verbal way.³

The category “shifting” was substituted by the name self-management. Self-managing behaviors indicate a motivational ambivalence such as moving the fingers or scratching a part of the body.³ For example, humans scratch their heads in conflict situations. Studies with animals and humans suggest that variables such as early exposure to stress generate an impact on the subject’s early events that may facilitate the appearance of self-management behaviors.¹¹ Pharmacological research has shown an increase in emotional activation associated with self-scratching in non-hu-

Table 2. Behavioral categories of the Ethological Coding System for Interviews (ECSI)

1	Eye contact
2 – 6	Affiliation
7 – 9	Submission
2 – 9	Pro-social behavior
10 – 15	Evasion
16 – 22	Assertiveness
23	Gesture
24 – 32	Shifting
33 – 37	Relaxation

Table 3. Modified Ethological Coding System for Interviews (ECSI)

Behavior	Definition
1. Look at*	Look at the interviewer.
2. Head to one side	Incline the head left or right towards the shoulders.
3. Bob	A swift upwards movement of the head, like a reverse nod.
4. Flash	Eyebrows briefly raise and lower.
5. Raise eyebrows*	The eyebrows are raised and remain so for two seconds or more.
6. Smile	The corners of the mouth stretch backwards and upwards.
7. Surprise**	The upper eyelids and eyebrows are raised, the jaw is lowered. Shoulders may be raised with inhalations.
8. Nod*	The normal gesture of agreement.
9. Pressed lips	The lips are lightly and inwardly pressed together.
10. Corners move backwards	The corners of the mouth are stretched backwards, but not upwards as in a smile.
11. Looking elsewhere	Directing the gaze towards another part of the room away from the interviewer.
12. Looking down	Directing the gaze downwards looking at the feet, the lap, or the floor.
13. Eyes closed	The eyes are closed for two seconds or more.
14. Chin	The chin is directed towards the chest.
15. Huddle	The torso is inclined forward until the head is near the knees.
16. Still	A sudden pause of any movement, as though frozen.
17. Crossed arms*	Arms are crossed at chest height accompanied and/or followed by evasive behaviors.
18. Fear**	The upper eyelids and eyebrows are raised and the corners of the mouth are stretched horizontally. This facial expression may be accompanied by the head and body recoiling.
19. Shake head	The normal gesture of denial.
20. Extending the head*	A swift forward movement of the head in the direction of the interviewer.
21. Lean	Leaning forwards from the hips towards the interviewer.
22. Furrowed brow*	Wrinkling the inner part of the eyebrows and forehead.
23. Shoulders	The shoulders are raised and allowed to fall.
24. Small mouth	The corners of the mouth contract so that the mouth appears smaller.
25. Wrinkled nose	Wrinkling of the skin of the nose.
26. Movement	Various hand and arm movements during speech.
27. Grooming	Passing the fingers through the hair in a combing movement.
28. Hand to face	Hand(s) in contact with the face.
29. Hand to mouth	Hand(s) in contact with the mouth.
30. Scratching	Using the hands to scratch any part of the body.
31. Yawning	The mouth is opened widely and roundly and then slowly closed. This movement of the mouth is accompanied by a deep breath and frequently with closed eyes and lowered eyebrows.
32. Finger movement*	Rapid and repetitive movement of the fingers touching a nail, a handkerchief, the other hand, etc.
33. Twisted mouth	The closed lips are pushed forwards and to one side.
34. Licking lips	Passing the tongue across the lips.
35. Biting lips	One lip, generally the lower one, is drawn in and bitten by the teeth.
36. Leg movement**	Rapid and continuous movement of the leg(s).
37. Aeration**	Moving the arms or a piece of clothing to ventilate the body.
38. Rubbing eyes**	Rubbing the eye(s) with the hand(s).
39. Hand to body**	The hand(s) in contact with any part of the body except the face or mouth.
40. Relaxation*	An obvious easing of the muscles, such that the whole body relaxes into the chair.
41. Getting comfortable	A movement to find a more comfortable position in the chair.
42. Laugh	The corners of the mouth are stretched backwards and upwards, separating the lips, such that the upper and lower teeth are exposed.
43. Neutral face	Face without expression and particularly without muscle tension. Basic facial expression of being awake.
44. Sadness**	The upper eyelids descend, the inner eyebrows raise, and the corners of the mouth descend. There may be a lowering of the head and the gaze directed down, with a fall in posture and a loss of muscle tension.
45. Crying**	Release of tears, frequently accompanied by cries and sobs.
46. Anger**	The eyelids tense, the inner eyebrows descend, and the lips are pressed together, the jaw and the head are directed forward.
47. Disgust**	The nose is wrinkled, the naso-labial area is raised, and the lower lip is protruded.
48. Scorn**	Asymmetrical elevation of the corner of the upper lip.
49. Hand to body hitting**	The hand(s) in contact with any part of the body but with greater intensity, except the face or mouth. The above may be accompanied and/or followed by aggressive facial expressions.
50. Scornful gaze**	Raised eyebrows with a rolling of the eyes.
51. Interruption**	Stopping the conversational partner while they are speaking.

Table 4. Behavioral categories of the modified Ethological Coding System for Interviews (ECSI)

1	Eye contact
2 – 7	Affiliation
8 – 10	Submission
11 – 18	Evasion
19 – 25	Assertiveness
26	Movement
27 – 39	Self-management
40 – 43	Relaxation Shifting
44 – 45	Sadness
46 – 51	Aggression

man primates. For example, chimpanzees scratch themselves when experiencing difficulty in performing cognitive tasks. As such, self-management behaviors serve as an external indicator of an internal state of anxiety. An increase in the appearance of this behavior is associated with an increase in cardiac frequency.¹²

Finally, during relaxation, behaviors occur which suggest low levels of emotional stimuli and a high level of comfort.³

Furthermore, new behavior categories of sadness and aggression were added, due to their frequent appearance and high importance within the therapy sessions. Sadness is an emotion produced in response to unpleasant events and which expresses emotional pain, and aggression is a behavior that has the intention of injuring or offending the conversational partner.¹³⁻¹⁵

Within the behavior categories that were modified and added, the following behavior patterns were included:

The behavior pattern surprise was included in the affiliation category, and fear was included in evasion. The following behavior patterns were included in the self-management category: leg movement, aeration, rolling the eyes, and hand to body. The aggression category was made up of

the following behaviors: scorn, hand to body hitting, scornful gaze, interruption, and facial expressions of anger and disgust. The category sadness included facial expressions of sadness and crying.¹⁶

All of the behavior patterns were distributed into the categories according to their operational definition, obtained from specialized literature (Tables 3 and 4).

As well as the behavioral frequencies, the continuity of behavior was recorded by means of asterisks to obtain the duration of the behavior (Table 5).

The three “blind” observers who carried out the first procedure made records of a second video recording of the two-way patient-therapist intervention. They recorded the frequency and duration of the behavior patterns with the modified ECSI ethogram. This grading was also carried out at 15-second intervals during the first and last ten minutes of the intervention, with a total of 80 intervals.

RESULTS

With the aim of assessing inter-observer validity for the modified ECSI, the three records obtained were analyzed with an intraclass coefficient of correlation, considering a level of significance of $p \leq 0.05$. The results obtained were $r = 0.993$, $p < 0.001$.

DISCUSSION

With the validation of the ethogram, the methodological instrument of human ethology, doors are opened to carrying out multiple studies on non-verbal behaviors that are presented during therapy sessions.

The ECSI ethogram, originally comprised of seven categories and a total of 37 behavior patterns, was translated into Spanish and suitable modifications were made. The result of

Table 5. Excerpt from record page with frequency and continuity of behaviors in periods of 15 seconds

Code	Behavior	05:00	05:15	05:30	05:45	06:00	06:15	06:30	06:45	07:00	07:15	07:30	07:45	08:00
1	Looking at	2	*1	2	2	3		1	*	*	*1	*	*	*
2	Head to one side				1									
3	Bob	1												
4	Flash			2			1							
5	Raised eyebrows				1	1								
6	Smile													
7	Surprise													
8	Nod				1	1		1	3	1	1	2	2	1
9	Pressed lips				1	1								
10	Corners backwards						1							
11	Looking elsewhere	1	1	2	*2	3	*1				1			
12	Looking down	*1	1		1	1	1							

this work was an ethogram comprised of ten categories with a total of 51 behavior patterns. Just as shown in the work of Troisi (1999), it is seen that the behaviors in the ECSI ethogram are presented naturally during a clinical interview in the psychotherapeutic context. As such, the modifications and validation allow the grading and analysis of non-verbal behaviors presented in the two-way patient-therapist interaction by means of a more detailed record.

It is proposed that the translated and validated ECSI ethogram is used to record non-verbal behaviors throughout the psychotherapeutic treatment of multiple patients in order to analyze the development of social interaction in that process,^{17,18} as well as the changes that emerge during each session and during the therapy process, which provides information about the patient's evaluation and the impact of treatment. On the other hand, the record proposed may contribute valuable information to the diagnosis of patients, with the aim of becoming more successful, taking into account the non-verbal behaviors presented by the patients as well as verbal declarations. In the future, the use of the ECSI ethogram may directly influence the planning of treatment by the therapist.

Finally, the primary limitation of this study is the quality of the video recordings. Sometimes this did not allow for detailed appreciation of, for example, gestures or behaviors that require higher resolution recording. For this reason, higher definition video recordings are suggested for future investigations.

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Conflict of Interest

No author of this paper has a conflict of interest, including specific financial interests, relationships, and/or affiliations relevant to the subject matter included in this manuscript.

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REFERENCES

1. Troisi A. Ethological research in clinical psychiatry: The study of nonverbal behavior during interviews. *Neurosci Biobehav Rev* 1999;23:905-913.
2. Fuchs T. Non-verbale Kommunikation: Phänomenologische, entwicklungspsychologische und therapeutische Aspekte. *Zeitschrift Klin Psychol Psychiatr Psychother* 2003;51:333-345.
3. Annen S, Roser P, Brüne M. Nonverbal behavior during clinical interviews: Similarities and dissimilarities among schizophrenia, mania, and depression. *J Nerv Ment Dis* [Internet]. 2012 enero [cited 2012 diciembre 14];200(1):26-32. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22210359>
4. Eibl-Eibesfeldt I. *Etología. Introducción al estudio comparado del comportamiento*. Barcelona, España: Omega; 1979.
5. Troisi A, Moles A. Gender differences in depression: an ethological study of nonverbal behavior during interviews. *J Psychiatr Res* 1999;33:243-250.
6. Troisi A, Delle CR, Russo F, Russo MA, Mosco Cet al. Nonverbal behavior and alexithymic traits in normal subjects: individual differences in encoding emotions. *J Nerv Ment Disord* 1996;184:561-566.
7. Troisi A, Pompili E, Binello L, Sterpone A. Facial expressivity during the clinical interview as a predictor functional disability in schizophrenia. A pilot study. *Prog Neuropsychopharmacol Biol Psychiatry* [Internet]. 2007 marzo 30 [cited 2012 diciembre 12];31(2):475-481. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/17188789>
8. Eibl-Eibesfeldt I. *Die biologie des menschlichen verhaltens: Grundriß der humanethologie* [The biology of human behavior: Principles of human ethology]. 3rd ed. Munich, Alemania: Piper; 1995.
9. Schmidt KL, Cohn JF. Human facial expressions as adaptations: Evolutionary questions in facial expression research. *Yearb Phys Anthropol* [Internet]. 2001 [cited 2010 agosto 17];44:3-24. Available from: <http://www3.interscience.wiley.com/journal/89012905/abstract>
10. Naranjo Pereira ML. Motivación: Perspectivas teóricas y algunas consideraciones de su importancia en el ámbito educativo. *Educación* 2009;33(2):153-170.
11. Gilmer WS, McKinney WT. Early experience and depressive disorders: human and non-human primate studies. *J Affect Disord* [Internet] 2003 julio;75(2):97-113. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/12798250>
12. De Waal FBM. What is an animal emotion? *Ann N Y Acad Sci* [Internet]. 2011 abril [cited 2011 julio 19];1224(1):191-206. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21486301>
13. Berkowitz LA. En: Dalglish T, Power MJ (eds). *Handb Cogn Emot* 1st ed. West Sussex, England: John Wiley & Sons, Ltd.; 1999; p. 411-428.
14. Ekman P. Facial expressions. En: Dalglish T, Power M (eds). *Handb Cogn Emot* [Internet]. New York: John Wiley & Sons Ltd; 1999 [cited 2010 agosto 16]. p. 17. Available from: <http://arjournals.annualreviews.org/doi/abs/10.1146/annurev.ps.30.020179.002523>
15. Power MJ. Sadness and its disorders. En: Dalglish T, Power MJ (eds). *Handb Cogn Emot* 1st ed. West Sussex, England: John Wiley & Sons, Ltd.; 1999; p. 497-519.
16. Ekman P. Facial expression and emotion. *Am Psychol* [Internet]. 1993 abril; 48(4):384-392. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/8512154>
17. Schmid Mast M. On the importance of nonverbal communication in the physician-patient interaction. *Patient Educ Couns* [Internet] 2007 agosto [cited 2012 noviembre 26];67(3):315-318. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/17478072>
18. Henry SG, Fuhrel-Forbis A, Rogers MAM, Eggly S. Association between nonverbal communication during clinical interactions and outcomes: a systematic review and meta-analysis. *Patient Educ Couns* [Internet]. Elsevier Ireland Ltd; 2012 marzo [cited 2012 noviembre 26];86(3):297-315. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21824738>