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**EMOTION REGULATION IN
CONVERSION DISORDER:
TOWARDS AN INTEGRATIVE
PERSPECTIVE**

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Towards an integrative perspective.

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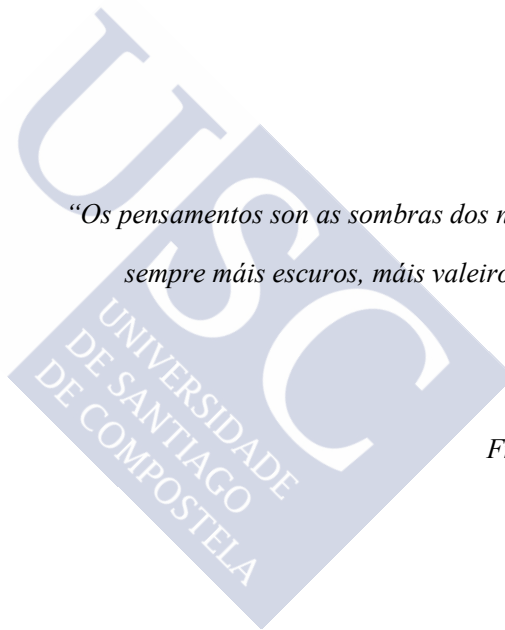


A miña familia



*“Os pensamentos son as sombras dos nosos sentimentos;
sempre máis escuros, máis valeiros e máis simples”*

Friedrich Nietzsche





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Á miña familia, porque son a orixe, a raíz e os meus pés na terra. Polo seu apoio incondicional e o seu cariño. Por estar.

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LIST OF PUBLICATIONS

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5. González A, Del Río-Casanova L, Justo-Alonso A. Integrating neurobiology of emotion regulation and trauma therapy: reflections on EMDR therapy. *Rev Neurosci*. 2017 Jan 24;28(4):431–40.



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1. INTRODUCTION



1 INTRODUCTION

1.1 CONVERSION DISORDER

1.1.1 Definition and conceptualisation

Conversion Disorder is defined by the presence of one or more symptoms of sensorimotor impairment that cannot be explained by a medical condition. To be categorized as a disorder, both clinical discomfort and functional disability must be significant (American Psychiatric Association, 2013). The majority of authors in this field share this definition, although some have asserted that it falls short in explaining the complexities of conversion phenomena (Derouesné, 1996). Surrounding this concept, multiple controversies remain active:

1) Concerning its physical or psychological character

Given that this is both a neurological and psychiatric clinical presentation, contributions have been made from both specialties. Whereas Neurology has focused on conversion as a differential diagnosis of neurological pathologies (Adams et al., 2009), the psychiatric tradition sought to delve into the psychological mechanisms that trigger and maintain the symptom. Despite this dichotomy, with the recent advances in functional neuroimaging the psychiatric and neurological perspectives have started to find commonalities relating to the presence of functional alterations that touch on neural pathways linked to aspects such as memory, volition, emotion and sensorimotor perception.

2) Concerning its nosological placement

At this juncture, we can say that there are three main perspectives that contemplate conversion:

- a. As a phenomenon associated with somatization
- b. As a dissociative phenomenon
- c. As a posttraumatic manifestation

3) Concerning its pathogenesis

There are two main proposals:

- a. Psychodynamic theories have understood conversion as psychological defense mechanism that is expressed through the body.
- b. Ethologically, it has been suggested that conversion symptoms represent different types of primitive defensive responses already present in less-developed animal species.

1.1.2 Epidemiology

Prevalence figures for Conversion Disorder vary from one sample to other ranging from 11 to 500 cases per 100,000 inhabitants (American Psychiatric Association, 2000). In the general population, prevalence would be around 0.3%. Clinical samples with more posttraumatic and dissociative symptoms can reach up to 50% (Fricke-Neef and Spitzer, 2013).

Many conversion symptoms are isolated, mild or self-limited and do not reach the levels of severity and functional impairment to be labelled as a disorder. It is estimated that between one third and 50% of the general population may suffer at one point in their lives from a subclinical conversion symptom (Sar et al., 2009a).

Furthermore, gender and age seem to influence the prevalence of Conversion Disorder, with a higher prevalence in children than in adults and in women than in men, with a ratio that varies between 2:1 and 10:1, depending on the study (Sadock and Sadock, 2004)(Fricke-Neef and Spitzer, 2013).

1.1.3 Comorbidity and evolution

Comorbidity of Conversion Disorder with other different medical disorders (especially neurological disorders) is common (Duncan, 2010)(Mink, 2013). This results in a problem that transcends the field of Psychiatry. Up to 30% of Neurology consultations are assigned to the study of these “functional” disorders. They are patients with a variable and often unfavorable evolution, and up to 55% do not show signs of improvement after 8 months of monitoring (Carson et al., 2000). Up to 83% of symptomatic persistence after 12 years has been reported for some of the clinical subtypes (Stone et al., 2003).

Similarly, CD has comorbidity with multiple psychiatric disorders, particularly depression, anxiety and dissociation. For example, 89% of conversion patients in the Sar sample received another psychiatric diagnosis such as Somatoform Disorder, Dysthymia, Simple Phobias, Obsessive Compulsive Disorder, and Major Depressive Disorder, and most noteworthy among them Dissociative Disorders (47,4%) (Sar et al., 2004). Comorbidity with psychoform dissociation ranges between 20-60% in different studies (Rawat et al., 2015)(Yayla et al., 2015).

1.1.4 The history of Conversion Disorder

1.1.4.1 From ancient times until 19th Century

The study of conversion, dissociation and hysteria was often approached together. For this reason, it is impossible to distinguish their historical evolution as different phenomena.

Prior to the 19th Century, conversion manifestations were either considered to be a result of physical ailments (explained by very primitive ethological theories), or as a result of manifestations associated with witchcraft and possession. In ancient Greece, it was considered that clinical manifestations of conversion appeared in women because of the movement of the uterus through the body. This would give name to the term hysteria (*hustera* means uterus in Greek). Hippocrates dedicated part of his treatise on general medicine to describe the symptoms of hysteria and its treatment (Aybek et al., 2008).

The word dissociation derives from the Latin verb “*dissociare*”, which has its origin in the noun “*socius*”, meaning dissociation similar to the concept of “disunity”. In 1887 the term begins to appear in the works of several authors such as Charcot, Janet, Myers, or Gilles de La Tourette (Van der Hart and Rutger, 1989). However, the concept of dissociation as it is known today is due to Pierre Janet, who used this word when he developed the Theory of Disaggregation or Disintegration, understood as a constitutional predisposition in traumatized individuals (Janet, 1986).

From the 17th Century, different attempts were made to find a cerebral substrate that explained hysterical manifestations (Alvarez et al., 2010). In this regard, it is worth mentioning, within the records of studies on dissociation and conversion, precursors such as Mesmer and Charcot. Mesmer was a controversial figure who developed the theory of animal magnetism or Mesmerism between the 18th and beginning of the 19th Century. Mesmer believed that causing his patients convulsive

crisis and loss of consciousness would cure them of all diseases and used methods that aimed to induce a state of consciousness similar to sleepwalking (Rojo Pantoja, 2006). Shortly thereafter, scientific evidence ruled out his hypotheses, but his work served to popularize and highlight the healing ability of hypnotic experiences. In the wake of the fluidists, the hypnotist trend arose. Hypnotists maintained that all these phenomena depended on the psychological modifications of the subject. The magnetizer performed a moral action that changed the thoughts of the subject. This moral change would determine the outcome. While magnetism developed more in Germany, England and later on in the United States, hypnotism would become entrenched with more force in France, significantly influencing the later developments of Charcot, Richet and finally Pierre Janet.

Jean-Marie Charcot started to use hypnosis in his studies of hysteria and hysterical paralysis towards the late 70s. His first work was titled “*Catalepsie et sonambulisme hystériques provoqués*” (Charcot, 1878). He believed hypnotic phenomena to be a sort of induced neurosis that could serve as a model for the study of spontaneous neurosis. Charcot depicted an array of signs (sensitivity impairments, contractures, etc.) that were used to describe “*hystéro-épilepsie*” and the stages of the “*grand mal*”. Charcot found no anatomical lesions that could be responsible for the clinical picture and referred to a possible dynamic functional lesion. Moreover, from 1884 Charcot began studying traumatic paralysis and established the analogy between the nervous shock that followed the trauma and hypnotic states. Charcot can therefore be considered a precursor in conceptualizing conversion as a functional neurological posttraumatic disorder.

Not only were dissociation and conversion closely related and even seemed indistinguishable at times, but also, before the 18th Century, most allusions to cases of hysteria put emphasis on somatic manifestations. These cases of hysteria described crisis that mimicked seizures, Movement Disorders, Sensory Disorders, etc. However, with an interest in hypnosis, a new perspective began to appear that also sought to analyze the psychological phenomena that occurred in patients suffering from these physical manifestations. With figures such as Janet and Freud, interest in the mental processes that gave rise to hysteria would take on more importance. Somatic symptoms started to be considered as a manifestation of the clinical picture and not as the complete picture, as previously postulated.

1.1.4.2 Pierre Janet and Sigmund Freud

In the early stages of his studies on hypnosis, Pierre Janet concurred, almost entirely, with the ideas proposed by Charcot. In his article, “*Les états intermédiaires de l’hypnotisme*”, Janet refers to hypnotism as a pathological phenomenon typical of hysterical patients and admits it appears in the stages defined by Charcot: lethargy, catalepsy and somnambulism (Janet, 1886). Over the years, Janet would advance towards a rounded-out understanding regarding hypnotism in which all the observed hypnotic states would form a continuous circle comprised of up to 9 stages.

Subsequently, and through the study of cases with a probable Dissociative Identity Disorder, Janet elaborated a large part of his conceptualizations around disaggregation (Janet, 1889a)(Janet, 1889b). The author thought that emotions, especially those considered negative (such as sadness or fear) had the ability to weaken the processes of synthesis and cause disaggregation between different mental states. If memory, attention, will and perception have a synthetic potential, emotions would be highlighted by their antisynthetic potential. In this sense, it would not be so much the traumatic event that would produce the disaggregation of the images associated with an idea, but rather the emotions associated with the moment that would have the potential to break the processes of synthesis, and ultimately, interrupt the normal integration of the experience. Janet thus anticipated modern developments about the relevance of emotion regulation in conversion.

Although he didn’t delve as deeply as Freud, Janet also showed interest in the study of the somatoform manifestations of dissociation. The author considered that the psychic and somatic manifestations of disaggregation were part of a varied but unique phenomenon that arose in individuals with hysterical traits. His work abounds in clinical descriptions of treated hysteria cases in which there was a clear presence of varied sensory and motor symptoms: anesthesia, paralysis, catalepsy, hyperalgesia, hyperesthesia, etc. He deepened the study of paralysis and anesthesia by categorizing them and differentiating generalized, localized and systematic forms.

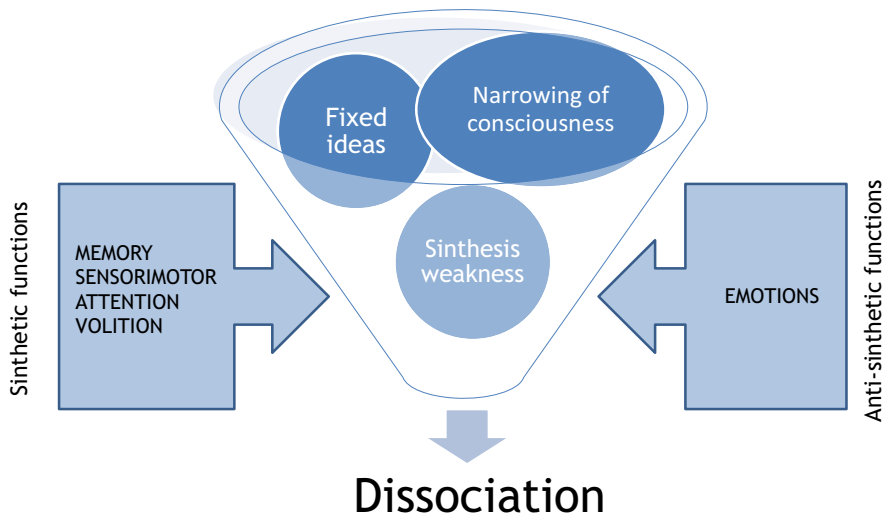


Figure 1: Components of Janet 's Dissociation Theory (Désagrégation).

For his part, Sigmund Freud maintained an eclectic stance in which he would include both a psychological understanding of hysteria more similar to that of Bernheim (who understood that it was only suggestion) and a more physiological perspective (which came from his German influences and also from Charcot's idea that hypnosis was another clinical variant of hysteria). He would oscillate between these two positions and later, would feed off of both to build a theoretical body around hysteria and other neuroses.

Both Freud and Jung initially endorsed Janet's theory, agreeing that trauma and/or childhood sexual abuse were at the base of dissociative and conversion clinical manifestations, sharing a significant amount of the theoretical precepts proposed by Janet. However, over time Freud (1894) abandoned the idea that trauma was behind the symptomatology. Instead, he developed a theory about neurosis in which infantile desires and repressed impulses explained this type of phenomena (González, 2010). It was therefore Freud himself who developed the concept that intrapsychic conflict converted into a somatic symptom through the defensive mechanism of repression. The term "conversion" is therefore due to this author. In his "*Comparative Study of Hysterical and Organic Paralysis*" (Freud, 1893) the author studied and classified the different types of paralysis using a comparative methodology. He placed hysterical paralysis in an intermediate position between the so-called organic representation paralysis (the reproduction of the periphery in the cortex was not an exact point-by-

point reproduction nor a true projection, rather a relationship by means of fibres, which could be described as representative) and projection paralysis (in which the periphery is projected point-by-point on the grey matter of the cord). Through his studies on paralysis Freud concluded that, in the absence of an anatomical explanatory correlation of the symptoms, a functional or dynamic lesion must exist. According to Freud, "in paralysis and other manifestations, hysteria behaves as though anatomy did not exist or as though it had no knowledge of it" (Freud, 1893). In this sense and as an example, the mental representation of the arm would be paralyzed rather than the anatomical reality of this extremity. Freud explains that the abolished function is associated in the subconscious with a strong affective value. The memory of the repressed traumatic event, subconsciously isolated in the form of a second consciousness, would facilitate the paralysis (Thoret et al., 1999). Similarly, he understood that bringing these repressed experiences to consciousness would lead to the cessation of hysterical symptoms. For an experience to be set in this second consciousness, two conditions must be met: that the hysteric would intentionally forget an experience or reject its representation, or that the hysteric suffered an unusual psychic state (states of ecstasy, self-hypnosis or significant emotional states). Therefore, Freud considered that there could be a part of conscious repression and, at the same time, a more involuntary mechanism that processed information in a parallel consciousness when emotionally intense situations occurred. Similarly, Freud noted that the difficulty to process these emotions could be both psychological and physiological. In short, Freud stood out for having highlighted the need to unify mind and brain and contemplate both psychological and physiological variables when understanding the functioning of the psyche (Freud, 1895)(Ballmaier and Schmidt, 2005). Many of these intuitions seem to be supported by recent research in neurobiology.

1.1.4.3 Advancing in the 20th and 21st Centuries

During the period of Janet and Freud, interest in this condition continued after the boom of research on hysteria. Multiple authors, especially psychoanalysts, continued to research the underlying intrapsychic and relational mechanisms of hysteria in general and Conversion Disorder in particular. The post-war era focused on the exhaustive description of the cases, the analysis of the disorder's repression as well as the development of new theories regarding the connection and object relations that would change the way of understanding conversion. By the 60s interest was revived to find an organic cause behind this diagnosis. In 1965, the first rigorous long-term follow-up study of patients diagnosed with hysteria was published. The findings showed that two thirds of the cases corresponded to patients who, after 10 years of

follow-up, had been diagnosed with a medical condition that explained the symptoms (Slater and Glithero, 1965). These findings questioned the construct itself of conversion, taking into account that it could be the manifestation of a yet unknown organic clinical picture. However, with the refinement of the diagnostic tests and the improvement of the research methodology, this misdiagnosis rate decreased significantly. To date, the rate for misdiagnosis is 4% for this disorder, which is analogous to those found in other psychiatric and neurological diseases (Stone et al., 2005). It was therefore concluded that Conversion Disorder was more than an expression of a misdiagnosis, that is, something more than an undiagnosed neurological disease.

Hysteria, which had been one of the most studied disorders in the first half of the 20th century, would practically fall into oblivion during the second half of the century. However, interest would re-emerge strongly in the 90s and since then several working groups have developed different theories to explain this disorder. Notable among them, the Van der Hart Theory of Structural Dissociation of the Personality (2011), physical theories such as the one proposed by Ogden and Minton (2000) or others evolutionary theories such as the approaches proposed by Schore (1994), Van der Kolk (1996), Porges (2007) or Putnam (1997). To date, we can say that most of these theories emphasize the importance of childhood traumatic experiences and attachment in Conversion Disorder. Multiple authors have considered conversion to be a response to trauma while others have emphasized that it is not the trauma itself that provokes the manifestations of such symptoms, rather the alterations in emotion regulation that accompany the traumatic experiences.

1.1.4.4 International Classifications

The first edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM) conducted by the American Psychiatric Association included within the same section, called Psychoneurotic Disorders, both Dissociative Reaction and Conversion Reactions, as well as other Anxious and Depressive Reactions (American Psychiatric Association, 1952). The second edition of the handbook (DSM-II) included dissociation and conversion finding them to be two types of Hysterical Neurosis. Dissociation received less interest in the decades following the publication of the DSM-II.

From 1978 on, the term "somatoform" was put into use, which would progressively replace the initial term of hysteria and the later one of Briquet's Syndrome (North, 2015). For a few years, the definition associated with the term

somatoform was more related to a negative diagnosis (that is, with the absence of a physical explanation for a somatic symptom) than with a positive diagnosis with defined clinical characteristics, a known ethology and a certain evolution. Contrary to these views, several psychodynamic schools would try to delve deeper into the underlying psychological mechanism in conversion, dissociation and somatization. However, these attempts would fail with the appearance of the DSM-III (American Psychiatric Association, 1980). In this edition an atheoretical approach prevailed, in search of psychiatric diagnoses based on measurable characteristics that included not only the typical symptoms but also the longitudinal course, familiarity and the evolution of the syndromes. At this time, St. Louis' definition of Briquet's Syndrome was updated and renamed Somatization Disorder. The category of Somatoform Disorders in the DSM-III included Conversion Disorder, Psychogenic Pain Disorder/Hypochondriasis and Atypical Somatoform Disorders. Some authors pointed out at that time that the classification obviated the presence of psychological symptoms associated with Briquet's Disorder, for which they coined the term "psychoform" (see the review by Carol North (2015)). The DSM-III separated Dissociative Disorders from Somatoform Disorders, which included Conversion Disorder. The revised third edition of DSM-III (DSM-III-R) made minor changes in the disorders that concern us (American Psychiatric Association, 1987) and the fourth edition (DSM-IV) and its revision (DSM-IV-TR) simplified the Somatization Disorder criteria (requiring 8 symptoms from a list of 32) (American Psychiatric Association, 1994)(American Psychiatric Association, 2000). In the DSM-IV several symptoms were renamed: Somatoform Pain Disorder was renamed Pain Disorder, Multiple Personality Disorder was renamed Dissociative Identity Disorder and Psychogenic Amnesia was renamed Dissociative Amnesia. The manual contained examples of "pseudoneurological" symptoms that included both symptoms that could be called psychoform such as amnesia (included in dissociative symptoms) or hallucinations, and sensorimotor symptoms such as difficulties in coordination and/or balance, paralysis or paresis, dysphagia, aphonia, urinary retention, blindness, deafness, pseudocrisis, etc. In the fifth edition of the manual (American Psychiatric Association, 2013) Somatoform Disorders established in previous editions were reconceptualized into a new category called Somatic Symptom and Related Disorders. Somatization Disorder disappeared, and the main diagnosis of this category would become Somatic Symptom Disorder which requires one or more physical symptoms that cause significant distress and dysfunction in daily life. The criteria related to the absence of a somatic explanation for the symptom is not explicitly mentioned in the text (Vallejo Pareja, 2014). With the DSM-5, Hypochondriasis, Pain Disorder and the Undifferentiated Somatoform Disorder also disappeared. In addition, the DSM-5 includes, as a new diagnosis, the Psychological Factors Affecting Other Medical

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Conditions, which refers to those psychological and behavioral factors that may adversely affect ones' medical condition by interfering with other clinical conditions.

With regards to the disorder that concerns us, the configuration that has remained after the final publication of the DSM-5 has maintained the same line as the DSM-IV in relation to the categorization of Conversion Disorder related to other clinical entities with somatic origin. Conversion Disorder maintained similar criteria, describing the presence of one or more symptoms of alterations in voluntary motor and/or sensory function and emphasizing the crucial importance of a neurological examination to discard other causes for the presented symptomatology. In fact, it is considered that Conversion Disorder should be evaluated by a specialist in the field of neurology/neurobiology to distinguish it from other neurological affections. Whereas it is the responsibility of Psychiatry to differentiate CD from Factitious Disorders and Malingering, as well as how to study the psychological factors that trigger and maintain conversion symptoms. Also note that the DSM-5 Conversion Disorder does not consider psychological factors to be associated with the symptom, regardless of whether they are or not. Similarly, for diagnosis, symptoms must be significant symptomatic not explained by the presence of another physical or psychiatric illness.

The DSM-5 therefore maintains the distinction between the terms dissociation and conversion, not only because one concerns the body and the other the psyche, but also because it considers them to stem from different phenomena. As a strong point, it can be said that the American classification includes clinical specifiers of the symptom such as: with weakness or paralysis, abnormal movement, swallowing symptoms, speech symptoms, with seizures or attacks, with anesthesia or sensory loss, special sensitive symptoms, and with mixed symptoms. It is also specified if the episode was acute or chronic and if there was an associated psychological stress factor (American Psychiatric Association, 2013).

On the other hand, in 1978, the WHO (World Health Organization, 1978) published its ninth International Classification of Diseases (ICD-9) that included Dissociative Disorders (Dissociative Amnesias, Dissociative Fugue and Dissociative Identity Disorder), Conversion Disorders (blindness, deafness, paralysis, astasia-abasia and conversive reaction) and Factitious Disorders within a common category. The classification contemplated other disorders in separate categories such as Somatoform Disorder, Depersonalization Disorder and Hypochondriasis. Conversion Disorder was included in conjunction with Dissociative Disorders and separated from somatization manifestations.

The tenth edition of the manual (ICD-10)(World Health Organization, 1992) sustained the union between conversion and dissociation that was included in the same category. This choice has been supported by multiple authors who consider that the intimate relationship between both constructs was given from the time of Janet and that it is more respectful both with theories focused on seeking the etiopathogenesis of the disorder as well as with dynamics theories focused in characterizing the underlying psychological mechanisms (Bowman, 2006)(Brown et al., 2007)(Nijenhuis et al., 2003).

Delving deeper into this classification, we see how the ICD-10 includes Conversion Disorder (CD) within the chapter F40-F48 called Neurotic, Stress-related and Somatoform Disorders. Within this section, F44 will correspond to Dissociative Disorders (Conversion). As can be seen, the most widely used classification in Europe makes no distinction between the terms dissociation and conversion and uses them synonymously (World Health Organization, 1992). Many authors have considered it a success to take unitarily the manifestations classically called dissociative and conversive, given that the differentiation of both refers to a widely criticised model of mind-body duality (Bowman, 2006)(González, 2010). Some authors have even questioned the usefulness of a category of Somatoform Disorders given that there are various difficulties to consider, for example: Somatoform Disorders differ widely among cultures, the subgroups contemplated within the category are not reliable, the criteria of exclusion are ambiguous, and it is an intrinsically dualistic category that divides the somatic symptoms into symptoms that reflect a disease and psychological symptoms (which has been widely discussed). Finally, this nomenclature can be questionable at the time of its medical-legal interpretation by insurance companies or private medical assistance groups (Mayou et al., 2005).

We therefore conclude that there is a discrepancy that lives on today about whether Conversion Disorders are a type of somatoform presentation or whether it is the expression of a dissociative manifestation related to stress and trauma.

1.1.5 Neurobiology of Conversion Disorders

Functional imaging tests allow for the assessment of pathologies without any structural brain alterations. This has been key for multiple psychiatric disorders, among them, Conversion Disorder.

We will approach CD focusing primarily on those learnings obtained from functional neuroimaging studies and will later mention some neurophysiological studies of interest

1.1.5.1 Learnings extracted from functional neuroimaging

Functional neuroimaging studies in conversion patients revealed a global bilateral increase of frontal and parietal flow, as well as in the right amygdala, the anterior cingulate cortex (ACC) and the insula (Lanius et al., 2014a)(Vuilleumier et al., 2001). According to Spiegel, the inhibition of sensorimotor function stems from alterations at the attention level mediated by ACC, a key structure for emotion regulation and processing (Spiegel and Cardeña, 1991). In relation to the frontal areas, it is generally considered that there is a hyperfunction during conversion (episode), although this is a non-unitary structure in which different parts of the frontal cortex behave differently during conversion episodes. For example, it has been shown that motor inhibition (in cases of conversion paralysis) is mediated by the lower frontal gyrus (the same area that mediates motor inhibition in healthy subjects). However, in conversion subjects, the medial prefrontal cortex exhibits a higher degree of activity more similar to that of subjects feigning the symptoms than in healthy patients (Hassa et al., 2016). It has been considered that these findings show how conversion is found in an intermediate area between health and sickness, between conscious and preconscious. Conversion is different from feigning, but it is not explained by organic lesions (Vuilleumier, 2005)(Spence et al., 2000). Similarly, in one of the few studies focused on acute episodes, an inhibition of the sensorimotor areas in the prefrontal cortex was observed during conversive paresthesia (using a paradigm in which the affected member was stimulated)(Tiihonen et al., 1995). These findings are consistent with the hypothesis of several authors who postulate that early cortical processing would not be altered in this disorder, rather it would be the subsequent processing in associative areas that would inhibit sensorimotor areas as well as others areas related to attention and volition (Sierra and Berrios, 1998). According to Kihlstrom, conversion is the result of a dysfunction in the monitoring and control of functions related to consciousness, which would bring about the appearance of a dissociative-like state that would alter the perception and consciousness of voluntary actions (Kihlstrom, 1994). For a comprehensive review see Vuilleumier (2005). Regarding the role of limbic regions, a tendency towards hyperfunction of these structures has been observed (Kozłowska et al., 2017a) and it has also been postulated that the increased activity in frontal and limbic lobes would be caused by emotional stress (Aybek et al., 2014).

Some authors emphasize that alterations in fronto-limbic functioning are the most notorious finding in CD. In contrast, others have given special importance to other subcortical areas such as the thalamus and the basal ganglia. In a study with morphometric MRI, Atmaca observed a decrease in the volume of both the basal ganglia and the right thalamus (and somewhat less than the left thalamus) in his cohort of conversion patients (Atmaca et al., 2006). This decrease in volume may be due to a previous depletion of these areas, which previously have been activated, as well as an increase in oxidative stress. These findings are similar to those observed in subjects with high dissociative features, as well as in patients susceptible to hypnosis. The evidence suggests a parallelism between conversion and dissociation in existing neurobiological mechanisms; in the case of conversion, other areas related to sensorimotor function are involved (Vuilleumier, 2005).

However, although there is not a single change in brain function that defines conversive pictures, there is a complex alteration at representational levels and high-order processing in areas where the sensorimotor function must be integrated with complex information in terms of meaning, relevance, motivation or action (Vuilleumier, 2005)(Yazić and Kostakoglu, 1998). Therefore, in addition to the fronto-limbic circuits, other subcortical areas and the cortico-striato-thalamo-cortical pathways will be involved. It is postulated that overactivation of fronto-limbic pathways would be related to a response to clear stress conditions. Under these conditions, suppression of the cortico-striato-thalamo-cortical pathways would result in the inhibition of conscious sensorimotor processing (Vuilleumier et al., 2001), under the influence of certain affective or motivational states. In view of this, some authors emphasize the role of the thalamus in this disorder while others postulate that the basal ganglia would have a more important role. Llinás maintains that the thalamus, in charge of integrating the information coming from different cortical and subcortical areas, plays a crucial role in the process that we have been describing. Llinás considers CD as a syndrome of dysrhythmia or thalamocortical desynchrony (Llinás et al., 1999). Meanwhile, Vuilleumier postulates that the basal ganglia in general, and particularly the caudate nucleus, would be particularly well placed to modulate motor processes based on emotional states processed in the limbic system (Black et al., 2004). The author points out that similar findings have been found in people with high dissociative features (Veltman et al., 2005) as well as in people who suffer or have experienced a Dissociative Disorder (Elzinga et al., 2007). The brain areas involved in DD are similar to those involved in CD but in the latter, other areas and pathways related to motor and sensory function will also be involved.

It is understood that the sensorimotor symptoms that appear in CD arise, in part, associated with changes in the neurobiological circuits linked to the somatosensory perception network attributed by some authors to attention and emotional processes. These changes are related to an acute or chronic increase in stress by minor damage or painful conditions and may also be exacerbated by a pre-existing genetic vulnerability (Harvey et al., 2006).

1.1.5.2 Learnings extracted from neurophysiology

Neurophysiological studies with electroencephalography (EEG) and evoked potentials have ruled out organic damage to sensorimotor fibers, proving the integrity of them (Vuilleumier, 2005). Some studies with magnetoencephalography and EEG have found a paradoxical amplification (and not an attenuation) of responses to tactile stimuli during hysterical anesthesia (Lader and Sartorius, 1968). These findings coincide with the understanding that there is no early suppression of sensorimotor pathways (even capable of being hyperreactive) in conversion, but that this inhibition would happen at later stages and mediated by fronto-subcortical circuits. While some controversy remains around this issue, it is generally considered that conversion would be at an intermediate zone between the conscious and unconscious processing. For example, in a study with evoked potentials it was found that during an acute episode of both dissociation and conversion late event related potential decreased (P300) (Rief et al., 1998). In addition, this decrease was inversely related to the level of traumatization. In this case, the results were similar to those found in cohorts of dissociative patients. In soldiers that had survived traumatic experiences Kimble described decrease in P300 also related to the trauma. His dissociative patients also showed a decrease in P300 to new stimuli that correlated with both trauma and dissociation. He found similar results in conversion patients during the acute episode, observing that this decrease in the amplitude of P300 was normalized after symptomatic recovery (Kimble et al., 2010). The opposite of this pattern would be those individuals with high interoceptive awareness (those who have increased body awareness, thus perceiving as exaggerated any change in their body) and with high levels of alexithymia. In these individuals, emotion regulation mechanisms such as reappraisal did not produce a decrease in arousal and the amplitude of P300 as normally occurs in healthy subjects (Pollatos et al., 2005). These findings are precisely the opposite of those we have been describing for patients with CD and/or DD in which the perception of their own bodily sensations and emotional states is diminished.

At this juncture, it is worth mentioning the interpretation of Kirino et al. regarding the attenuation of P300 in conversion and dissociative patients. The author interpreted this attenuation the result of a negative feedback loop from the medial temporal lobe to the cortex, which decreases the amount of information flow, allocation of attentional resources, and updating of working memory to avoid both excessive long-term memory system activity in medial temporal lobe and resurgence of affect-laden memories (Kirino, 2006). He also reported that these findings were more related to a cognitive distortion than to a narrowing in the field of consciousness (in his study the decrease in P300 during the dissociative episode was not accompanied by variations in the qualitative EEG). These results bring us back to the conclusion that dissociation and conversion occur somewhere between conscious and preconscious experiences.

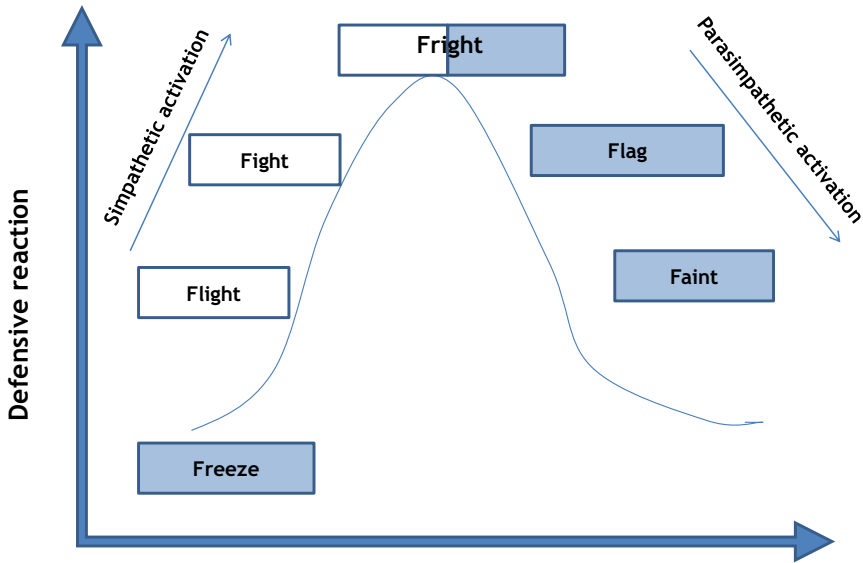
Finally, it should be noted that a decrease in habituation has been found in response to repeated stimuli in patients with different types of conversion symptoms similar to what has been described in patients with DD (Lader and Sartorius, 1968)(Horvath et al., 1980)(Moldofsky and England, 1975)(Hetzl-Riggin and Wilber, 2010), while in other neuroses there was only one continuation of it. It could be understood that patients with CD tend to interpret the repeated stimuli as if they were new (Horvath et al., 1980). It is unclear whether this interpretation is related to an increase in threat detection, a higher neurophysiological baseline activation and difficulties to make changes in cognitive state or amnesic integration.

1.1.6 Conversion Disorder from a phylogenetic standpoint

Multiple authors have observed fear responses in mammals that resembled some conversion symptoms (Moskowitz, 2004)(Van der Hart et al., 2006)(Nijenhuis, 2015). For some mammals, the ability to remain immobile (as if frozen or feigning death) can be an evolutionary advantage in the presence of a predator. At the beginning of the 20th Century, Kretschmer considered that some hysterical symptoms such as the paralysis of one or several extremities were related to freezing responses of animals (Kretschmer, 1926)(Kozłowska, 2007). This concept was gradually revisited from the 90s by multiple authors (Porges, 2007). (Van der Hart et al., 2011).

Meanwhile, Lang, Davis and Ohman studied the defensive reflexes in animals and humans and formed a model for the defensive cascade according to which there would be four stages (Lang et al., 2000). The model was then extended by Shauer and Elbert who postulated the existence of 6 types of response within the defense cascade: freeze, fight, flight, fright, flag and faint (Elbert and Schauer, 2010). The authors argued

that the first half of the responses would mainly be mediated by sympathetic action while the second half would be mediated by parasympathetic activation.



Dissociation increases as the defensive cascade progresses

Figure 2: Defensive reactions according to Elbert and Schauer (2010).

However, Porges repeatedly questioned the classical opposition between the sympathetic and parasympathetic nervous systems and postulated a hierarchical theory in relation to the defensive cascade. Porges’ Polyvagal Theory proposes three autonomic subsystems: a social engagement system formed by myelinated ventro-vagal fibers that manage to keep calm by inhibiting the SNS, a mobilization system dependent on the SNS and the most primitive immobilization system that depends on the unmyelinated fibers of the dorsal vagus. According to the author, these subsystems would be hierarchically organized so that when the most recent and evolved system (that of social engagement) fails, the typical responses of the remaining subsystems are heightened (Porges, 2007)(Porges, 2009). In this sense, the failure of the social engagement system (typical of mammals) would cause the mobilization system (dependent on the SNS) to be expressed, resulting in the appearance of fight or flight behaviors. If this second system (which arose from the bony fish) fails, it will give rise to the appearance of the oldest system that regulates the immobilization behaviors

typical of reptilians. Similarly, the author claims that these systems allow for a correlation of the neurophysiological state with the environmental demands. Therefore, when the environment is appraised as being safe, the limbic structures are inhibited, and the social engagement system is set in motion, calming the visceral responses. However, some individuals present a mismatch in this system, misinterpreting safe environments for threatening ones. The emergence of unwanted fight-flight or freezing states occurs, and the most adaptive responses based on social engagement are inhibited in these cases (Hopper et al., 2007). Based on this theory, the appearance of clinical conversion is explained as the result of a failure in the social engagement system which is mediated by the myelinated vagus fibers that allow older phylogenetic responses to emerge.

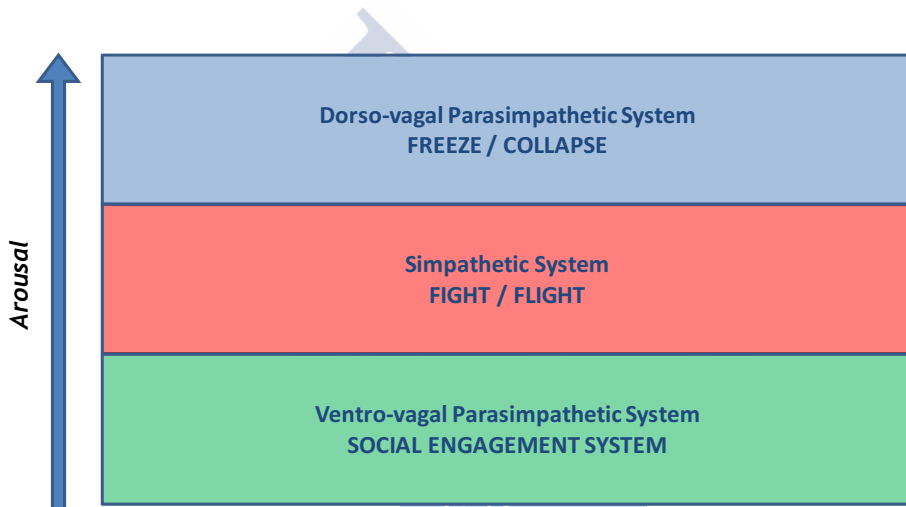


Figure 3: Hierarchical model explaining vegetative responses to cope with environmental challenges, adapted from Porges (2011).

1.1.7 Conversion Disorder as a posttraumatic spectrum disorder

Many authors have proposed the existence of a common etiology of Dissociative Disorders, Conversion Disorders and Somatoform Disorders related to traumatic experiences (especially childhood sexual abuse and interpersonal trauma)(Spence et al., 1985)(Van der Kolk et al., 1996). This perspective has been supported by multiple epidemiological studies that have described high rates of comorbidity within this group of disorders (Yayla et al., 2015) (Kundakç and Emre, 2004)(Bowman, 2006)(Spitzer et al., 1994)(Spitzer et al., 1999)(Espirito-Santo and Pio-Abreu, 2009)(Sar et al., 2004)(Sar et al., 2009b) and some authors have considered

that these comorbidities were due to a common etiopathogenesis. From this point of view, it is proposed that disorders such as Post Traumatic Stress Disorder, Personality Disorder, Conversion Disorders, Dissociative Disorders and Somatoform Disorders are included within a common spectrum related to the difficulties of adaptation to trauma (Van Dijke et al., 2010). However, some authors have criticized this concept, considering that high comorbidity rates do not justify the consideration of a group of disorders in common and understanding that the presence of dissociation in all of them could be understood as a confounding factor (Sar et al., 2004) or as an accompanying symptomatology (Reuber et al., 2003).

In terms of the relationship of these disorders with trauma, it is worth mentioning the abundant literature that explores this topic and finds higher rates of traumatic life events in these patients compared to the general population (Diseth and Christie, 2005)(Ozcetin et al., 2009). In a study of more than 500 people with traumatic life events, Van der Kolk found that trauma, emotion dysregulation, somatization and Posttraumatic Stress Disorder were highly related conditions (van der Kolk et al., 1996). The author postulated that these clinical manifestations formed a spectrum of adaptation reactions to trauma. For their part, Bière et al described low rates of dissociative experiences in the normal population exposed to traumatic events (8% versus 2% in the population without exposure to trauma). However, 90% of the people with dissociative symptoms had a previous history of traumatic exposure (Briere, 2006). Posttraumatic symptoms and emotion dysregulation were the two factors that best predicted the appearance of dissociative symptoms. Briere considers that trauma is an important ailment to condition the appearance of dissociative symptoms. He also considers that mechanisms of emotional (dys)regulation are more important; which will be addressed later on.

Regarding Conversion Disorders, a study focused on motor symptoms found that up to 71% of the patients had other conversion or dissociation symptoms, stressors associated with the onset of the symptoms were found in 60% of the sample and up to 50% of the cases met the diagnostic criteria for other psychiatric disorders (Factor et al., 1995). It is also worth noting the revision that was carried out by Fiszman's group on the relationship between trauma and pseudocrisis. The authors found trauma rates between 44-100% and of abuse between 23-77% in patients with pseudoseizures (Fiszman et al., 2004). Roelofs also found that exposure to trauma had effects on the severity of conversion symptoms (Roelofs et al., 2005). However, the author proposed to abandon the old paradigm of the unifactorial relationship between trauma and conversion to embrace a new multifactorial theory that aligned with the models of vulnerability to stress.

In short, we can say that, currently, new models have emerged that understand the relationship between traumatic experiences and the appearance of these type of disorders in a more complex way. Most of these models will explain how exposure to traumatic events will modify the emotional world of the person and how it will alter the experience of new emotional experiences. Some authors have related these alterations to the simple presence of sustained stress over time, while others have postulated more complex evolutionary and developmental theories in this regard. For example, Rockstroh et al. postulated that repeated exposure to traumatic events would condition the subject, in the face of new highly-emotional (especially negative) stimuli, showing a pattern of early hyperarousal in the frontocortical circuits (Rockstroh and Elbert, 2010). The authors suggested that this pattern reflected a preference of chronically stressed brains to develop a rapid but uncoupled sensory processing that would escape prefrontal control and thus easily activate an alarm response. This brain would give less importance to the slower and more contextual processing established through the ventral tracts. Therefore, little by little, and at the expense of brain plasticity, the brain's architecture was modified, making the subject an expert threat detector. In contrast, other authors have considered that more complex constructs such as emotion regulation and attachment would be the key point to understanding the relationship between trauma and psychopathology (Schoore, 2002).

1.1.8 Conversion Disorder as a dissociative manifestation

The understanding of conversion related to dissociation has been outlined over the years, from the first studies of Pierre Janet, to the inclusion of both disorders within the ICD. There are arguments supporting dissociation and conversion as very close ethiological phenomena (Nijenhuis et al., 1996)(Bowman, 2006)(Espirito-Santo and Pio-Abreu, 2009). First, the high comorbidity between both disorders, confirmed by multiple studies, should be noted. High rates of conversion symptoms have been found in patients with severe Dissociative Disorders as the Dissociative Identity Disorder has been confirmed by several studies in this regard (Coons et al., 1988). In a complementary way, high levels of dissociation have been identified in several cohorts of conversion patients (Spitzer et al., 1999)(Şar et al., 2004)(Evren and Can, 2007)(Yayla et al., 2015), oscillating in ranges between approximately 30-60% comorbidity.

It has also been argued that the link between dissociation and conversion has to do with three etiologic mechanisms that would be common for dissociation and conversion: the lack of recognition of the symptoms themselves (either related to

unawareness or lack of self-agency) (Kranick et al., 2013)(Demartini et al., 2016), the increase in suggestive capacity and tendency to present cognitive biases (Horvath et al., 1980)(Giesbrecht et al., 2008) as well as the difficulty to regulate when faced with overwhelming emotions (Roberts and Reuber, 2014)

1.1.8.1 Somatoform dissociation

Ellert Nijnhuis is considered a leading exponent in the defense of conversion as a purely dissociative phenomenon in the current era (Nijnhuis et al., 1998)(Nijnhuis, 2000) (Nijnhuis et al., 2003). Nijnhuis took up and popularized the term somatoform dissociation to refer both to the classic symptoms of conversion to which we have been referring, as well as other somatoform-like symptoms that correlated with his opinions regarding exposure to trauma and with dissociation (such as urinary discomfort, pains in the genital areas or other experiences related to the alteration of the senses such as modifications in olfactory or tactile experiences). For the author, somatoform and psychoform dissociation were two sides of the same coin. In fact, with the evolution of his research Nijnhuis progressed around the idea that it is difficult to distinguish the somatic or psychological nature of both processes, which in many cases overlapped (Nijnhuis, 2015).

We share with this and other authors the idea that dissociation and conversion are comprised of a common group of disorders related to emotion dysregulation and adaptation to trauma. In order to avoid confusion in reading, when used in isolation the term dissociation we will be referring to what Nijnhuis called psychoform dissociation. Meanwhile, we will favor the use of the word conversion to refer to what Nijnhuis called somatoform dissociation.

On the other hand, Nijnhuis himself is one of the co-authors of "The Haunted Self", one of the most important books for therapists that addresses posttraumatic disorders. The authors have developed a comprehensive model, the Theory of Structural Dissociation of the Personality, that proposes that dissociative and conversion disorders are part of a process of structuring the personality in subjects exposed to traumatic experiences and characterized by a pathologically emotional learning.

1.1.8.2 Theory of Structural Dissociation of the Personality

The Theory of Structural Dissociation of the Personality (Van der Hart et al., 2011) proposes that traumatization brings with it a certain degree of division or dissociation of the psychological systems that constitutes the subject's personality.

Biopsychosocial systems that determine the dynamic organization of personality have been called action systems and can be oriented for survival or for defense from a threat. The theory proposed by Van der Haart, Nijenhuis and Steele considers that in dissociation both systems are split, and one or more dissociated parts appear. One part will aim to maintain the proper functioning of the individual and will have to act as if nothing was happening. This part is called Apparently Normal Part (ANP). On the other hand, one or more of the dissociated parts may continue to be attached to the traumatic experiences, experiencing them as if they were still occurring in the present. These parts will have a defensive function, act as if the threat were still present and have been labelled as Emotional Part (EP). The authors postulate that alternation between intrusion and avoidance is observed in patients with psychoform and somatoform dissociation, as well as a cyclisation between states in which the person functions through their ANPs and other states in which the EPs takes control. Similarly, conversion symptoms (or somatoform dissociation symptoms, as the author refers to them) may appear either due to a loss of functionality of the ANP (memory loss, sensory loss, etc.) or through the EP that returns sensorimotor experiences associated with a past traumatic experience (symptoms of sensorimotor re-experiencing). These two situations can generate a wide variety of clinical manifestations when they occur in different contexts, under different emotional demands and taking into account different biographical experiences.

Based on the concepts of ANP and EP, the authors have proposed a hierarchy that ranges from low to high severity and low to high symptomatic complexity within dissociative disorders. These are classified as primary, secondary or tertiary structural dissociation (see "The Haunted Self") (Van der Hart et al., 2011). The therapy is largely aimed at increasing the awareness that some parties have of others, to promote mutual dialogue and to integrate the function of each of the parts that appear in the complete life of the person.

1.1.8.3 Similarities between dissociation and conversion from a neurobiological standpoint

From the perspective that psychoform and somatoform dissociation are only two sides of the same coin, we will share some perspectives regarding the neurobiology of dissociation for comparison with what has been previously described for conversion.

Recent research shows that there is a difficulty in integration between circuits related to volition, emotion, attention, cognition and perception in dissociation. These

integration difficulties have been well described by Lanius, Paulsen and Corrigan in their book *“Neurobiology and treatment of traumatic dissociation “* (2014a). The authors postulate that a series of neurochemical alterations underlie this integrative difficulty. They propose that the release of endogenous opioids and other anesthetic molecules disrupt the communication between lower and higher-level brain structures. Endogenous opioids inhibit the thalamus from producing a decoupling of higher brain structures such as the limbic cortex and neocortex, with respect to lower structures such as the brainstem. As a result of the failure to transmit the incoming information to the cortex, horizontal integration between cerebral hemispheres through the corpus callosum would be difficult. This lack of integration between bottom-up and right-left would be key in preventing a correct integration of the traumatic experiences and would suppose a convergent explanation with the classic theories of Janet regarding the disaggregation. In this case, the occurrence of a narrowing in the field of consciousness, mediated by thalamic structures, would not be sufficient, but a pro-anaesthetic situation (or partial catalepsy, the term used by Janet himself) mediated by a discharge of opioids, would also have to be present so that the dissociated subsystems could emerge. The authors hypothesize, in short, that the parts (ANPs or EPs) or discreet states that are observed in dissociation are the result of a deafferentation of basic affective circuits that are mobilized before the threat. This deafferentation is mediated by the release of endogenous opioids, which is started when there is excessive arousal and is difficult for the person to tolerate. Thus, it is explained that said states or parts remain separate or subconscious to ordinary mental functioning (Lanius et al., 2014b). The authors base this on previous findings stating that the brain’s top-down or bottom-up connections are much denser than at the horizontal level. This suggests that when this vertical integration cannot be carried out (as in the case of structural dissociation), horizontal integration appears at higher levels than its usual functions (integrating, for example, sensory input with emotions and thoughts). Particular emphasis is placed on the integration processes' of sensory input which they consider essential to connect the inner world of the person with the demands of the environment. In this respect, several authors have argued that the thalamus would have a fundamental role in the dissociation through its filtering function and modifying of sensory input to limbic and cortical areas (Krystal et al., 1995). The thalamus would not only function as a bottom-up type filter but will also play a role in top-down regulation (in fact, the cortico-thalamic fibers greatly outnumber the thalamo-cortical fibers). These reciprocal links are in the thalamic-cortico-thalamic circuits that are considered essential for both self-consciousness as well as to maintain the level of consciousness. The thalamus also has close links to the cingulate cortex. In this regard, the ACC has connections to the dorsomedial thalamic nuclei that mediate affective responses and autonomic regulation. Meanwhile the

ventral posterior cingulate cortex select events according to their relevance and transmits the information to anterior cingulate regions (Lanius et al., 2014b). This cingulate deafferentation would be the basis of the difficulty of integration between emotion and cognition. In addition, the authors consider the EPs described by Van der Hart as a result of brainstem and peripheral circuit functioning with little involvement of the thalamus Hart (Van der Hart et al., 2006). On the other hand, would be the ANPs, with little affective or defensive load, that would be stored in the cortico-striato-thalamo-cortical circuits.

This vision centered on the horizontal and vertical connection tie in with the theory proposed by Porges. These types of hierarchical models are based primarily on the phenomenon described by Hughling Jackson in 1958 whereby when a higher-order structure is damaged or stops working, lower-order structures emerge that take over. This perspective based on an evolutionary orientation, as well as the most modern interpretations concerning the hierarchy of brain function (Porges, 2007), were fundamental for the integration between the evolutionary findings described in mammals and in animals regarding the processing of emotions (Panksepp, 2010)(Panksepp, 2014). According to the Jacksonian perspective, we would understand that during exposure to a threat of higher cortical areas would be inhibit, giving way to a manifestation of activity of the subcortical and, phylogenetically older, paleocerebellum areas. The processing of typically mammalian information would give way to the expression of reptilian brain functioning (Porges, 2011).

We can see how, generally, most of the findings described for psychoform dissociation are similar to those described in Conversion Disorders, with the peculiarity that in the case of conversion, the circuits that govern sensorimotor functioning are involved.

Finally, note that this section has been developed from the standpoint that conversion is understood as a manifestation of somatoform dissociation. However, we take into account that the American classification DSM considers conversion to be within the Somatoform Disorders. That is why we include in the supplementary material of this thesis a work of our authorship published as an entry in *The SAGE Encyclopedia of Abnormal and Clinical Psychology*, which delves a little deeper into the neurobiology of somatic and somatoform disorders (Annex 1).

1.1.9 The heterogeneity of dissociative and conversion symptoms

1.1.9.1 The Unitary Model

Many of studies and reviews focused on elucidating the neurobiological and neurophysiological mechanisms on which the occurrence of dissociative phenomena is based do not usually distinguish the type of symptom that we are talking about. Consideration of dissociative symptoms as a qualitatively similar originated in the Unitary Model, which is based on the research of Bernstein and Putnam and resulted in the Dissociative Experience Scale (DES) (Bernstein and Putnam, 1986). The Unitary Model proposes that all dissociative/conversion phenomena are qualitatively similar and differ only in terms of the "amount of dissociation" present. Thus, there would be a continuum in dissociative disorders that would go from less to more by taking into account the "amount of dissociation" that is often linked to the severity of the disorder.

One of the arguments that has traditionally been advocated for in favor of this theory is the existence of frequent dissociative phenomena and that they have been considered nonpathological in the general population. For example, trance-type dissociative phenomena are considered a normal manifestation in some mystical and religious experiences. Similarly, situations can arise in day-to-day circumstances in which self-absorption is frequent in the general population (Roche and McConkey, 1990). This happens when the person allocates a large part of their attentional resources to a concrete perceptive or imaginative activity, remaining absorbed in their own thoughts (Tellegen and Atkinson, 1974) (Waller et al., 1996). Depersonalization and derealization have also been reported as frequent phenomena in non-clinical samples, with a 12-month prevalence between 46% and 74% (Hunter et al., 2004).

Below is a figure in which linearity of the model can be observed according to the increase of the degree of dissociation.

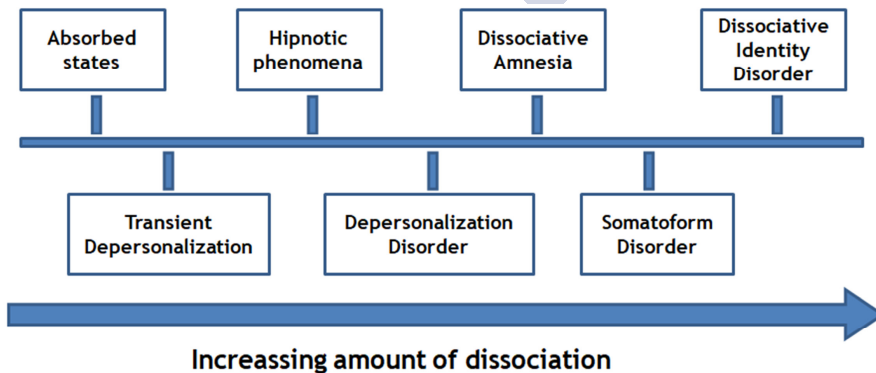


Figure 4: Unitary Model for dissociation. Adapted from Brown (2006).

However, several authors have criticised this theory and have proposed the existence of a complex factorial structure within the Dissociative Experience Scale (DES) (Mazzotti et al., 2016)(Kerig et al., 2016). It has been considered from this perspective that both dissociative and conversion symptoms cannot be understood as unitary constructs and several authors have therefore proposed different classifications thereof (Cardeña, 1994) (Holmes et al., 2005)(Brown, 2006)(Van der Hart et al., 2011).

1.1.9.2 Detachment and compartmentalisation

Cardeña, who distinguished between three types of ways of understanding the construct (Cardeña, 1995) stands out among the authors who have made attempts to categorize the dissociation:

- 1) Dissociation as the lack of integration of functions or mental modules.
- 2) Dissociation as an alteration of the consciousness state that leads to the disconnection of the self with respect to the rest of the world.
- 3) Dissociation as a defensive mechanism.

Allen would further simplify this classification by distinguishing only two categories or types of fundamental dissociative symptoms. Allen referred to them as detachment and compartmentalization, respectively. Detachment would be the mildest form of dissociation and the closest to non-pathological phenomena (which would include Cardeña's types 2 and 3), while compartmentalization would include more serious forms in which a lack of integration of modules or cerebral functions occur (the type 1 to which Cardeña was referring) (Allen, 2001). Other authors such as Putnam, Brown or Holmes have referred to these two main types of dissociative forms, with different nuances (Putnam, 1997)(Brown, 2002)(Holmes et al., 2005).

Detachment would correspond to what Putnam called in his categorization dissociative-process symptoms, with the second type of dissociation proposed by Cardeña as well as with the so-called type 2 dissociation by Brown. This category includes phenomena such as depersonalization, derealization and experiences similar to heautoscopy. In each of the cases, the subject experiences a sensation of being distanced, detached or disconnected from some component of daily experience, whether this component is the body component (in the case of experiences of heautoscopy or out of body), a component more related to the self (in depersonalization) or the world around him (in derealization)(Holmes et al., 2005).

Compartmentalization corresponds to Brown's type 1 dissociation and with Cardeña's first dissociative type. In compartmentalization, the different components of the experience are not integrated and the processes that are usually controllable, when they are controlled in a conscious way, are not controlled properly. In the following table, we can observe the classification of the dissociative and conversion symptoms regarding these two categories that we have been dealing with, which are part of the conversion of compartmentalization phenomena (Holmes et al., 2005).

Detachment phenomena	Compartmentalization phenomena
Emotional numbing Depersonalization Derealization Out-of-body experiences Amnesia due to encoding déficit	Conversion symptoms Hypnotic phenomena Made actions Multiple identities Amnesia due to retrieval deficit
Identity confusion (understood as an nonspecific symptom)	

Table 1: Symptomns associated to detachment and compartmentalization. Adapted from Brown (2006).

1.1.9.3 Positive and negative symptomatology

Pierre Janet made distinctions between various types of symptoms more than a century ago. The classic author differentiated dissociative experiences related to excitatory and hyperarousal states, of another type of dissociative experiences related to states of inhibition. This tradition has been supported by various authors throughout the 20th century and has been referred to in several contemporary models (Lanius et al., 2014a) (Van der Hart et al., 2005).

Negative conversion symptoms are considered those that occur due to sensorimotor pseudodeficiency, as in the case of paralysis, aphonia, blindness, deafness, sensory loss, etc. Meanwhile, positive conversion symptoms are considered to be clinical manifestations in which dysfunctional symptoms appear in excess, as is the case of aberrant movements, psychogenic tremors, pseudoseizures, etc. (Van der Hart et al., 2011).

From the Theory of Structural Dissociation of the Personality standpoint, somatoform dissociation symptoms are included as negative symptoms that surface

from the loss of motor functions, as well as those due to loss of abilities and loss of sensations. When a loss of motor functions occurs, this theory postulates that this may be emerging as a manifestation of the apparently normal part (ANP) or it may be the fruit of emotional parts (EPs) attached to paralysis or total submission. In the case of loss of abilities, the authors report that when one or more EPs markedly interfere in the functioning, they make the ANP lose efficiency for everyday skills. Finally, within the loss of sensations, there are very diverse phenomena that include the loss of the sense of touch, taste, hearing, smell, of painful sensation, perception of temperature, of sexual arousal, of the perception of one's own movement, or of other physical signs such as the loss of perception of hunger or fatigue (Van der Hart et al., 2011).

With respect to positive symptoms, Van der Hart et al. emphasize in their book "The Haunted Self" that the ICD-10 ignores some positive symptoms such as dissociative pain and dissociative tics, emphasizing mainly on negative symptoms. This group of authors have developed a more comprehensive questionnaire with the idea to include all those symptoms that do not fall in international rankings and which may underlie a dissociative mechanism (Nijenhuis et al., 1996). According to this group of Dutch authors, positive somatoform dissociation symptoms include sensations, perceptions, motor actions and other perceptions that do not take place in other parts of the personality. This includes experiences of pain, some intentional conduct, repetitive and uncontrolled movements such as tics, tremors and some type of paralysis and distorted perceptions that affect the five senses (Van der Hart et al., 2011).

1.2 EMOTION REGULATION

1.2.1 Emotions and their regulation

There is no single model to explain either the origin or the nature of the emotional world of individuals. Emotions include innate and learned corporal correlates, subjective perceptions, appreciations around the external world and cognitions associated with the emotion itself. In the field of emotions, the inner world of the individual interacts with the outside world and, at the same time, there is an imbricated relationship between the activity of the Central Nervous System (CNS) and autonomic activity.

Emotion regulation refers to the ability to modify components of emotional experience that include the physiological response, subjective experience, verbal and

nonverbal expression, as well as behaviors secondary to emotion (Gross, 2007). There are, in this sense, components of the implicit and explicit emotions that give rise to two fundamental ways of regulating emotions. Implicit emotion regulation happens spontaneously, involuntarily, as part of the early processing of emotional information. For its part, explicit emotion regulation refers to all voluntary processes that modulate the response to a stimulus or emotional experience and therefore have an evaluative, or rather cognitive nature (Lazarus and Folkman, 1984)(Gross, 2007).

Finally, a distinction has also been made between those strategies that are adaptive and those that are not. In this sense, the term emotion dysregulation has been used to encompass a wide range of processes and emotional responses that are not very adaptive.

1.2.2 Neurobiology of emotion regulation

Between the late 19th early 20th Centuries, William James and Carl Lange established a theory that emotions would be the perception of changes in a given organism would have upon receiving a stimulus. The James-Lange theory found its opposition to the early 20th Century from the point of view of Cannon and Bard who considered that before an emotional stimulus would take place two parallel effects would occur, one at the brain level and another visceral level. These would be independent from one another (Teixidó, 2003). Today, it is understood that there is an interaction between the CNS and peripheral organs that involves the implementation of self-regulatory mechanisms whose substrates are the motor and sensory pathways, as well as the neuroendocrine system (Porges, 2011).

By 1952, Paul MacLean would resume the topographic conceptions (Broca and Papez) and transform them by advocating the existence of an emotional system (limbic system) that would be constituted by different areas: the cingulate cortex, the hypothalamus, the anterior nucleus of the thalamus, the amygdala, the orbitofrontal cortex and the hippocampus (MacLean, 1952). Today there is still no consensus between how many and what the anatomical structures are or the functional pathways that make up the limbic system (Teixidó, 2003) and reference authors like Le Douarin (2012) have been very critical with this nomenclature.

As for hemispheric specialization of processing emotions, it was formerly considered that the right hemisphere was the emotional hemisphere and the left hemisphere was the rational and cognitive. To date, these definitions have been overtaken and in the case of emotions, a hypothesis of valence asymmetry has been

postulated. According to this hypothesis, the positive emotions or those related to approximation would lateralize towards the left hemisphere while the negative or withdrawal related emotions would move towards the right hemisphere (especially in the prefrontal regions) (Beraha et al., 2012). The broadest meta-analysis concluded that there was a tendency of lateralization towards the left hemisphere of positive emotions or of an approximation specifically in the lateral prefrontal cortex, while negative emotions lateralized towards the right amygdala (Wager et al., 2003) (Beraha et al., 2012).

On the other hand, it is worth noting that many of the models that study the neurobiological bases of emotion regulation allude to a classic interaction between cognition and emotion. There would be two differentiated processing routes: a so-called "cold" dorsal system that is related to executive control and a ventral emotional system called "hot" (Kenemans and Ramsey, 2013)(Jordan et al., 2013). The dorsal system includes dorsal frontal areas near the orbital area, the dorsolateral prefrontal cortex (dlPFC), the intraparietal sulcus, and the superior parietal lobe. The dlPFC is in charge of top-down type regulation inherent to the attentional and processing capacity limitations. The ventral system includes the ventrolateral prefrontal cortex (vlPFC), the anterior frontal gyrus, and the anterior part of the insula. Drevets and Raichle postulated the existence of a competitive relationship between the ventral and dorsal veins for the attentional resources and, therefore, between the stimuli of emotional demand and cognitive demand respectively (Drevets and Raichle, 1998). The ventral emotion-related system would be lateralized to the right and would manage to interrupt and divert the attentional focus towards behavioral or emotionally relevant stimuli, while the dorsal system would avoid distraction, select the stimuli in relation to the goals and objectives and be able to coordinate the responses. Similarly, cognitive tasks imply a decreased activation of the medial prefrontal cortex (mPFC) and other regions that form part of the default neural network, however, this reduction does not occur when subjects are exposed to emotionally negative stimuli (Robinson et al., 2013). In this sense, it is precisely the interaction between the ventral and dorsal tracts where the extrinsic emotion regulation arises, and the ACC would be one of the structures that would allow for the link between cognitive and emotional systems (Yamasaki et al., 2002).

There is another interaction between pathways that explains part of the processes of emotion regulation: the relationship between frontal and limbic areas. A common finding in the literature on emotion regulation is that when this process is started, the activity in the PFC increases and activity in the amygdala and in the medial orbitofrontal cortex (mOFC) decreases, resulting in an inversely proportional

relationship between the activity of both zones (Robinson et al., 2013). This phenomenon has been called cognitive suppression of emotion. For example, activity in the dorsomedial prefrontal cortex (dmPFC), dorsolateral prefrontal cortex (dlPFC), and the OFC would co-vary with the activity of the amygdala during reappraisal, conditioning the success of this cognitive strategy of emotion regulation.

In short, the passage of emotion regulation mechanisms has been simplified by stating that the ventral and dorsal passages (emotion and cognition, respectively) as well as the frontal and tonsillar zones have reverse activation patterns. Although this type of interaction has been widely replicated and is still valid, and occurs in the majority of the tasks studied, it is also considered that other activation patterns may occur differently depending on the demand. The authors emphasize the role of the dlPFC as a possible place of convergence of both subsystems. They also state that certain cognitive processes and stimuli cannot be easily classified as emotional or cognitive, pointing to a possible convergence of both constructs (Robinson et al., 2013).

1.3 EMOTION REGULATION WITHIN CONVERSION DISORDER

1.3.1 Trauma, attachment and emotion dysregulation: a road to pathology

Two main hypotheses have been proposed to understand the duality of trauma and emotional dysregulation.

- 1) Emotion dysregulation would be understood as a consequence of conditioning to fear and sensitization to stress in childhood.

The presence of trauma and insecure attachment are related to neurobiological functioning by means of the neurohormonal changes that occur through the modification of the maturation processes of some brain areas connected to emotion regulation such as the prefrontal cortex and the ACC as well as through modifications at the level of limbic functioning that occur in when faced with stress (the amygdala becomes acutely overactive while the prefrontal cortex tries to curb, often ineffectively, the emotional avalanche).

- 2) Emotion dysregulation would function as a factor of previous vulnerability capable of exacerbating fear and subsequent dysregulation.

Many findings in field of genetics have been found that explain how some people have a constitutional predisposition to exhibit one type of attachment or another, just as we mentioned that some people are predisposed to regulate their emotions in one way or another. In this regard, several polymorphisms have been linked to the presence of emotion dysregulation in childhood (Barzman et al., 2015) and the risk of disorganized attachment (Lakatos et al., 2000). As an example, Spangler found significant associations between disorganization in attachment and the 5-HTTLPR polymorphism of the serotonin transporter. However, further analysis of the interaction between genes and environment considered that this association was only valid in children of mothers who showed little reactivity (Spangler et al., 2009).

Therefore, there is a need to delve deeper into how constitutional and environmental factors interact when making alterations in connection and regulation of emotions (Digangi et al., 2013).

1.3.2 Emotion dysregulation in Conversion Disorders

There is an increasing number of authors who call upon the role of emotion dysregulation to explain the genesis of this type of disorder. A recent study in children has found that cumulative trauma affects behavior through three pathways: that of emotion regulation alone, of dissociation alone, and a combination of dissociation with emotion dysregulation (Hébert et al., 2018). Brière proposed that the relationship between exposure to trauma and dissociation was mediated by two independent factors: the development of Posttraumatic Stress Disorder (PTSD) and the decrease in emotion regulation capacities (Briere, 2006)(Briere et al., 2010). Another study by Novakova described the existence of multiple alterations in emotion regulation in his cohort of patients with pseudoseizures (patients tended to emotional suppression, to avoid or not process emotions, the emotional range and also to lower their emotions). In addition, the author found that difficulties in emotion regulation correlated with the subjective stress perceived by the subjects and with the presence of more severe somatic symptoms (Novakova et al., 2015). Whatever the exact mechanism, it seems presumable the existence of a complex and multifactorial relationship between exposure to traumatic events and sustained stress with the appearance of dissociative and conversion symptoms.

Emotion dysregulation can be considered a constitutional predisposition, a mediating factor, a risk factor or as another manifestation of the disorder indistinguishable from itself. Faced with this presumed multicausality that takes place

under the influence of numerous variables, we have chosen to summarize the main findings related to emotion dysregulation in patients with conversion.

Hereunder, we will include some studies that offer information on the mechanisms of emotion regulation involved in Conversion Disorder that can be understood as part of a process with a specific temporality that includes intrinsic and extrinsic phenomena. A recent case-control study involving patients with conversion sensory symptoms showed that modulation of early magnetoencephalographic activity in different categories studied (visual stimuli configured positive, negative and neutral images), was the same in cases and controls. The authors postulated that the automatic (intrinsic) detection of the different emotional stimuli studied was not altered in the conversion patient group. They stressed that the extrinsic emotion regulation in Conversion Disorder is what would be altered (Fiess et al., 2016). However, Kozłowska described the presence of both early and late alterations in emotional processing in a group of adolescents and children with "functional neurological symptoms". The author found that patients saw increases in the amplitudes of all components of the evoked potentials studied (waves P50, N100, P200, N200 and P300) when exposed to emotionally neutral auditory stimuli. He interpreted these findings as the result of an increase in basal arousal that could be understood as a necessary precondition for the clinical manifestations of conversion (Kozłowska et al., 2017b). More studies are required that include neurophysiological data with not only topographical information but also to define the temporal window, in order to understand more about the voluntary/involuntary nature of these processes and about the relationships between intrinsic and extrinsic emotional alterations.

On the other hand, emotional processing in CD has also been studied from the standpoint of the subject's reaction to specific emotional stimuli. The most replicated finding in this type of paradigms is the presence of an excess of reactivity to various types of emotional stimuli with negative valence. Several cohorts of patients with different types of conversion symptoms have shown to be more reactive than healthy controls when faced with angry faces (Bakvis et al., 2009), faces with fear and sadness (Aybek et al., 2015) or negative emotional images (Blakemore et al., 2016). It has also been postulated that there may be an increased reactivity towards neutral emotional stimuli (Ejareh Dar and Kanaan, 2016)(Pick et al., 2018). However, there is no much consensus on how the processing of positive emotional stimuli in patients with this disorder is. Some authors have described the existence of generalized cerebral connectivity alterations during recognition tasks of emotional faces that were not related to a single emotion but that occurred throughout the task of facial recognition (Espay et al., 2018a)(Espay et al., 2018b). Voon and Pick detected that in their

cohorts of conversion patients they were more reactive to all those high arousal stimuli and to emotional stimuli in general, regardless of their valence (Voon et al. 2010)(Pick et al., 2018). Overall, the authors also described an increase in connectivity between the amygdala and several areas related to emotion regulation and sensorimotor function during the implementation of the task (Pick et al., 2018).

Another group of studies found differences between conversive and healthy subjects in the processing of stimuli of different valence or in the processing of certain types of specific emotional stimuli. For example, Kozłowska found in a sample of conversant children and adolescents that patients were faster than controls in detecting sad faces but slower in detecting cheerful faces (Kozłowska et al., 2013). In another study of children by the same author, the existence of an increase in the monitoring of the emotional states of others and an increase in the preparation for motor action that they considered to favor self-protection in contexts of sustained relational stress that was based on early exposure to these stressors, which ends up modulating brain circuits that are still plastic at that age (Kozłowska et al., 2017a). On the other hand, Seignourel carried out an electromyography study in which he studied the startle response. It was found that both positive and negative stimuli generated physical reactions related to aversion in patients but not in the control groups (Seignourel et al., 2007). According to the authors, there would not only be a generalized hyperreactivity to any type of emotional stimulus, but there would also be a tendency to interpret any emotion as negative.

Another last stage of studies could be considered that which focuses on the analysis of alexithymia levels in these patients. Alexithymia has been defined as a cognitive-affective disorder characterized by difficulties in differentiating one's feelings and expressing them in words, but it has also been considered a personality trait (Ihme et al., 2014). Alexithymia has been studied in depth as a factor related to the genesis of somatoform disorders. There is extensive literature that supports the idea that this condition can be considered either a risk factor or a mediator in the appearance of various somatic symptoms (Taylor et al., 1992)(Kosturek et al., 1998) (Burba et al., 2006)(Pedrosa Gil et al., 2008)(Tominaga et al., 2014). Higher rates of alexithymia have been described in several cohorts of patients with CD (Gulpek et al., 2014)(Demartini et al., 2014)(Steffen et al., 2015). By his hand, Alexithymia has been correlated with the severity of the symptoms in CD (Steffen et al., 2015) and it has been seen that it could be predicted by the presence of childhood physical abuse (Kozłowska et al., 2017a).

1.3.3 Under-regulation and over-regulation of affect in Conversion Disorder

Upon simplifying the study of patterns of emotion dysregulation we have chosen to consider two types of strategies based on emotional control. We will differentiate those strategies of emotion regulation in which there is a deficit in the control of the emotions and will call this under-regulation of affect. The strategies in which there is an excessive control or emotional brake will be called over-regulation of affect, following the proposal of previous authors (Paivio and Christine, 2001)(Van Dijke, 2008)(Lanius et al., 2010)(Van Dijke et al., 2010)(Van der Hart et al., 2011). In the first strategy a state of great emotional reactivity reigns in which excitatory experiences and intense emotions become intolerable. According to Van Dijke, these patients tend to have an elevated emotional arousal, the feeling of being overwhelmed by emotions, exhibiting difficulties in controlling self and hetero-aggressive impulses, suicidal tendencies and sometimes uninhibited sexual behavior (Van Dijke, 2008). On the contrary, when emotional overregulation prevails, there is an excess of inhibitory control that is associated with dullness and affective distancing but also with phobia and emotional intolerance (Van Dijke, 2008)(Van Dijke et al., 2010). These two ways of regulating emotions will associate different neurobiological correlates. In under-regulation of affect, a failure of prefrontal inhibition over limbic regions occurs, increasing arousal in areas involved in the awareness of bodily states. Conversely, in over-regulation of affect, this inhibition is increased (leading to a hyperfunctioning of the ACC and the CPFVM). These findings are congruent with the cortico-limbic disconnection theory that Sierra and Berrios developed to explain depersonalization (Sierra and Berrios, 1998)(Hopper et al., 2007). They are also consistent with the Uliaszek proposal for patients with pseudoseizures. This author found in his cohort a group of highly emotionally dysregulated patients with severe concomitant psychiatric symptoms and impaired quality of life. Another group of patients had low emotion dysregulation and, on the contrary, used avoidance strategies and low attention to affective and corporal stimuli (Uliaszek et al., 2012). The author proposed, in the same way as it is done throughout this thesis, the profiling of patients based on how they use to regulate their emotions. On the other hand, an important study compared a cohort of patients with pseudocrisis against a healthy population and found that the score on the scale that measures the presence of dysregulated emotions (the Emotional Processing Scale questionnaire EPS-25 was used) correlated with a lower frequency of crises in the case group (Novakova et al., 2015). The study highlights that the group with the lowest score on the global scale was clinically shown in a subgroup of emotionally flattened patients rather than in a group of emotionally healthy subjects.

These two strategies of emotion regulation have been considered as a result of the fronto-limbic balance, however, they do not remain outside the role of autonomous nervous system of these processes. In this sense, the term "tolerance window " should be presented, alluding to that margin of security we move within when we experience emotions (Siegel, 1999). It is postulated that for an emotional stimulus to be tolerated the person has to be at intermediate levels of physiological activation. The simile of the window has also been useful to relate the different patterns of emotion regulation with the subtype of conversion symptoms. According to Ogden and Minton, when the sympathetic nervous system is activated in excess, fight/flight responses take place, meanwhile, if the parasympathetic nervous system predominates, a disconnection / conservation type of response tends to appear, similar to that that accompanies the states of collapse (Ogden and Minton, 2000). This same phenomenon was explained by Porges through a phylogenetic hierarchization of vegetative functions (Porges, 2009) and by Lanius as the result of a cortical deafferentation mediated by the balance of endogenous opioids (Lanius et al., 2014b). Regardless of whether we are far from knowing the exact mechanisms that underlie this, there is a greater consensus in the existence of these two types of differentiated responses. These responses, their neurobiological correlate at the central level and their peripheral vegetative correlate, have been related to the two subtypes of emotion regulation strategies that we have previously introduced: under and over-regulation of affect (Van Dijke et al., 2010).

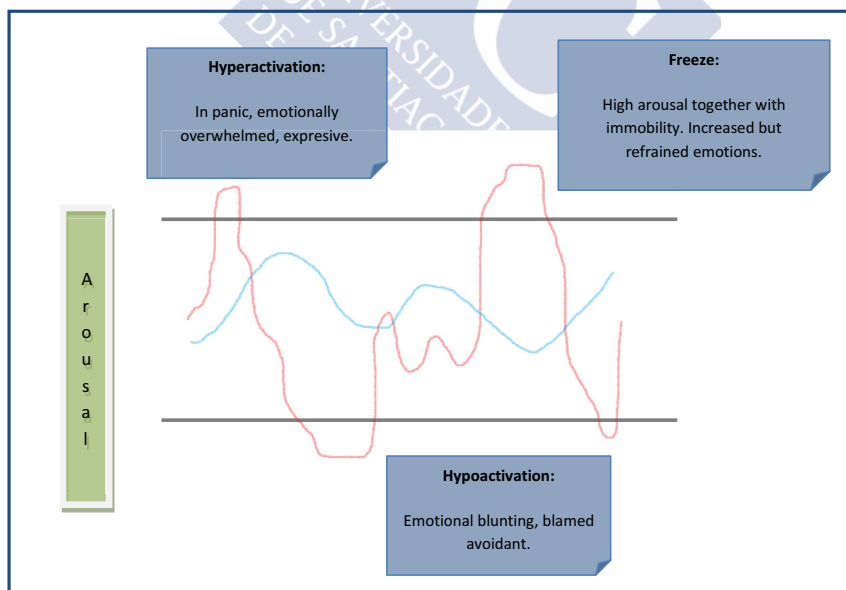


Figure 5: Clinical manifestations linked to trauma, organized around the concept of "tolerance window". Adapted from Oden and Minton (2000).

1.3.3.1 Subtype of conversion symptomatology and emotion regulation strategies

It has been postulated that different types of conversion manifestations might be related to the prevalence of different strategies of emotion regulation. It has been proposed that negative conversion symptomatology is related to cognitive mechanisms of inhibitory type and emotional overregulation, being developed in patients where emotional numbness predominates. Similarly, positive conversion symptomatology would be related to excitatory experiences and under-regulation of affect, occurring more often in patients who experience emotions as something highly activating and difficult to tolerate (Van der Hart et al., 2006)(Van Dijke et al., 2010)(Van der Hart et al., 2011)(Kozłowska et al., 2011)(Lanius et al., 2014a).

The two most relevant studies in this regard are those of Van Dijke and Kozłowska that will be presented below. Kozłowska's study categorized children and adolescents affected by Conversion Disorder into 4 subgroups according to a cognitive pattern: 57% of cases had an inhibition pattern, 34% showed a coercive-preoccupied type, 9% a mixed pattern and 0% showed a normative pattern (Kozłowska et al., 2011). In the study, the pattern called psychological inhibition was associated with negative conversion symptomatology and with certain concrete positive symptoms such as tics or tremors. On the other hand, children with a coercive-preoccupied pattern presented other motor symptoms more often such as gait disturbance, the acquisition of aberrant postures or the active refusal to move. Pseudoseizures appeared similarly in both subgroups. Meanwhile, Van Dijke's study included a large sample composed of 472 hospitalized patients diagnosed with BPD and/or Somatoform Disorder. He considered the existence of three groups of patients (with BPD, with Somatoform Disorder and with the comorbidity of both) and analyzed the emotion regulation strategies present in all of them. This was carried out through the measurement of alexithymia in the case of over-regulation of affect and a group of items selected ad hoc that are part of the SIDS-Rev scale that the author used to measure emotional underregulation. He found that these indirect measures of emotional under-regulation correlated weakly with positive psychoform dissociation and negative somatoform dissociation. On the other hand, indirect measures that were intended to reflect over-regulation of affect were weakly related to psychoform dissociation, both positive and negative. Neither the under-regulation of affect nor the over-regulation was related to negative somatoform dissociation. However, as the most interesting finding in this study, it should be noted that in the subgroup of patients with Somatoform Disorder without comorbidity with BPD, higher rates of negative somatoform dissociation were found. This was inversely related to under-

regulation of affect. The author postulated that the symptoms of negative somatoform dissociation could be an important marker associated with Somatoform Disorders and not other disorders of the posttraumatic spectrum such as BPD (Van Dijke et al., 2010). Van Dijke believes that BPD and Somatoform disorder occupy the two extremes of a spectrum of trauma-related disorders. He proposed that, taking into account the pattern of emotion dysregulation, patients with BPD would present an over-regulation pattern more often while among patients with Somatoform Disorders, under-regulation prevailed. Although several authors point in this direction and some results are prone to the same, we can say that until now there are still insufficient studies with rigorous methodology that prove the relationship between the type of symptoms presented and the subject's main emotion regulation strategy. Similarly, there are no legitimate instruments to measure the over- and under-regulation of affect, which limits the study in this field.







2. JUSTIFICATION



2 JUSTIFICATION

Despite the weight of the new international classifications of mental disorders, the history of Conversion Disorder continues, for many, to be linked to hysteria. Hysteria has been considered to be an old-fashioned entity, a stigmatizing concept and with little operational construct, etc. According to the authors, this uncertainty in the diagnosis and study reflected the inability of the medical community to adequately address this disorder (Aybek et al., 2008), which continues to be a frequent entity, with a highly variable evolution and difficult clinical management.

However, CD has not been studied only from the point of view of hysteria. Multiple authors have tried to describe, categorize and model this disorder by highlighting the efforts of Janet (Theory of Disintegration), Putnam (Theory of Discrete States), Van der Haart (Theory of Structural Dissociation of the Personality) or Porges (Polyvagal Theory). In general, we can say that the conceptions about conversion that explain the phenomenon stand out as a defense mechanism, as a disorder linked to trauma, as a subtype of Dissociative Disorder or as an entity related to Somatoform Disorders. While some perspectives consider more rigorously the biological basis of the disorder, others focus more on the underlying psychological mechanisms or make proposals for therapeutic intervention.

In this context, there is a need to develop integrative perspectives that include learning from neurobiology, psychopathology and psychology. To do this, we have focused our study on three main lines:

- 1) The study of the neurobiological basis of Conversion Disorder and its repercussion on emotion regulation processes.
- 2) The insight into the psychological processes embedded in its genesis and maintenance, giving special importance to the role of emotion dysregulation in the disorder.
- 3) The clinical and therapeutic implications of considering emotion regulation an essential core of Conversion Disorder.

Regarding the first point, it should be noted that in the last decades and with the arrival of new diagnostic instruments (functional neuroimaging and new more refined electrophysiological techniques) interest in explaining the neurobiological basis

underlying the disorder was regained (Allin et al., 2005). Multiple changes have been described in various circuits and brain areas during the acute and chronic phase of the disease (Vuilleumier, 2005). However, there is currently no single explanatory theory that contributes, from a neurobiological perspective, a complete explanation of the causes and factors involved in the genesis of Conversion Disorder. The existing bibliography lacks shared paradigms and approaches the problem from very different, and in many cases fragmented, perspectives. In this respect, it is appropriate to propose an approach that considers first the different types of conversion symptoms individually, delving into their particular characteristics and their neurobiology. Thus, an approximation from the particular to the universal can be made a posteriori, providing a global and integrating perspective in which the neurobiological alterations are related to the patterns of emotion dysregulation.

Regarding the second point mentioned, there is almost a general consensus among the scientific community that traumatic life events or those that produce high degrees of emotion dysregulation should be considered as fundamental factors in the etiopathogenesis of the disease. If it was initially proposed that the trauma itself was a generator of the dissociative and conversational pathology, over the years these hypotheses have been outlined and more and more importance has been given to the role of emotion dysregulation. In this sense Briere has proposed that psychopathology would appear after exposure to trauma when a posttraumatic stress disorder is generated or when significant alterations in emotion regulation are identified after the experience (Briere et al., 2010). This is not a new concept since multiple authors throughout history have given an important role to emotion regulation in the genesis of Conversion Disorder (Schore, 2002)(Frewen and Lanius, 2006)(Courtois et al., 2009)(Uliaszek et al., 2012)(Mosquera et al., 2014). Integrative perspectives are needed that contemplate the biology of this disorder as something dynamic and with bidirectional interactions with the processes related to stress, trauma and emotion dysregulation.

On the other hand, the study of emotions and their regulation is a growing discipline in the field of mental health and medicine in general. Increasingly, more investigative efforts are devoted to elucidating the role of emotions in the genesis of mental disorders. New research has started in how the regulation of emotions affects the course and evolution of different disorders. This has proliferated new psychotherapeutic approaches focused on the emotional world of the patient regardless of the underlying disorder. The identification of different patterns of emotion regulation can help to design personalized psychotherapeutic interventions. In this regard, it is interesting to determine whether there are distinct groups of patients who may be explained by different phenotypes within the CD. In relation to the case that

concerns us, both in various disorders related to trauma and in particular in Dissociative and Conversion Disorders, groups of patients have been identified that present different clinical manifestations and with a different course and evolution of the disease. Lanius distinguished in Post-Traumatic Stress Disorder (PTSD) between reexperiencing patients and dissociative patients (Lanius et al., 2010a). Holmes differentiated two types of dissociative responses: those that pursued disconnection/distancing and those defined by the presence of compartmentalization (Holmes et al., 2005). Other authors distinguished more or less directly between patients with a mechanism of deficient emotion regulation and patients with excessive regulation (Frewen et al., 2012)(Hopper et al., 2007)(Van Dijke et al., 2010)(Ogden and Minton, 2000)(Porges, 2007). And it is this last case in which we will delve deeper throughout the text, for its clinical usefulness and its interest when designing psychotherapeutic interventions further adapted to each case (Van der Hart et al., 2011).

In this context, a work is needed that integrates the role of the three fundamental axes described: neurobiology, emotion regulation and clinical manifestations. The development of this doctoral thesis revolves around these three aspects. It is based on the detailed study of the neurobiological and neurophysiological alterations associated with conversion in general and to each type of clinical manifestation in particular (article 1). It is intended to link these alterations to the presence of different patterns of emotion regulation. Once these relationships have been established for the different converse manifestations, the thesis will question whether a similar model can be extrapolated to other disorders included within the posttraumatic spectrum (article 2). Following the theoretical establishment of this model, we will proceed to make an observational study that includes several measures related to emotion dysregulation as well as clinical variables. This research allows to study, in a more detailed way, the different alterations in the way patients process emotions compared to a control group (article 3).

Thus, the thesis is structured around two methodological phases. The first phase includes a critical review of the existing literature on the neurobiology of CD, the appearance of changes in emotional processing and other disorders in the posttraumatic spectrum. This phase will be established within the first two articles where classification that organizes the clinical manifestations (in the case of the CD, it classifies each one of the symptoms and in the case of the posttraumatic spectrum it classifies the different disorders that compose it) on an axis based on the predominant emotion regulation strategy is proposed. In the second methodological phase, an experimental study of cases and controls based on the following working hypotheses is included:

JUSTIFICATION

- H1a: Patients with Conversion Disorder present more alterations in emotion regulation than the healthy population.
- H1b: The presence of emotion dysregulation in general, as well as alexithymia and high negative emotional intensity are risk factors for Conversion Disorder to occur.
- H1c: Emotion dysregulation is a good predictor of Conversion Disorder.
- H1d: Different clinical manifestations of (positive vs. negative) conversion are associated with different ways of regulating emotions in patients with Conversion Disorder (under vs. over-regulation of affect respectively).

In addition, two articles are included as complementary results. Article 4 corresponds to the validation in Spanish population of the SDQ-20 scale (Somatoform Dissociation Questionnaire). We did not have a legitimate psychometric instrument to measure the intensity and severity of conversion symptoms, which is why we included the validation of this scale. Finally, we incorporate a theoretical article that reflects on the implications of taking into account emotion regulation in the psychotherapeutic approach of patients who are treated through Eye Movement Desensitization and Reprocessing (EMDR), a specific technique for addressing disorders of the posttraumatic spectrum (article 5).

The concrete methodology of the two experimental studies appears detailed in the original articles, while the three theoretical articles are in themselves critical reviews with proposed models.



3. OBJECTIVES



3 OBJECTIVES

3.1 MAIN OBJECTIVE

The main objective of this thesis is to study the role of emotion dysregulation in Conversion Disorder. To this end, a series of specific objectives have been resolved, which are described below.

3.2 SPECIFIC OBJECTIVES (SOS)

- 1) Review the role of emotion dysregulation in posttraumatic spectrum disorders in general (SO1).
- 2) Correlate the different clinical manifestations of conversion with their underlying neurobiological patterns and with the mechanisms of emotion regulation that are most frequently associated with these (SO2).
- 3) To know which are the major difficulties of emotion regulation that appear in this disorder, by means of a comparative study of the general population and clinical population (SO3).
- 4) Reflect on the clinical and therapeutic utility of the described findings, gathering up the implications of the proposed model (SO4).





4. RESULTS

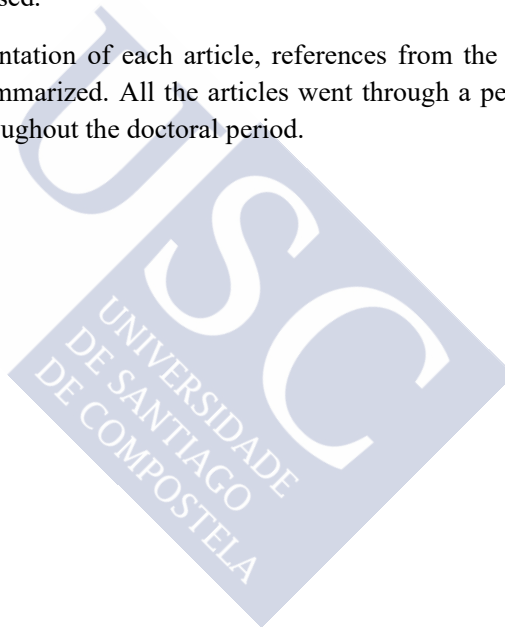


4 RESULTS

This thesis follows an article compendium modality. Therefore, the results are presented as research articles.

In this section, the main results of the study performed are presented. Three articles are presented as results and two more articles as complementary results. The three first articles compose the central core of the thesis and are planned in the research protocol proposed.

Before the presentation of each article, references from the journal and other publication data are summarized. All the articles went through a peer review process and were published throughout the doctoral period.





4.1 ARTICLE 1

Original title:

Excitatory and inhibitory conversive experiences: neurobiological features involving positive and negative conversion symptoms.

Authors:

Lucía del Río-Casanova, Anabel González, Mario Páramo,
Annemiek Van Dijke and Julio Brenlla.

Identification of the article:

Doi: 10.1515/revneuro-2015-0022

PMID: 26259230

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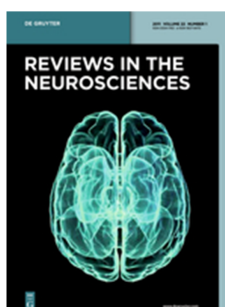
Identification of the journal:

Reviews in the Neurosciences

ISSN: 0334-1763

SCImago Journal Rank (SJR-2016): 1.249 (Q2)

Research Gate Impact Factor 2015: 3,66





4.2 ARTICLE 2

Original title:

Emotion regulation strategies in trauma-related disorders: pathways linking neurobiology and clinical manifestations

Authors:

Lucía del Río-Casanova, Anabel González, Mario Páramo, Annemiek Van Dijke and Julio Brenlla.

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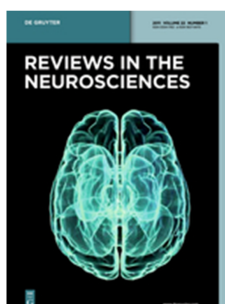
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4.3 ARTICLE 3

Original title:

The role of emotion dysregulation in conversion disorder.

Authors:

Lucía del Río-Casanova, Anabel González, Ania Justo, Vanessa Andrade, Mario Páramo, Julio Brenlla, Andrés Blanco.

Identification of the article:

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5. COMPLEMENTARY RESULTS



5 COMPLEMENTARY RESULTS

5.1 ARTICLE 4

Original title:

Validity and reliability of the Spanish version of the Somatoform Dissociation Questionnaire (SDQ-20)

Authors:

Ana Isabel González-Vázquez, Lucía del Río-Casanova, Natalia Seijo-Ameneiros, Paloma Cabaleiro-Fernández, Teresa Seoane-Pillado, Ania Justo-Alonso y Miguel Ángel Santed-Germán

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Research Gate Impact Factor (2015): 1.1



5.2 ARTICLE 5

Original title:

Integrating neurobiology of emotion regulation and trauma therapy:
reflections on EMDR therapy

Authors:

Anabel González, Lucía del Río-Casanova, Ania Justo-Alonso.

Identification of the article:

Doi: 10.1515/revneuro-2016-0070

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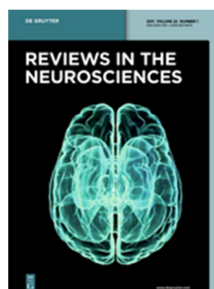
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6. DISCUSSION



6 DISCUSSION

6.1 EMOTION REGULATION STRATEGIES IN POSTTRAUMATIC DISORDERS SPECTRUM (SO1)

Throughout this thesis, based on the reviewed literature, it has deemed that the disorders most linked to traumatic experiences, to be include within the posttraumatic spectrum could be: Borderline Personality Disorder (BPD), Posttraumatic Stress Disorder, Conversion Disorder, Dissociative Disorder and Somatoform Disorders (Diseth and Christie, 2005) (Kozłowska et al., 2011) (Ozçetin et al., 2009) (Fizman et al., 2004). One of the arguments in favour of considering these disorders as part of a common group has been the presence of high comorbidity among them. It has also been argued that all these disorders could have a common etiopathogeny based on trauma and emotion dysregulation. Furthermore, it is considered that there are alterations in the pattern of close relationships and in the attachment that may be shared in this group of disorders (Van der Hart et al., 2011).

Our main contribution to this field of study was embodied through the publication of the second article of this thesis, in which the presence of specific regulation strategies in this psychopathological spectrum were analysed. To achieve this, we have considered emotion over-regulation and under-regulation as the main regulation strategies, including a third pattern consisting of the combination of both. We have taken into account the results of previous studies and have looked for arguments in favour of the hypothesis proposed by Van Dijke for the posttraumatic spectrum that was explained in the introduction (Van Dijke et al., 2010). Our article proposes, based on the reviewed literature, that in BPD and PTSD the most evidenced emotion regulation strategy proved to be the under-regulation strategy. In addition, the reviewed literature indicates that patients with BPD or PTSD with dissociation, alternate between emotion over- and under-regulation strategies. On the other hand, patients with Dissociative Disorder, Conversion Disorder or Somatoform Disorder presented a variety of different ways of regulating their emotions, considering these disorders as non-uniform entities in terms of emotion regulation. Figure 6 (corresponding to Table 1 of article 2) summarizes and situates the posttraumatic manifestations from left to right in an axis where on the left the strategies of under-regulation of affect are located (in which the patient appears overwhelmed by the

DISCUSSION

intensity of their own emotions that they are unable to control and that are often associated with greater emotional responsivity and higher arousal). One the right, are the posttraumatic manifestations associated to over-regulation of affect (characteristics of affectively flattened patients, with less reactivity and arousal).

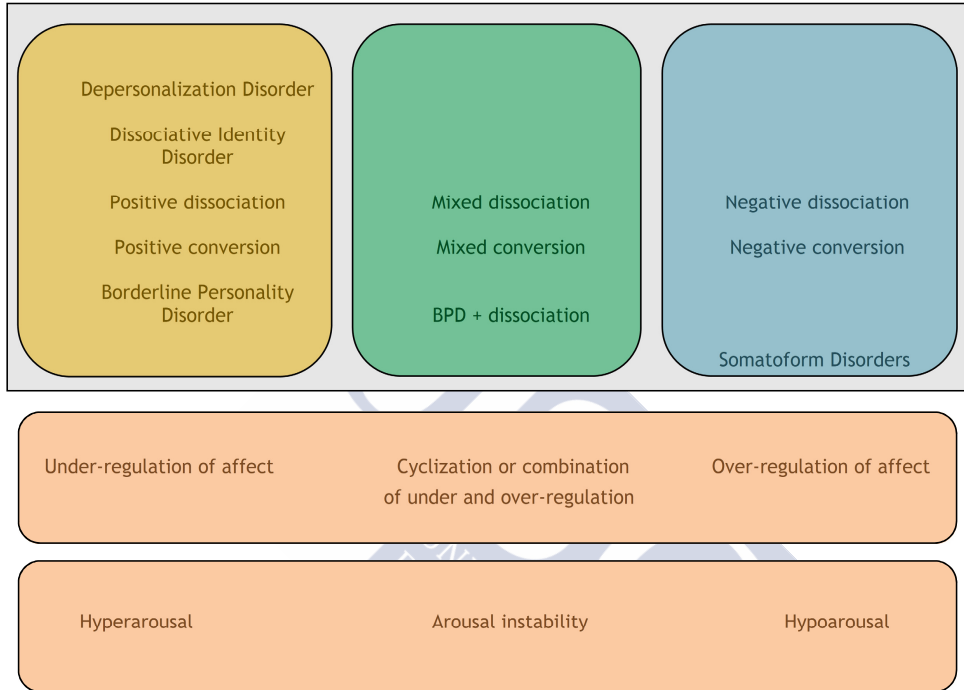


Figure 6: Posttraumatic spectrum disorders, organized around the most frequent emotion regulation strategies.

This perspective includes several factors that should be noted:

- 1) Posttraumatic pathology is considered as belonging to a spectrum in which the different disorders are located progressively and dynamically. This dimensional perspective is completed with the implementation of three categories that respond to three constructs linked to emotion regulation.
- 2) Emotion regulation is the base variable around which this spectrum is organized.

- 3) The predominant use of one or another emotion regulation strategy is related to a state of distinctive emotional activation that is made explicit through the axis in which the arousal is shown.

Similarly, this way of mapping posttraumatic spectrum disorders brings with it certain strengths and weaknesses that we will discuss below. We consider the following conditions and/or observations as strengths:

- 1) The existence of three fundamental emotion regulation strategies is contemplated in these patients: under-regulation of affect, over-regulation of affect and cyclization/combination of both.

Previously, some authors postulated the existence of two main emotion regulation strategies for the posttraumatic spectrum patients: the under- and over-regulation of affect. On the other hand, another group of authors warned about the tendency to present instability in the arousal and the tendency to vary between excitatory and inhibitory emotional states in these patients. The proposed categorization integrates both perspectives including a third group of demonstrations in which the cyclization or combination of inverse regulatory strategies is common.

- 2) The three categories refer to dysfunctional emotion regulation strategies.

From this perspective, we can deduce that in the present left and right extremes of the axis (where the purest over- and under-regulation of affect strategies are located) there is a tendency to manifest more fixed responses to different situations or similarly, to remain stuck before a certain state. Meanwhile, in the central category there is an opposing difficulty of sustaining a stable response. It should be noted that this observation does not refer to the intensity of the phenomenon. That is, those who are at either extreme of the under- or over-regulation of affect strategies do not regulate their emotions in a more dysfunctional way than those that cycle between strategies. The classification points out two different and equally maladaptive emotional difficulties: in patients who exhibit more clearly under or over-regulation there would be a rigidity when responding in the same way to different situations, while in cycler patients there would be a variability and instability in the response. Therefore, we can observe that none of the three categories that have made up the subject initiate emotion regulation strategies flexible enough to respond to the appropriate demands of a changing environment. Nor are the strategies cemented enough in order to sustain a response long enough for this to be functional and to allow an internal and external coherence.

It should be noted that both situations had already been perceived by the

classical authors who initiated the field of study of hysteria at the end of the 19th century, however at that time, little weight was given to emotion regulation as a generator of symptoms. Both Freud and Janet described clinical cases in which they observed both the tendency to repeat specific emotional states in their patients, as well as the tendency to express volatile and fluctuating emotions. In relation to the tendency to establish specific emotional states, Janet himself considers that hysterics had not only fixed ideas but that they also had persistent emotions. Furthermore, Janet admitted that the understanding at that time regarding the psychology of emotions was insufficient to explain these phenomena (Janet, 1893). This author perceived that a series of cognitions and affective states with a fixed and persistent character would exist that would help in maintaining the symptom. For his part, Freud gave a different explanation to the tendency to repeat cognitive schemes and similar emotion strategies in different situations that he observed in these patients. Freud spoke of a compulsion to repetition that would act as an update of repressed material that, when separated from consciousness, would tend to repeatedly reappear in a stereotypic way.

Regarding the tendency to oscillate between different emotional states, Janet considered that this manifestation reflected the very concept of disaggregation. The author postulated the existence of systems and subsystems differentiated within the self that would work at different levels of consciousness, associated with different experiences, memories and emotions that would have different degrees of relationship with each other. In line with this author, the Theory of Structural Dissociation of the Personality understands that the greater the dissociative severity is -characterized by the appearance of a greater number of parts of the personality-, the less knowledge some parts have of others (greater disintegration) and higher tendency of cyclization between the parts.

- 3) It is considered that the various disorders or specific clinical manifestations are associated most often with a predominant emotion regulation strategy.

While recognizing the heterogeneity within each disorder and the inter- and intra-individual variability that affects patients with posttraumatic spectrum disorders, understanding the most common patterns greatly facilitates the work of both the clinician and therapist. The fact that some disorders or manifestations show certain regulatory strategies allows for guiding the diagnosis and above all, to propose a psychotherapeutic intervention that is consistent with the emotional world of the subject. This intervention can be considered a transdiagnostic therapeutic strategy. In 5th article of this thesis, the relevance of understanding what is happening at an emotional level within in patient while applying a therapeutic intervention is clear, since this is one of the variables that allows access and greatly influences the success

of the intervention. If we know, by way of example, that the dissociative manifestations of a patient are always positive, we can get an idea of the underlying vegetative correlate and the type of emotion regulation mechanism that the subject is putting in to use. This is particularly important if we consider that in many cases the patient makes a subjective narrative that is incongruent with the emotional and physical experience. In these cases, when the emotion dysregulation is great and therefore the individual's capacity to understand and explain their experiences deteriorates, the clinical manifestations can be a good guide to infer what is happening to the patient internally.

Finally, we will outline the weaknesses of the proposed model:

- 1) The difficulty in defining precisely which disorders should be included within the spectrum associated with posttraumatic disorders.

This controversy has not been resolved by the proposed model, nor from other theoretical models. Different authors have made proposals with definitions of the posttraumatic spectrum (Van der Hart et al., 2004) from very broad to extremely restrictive. It should be remembered that the second article of the thesis, on which the development of this section is based, has not been designed to discuss the limits in which it is defined that a disorder or clinical manifestation is related to posttraumatic disorders. Therefore, any redefinition of these limits could modify and extend the proposed model.

- 2) The model's inability to resolve the relative question of comorbidity between disorders.

We have mentioned on several occasions throughout the text that there is significant comorbidity between the different disorders included within the posttraumatic spectrum. In fact, these high levels of comorbidity have been one of the criteria taken into account when considering them as linked disorders. However, the exact mechanisms under which said comorbidity operates are unknown, allowing for different clinical manifestations when exposed to situations of trauma and/or similar sustained stress, as Van del Kolk (1996) proposes. Although it may also correspond to disorders that share a prior biological vulnerability or common alterations in attachment patterns that can condition a higher comorbidity (Schore, 2003). This debate exceeds the bounds of this doctoral thesis.

6.2 NEUROBIOLOGICAL PATTERNS AND EMOTION REGULATION STRATEGIES IN CONVERSION DISORDER (SO2)

6.2.1 Neurobiological patterns in Conversion Disorder

In the introduction of this text, the main findings are summarized in terms of the neurobiological and neurophysiological basis of Conversion Disorder. In turn, the first article breaks down each of the main clinical conversion manifestations to delve into the underlying neurobiology. From the analysis carried out, we can provide two fundamental conclusions that are intimately related to the processes of emotion regulation:

- 1) There is no common neurobiological alteration that explains all conversion symptoms. If anything, we say there are different changes in two main pathways: the frontolimbic circuits and striatum-cortico-thalamo-cortical circuits.

These changes have to do with the functioning of areas primarily related to volition, attention, memory, emotion regulation and sensorimotor function. Under certain emotion and motivational states, alterations in the functioning of sensorimotor pathways occur. Moreover, most of changes perceived in these pathways have been evaluated and found in conscious stages of information processing. Although some authors have also found alterations at a preconscious level, these studies have been less frequent and countered. It is clear that there is an alteration in top-down regulation in Conversion Disorder that depends largely on emotional variables and the personal relevance of the stimulus. In turn, it has also been postulated that there are alterations in bottom-up regulation in which the peripheral vegetative system and brain areas such as the thalamus or the basal ganglia are involved. Similarly, a hypervigilance has been found in the preconscious stages of processing that would coexist with alterations in later stages related to emotion regulation and high-order modulation of perceptual phenomena (Bakvis et al., 2009).

- 2) If it were possible to identify two distinct frontolimbic functioning patterns, which related similar symptoms from one another (positive symptoms with positive symptoms, and negative with negative). These frontolimbic patterns served to hypothesize the predominant emotion regulation strategy in each one of them.

The results of article 1 and the summary of the neurobiological and neurophysiological patterns presented in the table of this article are the result of the

analysis of two already classical interactions: the interaction between the limbic system and the prefrontal cortex, and the interaction between the sympathetic and parasympathetic vegetative nervous system. Focusing on the opposition of patterns between these brain areas and these autonomic subsystems greatly simplifies the understanding of the field we address, although it does not explain the great variability of neurobiological findings described in the studies. However, it allows us to understand the existence of some primordial patterns of functioning at the CNS and autonomic level that are going to be closely related to emotion regulation and that therefore can be useful in the field of clinical and psychotherapy.

When we analysed the neurobiological and neurophysiological findings, symptom by symptom, we found that there were certain parallels between some types of symptoms, both in frontolimbic functioning patterns and in the predominance of a specific vegetative state. For example, we could see how sensory loss and motor loss relate more to each other than they do with other motor symptoms. That is to say, conversive anaesthesia is more similar to a conversion paralysis, than a paralysis to aberrant movements. Motor symptoms share among them the affectation of motor and premotor areas, as it is presumable, but they can be linked to inverse frontolimbic and vegetative patterns. We consider that these patterns are related to the predominance of one or another strategy of emotion regulation as we will see below.

6.2.2 Emotion regulation strategies in Conversion Disorder

The first article of this thesis carried out an in-depth review of the literature related to the neurobiological basis of Conversion Disorder, taking its main clinical manifestations separately. It was decided to prioritize the introduction of articles that use functional neuroimaging techniques and other experimental studies that evaluate the neurophysiological response in different conditions, with the purpose of analysing whether the observed neurobiological and neurophysiological patterns had some parallelism with the main strategies of emotion regulation. The previous literature pointed out that the main areas and circuits altered in the Conversion Disorder had to do with the integration of aspects such as motivation, emotion, attention and memory. And starting from this basis, it was plausible that the existence of different strategies of emotion regulation in this disorder also had its specific clinical and neurobiological correlates.

Within Conversion Disorder we will find clinical manifestations that should be situated toward the far end of emotion under-regulation, we would also find that other manifestations would be positioned closer to the overregulation and that there are

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symptoms linked to a combination of both strategies. In the figure below, the different types of conversion manifestations are classified according to their tendency to present themselves under states of under-regulation and over-regulation or cyclization/combination between emotion under- and overregulation.

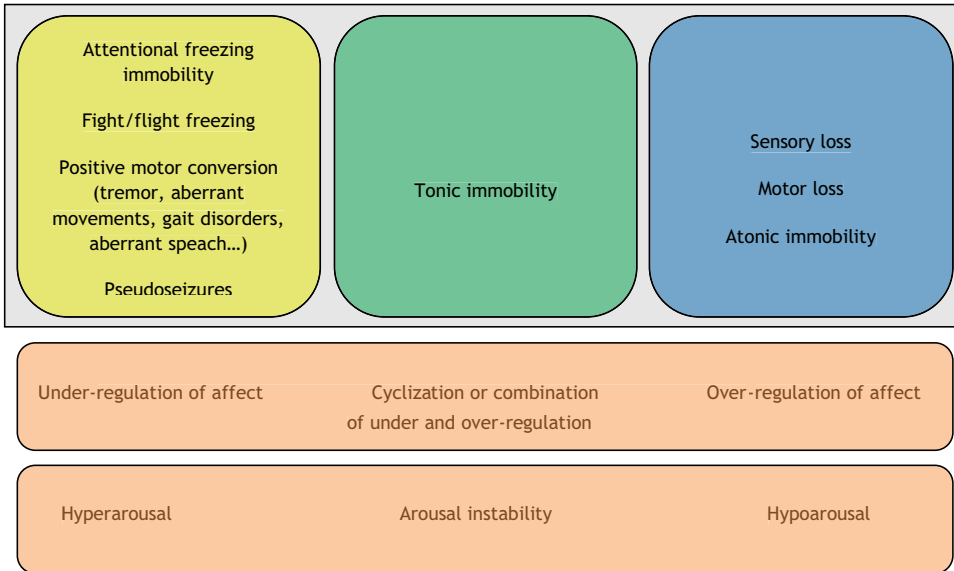


Figure 7: Conversion symptoms taking on account the emotion regulation strategy and the vegetative pattern associated.

It should be noted that our study of cases and controls, although it did confirm the relevance of emotion dysregulation in conversion disorder, did not allow for categorization of patients according to their specific emotion regulation strategies. This was not the primary objective of the study, but it was addressed as an additional topic. The limitation when establishing patient clusters based on predominant emotion regulation strategies was due to two main reasons:

- 1) The absence of standardized and valid assessment instruments to measure the emotion over- and under-regulation.

There are no standardized and validated assessment instruments that allow these constructs to be measured. As we have seen, Van Dijke and Kozkowka each made proposals that allowed us to indirectly assess the emotion regulation strategies that we have been analysing, but which can in no case be considered valid instruments for this purpose. Similarly, accurate cut-off points are not known from which we should

consider that a person is under or over-regulated. Finally, it is worth noting that the question of how to measure the cyclization between emotion over-regulation and under-regulation that we consider underlies the symptoms of a subgroup of patients remains to be resolved. In this sense, it would be necessary to propose and validate an adequate psychometric instrument to evaluate these regulatory strategies, which we are currently lacking.

2) The heterogeneity of the conversion symptoms in the sample

Our sample of conversion patients included a high percentage of patients with more than one conversion manifestation. Only 21% of cases had a single conversion symptom, while 53% had suffered at different times of their development 2 or 3 kinds of different symptoms and 26% of patients suffered more than three types of clinical manifestations. Since the sample collected was comprised primarily from outpatient psychiatric and neurological clinics it is likely that there is an overrepresentation of the most chronic cases, since transient and well-developed conversion symptoms often do not even reach specialized consultations, or if they do, they are discharged more quickly.

It should be noted that our patients exhibited, to a large extent, different types of symptoms and that in 69.5% of the cases both positive and negative symptoms occurred at different moments of the patient's development. This heterogeneity of the conversion symptoms is consistent with the discussion in our second article. As explained, it is predictable that it is easier to which is the predominant emotion regulation strategy in the simplest responses to trauma, such as for example PTSD. However, as traumatic experiences become repetitive and more complex and more variable clinical entities appear (such as dissociation, conversion and somatization), the distinction between under- and over-regulation of affect will become less evident. Similarly, it is foreseeable that in these situations linked to the complex trauma more diverse symptoms appear. From the Theory of the Structural Dissociation of the Personality, it can be understood that in the most serious and complex dissociative and conversive states, result of secondary and tertiary structural dissociation, a cyclization between different emotion and neurophysiological states occurs. This cyclization is explained from this model through changes (switching) between different parts of the personality that occur in these severe dissociative states. Presumably, there will be a coexistence of regulatory strategies related to both over- and under-regulation of affect in these states. This observation may have influenced the results, given that our sample consisted mostly of chronic patients with secondary and tertiary forms of structural dissociation.

6.3 MAJOR EMOTION REGULATION DIFFICULTIES ON CONVERSION DISORDER (SO3)

In the absence of a recognised methodology to determine the emotion regulation patterns called under- and over-regulation, we decided to choose a wide range of tests with a factorial structure in the experimental study conducted. This allowed for the following:

- 1) Describe in more detail the changes in processing and regulating emotions that patients have compared to controls.

In our third article we found that conversion patients had higher rates of alexithymia (including the three factors of the TAS scale), negative affective reactivity, greater negative intensity, as well as greater emotion dysregulation (including the 5 factors evaluated by the DERS scale). Similarly, frequent correlations were found between these variables, which is in line with other authors (Van der Kolk et al., 1996).

To further examine and explain the different variables we carried out a factorial analysis that was not included in article 3 due to space limitations. Two main factors were identified in both the control and case groups. Factor 1 included variables related to alexithymia, psychoform and somatoform dissociation, anxiety, depression and emotion dysregulation. This allowed for the consideration of a non-specific factor where all these variables would converge, which explained up to 42.6% of the variability in the control samples and 38% in cases samples. Factor 2 was related to the psychoform dissociation that contributes with a differentiated effect and explained 22.5% of the variability in the control group and 21.9% among the cases. A third factor related to affect intensity was identified that explained 15.6% of the variability. This third factor only occurred in a group of conversion patients.

	Factors in controls	
	1	2
DERS	,665	,354
DES	,695	-,652
DES-T	,583	-,750
AIM	,499	,317
HADS-A	,610	,449
HADS-D	,762	,261
TAS	,686	,417
SDQ	,689	-,379

	Factors in cases		
	1	2	3
DERS	,751	-,275	-,143
DES	,553	,782	-,174
DES	,405	,873	-,164
AIM	,060	,130	,905
HADS-A	,666	-,044	,361
HADS-D	,770	-,440	-,243
TAS	,793	-,291	-,081
SDQ	,580	,020	,391

Table 2: Factorial analysis showing the main factors influencing the variance of the sample.

Regarding the first factor, it should be noted that depression was not a contributing factor when predicting its presence of conversion in the logistic regression models calculated. Anxiety, along with emotion dysregulation, were the most predictive factors in the model. It is remarkable that the correlations between emotion dysregulation and conversion was sustained (although less intensely) when the anxiety variable was controlled. This suggests that anxiety may be an enhancer of emotion dysregulation or that both may be measuring some analogous phenomena. This convergence does not explain the full force of the correlation detected between emotion dysregulation and CD.

DISCUSSION

Note that the high affect intensity was a third factor differentiated only in the patient group. Several authors pointed out that conversion patients showed an increased reactivity toward negative emotional stimuli combined with a diminished reactivity toward positive stimuli (Seignourel et al., 2007)(Diers et al., 2008) (Browning et al., 2011)(Frewen and Lanius, 2006)(Kozłowska et al., 2011)(Kozłowska and Williams, 2009). Meanwhile, other authors have reported that there would be an increased reactivity to high arousal stimuli or to emotional stimuli in general, independent of its valence, in conversion patients (Voon et al., 2010)(Pick et al., 2018). Given this variability in the findings, we will make a series of reflections based on the results of our study.

Methodologically, it should be noted that we have collected of the subjects' assessment of their own emotional intensity. Therefore, our goal at this level was linked to explicit emotion regulation mechanisms. The group of conversion patients showed a greater negative affective reactivity as well as a higher tendency to present negative affect intensity in comparison with the control group. Both the negative affective intensity and the negative reactivity proved to be risk factors for the presence of conversion (OR = 1.79 and 2.05 respectively). On the other hand, positive affect intensity and serenity did not differ in either group. These findings may coincide with previously mentioned studies where increased reactivity to negative emotional stimuli was observed in experimental studies with various neurophysiological and neuroimaging techniques, that were not observed for positive stimuli. One of the possible explanations, consistent with the literature reviewed, would be that conversion patients only see their way of processing negative emotional experiences altered since they have previously sensitised to this type of stimuli related to exposure to stress and previous trauma. Previous experiences and a certain predisposal vulnerability could cause these patients to detect threats faster and react to them more. However, it remains to be explained why positive emotions are experienced with the same intensity in patients as in healthy controls. To this effect, we have obtained results that due to space limitations could not be included in article 3 but that might be of interest. Not only did we study the global scores in the questionnaires but also the scores within the different factors. We found that having a greater negative affect intensity correlated with the conversion patients with greater presence of anxiety and depression, as well as greater difficulty in describing their emotions, greater emotional lack of control, lack of clarity and rejection of their own emotions. On the other hand, a greater positive affective reactivity was associated in patients with less attention to emotions, less depression and more serenity. These correlations were statistically significant. These findings leave hypothesis to be tested in the future: Did reactivity to positive emotions turn out to be normal in patients because they paid less attention to

their emotions? If so, it would not be so much that positive emotions are experienced with the same intensity as the general population, but that patients could also be more reactive to positive emotions. However, at a later stage, there would be a mechanism of "emotional inattention" operating to decrease the emotional reactivity. These results would be in line with the discoveries made by Voon, that patients over-reacted to highly arousing emotional stimuli regardless of valence (Voon et al., 2010) or those of Pick that found an attentional increase towards emotional faces regardless of whether they portrayed positive or negative emotions (Pick et al., 2018). The patients might be functioning with intrinsic emotional regulation mechanisms that increase their reactivity when faced with all types of high arousal emotions, with extrinsic emotion regulation mechanisms that diminish attention of positive stimuli and direct it toward negative ones. This hypothesis is consistent with theories of trauma and attachment proposing that the absence of positive emotional experiences with the caregiver may limit the ability to experience positive experiences later on (Schore, 2003).

- 1) Carry out an indirect observation of the emotion regulation strategies (over-regulation, under-regulation and cycling strategies) based on scores in certain factors.

Some of the factors of the scales used in our study have traditionally been related to over-regulation of affect (such as those related to alexithymia, inattention to emotions, emotional rejection and dissociation), while other factors correspond more with under-regulation strategies (emotional interference, lack of emotional control, as well as intensity and reactivity to negative affects). The observation of the scores in these factors gives us an indirect measurement of the tendency to use one or another type of regulatory strategies.

In general, this points out that multiple correlations were found between the different factors, both in the case group and in the control group. This fact reveals again that the evaluation instruments chosen do not correspond clearly with the constructs called under-regulation of affect and over-regulation of affect that we propose for the study of patients with conversion. However, the observation of the results obtained in the different factors of the chosen variables did allow us to see how some specific emotional alterations were more related to the presence of positive symptoms and others to the presence of negative symptoms as we will discuss next.

- 2) Carry out an assessment of the risk of suffering from Conversion Disorder based on the different difficulties in emotion regulation.

Since this study was conducted with a control group, we have been able to make risk estimates and have calculated the Odds Ratio for the variables related to emotion regulation as well as for other clinical variables. As for the difficulties in emotion regulation, we have been able to verify that alexithymia, emotion dysregulation, as well as negative affect intensity and reactivity were statistically significant risk factors for suffering a Conversion Disorder.

These results replicated findings described by other authors (Van der Kolk et al., 1996)(De Gucht and Heiser, 2003)(Demartini et al., 2014) (Uliaszek et al., 2012) .

- 3) To know the predictive ability of emotion dysregulation when judging whether a subject belongs to the group of conversion patients or that of healthy subjects.

In the experimental study accomplished, emotion dysregulation (measured through the DERS scale) and anxiety were the factors with greater predictability of patients belonging to the case group when a logistic regression analysis was performed. These two variables were able to correctly classify 92.9% of the controls and 93.1% of the cases. On the other hand, the difficulties in emotion control and the interference in goal-oriented behaviours were the DERS factors with greater capability to predict the presence of a CD.

Difficulties in emotion regulation are not specific to any psychiatric disorder and actually appear in multiple clinical conditions. Therefore, emotion dysregulation does not help us make a differential diagnosis. A dysregulated person does not always have to manifest clinically through conversion symptoms, however, we can say that dysregulation does increase the risk of conversion and that very few conversion patients manifest an adaptive way of regulating their emotions. This is also useful when distinguishing between patients with neurological conditions and patients with conversion.

6.4 CLINIC AND THERAPEUTIC UTILITY OF THE DESCRIBED FINDINGS (OS4)

Next, we reflect on the implications and utilities that the findings obtained throughout this study may have on daily clinical practice and on the design and approach in psychotherapeutic interventions.

In light of what has been disclosed throughout the text, three basic recommendations should be taken into account when approaching, in psychotherapy, a case of a patient with a Conversion Disorder:

- 1) Consider emotion regulation as a transdiagnostic element in the psychotherapy of trauma-related disorders, as it is a treatment aimed at improving emotion regulation and therefore can be applied to conversion patients.
- 2) Evaluate which emotion regulation strategies are used most by the patient.
- 3) Consider the symptomatology when designing the intervention.

6.4.1 Consider emotion regulation as a transdiagnostic element in psychotherapy

Emotion dysregulation has been further consolidated in recent years as a main factor to consider when approaching CDs. As we have seen, there is a predisposing tendency to misregulate one's emotions with an exposure to sustained stress and traumatic experiences. This will increase this dysregulation until it becomes set as a more stable pattern.

If we consider that emotion dysregulation has a relevant presence in Conversion Disorder, the assessment of the alterations in emotion regulation in these patients (through the different psychometric instruments intended for that purpose) becomes necessary. The clinician usually includes in the anamnesis the moment in which the symptoms appeared, how they developed and evolved, the frequency of them, the possible function with which they are linked, etc... Similarly, it is important to introduce a biographical view of the implementation of the different ways the patient uses in order to regulate his emotions. In this regard, it is of particular interest to delve into the emotional experiences and the way they were regulated in childhood. It is important to see how each specific emotion was regulated by the caregiver and how it was experienced by the child. These aspects of dyadic regulation of emotion (which mainly consider the figure of the primary caregiver as an external regulator) are collected in the attachment in the adult interview or Adult Attachment Interview (AAI), the most recognised tool for assessing attachment patterns. Indirectly, it can also be deduced from other measures of adult attachment (Roisman et al., 2007). But emotion regulation itself must be analysed and understood both in regard to its development throughout the history of the subject, as well as its interference with functionality in the present.

Instruments such as the DERS, TAS and the AIMS are useful in that they are quick, understandable and easy to introduce within the haste of daily clinical practice. They also include the evaluation of stable personality traits such as the alexithymia (TAS) or affect intensity (AIMS), with the assessment of how to regulate emotions

proposed by the DERS within the last year. To introduce more complex evaluations concerning the regulation of emotions that, for example, include evaluations by the observer or even allow us to provide a neurobiological/neurophysiological response to a specific emotional stimulus, would be ideal if not less operational.

In addition to the psychometric evaluation, a personalized clinical evaluation of the emotion regulation styles is imposed, along with their variability in the daily functioning and in the consultation situation. This clinical evaluation can take into account the discrepancy between what is perceived by the patient and what is observed, the functional impact of dysregulation, and possible ways to modify it. This work on emotion regulation can be considered a cross-cutting tool for diagnosis and therapeutic orientation. For example, by working from a cognitive-behavioural approach, the contribution will enrich understanding of emotions settings mindsets, cognitive schemas and self-referential beliefs. In the same way we could see the contribution to psychodynamic, humanistic, integrative approaches, or more specifically in trauma-oriented therapies such as EMDR, as we have seen in article 5.

In addition, assessing a subject's emotion regulation has a dual function: on the one hand allows the patient to enhance their metacognitive skills, reflecting on the emotional experience, and on the other hand allows the therapist to plan specific intervention strategies.

In short, we can say that considering emotion regulation as one of the fundamental cores to be evaluated in patients with Conversion Disorders allows:

- 1) That the patient acquires metacognitive skills, thus enhancing cognitive emotion regulation (top-down).
- 2) That the therapist has an emotional mapping that allows them to plan specific strategies.
- 3) That the subject recognizes the links between their history and the symptoms they present, including the underlying a regulation.
- 4) That patient and therapist collaborate in building a restorative narrative around past experiences.
- 5) That concrete interventions are designed to address and repair specific difficulties in the way the subject regulates their emotions.

6.4.2 Evaluate which are the main emotion regulation strategies

Research on under- and over-regulation of affect strategies in Dissociative Disorders in general and more concretely Conversion Disorder must continue developing and contributing to an operative methodology. Despite this difficulty, the existence of these two regulatory patterns that we have been arguing is evident in the common clinical practice and multiple books in the clinical field present cases that could be closer to one strategy or another (Van der Hart et al., 2011)(González, 2010).

There are two aspects of determining which predominant emotion regulation mechanism a subject uses. On one hand, it allows for an individualized guidance of the psychoeducational interventions carried out with the patient. On the other, it is a fundamental element for the therapist when designing the intervention.

After the assessment of the patient that includes the indicators proposed in the previous section, we can have an idea regarding the main changes in the way the subject regulates emotions and which strategies they use automatically or voluntarily to regulate their emotions. In this way, we will know if the patient has to be over-regulated (manifesting predominantly affective numbing and disconnection), if they opt for under-regulation (emotionally overwhelmed and with high reactivity) or if there is a frequent cycling between both patterns. Each of these strategies require different interventions. In the first case, we can introduce techniques to enhance emotion recognition, connection with affective states, emotional acceptance and the abandonment of control and rigidity for the sake of flexibility and change. With regard to under-regulation, the approach is practically the opposite. This includes introducing control and an active and healthy attitude toward emotions, learning to manage them, modulate them and guide them to adaptive actions. When the regulatory strategy shifts from one session to another as well as within the same session, the therapist will have to alternate between one technique or another. However, they must strive for the concept of balance, in a global sense, on overcoming false dilemmas between opposites and in the development of an integrating metaconscience.

This proposal to guide therapeutic intervention based on predominating emotion regulation strategy has been presented by our group at the European Congress of Trauma and Dissociation in Amsterdam (ESTD 2016 Conference -Amsterdam-: Trauma, dissociation and Affect dysregulation across the life-span).

6.4.3 Consider symptomatology when designing the intervention

Throughout the text, the heterogeneity of the dissociative and conversion manifestations has been mentioned on several occasions. In particular, that the different conversion symptoms should be assessed individually as well as grouped around the underlying emotion regulation strategy. We consider that other classifications of symptoms such as distinguishing between sensory, motor, and mixed symptoms are not as useful when designing therapeutic interventions when compared to the approach we propose.

In the event of a singular conversion symptomatology, it is of special interest to discover with the patient what the clinical characteristics of their disorder are, when it first appeared in their history, and what the triggers of said symptom at present are. Furthermore -if we are able to identify it- it is interesting to elucidate what is the function of the symptom, why did it originally emerged and what sustains it today. Through careful observation of the symptom (not only in its manifestation but also its frequency, emotional triggers or the reactions of the environment to the appearance of the symptom, the factors that sustain it, the possible secondary gains, etc.) a narrative will be constructed. This must be accepted by both the patient and the therapist. The narrative should seek to explain the symptom (related to the underlying neurobiological and psychological processes, as well as also understanding the subjectivity of the person), and also a reformulate the problems that provide a radically different perspective. Something similar will be done when the symptoms are diverse, although the route to their development may be different. Each symptom will have its debut moment, surrounded by its context, its function, etc. However, there may be both triggers and maintenance factors that are unique to one of the symptoms or that are common to several symptoms. This last observation is our most common clinical experience. Faced with a situation that motivates the hyperarousal, different conversion symptoms may appear that can be either linked to under-regulation of affect (when arousal is not decreased by regulatory strategies) or to over-regulation of affect. In the first case positive symptoms are more common while in the second cases negative symptoms prevail. But the reason for the appearance of one symptom or another is not generalisable, and we have only found in the reviewed literature similar explanatory proposals for specific cases. In any case, knowing the internal system and the different parts of the personality that operate supposes a complete process that requires metacognitive skills but also emotion regulation abilities. When the patient faces their internal world and all that it entails, they must learn to regulate all those aspects in a different way, modifying dysfunctional regulation styles.

But emotion regulation goes beyond under- and over-regulation. Those strategies are both linked with cognitive regulation. It is true that there are specific cognitive-emotional patterns that may have been consolidated based on prior emotional experiences and over which the patient may have relative control (based on top-down strategies) (Roelofs et al., 2003). But there are also other convergent states that appear automatically, elude voluntary control and are mediated by bottom-up strategies (more linked to mechanisms of explicit emotion regulation or vegetative responses mediated by the sympathetic nervous system or the vagal dorsal system). This disparity reflects a question that remains open to this day. Is conversion a conscious or unconscious mechanism? This question is not a primary objective of the thesis; however, evidence that there are alterations in these disorders has been gathered, both preconscious and subject to a certain cognitive control. We aim to understand both dissociation and conversion as complex phenomena in which processes of implicit and explicit emotion regulation interact. Knowing the degree of control that a patient may or may not have over a clinical manifestation may be important when deciding the type of intervention to perform. For example, in the case of dissociative auditory pseudohallucinations, there is usually a certain degree of communication between the voices. In this case, work can be done by promoting an internal dialogue, increasing the communication between the voices and giving them a biographical and narrative meaning (voices understood as dissociated parts of the personality). On the contrary, in the case of collapse responses that stem from a primitive dorso vagal response, there is usually no degree of patient control once the manifestations have presented themselves. In this case, the symptom-oriented intervention can focus on the identification of the precipitating factors, preparing (the setting) for a possible crisis, etc. In this way, we can see how some symptoms actually operate responding to patterns similar to the dissociated parts of the personality, while other symptoms mimic responses with a more primitive character that resemble the mammalian defensive cascade. These symptoms cannot be approached equally from a psychotherapeutic standpoint.

To conclude, we can consider that the comprehensive study of conversion symptoms presented by the patient is not only useful when conducting psychoeducation or when designing interventions to understand and reduce the frequency and impact of said symptoms. Symptomatic observation also has the capacity to be an indirect gauge of the psychophysiological state in which the patient is found. Conversion Disorder subjects frequently have difficulties when it comes to expressing their emotions, to interpret their bodily sensations and to reflect on themselves and their context. In some cases, the symptoms show us information that the subject is not able to communicate or whose communication is contradictory. As

DISCUSSION

an example, if we observe a patient manifest a negative-type symptom during a period of their life, we can understand that it is possible that they are operating emotion over-regulation strategies, that is, the subject is in need of stopping their emotional experiences (they achieve this, but in this case excessively). Thus, although the subject tells us that nothing is going on in their life, the presence of these symptoms gives us indirect information that that they might experiencing external or internal events/experiences that set these regulatory strategies in motion.





7. CONCLUSIONS



7 CONCLUSIONS

The main conclusions of this work are presented below. They specify the corresponding objectives as well as the hypotheses intended for the experimental part of this work.

1) Posttraumatic spectrum disorders can be classified/organized in relation to the emotion regulation strategy that predominates in them.

The results of this study show a high level of complexity in the disorders that we have defined as traumatic, showing more than just an association defined between different disorders and specific regulatory strategies. While PTSD and BPD tend to use more commonly under-regulation of affect strategies, Somatoform Disorder predominately uses over-regulation strategies. Meanwhile, dissociative and conversion disorders must be understood as heterogeneous entities. Different conversion symptoms are associated with differentiated neurobiological and neurophysiological mechanisms, which respond to different frontal and vegetative functioning patterns respectively. Such neurobiological and neurophysiological mechanisms correlate with present emotion regulation strategies (SO1).

2) Patients with Conversion Disorder present more impairments in emotion regulation than the healthy population (SO3).

It was observed that patients (relative to healthy controls) had significantly higher levels of alexithymia indicators, emotion dysregulation in general, as well as the presence of increased reactivity and negative affect intensity (H1a).

Similarly, Alexithymia, emotion dysregulation, reactivity and negative emotion intensity can be considered risk factors for Conversion Disorder (H1b). Among them, emotion dysregulation (measured through the DERS) is shown as the best predictor for the presence of conversion (H1c).

3) At least three types of emotion regulation strategies have been identified in Conversion Disorder: emotion under-regulation, over-regulation and a third strategy consisting of an alternation between the two (SO2).

The difficulty in the operationalization and validation of these constructs means that we are unable to establish exact cut points to categorize them as under-regulated, over-regulated or cyclers. However, we can refer to a predominance of one or another strategy as has been argued in the discussion.

4) Different clinical manifestations of conversion are associated with different ways of regulating emotions in patients with Conversion Disorder (SO2) (H1d).

We have obtained indirect data that point to the possibility that the negative conversion symptomatology is associated primarily with patterns of over-regulation of affect and negative conversion symptoms are associated with patterns of under-regulation.

5) Emotion regulation should be considered as one of the main axes when designing and implementing a psychotherapeutic approach to Conversion Disorder (SO4).

The evaluation of both the type of symptomatology that the patient presents and the main emotion regulation strategies used (seen longitudinally as well as transversally) can be very useful when dealing with the disorder. It provides a map and a line of action for the therapist and increases the metacognitive capacity and the ability to adaptively regulate the subject's emotions. Both situations result in an improved clinical and therapeutic approach.

A large, light blue watermark of the USC logo is positioned diagonally across the page. The logo consists of the letters 'U' and 'S' in a stylized font, with 'C' partially visible. Below the letters, the text 'UNIVERSIDADE DE SANTIAGO DE COMPOSTELA' is written in a smaller, sans-serif font.

8. SUPPLEMENTARY MATERIALS



8 SUPPLEMENTARY MATERIALS

8.1 ANNEXE 1: BIOLOGICAL FACTORS ON SOMATIC SYMPTOM AND RELATED DISORDERS.

Hereby we deepen into the neurobiology of Somatic Symptom and related disorders. This category of DSM-5 includes Conversion Disorder within a larger section. Along this thesis, ICD-10 perspective has been privileged, considering CD as a dissociative manifestation. Its neurobiology has been compared to the one found in Dissociative Disorders. In this sense, it should be interesting to reflect on CD as a disorder linked to Somatic Symptom and related disorders.

The text we are presenting gives us the opportunity to show the relationship between the findings we have demonstrated along the thesis, with the neurobiology underlying other Somatic Disorders.

This work has been proposed to the authors by the editors of The SAGE Encyclopedia of Abnormal and Clinical Psychology, where it can be consulted:

<https://uk.sagepub.com/en-gb/eur/the-sage-encyclopedia-of-abnormal-and-clinical-psychology/book243472>



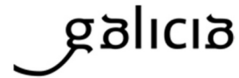
8.2 ANNEXE 2: RESEARCH ETHICS COMMITTEE APPROVAL

Secretaría Técnica



XUNTA DE GALICIA
CONSELLERÍA DE SANIDADE
Secretaría Xeral Técnica

Comité Autonómico de Ética da Investigación de Galicia Secretaría Xeral. Consellería de Sanidade



Edificio Administrativo San Lázaro 15703 SANTIAGO DE COMPOSTELA Tel: 881 546425; ceic@sergas.es

DITAME DO COMITÉ DE ÉTICA DA INVESTIGACIÓN DE SANTIAGO-LUGO

Juan Manuel Vázquez Lago, Secretario do Comité de Ética da Investigación de Santiago-Lugo

CERTIFICA:

Que este Comité avaliou na súa reunión do día 17/03/2015 o estudo:

Título: Trastorno Conversivo como trastorno de desregulación emocional **Promotor:** Lucía del Río Casanova

Tipo de estudo: Outros

Versión:

Código do Promotor: Código de Rexistro: 2015/143

E, tomando en consideración as seguintes cuestións:

- A pertinencia do estudo, tendo en conta o coñecemento dispoñible, así coma os requisitos legais aplicables, e en particular a Lei 14/2007, de investigación biomédica, o Real Decreto 1716/2011, de 18 de novembro, polo que se establecen os requisitos básicos de autorización e funcionamento dos biobancos con fins de investigación biomédica e do tratamento das mostras biolóxicas de orixe humana, e se regula o funcionamento e organización do Rexistro Nacional de Biobancos para investigación biomédica, a ORDE SAS/3470/2009, de 16 de decembro, pola que se publican as Directrices sobre estudos Posautorización de Tipo Observacional para medicamentos de uso humano, e a Circular nº 07/2004, investigacións clínicas con produtos sanitarios.
- A idoneidade do protocolo en relación cos obxectivos do estudo, xustificación dos riscos e molestias previsibles para o suxeito, así coma os beneficios esperados.
- Os principios éticos da Declaración de Helsinki vixente.
- Os Procedementos Normalizados de Traballo do Comité.

Emite un **INFORME FAVORABLE** para a realización do estudo polo/a investigador/a do centro:

Centros	Investigadores Principais
Area de Xestión Integrada de Santiago de Compostela	Lucía del Río Casanova

En Santiago de Compostela, a 17 de marzo de 2015

O secretario

Juan M. Vázquez Lago



8.3 ANNEXE 3: PSYCHOMETRIC INSTRUMENTS USED

Difficulties on Emotion Regulation Scale

DERS

Por favor, indique con qué frecuencia se le pueden rodeando con un círculo el número correspondiente s continuación:				
1 Casi nunca (0-10%)	2 Algunas veces (11-35%)	3 La mitad de las veces (36-65%)	4 La mayoría de las veces (66-90%)	5 Casi siempre (91-100%)

1 Percibo con claridad mis sentimientos	1	2	3	4	5
2 Presto atención a como me siento	1	2	3	4	5
3 Vivo mis emociones como algo desbordante y fuera de control	1	2	3	4	5
4 No tengo ni idea de cómo me siento	1	2	3	4	5
5 Tengo dificultades para comprender mis sentimientos	1	2	3	4	5
6 Estoy atento a mis sentimientos	1	2	3	4	5
7 Doy importancia a lo que estoy sintiendo	1	2	3	4	5
8 Estoy confuso/a sobre lo que siento	1	2	3	4	5
9 Cuando me siento mal reconozco mis emociones	1	2	3	4	5
10 Cuando me siento mal, me enfado conmigo mismo/a por sentirme de esa manera	1	2	3	4	5
11 Cuando me siento mal, me da vergüenza sentirme de esa manera.	1	2	3	4	5
12 Cuando me siento mal, tengo dificultades para sacar el trabajo adelante	1	2	3	4	5
13 Cuando me siento mal, pierdo el control	1	2	3	4	5
14 Cuando me siento mal, creo que estaré así durante mucho tiempo	1	2	3	4	5
15 Cuando me siento mal, creo que acabaré sintiéndome muy deprimido/a	1	2	3	4	5
16 Cuando me siento mal, me resulta difícil centrarme en las cosas	1	2	3	4	5
17 Cuando me siento mal, me siento fuera de control	1	2	3	4	5
18 Cuando me siento mal, me siento avergonzado conmigo mismo/a por sentirme de esa manera	1	2	3	4	5
19 Cuando me encuentro mal, me siento como si fuera una persona débil	1	2	3	4	5
20 Cuando me encuentro mal, me siento culpable por sentirme de esa manera	1	2	3	4	5
21 Cuando me siento mal, tengo dificultades para concentrarme	1	2	3	4	5
22 Cuando me siento mal, tengo dificultades para controlar mi comportamiento	1	2	3	4	5
23 Cuando me siento mal, me irrito conmigo mismo/a por sentirme de esa manera	1	2	3	4	5
24 Cuando me encuentro mal, empiezo a sentirme muy mal sobre mí mismo	1	2	3	4	5
25 Cuando me siento mal, creo que regodearme en ellos es todo lo que puedo hacer	1	2	3	4	5
26 Cuando me siento mal, pierdo el control sobre mi comportamiento	1	2	3	4	5
27 Cuando me siento mal, tengo dificultades para pensar sobre cualquier otra cosa	1	2	3	4	5
28 Cuando me siento mal, mis emociones parecen desbordarse	1	2	3	4	5



Dissociative Experiences Scale-II

D.E.S.

Eve Bernstein Carlson, Ph. D. & Frank Putnam, M. D.

Este cuestionario consiste en 28 preguntas acerca de experiencias que usted puede haber tenido en su vida diaria. Estamos interesados en la frecuencia con las que usted las ha tenido. Es importante de todas formas que sus respuestas muestren con qué frecuencia ocurren cuando no está bajo la influencia del alcohol o las drogas. Para responder a las preguntas, por favor, vea hasta qué grado la experiencia descrita se aplica a usted y marque un número que indique el porcentaje más apropiado

Nombre:.....
 Fecha:

1. Algunas personas tienen la experiencia de conducir o viajar en coche, en autobús o en el metro y repentinamente se dan cuenta de que no recuerdan lo que pasó durante parte o todo el viaje. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

2. Algunas personas encuentran a veces que están escuchando hablar a alguien y se dan cuenta de que no han escuchado parte o todo lo que se dijo. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

3. Algunas personas tienen la experiencia de encontrarse en un lugar sin tener idea de cómo llegaron allí. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

4. Algunas personas tienen la experiencia de encontrarse vestidas con ropa que no recuerdan haberse puesto. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

5. Algunas personas tienen la experiencia de encontrar cosas nuevas entre sus pertenencias que no recuerdan haber comprado. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

6. Algunas personas encuentran que se les aproxima gente que los llama por otro nombre e insiste en que se conocieron antes. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

7. Algunas personas tienen la experiencia de sentir como si estuvieran de pie cerca de ellos mismos o mirándose hacer algo como si vieran a otra persona. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

SUPPLEMENTARY MATERIALS

8. Algunas personas dicen que no reconocen a miembros de su propia familia o amigos. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

9. Algunas personas no recuerdan importantes momentos de su vida (por ejemplo su matrimonio o el día de su comunión). Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

10. Algunas personas son acusadas de mentir cuando ellas no piensan que lo hagan. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

11. Algunas personas tienen la experiencia de mirar al espejo y no se reconocen a sí mismas. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

12. Algunas personas experimentan que el mundo que las rodea, objetos o personas no son reales. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

13. Algunas personas tienen la experiencia de sentir que su cuerpo no les pertenece. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

14. Algunas personas tienen la experiencia de revivir un suceso del pasado tan vívidamente como si estuviera pasando en este mismo momento. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

15. Algunas personas tienen la experiencia de no estar seguras de qué cosas que creen recordar que pasaron, pasaron realmente o sólo las soñaron. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

16. Algunas personas tienen la experiencia de, al encontrarse en un lugar conocido, encontrarlo extraño y no familiar. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

17. Algunas personas tienen la experiencia de encontrarse mirando la televisión o una película y se quedan tan absortos en la trama que no se dan cuenta de otras cosas que pasan alrededor de ellos. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

18. Algunas personas encuentran que se quedan tan envueltos en sueños o fantasías que sienten que realmente les están pasando. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

19. Algunas personas tienen la experiencia de que a veces pueden ignorar el dolor. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

20. Algunas personas tienen la experiencia de encontrarse a veces sentados mirando un punto fijo en el espacio, pensando en nada y no se dan cuenta del paso del tiempo. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

21. A algunas personas le pasa que hablan solas en voz alta con ellas mismas. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

22. Algunas personas tienen la experiencia de actuar diferente frente a situaciones parecidas. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

23. Algunas personas, a veces, encuentran que en ciertas situaciones son capaces de hacer cosas con diversión y espontaneidad para las que a veces tienen dificultades (deportes, trabajo, situaciones sociales). Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

24. Algunas personas a veces no pueden recordar cuando hicieron algo o pensaron hacerlo (por ejemplo, no saben si mandaron una carta o pensaron en mandarla). Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

25. Algunas personas encuentran evidencias, pruebas, de haber hecho cosas que no recuerdan haber hecho. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

26. Algunas personas a veces encuentran escritos, dibujos o notas entre sus cosas que no recuerdan haber hecho. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

27. Algunas personas escuchan voces dentro de sus cabezas que les dicen cosas que tienen que hacer o que les comentan sobre cosas que hicieron. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

28. Algunas personas sienten como si vieran el mundo a través de una niebla de modo que la gente aparecen lejos o poco claros. Marque un número para mostrar qué porcentaje del tiempo le pasa a usted:

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%



Hospital Anxiety and Depresión Scale

HAD

Identificación Fecha

Este cuestionario se ha construido para ayudar a quien le trata a saber cómo se siente usted. Lea cada frase y marque la respuesta que más se ajusta a cómo se sintió usted durante la semana pasada. No piense mucho las respuestas. Lo más seguro es que si contesta deprisa, sus respuestas podrán reflejar mejor cómo se encontraba usted durante la semana pasada.

1 Me siento tenso o “nervioso”

- Todos los días
- Muchas veces
- A veces
- Nunca

2 Todavía disfruto con lo que antes me gustaba

- Como siempre
- No lo bastante
- Sólo un poco
- Nada

3 Tengo una sensación de miedo, como si algo horrible me fuera a suceder

- Definitivamente, y es muy fuerte
- Sí, pero no es muy fuerte
- Un poco, pero no me preocupa
- Nada

4 Puedo reírme y ver el lado divertido de las cosas

- Al igual que siempre lo hice
- No tanto ahora
- Casi nunca
- Nunca

5 Tengo mi mente llena de preocupaciones

- La mayoría de las veces
- Con bastante frecuencia
- A veces, aunque no muy a menudo
- Sólo en ocasiones

6 Me siento alegre

- Nunca
- No muy a menudo
- A veces
- Casi siempre

7. Puedo estar sentado tranquilamente y sentirme relajado

- Siempre
- Por lo general
- No muy a menudo
- Nunca

8. Me siento como si cada día estuviera más lento

- Por lo general, en todo momento
- Muy a menudo
- A veces
- Nunca

9. Tengo una sensación extraña, como de “aleteo” en el estómago

- Nunca
- En ciertas ocasiones
- Con bastante frecuencia
- Muy a menudo

10. He perdido interés por mi aspecto personal

- Totalmente
- No me preocupo tanto como debiera
- Podría tener un poco más de cuidado
- Me preocupo al igual que siempre

11. Me siento inquieto, como si no pudiera parar de moverme

- Mucho
- Bastante
- No mucho
- Nada

12. Me siento optimista respecto al futuro

- Igual que siempre
- Menos de lo que acostumbraba
- Mucho menos de lo que acostumbraba
- Nada

13. Me asaltan sentimientos repentinos de pánico

- Muy frecuentemente
- Bastante a menudo
- No muy a menudo
- Nada

14. Me divierto con un buen libro, la radio o un programa de televisión

- A menudo
- A veces
- No muy a menudo
- Rara vez

TOTAL ANSIEDAD:

TOTAL DEPRESIÓN:

Somatoform Dissociation Questionnaire-20

**CUESTIONARIO DE DISOCIACION SOMATOFORME
SDQ 20**

© Nijenhuis, Van der Hart & Vanderlinden Assen-Amsterdam-Leuven Versión en Castellano por Olaf Holm, (Revisión 2007)

INSTRUCCIONES

Este cuestionario pregunta acerca de diferentes síntomas o experiencias corporales que usted puede haber tenido brevemente o durante más tiempo.

Por favor, indique hasta qué punto estas experiencias se aplican a su caso **durante el año pasado**.

Para cada afirmación, rodee con un círculo el número de la columna que mejor se le aplica.

Las posibilidades de respuesta son:

- 1 = No tiene nada que ver conmigo
- 2 = Se corresponde un poco con mi experiencia
- 3 = Se corresponde moderadamente con mi experiencia
- 4 = Se corresponde bastante con mi experiencia
- 5 = Se corresponde al máximo con mi experiencia

Si un síntoma o experiencia refleja lo que le sucede a usted, por favor indique si algún médico lo ha relacionado con una **enfermedad física**, rodeando con un círculo la palabra NO o SI de la columna “¿Se conoce la causa física?”. Si ha marcado el SI, por favor escriba la causa física (si la sabe) en la línea de puntos.....

Ejemplo:

Síntoma o experiencia	Grado en el que se corresponde con lo que a usted le sucede	¿Hay una causa física conocida?
A veces mis dientes rechinan	1 2 3 4	5 NO SI.....
Tengo calambres en las Pantorrillas	1 2 3 4	5 NO SI.....

Si Ud. ha rodeado con un círculo el 1 de la primera columna, que significa NUNCA, NO necesita responder a la pregunta “¿se conoce la causa física?”.

Si rodea con un círculo el 2, 3, 4, o 5, DEBE rodear también la palabra SI o NO de la columna “¿Hay una causa física conocida?”.

Si responde SI en el apartado “¿Hay una causa física conocida?”, escriba cuál es si la conoce.

Por favor no deje ninguna pregunta sin contestar. Gracias por su colaboración.

CUESTIONARIO SDQ-20

Síntoma o experiencia	Grado en el que se corresponde con lo que a usted le sucede	¿Hay una causa física conocida?
1. Tengo problemas al orinar	1 2 3 4 5	NO SI.....
2. Me desagradan sabores que habitualmente me gustan (exceptuando durante el embarazo o menstruación)	1 2 3 4 5	NO SI.....
3. Oigo los sonidos cercanos como siviliera del lejos	1 2 3 4 5	NO SI.....
4. Tengo dolor al orinar	1 2 3 4 5	NO SI.....
5. Siento mi cuerpo, o parte de él, entumecido	1 2 3 4 5	NO SI.....
6. Las personas o cosas parecen más grandes de lo habitual	1 2 3 4 5	NO SI.....
7. He tenido un ataque que se parece a una crisis epiléptica	1 2 3 4 5	NO SI.....
8. Mi cuerpo, o parte de él, es insensible al dolor	1 2 3 4 5	NO SI.....
9. Me desagradan olores que habitualmente me gustan	1 2 3 4 5	NO SI.....
10. Me duelen los genitales (exceptuando durante las relaciones sexuales)	1 2 3 4 5	NO SI.....
11. Hay momentos en que no puedo oír (como si estuviera sordo)	1 2 3 4 5	NO SI.....
12. Hay momentos en que no puedo ver (como si estuviera ciego)	1 2 3 4 5	NO SI.....
13. Veo las cosas que me rodean diferentes de lo habitual (ej: como viéndolas por un túnel o viendo sólo una parte)	1 2 3 4 5	NO SI.....
14. Puedo oler mucho MEJOR o PEOR que habitualmente (aunque no tenga catarro)	1 2 3 4 5	NO SI.....
15. Es como si mi cuerpo, o parte de él, hubiera desaparecido	1 2 3 4 5	NO SI.....
16. No puedo tragar o me cuesta mucho trabajo tragar	1 2 3 4 5	NO SI.....
17. Paso noches enteras sin dormir, pero durante el día estoy muy activo	1 2 3 4 5	NO SI.....
18. No puedo hablar (o sólo con gran esfuerzo) o sólo puedo susurrar	1 2 3 4 5	NO SI.....
19. Me quedo paralizado por momentos	1 2 3 4 5	NO SI.....
20. Me quedo rígido por momentos	1 2 3 4 5	NO SI.....

Antes de continuar por favor fíjese **si ha contestado a las 20 preguntas** o afirmaciones anteriores.

Además, cumplimente por favor estos datos y señale con una X lo que se aplica a su caso:

21. Edad: años

& Sexo: Mujer..... Hombre.....

& Estado civil:

- Soltero....
- Casado....
- Vive en pareja....
- Separado....
- Divorciado....
- Viudo....

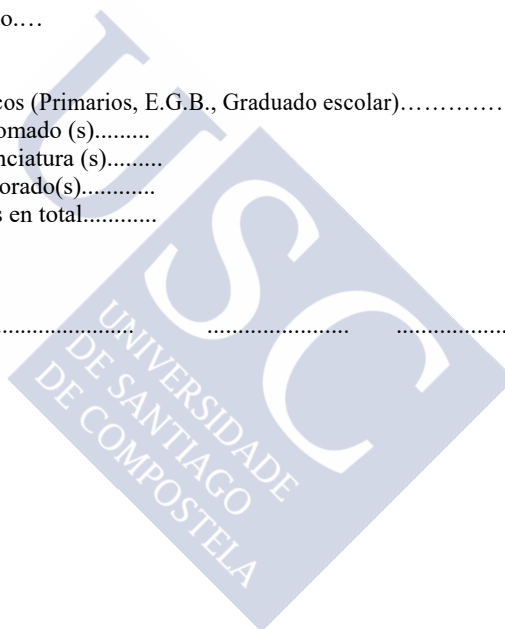
24. Estudios:

- Básicos (Primarios, E.G.B., Graduado escolar).....
- Diplomado (s).....
- Licenciatura (s).....
- Doctorado(s).....
- Años en total.....

25. Fecha de hoy

26. Nombre

.....





Toronto Alexithymia Scale

Escala de Alexitimia de Toronto (TAS -20)

Te agradeceríamos respondieras a una serie de cuestiones respecto a como te sientes. Elige la opción que consideres correcta o se acerque mas a lo que piensas al respecto.

1	2	3	4	5	6
Muy en desacuerdo	En desacuerdo	Ligeramente en desacuerdo	Ligeramente de acuerdo	De acuerdo	Muy de acuerdo

AL1.	A menudo estoy confundido con las emociones que estoy sintiendo.	1	2	3	4	5	6	
AL2.	Me es difícil encontrar las palabras correctas para expresar mis sentimientos.	1	2	3	4	5	6	
AL3.	Tengo sensaciones físicas que incluso ni los doctores entienden.	1	2	3	4	5	6	
AL4.	Soy capaz de expresar mis sentimientos fácilmente.	1	2	3	4	5	6	
AL5.	Prefiero pensar bien acerca de un problema en lugar de solo mencionarlo	1	2	3	4	5	6	
AL6.	Cuando me siento mal no sé si estoy triste, asustado o enojado.	1	2	3	4	5	6	
AL7.	A menudo estoy confundido con lo que siento en mi cuerpo.	1	2	3	4	5	6	
AL8.	Prefiero dejar que las cosas pasen solas, sin preguntarme por qué suceden así.	1	2	3	4	5	6	
AL9.	Tengo sentimientos que casi no puedo identificar.	1	2	3	4	5	6	
AL10	Estar en contacto con las emociones es muy importante.	1	2	3	4	5	6	
AL11	Me es difícil expresar lo que siento acerca de las personas.	1	2	3	4	5	6	
AL12	La gente me dice que exprese más mis sentimientos.	1	2	3	4	5	6	
AL13	No sé qué pasa dentro de mí.	1	2	3	4	5	6	
AL14	A menudo no sé por qué estoy enojado.	1	2	3	4	5	6	
AL15	Prefiero hablar con la gente de sus actividades diarias mejor que de sus sentimientos.	1	2	3	4	5	6	
AL16	Prefiero ver programas de TV simples pero entretenidos, que programas difíciles de entender	1	2	3	4	5	6	
AL17	Me es difícil expresar mis sentimientos más profundos incluso a mis mejores amigos	1	2	3	4	5	6	
AL18	Puedo sentirme cercano a alguien, incluso en momentos de silencio.	1	2	3	4	5	6	
AL19	Encuentro útil examinar mis sentimientos para resolver problemas personales.	1	2	3	4	5	6	
AL20	Analizar o buscar significados profundos a las películas, espectáculos y entretenimientos, disminuye el placer de disfrutarlos.	1	2	3	4	5	6	



Affect Intensity Measurement

A. I. M.

Instrucciones: Las siguientes preguntas se refieren a sus reacciones emocionales ante sucesos o hechos típicos de su vida. Por favor, conteste con sinceridad indicando cómo reacciona ante ellos, en base a la siguiente escala:

1. Cuando logro hacer algo difícil me siento encantadoo exuberante	<input type="checkbox"/>	21 Al ver la foto de una accidente de coche en un periódico, el estómago se me revuelve	<input type="checkbox"/>
2. Me siento feliz es un sentimiento muy fuerte de euforia	<input type="checkbox"/>	22. Cuando estoy feliz me siento energético y lleno de alegría.	<input type="checkbox"/>
3.Me gusta muchísimo estar con gente	<input type="checkbox"/>	23. Cuando recibo un premio me pongo "supercontento".	<input type="checkbox"/>
4. Me siento bastante mal cuando miento	<input type="checkbox"/>	24. Cuando tengo éxito en algo, mi reacción es la de sentirme tranquilo y contento	<input type="checkbox"/>
5.Cuando resuelvo un problema me siento eufórico	<input type="checkbox"/>	25.Cuando hago algo mal tengo fuertes sentimientos de vergüenza y culpa	<input type="checkbox"/>
6.Mis emociones tienden a ser más intensas que las de la mayoría de la gente	<input type="checkbox"/>	26.Puedo estar tranquilo aún en los días más adversos	<input type="checkbox"/>
7.Mis buenos estados de ánimo son tan fuertes que cuando los tengo me siento en el paraíso	<input type="checkbox"/>	27.Cuando las cosas van bien, me siento como en la gloria	<input type="checkbox"/>
8:Me entusiasmo demasiado	<input type="checkbox"/>	28.Cuando me enojo, me es fácil seguir siendo racional y no reaccionar de manera extrema	<input type="checkbox"/>
9.Cuando termino de hacer un trabajo que me parecería imposible, me siento en éxtasis	<input type="checkbox"/>	29.Cuando sé que he hecho algo bien, me siento relajado y contento, más que excitado y exaltado	<input type="checkbox"/>
10.Mi corazón se acelera cuando va a pasar algo estimulante	<input type="checkbox"/>	30.Cuando siento ansiedad, normalmente es muy fuerte	<input type="checkbox"/>
11. Las películas tristes me afecta mucho	<input type="checkbox"/>	31.Mis estados de ánimo negativos son poco intensos	<input type="checkbox"/>
12.Cuando estoy feliz es más un sentimiento de estar sin problemas y contento, más que de estar entusiasmado y animado	<input type="checkbox"/>	32. Cuando estoy entusiasmado por algo, busco compartir mi entusiasmo con todo el mundo	<input type="checkbox"/>
13.Cuando tengo que hablar en público por primera vez , me tiembla la voz y se me acelera el corazón.	<input type="checkbox"/>	33. Cuando me siento feliz estoy tranquilo y contento	<input type="checkbox"/>
14.Cuando algo bueno sucede generalmente soy mucho más entusiasta que los demás.	<input type="checkbox"/>	34. Mis amigos dirían probablemente que soy una persona tensa.	<input type="checkbox"/>
15.Es posible que mis amigos digan que soy sentimental.	<input type="checkbox"/>	35. Cuando estoy feliz reboso de energía	<input type="checkbox"/>
16.Los recuerdos que más me gustan son en los que me sentía contento y tranquilo, mmás que animado y entusiasmado.	<input type="checkbox"/>	36. Cuando me siento culpable, es una emoción bastante fuerte	<input type="checkbox"/>
17.Me afecta mucho ver a alguien que se encuentra mal.	<input type="checkbox"/>	37. Puedo decir que mis buenos estados de ánimo son más cercanos a la satisfacción que al gozo	<input type="checkbox"/>
18.Cuando me siento de buen ánimo me es fácil pasar de sentirme bien a estar realmente contento.	<input type="checkbox"/>	38. Cuando alguien me halagan, me pongo que desborde de felicidad.	<input type="checkbox"/>
19. "Tranquilo y controlado" es una buena forma de describirme	<input type="checkbox"/>	39.Cuando estoy nervioso, me pongo todo tembloroso	<input type="checkbox"/>
20.Cuando estoy feliz me siento como si reventara de alegría.	<input type="checkbox"/>	40.Cuando estoy feliz, es sentimiento se parece más a la satisfacción y la calma interna que a la excitación.	<input type="checkbox"/>



8.4 ANNEXE 4: CERTIFICATE OF ACCEPTANCE FOR PUBLICATION (ARTICLE 3)

Madrid, 16 de enero de 2018

CERTIFICADO DE PUBLICACIÓN

Certificamos que el siguiente artículo ha sido aceptado pendiente de publicación en la revista "Actas Españolas de Psiquiatría".

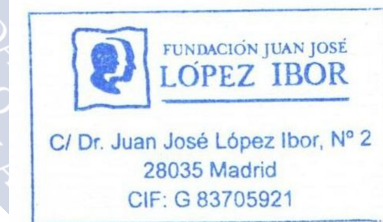
"El papel de la desregulación emocional en el trastorno conversivo", Lucía del Río Casanova, Ana Isabel González Vázquez, Ania Justo, Vanessa Andrade, Mario Páramo, Julio Brenlla, Andrés Blanco Hortas. Actas Esp Psiquiatr. In press.

Para que conste donde sea preciso,



Felipe Bravo Secretaría Técnica

Revista Actas Españolas de Psiquiatría.







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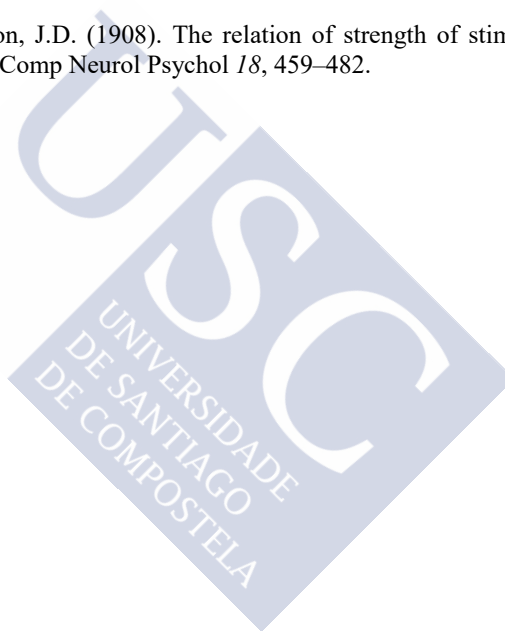
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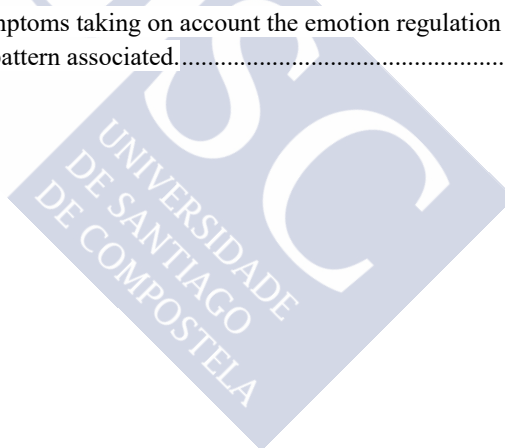
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Introdución

O Trastorno Conversivo (TC) defínese pola presenza dun ou máis síntomas de alteración da función motora ou sensitiva voluntaria en ausencia dunha enfermidade médica que o explique. Para acadar a categoría de trastorno, o malestar clínico e o deterior funcional deben ser relevantes (American Psychiatric Association, 2013c). Esta definición común xérase en base a unha idea simple compartida pola maioría de autores no campo en torno ás características do trastorno, pero deixa atrás gran parte da complexidade que atinxe ao TC (Derouesné, 1996). Quedan abertas varias controversias en torno ao TC tales como:

- 1) Se a súa natureza é física ou psicolóxica, tratándose dun trastorno que se atopa a cabalo entre a Neuroloxía e a Psiquiatría.
- 2) Cal é a súa ubicación nosolóxica: se se trata dun fenómeno relacionado coa somatización, relacionado coa disociación ou se se pode considerar unha manifestación postraumática.
- 3) Respecto da súa patoxenia, pode se entendido como unha defensa psicolóxica manifestada a través do corpo ou como una manifestación vinculada coas respostas defensivas primitivas, xa presentes noutros seres vivos (reptiles e mamíferos fundamentalmente).

En canto á prevalencia do trastorno, as cifras son diferentes en distintas mostras de poboación, contemplándose un rango entre 11 e 500 casos por cada 100.000 habitantes (American Psychiatric Association, 2000). En poboación xeral a prevalencia estaría en torno a un 0,3% e, en mostras clínicas con presenza de sintomatoloxía postraumática ou disociativa, poden acadar ate un 50% (Fricke-Neef and Spitzer, 2013). O TC é máis frecuente en nenos que en adultos e en mulleres que en homes, cunha ratio que varía entre 2:1 e 10:1 dependendo do estudo (Sadock and Sadock, 2004)(Fricke-Neef and Spitzer, 2013).

Dende o punto de vista histórico, o estudo do TC ven ligado co concepto clásico de histeria (co que era indistinguible ate o século XIX) e de disociación. Antes do século XIX as manifestaciones conversivas eran entendidas ben como froito de afeccións físicas explicadas a través de teorías etiolóxicas moi primitivas, ben como manifestacións relacionadas coa bruxería e a posesión. Na antiga Grecia considerábase que as manifestacións clínicas conversivas aparecían en mulleres por causa da migración do útero a través do corpo, o cal daría o nome ao termo histeria (Aybek et al., 2008). A partir do século XVII déronse diferentes intentos fallidos de atopar un sustrato cerebral que explicase as manifestacións

históricas (Alvarez et al., 2010). Nesta liña caben destacar as teorías de Mesmer (magnetismo animal ou mesmerismo) e de Charcot (quen estudou a catalepsia, o sonambulismo e as crises históricas, dividindo estas últimas en fases segundo sucedían de xeito fenomenolóxico os diferentes síntomas) (Rojo Pantoja, 2006). Posteriormente, Freud e Janet revolucionarían a comprensión deste trastorno realizando aportacións con repercusión ate a actualidade.

Janet propuxo a Teoría da Desagregación (Disociación) explicando que na disociación se daba un estreitamento do estado de conciencia, unha alteración na capacidade sintética do individuo e a presenza de ideas fixas. Neste contexto, as emocións terían unha función antisintética entendéndose que estados emocionais extremos poderían provocar a dificultade de procesar e integrar a información provinte do medio. Pola súa banda, Freud estudou máis ben as manifestacións somáticas da histeria. Etioloxicamente, consideraba que o malestar psicolóxico e os conflitos intrapsíquicos reprimidos saían á luz convertidos en síntomas somáticos, o cal explica a nomenclatura “conversión” (Rojo Pantoja, 2006). Na primeira metade do século XX, buscáronse novas explicacións para a conversión dende as teorías psicanalíticas en auxe e na segunda metade, a interese no trastorno decaería ate que na década dos 90 se retomou a interese por ela xurdindo diversas teorías para intentar explicar a natureza e etiopatoxenia do fenómeno. En xeral, podemos dicir que hai dúas tradicións principais na forma de abordar o trastorno que se poden observar na conformación das dúas clasificacións internacionais das enfermidades máis utilizadas. Mentres que a tradición americana (co DSM-5) considera que a conversión é un trastorno relacionado cos síntomas somáticos, a tradición europea (coa CIE-10) considera que se trata dun fenómeno disociativo. Un terceiro grupo de autores apuntan, na mesma dirección desta tese, a que o TC se relacione con trauma pero solo en presenza de alteracións na regulación emocional (Briere, 2006) (Briere and Hodges, 2010).

O desenvolvemento da neurofisioloxía e da neuroimaxe funcional permitiron tamén confirmar a implicación das vías neurales relacionadas coas emocións na xénese deste trastorno. Tense descrito un aumento bilateral xeralizado do fluxo frontal e parietal, así como na amígdala (dereita), o córtex cingulado anterior e a ínsula (Lanius et al., 2014a)(Vuilleumier et al., 2001). Mentres que algún autores teñen centrado o seu estudo na alteración dos circuitos fronto-límbicos, outros teñen enfatizado a relevancia do tálamo e os ganglios basais. Por outra banda, atopouse que o procesamento cortical temprano non estaría alterado, senon que o estaría o procesamento máis tardío que acontece en áreas asociativas e outras áreas relacionadas coa atención e a volición, que baixo estados emocionais determinados inhibirían as áreas sensoriomotoras (Sierra and Berrios, 1998).

Dende o punto de vista neurobiolóxico, o noso estudo céntrase na análise dos padróns de funcionamento frontolímbico e nos estados neurovexetativos asociados a diversos tipos de síntomas conversivos e aos diferentes trastornos que forman parte do espectro postraumático. Nestes trastornos, a desregulación emocional pode entenderse como consecuencia do condicionamento ao medo e a sensibilización a estrés na infancia ou ben como factor de vulnerabilidade previa capaz de exacerbar o medo e a desregulación posteriores. A

combinación destes factores constitucionais e ambientais da como froito unha tendencia a regular de forma desadaptativa as emocións nestes pacientes. Xurden así dúas formas principais de regular as emocións baseadas na capacidade de control emocional dos suxeitos: a sobre regulación emocional (cando o suxeito activa áreas frontais para frenar a sobre activación límbica, dando como resultado un aplanamento afectivo) e a infrarregulación emocional (cando as rexións frontais non son capaces de frenar a avalancha límbica e o suxeito se amosa sobre activado e desbordado emocionalmente). Nalgúns estudos, a sobre regulación emocional tense relacionado coa presenza de síntomas conversivos de tipo negativo (aqueles que xurden en relación con funcións inhibitorias) e a infrarregulación emocional con síntomas positivos (aqueles relacionados con experiencias excitatorias). Segundo temos revisado, existiría un terceiro padrón caracterizado pola coexistencia ou superposición de ambas estratexias. De igual modo, mentres que a sobre regulación tende a relacionarse con estados de baixa activación vexetativa, a infrarregulación adoita vincularse cunha elevación da activación.

Xustificación e metodoloxía

Neste contexto, existe unha necesidade de desenvolver perspectivas integradoras que inclúan aprendizaxes provintes da neurobioloxía, a psicopatoloxía e a psicología. Para iso, temos focalizado o noso estudo en tres liñas fundamentais:

- 1) O estudo das bases neurobiolóxicas do TC e a súa repercusión sobre os procesos de regulación emocional.
- 2) A profundización nos procesos psicolóxicos imbricados na súa xénese e mantemento, concedendo especial importancia ao rol da desregulación emocional no trastorno.
- 3) As implicacións clínicas e terapéuticas de contemplar a regulación emocional como núcleo fundamental no Trastorno Conversivo.

O traballo estruturouse en torno a dúas fases metodolóxicas. A primeira inclúe unha revisión crítica da literatura existente en torno á neurobioloxía do TC e a aparición de alteracións no procesamento emocional neste e outros trastornos do espectro postraumático. Esta fase materialízase na escritura dos dous primeiros artigos. A segunda fase metodolóxica consiste na realización dun estudio experimental de tipo casos e controis baseado nas seguintes hipóteses de traballo:

- H1a: Os pacientes con TC presentan máis alteracións na regulación emocional que a poboación.
- H1b: A presenza de desregulación emocional, alexitimia e alte intensidade emocional negativa son factores de risco para que suceda un Trastorno Conversivo.

RESUMO

- H1c: A desregulación emocional é un bo predictor da presenza dun Trastorno Conversivo.
- H1d: Diferentes manifestacións clínicas de conversión (positiva vs negativa) asócianse con diferentes formas de regular as emocións nos pacientes con TC (infra vs sobre-regulación emocional respectivamente).

Obxectivos

O principal obxectivo desta tese é estudar o papel da desregulación emocional no Trastorno Conversivo. Para isto, fóronse resolvendo unha serie de obxectivos específicos que se expoñen a continuación:

- Revisar o papel da desregulación emocional nos trastornos do espectro postraumático en xeral (Oe1).
- Correlacionar as diferentes manifestacións clínicas de conversión cos seus padróns neurobiolóxicos subxacentes e cos mecanismos de regulación emocional que máis frecuentemente se asocian a estes (Oe2).
- Coñecer cales son as principais dificultades na regulación emocional que aparecen neste trastorno, mediante un estudo comparativo en poboación xeral e clínica (Oe3).
- Reflexionar sobre a utilidade clínica e terapéutica dos achados descritos, recollendo as implicacións do modelo proposto (Oe4).

Resultados

Artigo 1:

Realízase unha revisión da literatura e unha proposta de modelo. Revisase de forma individual cada un dos principais síntomas conversivos, priorizando estudos con base neurobiolóxica e neurofisiolóxica. Recóllense as principais alteracións funcionais detectadas en relación con cada síntoma e faise especial fincapé nos padróns de funcionamento frontolímbico e no estado neurovexetativo que se asocia a cada tipo de manifestación clínica. Proponse unha categorización dos síntomas en función destas dúas variables tal e como se amosa na figura que sigue.

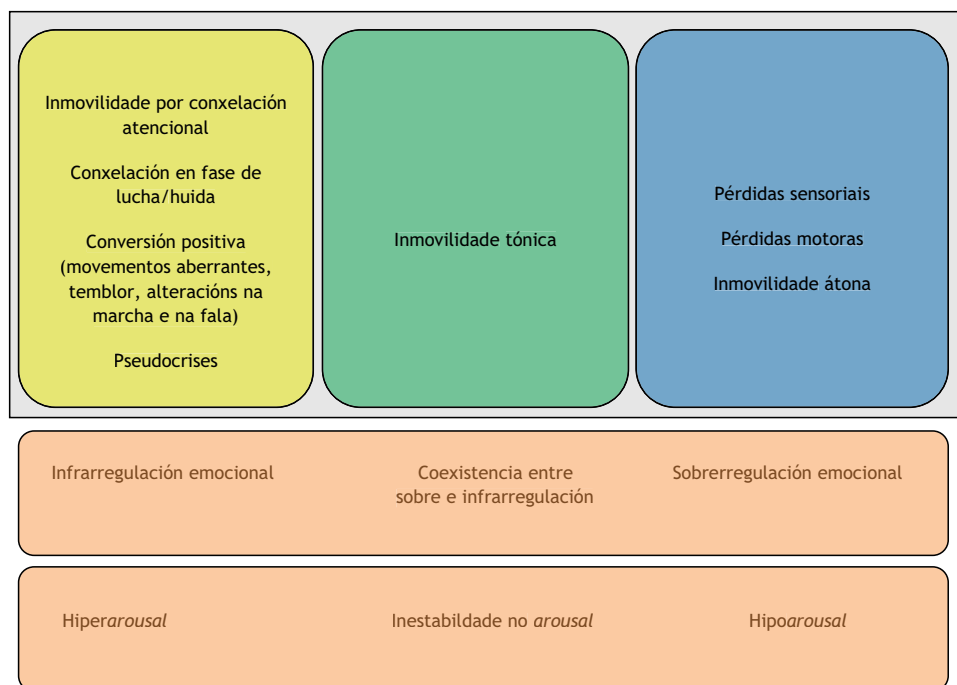


Figura 7 (traducida) : Síntomatoloxía conversiva en función da estratexia de regulación emocional e o padrón neurovexetativo.

Artigo 2:

As alteracións na regulación emocional relacionadas cunha orixe traumática teñen sido estudadas principalmente en casos de Trastorno por Estrés Postraumático e en adultos. Porén, os efectos das experiencias traumáticas van máis alá deste diagnóstico. Tense proposto que existe un grupo de trastornos relacionados coa traumatización que forman un espectro que reflicte as diferentes formas de enfrentarse ás experiencias traumáticas e as manifestacións clínicas que neste contexto poden xurdir. Aínda que non existe consenso en torno a qué trastornos compoñen este espectro, hai algúns que foron estudados con máis profundidade: o Trastorno por Estrés Postraumático, o Trastorno Límite da Personalidade, os Trastornos Disociativos, os Trastornos Conversivos e os Trastornos Somatomorfos.

Neste segundo artigo buscamos comprobar hipótesis similares ás propostas no artigo 1, máis neste caso, aplicadas a cada un dos trastornos do espectro postraumático. Revisouse a literatura de forma crítica buscando coñecer cales serían os padróns de regulación emocional predominantes en cada un dos trastornos. Isto permitiu situalos ao longo dun diagrama no que no extremo correspondente á sobrerregulación emocional se atoparían os síntomas conversivos negativos e os trastornos somatomorfos, no extremo oposto (correspondente á infrarregulación emocional) atoparíase o TEPT, o TLP, a conversión positiva e a conversión

positiva, e por último nun punto intermedio no que coexisten ambas estratexias situaríanse os síntomas disociativos e conversivos mixtos, así como o TLP en coexistencia de disociación.

Artigo 3:

Esta investigación pretende profundizar no papel da desregulación emocional no TC. Estúdanse as diferenzas existentes entre un grupo de pacientes con TC (n=43) e un grupo control (n=42) no que concerne á forma de regular as emocións así como a outras variables clínicas fundamentais. Ambos grupos se someteron a dúas entrevistas psiquiátricas e completaron 6 cuestionarios autoadministrados evaluando a depresión, ansiedade, alexitimia, desregulación emocional, intensidade efectiva, así como a disociación psicomorfa e somatomorfa.

Como resultados obtivéronse puntuacións significativamente máis altas no grupo de casos nas seis variables estudadas ($p < .001$). A reactividade e intensidade emocional negativas foron maiores no grupo de pacientes ($p < .01$) mentres que ambos grupos puntuaron de maneira similar en afectividade positiva e serenidade. A ansiedade, a alexitimia e a desregulación emocional foron os factores de risco máis importantes identificados (OR= 5.85/3.50/3.23 respectivamente). A ansiedade e as dificultades na regulación das emocións foron as variables que mellor explicaron a pertenza ao grupo de pacientes nos modelos de regresión loxística calculados. Entre os 5 factores que mediron diferentes dificultades na regulación emocional, os máis relevantes foron a falta de control emocional e a interferencia en condutas orientadas a unha meta. A sintomatoloxía conversiva positiva e a sintomatoloxía conversiva negativa correlacionáronse con distintos padróns de regulación emocional. Atopouse evidencia de que os síntomas negativos están asociados máis frecuentemente con variables relacionadas coa sobre-regulación emocional mentres que os síntomas positivos o están con variables relacionadas coa infraregulación. Estes resultados son preliminares, precisándose de estudos deseñados especificamente co fin de confirmar esta hipótese.

Resultados complementarios

Como resultados complementarios preséntase a validación castelán da escala *Somatoform Dissociation Questionnaire-20* (SDQ-20), que da lugar ao cuarto artigo da tese. Así mesmo, preséntase un quinto artigo no que se reflexiona sobre as implicacións clínicas e terapéuticas de considerar a regulación emocional como núcleo de traballo nas abordaxes das patoloxías traumáticas.

Discusión

Realizouse unha discusión razonada organizada en torno aos catro obxectivos específicos da tese.

Con relación ao papel da desregulación emocional nos trastornos do espectro postraumático, a nosa maior aportación canalizouse a través da segunda publicación desta

tese. Froito da mesma xurdiu unha categorización destes trastornos baseada nos padróns de regulación emocional máis frecuentes e nos correlatos neurovexetativos máis destacables en cada un dos trastornos. Esta perspectiva contempla a patoloxía postraumática como pertencente a un espectro onde os diferentes trastornos se sitúan de forma progresiva e dinámica. Esta perspectiva dimnesional complétase coa proposta de tres categorías que responden a tres constructos vinculados coa regulación das emocións: a sobre-regulación emocional, a infrarregulación emocional e un terceiro padrón caracterizado pola coexistencia de ambas. Destaca que as tres categorías fan referencia a estratexias de regulación emocional que resultan disfuncionais e que por tanto, non permiten ao suxeito adaptarse de forma flexible e eficiente ás demandas do entorno. Como debilidades do modelo proposto destaca o feito de que o espectro postraumático é un concepto amplo e os seus límites todavía non están ben definidos, e tamén o feito de que o modelo non resolve a controversia en torno á comorbilidade entre trastornos.

En segundo lugar, realízase unha reflexión en torno aos padróns neurobiolóxicos no TC. Conclúise que non existe unha alteración neurobiolóxica común que explique todos os síntomas conversivos. En todo caso, poderíamos considerar que existen alteracións diferentes en dúas vías principais: os circuitos frontolímbicos e os circuitos cortico-estriato-tálamo-corticais. Identificáronse dous padróns de funcionamento frontolímbico diferenciados, que ademais relacionaron síntomas parecidos entre sí (síntomas positivos con síntomas positivos, e negativos con negativos). Estes padróns frontolímbicos, así como a evidencia científica previa que se ten publicado ao respecto, serviron para hipotetizar sobre a estratexia de regulación emocional predominante en cada tipo de manifestación clínica.

En canto ás estratexias de regulación emocional no TC, a literatura previa apuntaba a que a desregulación emocional se podería considerar un síntoma nuclear e/ou un factor implicado na etiopatoxenia da enfermidade. De feito, as principais áreas e circuitos neuronais alterados no Trastorno Conversivo teñen que ver coa integración de aspectos como a motivación, a emoción, a atención e a memoria. A revisión bibliográfica realizada permitiunos ordear as diferentes manifestacións conversivas en torno aos padróns de regulación emocional predominantes en cada unha tal e como temos reflectido anteriormente. Como limitación desta proposta destaca a ausencia de instrumentos de avaliación estandarizados e validados para medir os constructos denominados sobre e infrarregulación emocional. En canto á posible asociación entre as estratexias de regulación emocional e os tipos de síntomas (positivos/negativos), cabe destacar que no estudo de casos e controis a mostra clínica caracterizábase por conter pacientes conversivos que na súa meirande parte tiñan unha evolución crónica e presentaban tanto síntomas positivos como negativos. De tal modo, o número de pacientes con solo síntomas positivos ou solo síntomas negativos resultou insuficiente para realizar unha análise de *clusters* de síntomas ou para establecer categorías consistentes de pacientes sobre-regulados, infrarregulados e cicladores. A pesar destas dificultades, o noso estudo sí permitiu correlacionar a presenza de maior sintomatoloxía negativa ou positiva (medidas a través dos resultados en certos ítems da escala SDQ-20) coas diferentes alteracións emocionais estudadas. Neste sentido, a disociación somatomorfa

negativa correlacionouse significativamente co rexeitamento emocional e a dificultade para describir sentimentos, mentres que a disociación somatomorfa positiva se correlacionou co rexeitamento emocional, a interferencia emocional, a falta de control, a dificultade en identificar e describir emocións e a reactividade emocional negativa. Estes datos abren un campo para futuros estudos en torno á categorización dos síntomas conversivos, para a que propoñemos que a regulación emocional sexa tida en conta como elemento central.

Por outro lado, discútese os achados extraídos da parte experimental en torno á contribución doutras variables clínicas como a depresión e a ansiedade, e a cales son as alteracións emocionais específicas que se identificaron no TC. Se temos en conta a valencia emocional, vemos que varios autores apuntaron a que os pacientes conversivos presentaban unha reactividade aumentada cara os estímulos emocionais negativos combinada cunha reactividade diminuída cara os estímulos positivos (Seignourel et al., 2007)(Diers et al., 2008) (Browning et al., 2011)(Frewen and Lanius, 2006)(Kozłowska et al., 2011)(Kozłowska and Williams, 2009) mentres que outros autores referiron que os pacientes con TC terían un aumento na reactividade emocional ante estímulos de alto arousal (Voon et al., 2010)(Pick et al., 2018). O noso estudo replicou a existencia dun aumento da reactividade emocional ante estímulos emocionais negativos. Pola súa banda, a serenidade e a reactividade emocional positivas non foron significativamente diferentes entre os dous grupos. Discútese que este feito debe ser interpretado literalmente ou ben que pode ser o resultado da presenza de menor atención emocional en xeral nestes pacientes. De confirmarse esta última hipótese, no se trataría tanto de que as emocións positivas sexan vividas coa mesma intensidade que a poboación xeral, senon que os pacientes poderían ser tamén máis reactivos ás emocións positivas pero habería un mecanismo posterior de “inatención emocional” operando para disminuir a reactividade emocional.

Por último, discútese as implicacións terapéuticas dos achados descritos ao longo da tese. Poden extraerse tres recomendacións básicas a ter en conta á hora de aproximarse en psicoterapia un caso dun paciente con Trastrono Conversivo: 1) Considerar a regulación emocional como elemento transdiagnóstico na psicoterapia dos trastornos asociados al trauma; 2) Evaluar cales son as estratexias de regulación emocional principais que utiliza o paciente e 3) Ter en conta sintomatoloxía que presenta o suxeito á hora de diseñar a intervención.

Conclusións

- 1) Os trastornos do espectro postraumático poden ser ordenados en relación á estratexia de regulación emocional que predomina nos mesmos.
- 2) Os pacientes con TC presentan máis alteracións na regulación emocional que a poboación sana.

- 3) Téñense identificado alomenos tres tipos estratexias de regulación emocional no Trastorno Conversivo: infrarregulación emocional, sobre regulación e unha terceira estratexia composta por unha alternancia entre ambas.
- 4) Diferentes manifestacións clínicas de consversión poden asociarse con diferentes formas de regular as emocións nos pacientes con Trastorno Conversivo.
- 5) Debe considerarse a regulación emocional como uno dos eixos primordiais á hora de deseñar e implementar a abordaxe psicoterapéutica do Trastorno Conversivo.





The image features a large, light blue watermark of the USC logo, which is a diamond shape containing the letters 'USC' and the text 'UNIVERSIDAD DE SANTIAGO DE COMPOSTELA' around it. The watermark is positioned diagonally across the page.

O doutorando declara non ter ningún conflito de interese en relación coa presente tese de doutoramento

En Santiago, 22 de Xuño de 2018.

Asdo. Dna. Lucía del Río Casanova