

Visual perception and audiovisual translation: directed vision¹

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Abstract

This paper is based on the premise that “some of the basic skills needed to understand film and television are identical to those necessary for natural visual perception” (Grodal 1999: 76). Perception is an unconscious and natural way of interpreting our environment based on prior experience and learning. In contrast to the deeply rooted Western belief that image is universal and true, our argument is that visual perception is a cognitive process determined by prior experience, environment, context, cultural values and motivation. This paper analyzes the application of cognitive research on visual perception in audiovisual narrative strategies and its implications for the study of the audiovisual translation process and of its reception.

Resumen

En este trabajo, partimos de la premisa de que las destrezas perceptuales innatas necesarias para entender una obra audiovisual son idénticas a las de la percepción visual natural (Grodal, 1999: 76). La percepción es una forma inconsciente y natural de interpretar nuestro entorno gracias a la experiencia previa y al aprendizaje. Sostenemos, en contra de la creencia profundamente arraigada en Occidente de que la imagen es universal y verdadera, que la percepción visual es un proceso cognitivo determinado por la experiencia previa, el ambiente, el contexto, los valores culturales y la motivación. En este trabajo vamos a estudiar la aplicación de las investigaciones cognitivas sobre percepción visual en las estrategias narrativas audiovisuales, así como sus implicaciones en el estudio del proceso de traducción audiovisual y en el de su recepción.

Keywords: Audiovisual translation, visual narration, film analysis, cognit, perceptual scheme

Palabras clave: Traducción audiovisual. Narración visual. Análisis fílmico. Cognition. Esquema perceptual.

¹ This article is the English version of “Percepción visual y traducción audiovisual: la mirada dirigida” by Christina Lachat Leal. It was not published on the print version of MonTI for reasons of space. The online version of MonTI does not suffer from these limitations, and this is our way of promoting plurilingualism.

“Percepts without concepts are blind”
Kant, *The critique of Pure Reason*

1. Introduction

The topic of numerous philosophical treatises dating back as far as Aristotle, and the subject of a large volume of experimental psychology studies, visual perception remains largely unknown outside of specialised circles. As a result, and despite a large amount of evidence to the contrary, some of which, such as optical illusions, are well known to the general public (for example the famous Rubin vase used by the Gestalt), two beliefs regarding visual perception, namely that we all see the same thing, therefore image is universal, and what we see is reality, therefore the image doesn't lie, persist. These beliefs are so deeply rooted in our way of thinking that we believe more in what we see than in what we hear. In our opinion, this has also influenced the analytical approaches applied to audiovisual translation by considering it to be a subordinated form of translation.

Perception is a basic yet complex cognitive process that allows the information received via the senses to be interpreted and understood. As such, it is an innate and natural way of interpreting our surroundings that is essential for human survival. To follow and understand an audiovisual work, we make use of identical innate perceptual skills to those involved in natural visual perception (Grodal 1999: 76), although in contrast to natural perception, our perception of an audiovisual work is guided by a narrator who takes advantage of natural perception mechanisms to direct the spectator's attention using perceptual narrative strategies arising from a symbiosis between the various narrative, visual and auditory elements (image, music, background noise, voice) employed.

As noted previously by Bravo (2003), research into audiovisual translation has tended to treat the study of film language and narrative strategies, the subordination of translation to image and the problems that arise as a result only superficially. Indeed, we can go still further by noting the large amount of research dedicated to the analysis of dubbed dialogues or subtitles that offers little or no analysis of the narrative elements of the image or even a simple description of it. It is highly likely that one of the reasons for this is the absence of a consistent theoretical framework for image analysis.

Cinema itself is just over a century old, and other audiovisual media are younger still (ca. 50 years), which is very little time in research terms. However, contributions in this field have progressed rapidly in the past few years as a result of a series of major technological breakthroughs, which have led to the almost exponential development of audiovisual supports and significant advances in the field of neuroscience resulting from functional magnetic resonance imaging (MRI).

Herein we will initially discuss perception from a cognitive psychology point of view and then propose a method for analysing the narrative strategies used in film and television that involves the application of perception and perceptive strategies. Finally, as we firmly believe that audiovisual translation research should cease to consider image to be simply a luxury supporting actor and should instead move towards the creation of a specific analytical methodology that includes visual perception, we will give a few examples of possible applications of our proposal in the field of audiovisual translation.

2. Perception

Perception is a primary cognitive process that appeared prior to language and, as such, has played a key role in our evolution. Recent breakthroughs in the field of neuroscience have allowed us to better understand this primary yet complex cognitive process.

According to Fuster (2010), memories and mental items of knowledge are made up of extensive networks of neurons, known as cognits, which connect together as a result of an individual's environmental and educational experience to form even more extensive networks. This is a constant cumulative process in which new cognits modify and replace older ones. Coincident external stimuli not only form connections between each other but also with pre-existing networks containing similar elements. This combinatorial capacity is essentially infinite and idiosyncratic (Fuster 2007: 61).

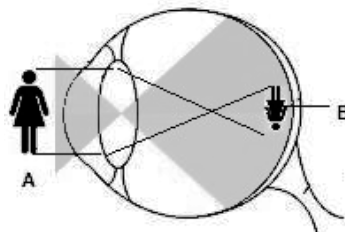
A cognit is a unit of knowledge or memory in the cerebral cortex that contains all the elements of perception or action related to a fact, object, experience or event linked together. (Fuster 2010: S4)

These networks are structured into two sensory- and motor-based hierarchies. The perceptual hierarchy represents cognits defined by primary sensory parameters and individual perceptive cognits. Phyletic memory, which forms part of the genetic memory acquired during evolution as a means of environmental adaptation, is the foundation for all memory (both perceptual and executive). This innate memory is reactivated by perceptive or motor actions. Unless something unexpected occurs, the majority of this activation, like the perception of normal events, is unconscious (Fuster 2010: S6-7).

2.1. *The act of seeing*

The cognitive psychology studies concerned with cognitive perception processes tend to be based on one of two theories: ecological and constructivist. However, we can discard the former as being arbitrary and contrary to the findings of neuroscience as it proposes that perception is a direct, unconstructed process and that we store information exactly as we perceive it. The second theory considers the seeing process to be active, thus meaning that our view of the world is constructed on the basis of both information from our surroundings and stored information and therefore that perception is not simply a copy of reality but a representation of reality that must be interpreted. This proposal turned the traditional approach towards the study of visual perception on its head, as until then the predominant model was based on the supposition that cognitive perception mechanisms are passive and therefore we see what our eyes see.

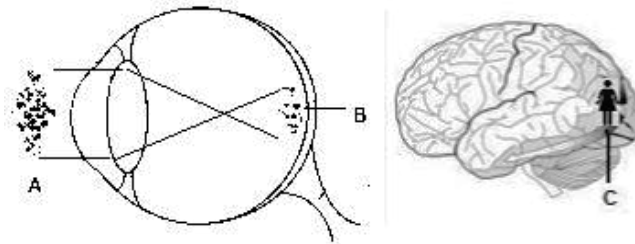
I would like to illustrate this altered perspective with a didactic representation of the visual system that was widely used in text books in the 1970s. This image was very similar to that portrayed in scheme 1. According to this model, the visual stimulus (A) is transformed into the inverted image of a silhouette of a woman (B) in the eye itself, and the brain simply has to re-invert that image.



Scheme 1

As a result of a series of technological breakthroughs in the past few decades, numerous neurological and neurobiological studies have shown that it is the brain, and specifically the visual cortex, that sees, not the eyes. The eye collects the light and its photoreceptors respond to the light stimulus by generating a nerve impulse which, in turn, leaves the eye via the optic

nerve and reaches the visual cortex, where such impulses are interpreted to generate vision. Scheme 2 summarises this process. A and B represent the light captured by the eye, and C is the result of visual interpretation, namely the silhouette of a woman.



Scheme 2

As can be seen, visual perception is not passive but is motivated, it has an intention, it's an action, the action of seeing. In other words, we see what we want to see. However, unless something unexpected happens, we are unaware of this process as it is an automatic, reflex action (Fuster 2010: S7).

2.2. Perceptual schemes

Perception is an essential activity that allows an organism to adapt to a specific environment. Therefore, as this environment is continually changing, perceptual activity must adapt to these changes. The act of perceiving is therefore a construct of the subject that derives from the relationship established between the present and the past and which depends on the ability and experience of the perceiver (Neisser 1976). Perception depends on pre-existing structures, known as schemes, which govern perceptual activity and are modified during it. A scheme collects the information that arrives via the senses and is transformed by this information. It also directs movements and exploratory activities in order to gain access to subsequent information that ends up modifying it (Neisser 1981: 67).

When constituting an anticipatory scheme, the perceiver concentrates on an act comprising both environmental information and his own cognitive mechanisms. As such, the perceiver is transformed by the information acquired. This transformation is not simply a question of creating an internal replica where previously there was nothing but rather in altering the perceptive scheme such that the following act follows a different path. (Neisser 1981: 70)

The perceptual scheme is an active structure that searches for information by detecting and analysing relevant information from our surroundings in order to anticipate effects which, in turn, modify the scheme in a circular process known as the perception–action cycle (Neisser 1981), which does not require consciousness (Fuster 2010: S7).

2.3. Colour perception

Although we are still far from fully understanding how our brains work, neurobiology has provided some highly valuable information regarding colour perception which helps to illustrate the above proposal.

As noted by Goethe in his famous statement that colors are the deeds and sufferings of light (see Aparici and García 2009: 82), we know that light is the source of all colours and that its reflection in illuminated objects determines our perception of the colour of a surface. However, we also know that the amount of light reflected from a surface changes continually, thus raising some interesting questions: why don't we perceive these surface colour changes? why is our favourite red sweater still red under sunlight and fluorescent light and why, in the best of cases, do we only perceive a slight change in shade? It is true, however, that, as noted by the neurobiologist Zeki, “the world would become a very strange place indeed if the colour of a surface changed with each change in light composition” (2000: 4).

The application of diagnostic imaging techniques to cerebral processes has allowed the neural centre where the operation that allows colour to be perceived or constructed, known as the *V4* complex, to be located. The fact that the *V4* complex is key to colour construction can be seen from clinical cases concerning patients with damage to this region but a normal retina and

visual apparatus, who can only see shades of grey. Colour is not itself a property of an object but our brain's interpretation of this property and an efficient biological signalling mechanism (Zeki 2000). Thus, colour perception has a role, it is an act of seeing motivated by the need to determine the properties of something instantly and in a highly efficient manner. For example, there is a theory that the greater ease with which women perceive colours stretches back to the Neolithic period when one of women's main tasks was the harvest, thus meaning that they needed to rapidly find fruit amongst dense vegetation and ascertain its degree of ripeness (Gegenfurtner and Rieger 2000).

If colour is an interpretation of our mind rather than an inherent property of an object, we can suppose that colour perception is highly likely to depend on evolutionary and environmental, in other words genetic, social and cultural, factors.

This should not surprise linguists, as anthropological linguistics has paid a great deal of attention to the differences in lexical colour categorisation between different languages, which is widely recognised by translators and suggests that language may have some influence on the way in which we perceive colour. Even if we were to accept that language can affect some of our cognitive processes to some extent, we do not agree with this theory, mainly because it would be like saying that humans were unable to perceive colour before language appeared. This would therefore contradict the vital role played by perception, especially visual colour perception, in the survival and evolutionary success of our species.

In light of this, we maintain that the perception of colour, and therefore of some colours rather than others, is intentional and responds to their utility in placing ourselves in our natural surroundings or in society. Perception can be determined genetically and learned socially.

3. Perception and audiovisual communication

As noted in the introduction, we believe that the perceptual skills required to understand an audiovisual work are identical to those that form part of natural perception, thus meaning that audiovisual communication is governed by the mechanisms of natural perception. In contrast to language, which is a form of conscious communication based on an arbitrary construct (language), audiovisual communication is based on an innate and unconscious process. As a result, the cognitive effort required to learn a written language is greater than that required to learn its spoken counterpart, which tends to make greater use of perception strategies.

Although audiovisual communication is based on natural perception, in contrast to the latter the spectator does not select the most relevant information or even search for it. One of the main achievements of this type of communication is ensuring, using visual and sound-based narrative perceptive strategies, that the spectator is under the illusion of perceiving in a natural manner. Over the years film directors have developed an arsenal of techniques aimed at directing the spectator's consciousness during viewing (Hasson *et al.* 2008: 1), some of which they have applied with great mastery. Indeed, this is true to such an extent that many major films contain major errors or mistakes that pass unnoticed by the vast majority of spectators unless they are actively looking out for them. For example, Francis Ford Coppola's film *Apocalypse Now* contains a total of 391 errors.

Herein we propose the hypothesis that audiovisual communication use two types of audiovisual narrative strategies to direct the spectator's perception, namely those based on pre-existing schemes that simulate natural perceptive processes and others that create new perceptual schemes.

3.1. *Simulation of natural perception*

This occurs when the narrator is more invisible, when the camera becomes the spectator's eyes. It attempts to present an iconic image and allow the spectator to extract the relevant information regarding geography, time-frames and characters. This technique is highly effective in film narration as it can place an action and fix it in time in just a few seconds. As an example we can consider the opening sequence in the film *Potiche*, directed by François Ozon (2010):

A woman of around 60 years of age jogs in front of a factory and enters a mansion. In front of the mansion, next to some very well trimmed hedges, we can see two cars, a black one and one with a red and white roof similar in style to those popular in the 1970s.

In just one scene we have identified the time-frame —the 1970s— and we know that the lead character is well-off, most likely upper middle class. This strategy can also be used for much more dramatic purposes in film narration. For example, when perceiving an image we don't normally expect it to represent something more, therefore if the cinematic narrator presents us with an iconic image we simply apply appropriate perceptual schemes to analyse the environmental signals transmitted by the image with no dual intent. However, if the narrator breaks this representation in the next image or scene, he/she will surprise and excite us.

3.1.1. Phyletic schemes

In this case the strategy takes advantage of our genetic memory by activating a phyletic scheme. For example, the use of light, especially shadows and chiaroscuros, activates a phyletic scheme representing danger or uncertainty, which is somewhat reinforced by the fact that we currently live in a very well lit environment.

3.1.2. Anthropomorphic perception schemes

A further strategy involves using our anthropomorphic perception schemes (Grodal 1999: 90), which we apply unconsciously when watching a film, to ensure that we identify the image field as our field of vision and “make us believe that this space does not stop at the edges of the screen but carries on indefinitely” (Aumont 1992: 232). An anthropomorphic strategy that places an element outside this field, behind the camera, in other words behind us, is very expressive. Other examples include a high-angle shot, which results in view from above, thus minimising a person or trivialising a situation, or its opposite, the low-angle shot, which enlarges the character or magnifies any other element.

3.1.3. Cultural and social schemes

The iconic image introduced in the first example in this section activates a cultural scheme, a strategy that is commonly used to place an event geographically and characters socially. This can be a subtle recourse, such as changes to the countryside with the passing of the seasons, changes to clothing and accessories —usually cars— to show social rise, or a more obvious one, such as the image of a clock to represent the passage of time.

A close-up, which allows the spectator to perceive the emotional state of characters and is even more effective when expressions or gestures contradict words, is another highly expressive narrative strategy, especially as both film directors and scriptwriters are fully aware of, and apply, the sense of primacy of the spectator's visual perception, in other words spectators believe more in what they see than in what they hear (Rodríguez 2009: 68).

The use of colour to transmit emotional states depending on its location in the upper or lower tonal scale is another narrative strategy.

3.1.4. Anticipatory schemes

As we have seen in the section concerning perception, the search for information to anticipate events is the main reason for the act of seeing. In light of this, it is only natural that many narrative strategies are based on anticipatory schemes, which themselves can be based on genetic, cultural, social or, as we will see below, specifically audiovisual schemes. Although they may make use of only an image, the majority of anticipatory strategies combine both image and sound. This is well exemplified by music, which is often used to warn the spectator that something bad is about to happen, or the sound of a siren, which anticipates an influx of people. A further, perhaps more effective and dramatic strategy involves breaking this anticipatory scheme: there is nothing more frightening than the sound of a siren accompanied by the sight of deserted streets

3.2. *Acquired audiovisual perception*

Cinema reconstructs visual systems that correspond to the rules of perception whilst creating a series of conventions to which we slowly adapt until they become natural (Benet, 2004: 201). As they are not a static representation of reality, schemes possess a high capacity to adapt within the circular process that is the perceptive cycle. Although we do not make comparisons, we are able to recognise new stimuli and integrate them into modified schemes which, in the context of audiovisual perception, we can term film-based schemes, televisual schemes, interactive schemes, etc.

In other words, we have learned to watch films, adverts, documentaries and video games. As our audiovisual perception is continually evolving, some film- and video game-based schemes will be transformed into unconscious perceptive processes. The close-up, extreme close-up and detail shot are very clear examples of such visual narrative strategies. In the early years of the last century close-ups that framed the upper torso or even the head produced some degree of repulsion for quite a long time (Aumont 1992: 149). Although fiction films, documentaries, series, TV programmes and video games tend to share conventions, they have also created their own. Indeed, each genre of film often creates its own conventions, thus meaning that we can consider the existence of horror film-, musical- and animated film-based perceptive schemes.

4. *Directed vision and translation*

As we have proposed in section 2, visual narrative strategies are based on the perceptual schemes of the recipients of the audiovisual work. These schemes are not universal but depend on genetic, cultural and individual factors, including the spectator's own audiovisual experience. However, although such perception may be individual, our differences in genetic and physical terms are minimal, essentially irrelevant. This similarity between perceptive processes and their plasticity produces a false sensation of simplicity surrounding these processes, which itself results in the feeling that anybody should be capable of understanding an audiovisual work without needing to understand the mechanisms underlying audiovisual communication. This fallacy traps both translators/adaptors and spectators of a dubbed or subtitled work, the latter of whom will always ascribe their poor understanding of a work to an erroneous translation rather than their own lack of perceptive skills.

Likewise, as the translator may be unaware of, or not understand, visual narrative strategies due to this concept of audiovisual translation restricted by paraverbal elements—a concept that implicitly entails the idea that translation is limited to words, that images simply complicate the task further or even make it impossible and that, in the end, the translator is a slave to the script (Zabalbeascoa 2008: 33)—he may not be able to evaluate to what degree these strategies are likely to affect the reception of the translation or how they influence the translation process as he is also a spectator of the audiovisual work.

However, we are well aware that the sensation that the image restricts or complicates the translation arises due to the lack of tools which allow us to analyse these images and detect perceptive differences between spectators of the original and translated versions.

4.1. *The audiovisual translation process*

As a spectator of the audiovisual work, the translator will necessarily find his vision directed by visual narrative strategies unless he is able to detect and analyse them. Furthermore, as visual perception is an unconscious process, if the translator is unable to locate these visual narrative strategies he becomes a passive recipient of the work, with a biased vision of it. In this case, such unconscious perception may affect the translator's decision-making. Sokoli (2005) has compared the subtitles for the Spanish and Greek versions of four fragments from *The English Patient*, a comparison in which we find an interesting example of connotation reproduced by the image that has affected the subtitling.

In the first example, the protagonist states “I’ve got this much lung”, making a gesture with the hand that signifies “little”, and this is translated as [...] (half a lung). In other words, the Greek

translator decided to explain the visual information even though this was not contained in the audio-verbal element. (Sokoli 2005: 18)

Starting from the premise that this gesture forms part of Greek perceptual schemes, if it doesn't the author would have stated otherwise, we propose the possibility that the translator has not consciously decided to explain the image but has directly translated the message perceived, without distinguishing between the possible sources (visual or auditory).

It is therefore important that the translator becomes an active expert recipient and is able to analyse his perception of the audiovisual work in the same manner as the translator of a written text performs a textual analysis of the original text. Thus, whilst viewing the work to check that his copy of the script agrees with the final production, he can identify the constituent elements of the image that provide it with meaning. These elements can be taken into account subsequently when taking decisions and solving translation-related problems. Identification of the perceptive cultural schemes activated when viewing the sequence will allow the translator to compare the schemes of the original spectator with those for the spectator of the translation, thus allowing him, in a best case scenario, to opt for a solution that does not divert the spectator's vision and, when such a diversion cannot be avoided, to reduce the effects of the translation as much as possible.

For example, in a series shot in a Scandinavian country, such as *Varg Veum—a TV series directed by Morten Tyldum (2008)*—, sunlight, or its absence, which situate us visually at a certain time of day or night, activate phyletic schemes which in principle should be considered universal. However, this may produce a distracting effect for a Spanish spectator due to the presence of incongruent verbal and visual elements. Although this effect is inevitable, the translator, upon detecting it, should be able to assess its impact on the narrative and, depending on the genre (fiction or documentary), scene and narrative value of the image with respect to the script, opt for the most appropriate and least distracting solution.

At this point we would like to point out that, unfortunately, during the audiovisual translation process the translator is not usually responsible for the final product, except, perhaps, in the case of subtitling, where the adjuster only usually performs technical adjustments. During the translation process for dubbing, where studios order a literal translation from the translator, the adaptor takes the final decision regarding the translation. Even supposing that the adaptor is an expert recipient in film-based language, we doubt that he will have sufficient abilities in the original culture to be able to recognise the cultural and social perceptive schemes of the original recipients. Likewise, we believe that it is not necessary to have such abilities: it would be sufficient to be able to work with competent audiovisual translators.

4.2. *Reception of the audiovisual translation*

We believe that a perceptual scheme-based analysis of the mechanisms of visual perception could be of great use in studies of the reception of audiovisual translation as it could prevent such analyses concentrating almost exclusively on script translation rather than taking into account the relationship between reception of the visual and auditory message. Likewise, such an analysis could detect, amongst other aspects, whether reception errors are due to the fact that the translation has diverted the attention of the spectator from the original path or whether they are due to insurmountable discrepancies between the perceptive schemes of the original recipients and those for the translation.

4.3. *The translator's audiovisual skills*

Throughout this work we have demonstrated that genetic, environmental, cultural, social and individual factors intervene in image perception and therefore that this perception may differ from one spectator to the next. Likewise, we have shown that the perception of an audiovisual work is directed by an author, who like any other author targets a specific type of spectator. As such, we consider it vital to integrate visual elements into the audiovisual translation process. Thus, similar to the manner in which a high degree of linguistic competence in both languages is demanded for translators of written works, the audiovisual translator must show an in-depth

understanding of film-related language and analysis, which would in turn result in a greater understanding of the work of such translators.

In this respect, it is revealing that, in contrast to literary translation, where a translator normally specialises in a particular author, such specialisation tends to be the exception in audiovisual translation. The only exception we are aware of is Vicente Molina Foix, specifically selected by the film director Stanley Kubrick, who was well known for his perfectionism and placed such a high value on the dubbing of his films that he intervened personally in the selection process for dubbing directors, actors and translators.

5. Conclusions

In this initial approach we have shown that the study of audiovisual perceptive schemes and their application to audiovisual translation could open up new areas in the field of audiovisual translation research. Firstly, this will allow us to develop new tools for analysing the perception of an audiovisual work and identify the narrative strategies that activate specific perceptive schemes. Such tools will simplify the process and study of audiovisual translation and allow us to change the concept of subordinated translation for one of symbiotic translation. Secondly, we will be able to apply the results of this research to create a specific analytical methodology for audiovisual translation.

Furthermore, we believe that the utility of this approach is not restricted to translation as it could also be applied to the study of the reception of audiodescription and subtitling for the deaf as the importance of these narrative strategies increases with the differences between the perceptive schemes of the spectators.

Finally, we would like to point out that the future perspectives of this research line are highly promising as a result of the recent boom in perception-related studies in fields such as neurology, neurobiology, neuroesthetics, cognitive psychology, marketing and advertising.

References

- APARICI, Roberto & Agustín García Matilla, (2009) *La imagen: análisis y representación de la realidad*. Barcelona: Gedisa.
- AUMONT, Jacques (1990) *L'image*. Paris: Édition Nathan. Citado por la traducción española de Antonio López Ruiz: *La imagen*. Barcelona: Paidós, 1992.
- BENET, Vicente J. (2004) *La cultura del cine: introducción a la historia y la estética del cine*. Barcelona: Paidós Ibérica Ediciones SA.
- BRAVO, José María (2003) "La investigación en traducción audiovisual en España: los textos cinematográficos". In: García Peinado, Miguel Angel & Emilio Ortega Arjonilla, (eds.) *Panorama actual de la investigación en traducción e interpretación*. Granada: Atrio. pp. 235-252.
- FUSTER, Joaquin (2007) "Cajal y la neurociencia cognitiva cien años más tarde". *Quark* 39-40. pp. 59-6.
- FUSTER (2010) "El paradigma reticular de la memoria cortical". *Rev. Neurol.* 50:3. pp. S3-10.
- GEGENFURTNER, Karl R. & Jochem Rieger (2000) "Sensory and cognitive contributions of color to the recognition of natural scenes". *Current Biology* 10:13. pp. 805-808. Versión electrónica: <<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.37.4788&rep=rep1&type=pdf>>
- GRODAL, Torben (1999) *Moving pictures: A new theory of film genres, feelings, and cognition*. Oxford: Oxford University Press.
- HASSON, Uri, Ohad Landesman, Barbara Knappmeyer, Ignacio Vallines, Nava Rubin & David J. Heeger (2008) "Neurocinematics: The neuroscience of film". *Projections* 2:1. pp.1-26.
- NEISSER, Ulric (1976) *Cognition and reality: principles and implications of cognitive psychology*. San Francisco: W.H. Freeman and Co. Citado por la traducción española de Manuel Ato García: *Procesos cognitivos y realidad: principios e implicaciones de la psicología cognitiva*. Madrid: Marova, 1981.

- RODRÍGUEZ DE FONSECA, Francisco Javier (2009) *Cómo escribir diálogos para cine y televisión*. Madrid: T&B.
- SOKOLI, Stavroula (2005) "Temas de investigación en la traducción audiovisual: la definición del texto audiovisual". In: Zabalbeascoa, Patrick, Laura Santamaría & Frederic Chaume (eds.) *La traducción audiovisual: investigación, enseñanza y profesión*. Granada: Comares. pp. 177-185.
- ZABALBEASCOA, Patrick (2008) "The nature of the audiovisual text and its parameters". In: Díaz Cintas, Jorge (ed.) *The didactics of audiovisual translation*. Amsterdam: John Benjamins. pp. 21-37.
- ZEKI, Semir (2000) "Esplendores y miserias del cerebro". In: Mora, Francisco & José María Segovia de Arana (eds) *Ciencia y sociedad: "nuevos enigmas científicos"*. Madrid: Fundación Santander Central Hispano. Versión electrónica: <<http://neuroesthetics.org/pdf/esplendores.pdf>>

BIONOTE / NOTA BIOGRÁFICA

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Christina Lachat Leal, PhD, teaches translation at the University of Granada since 1999. She has published several works related to cognitive translatology, problem solving, learning and expert knowledge in the context of the research team Petra (Expertise and environment in translation) including the book *Identificación, representación y resolución de problemas de traducción* (Identifying, representing and solving translation problems: an empirical study of the behavior of experts and novices). After her involvement in the research project TRACCE (Evaluation and management of accessibility resources for sensory disabled people through audiovisual translation), her research has incorporated visual perception and audiovisual translation.

La doctora Christina Lachat Leal, profesora del Departamento de Traducción e Interpretación de la Universidad de Granada desde el año 1999, ha publicado varios trabajos relacionados con la traductología cognitiva, la resolución de problemas, el aprendizaje y el conocimiento experto, en el marco del grupo de investigación Petra: Pericia y entorno de traducción, entre los cuales cabe destacar el libro *Identificación, representación y resolución de problemas de traducción: estudio empírico del comportamiento de expertos y principiantes*. Tras su participación en el proyecto TRACCE (Evaluación y gestión de los recursos de accesibilidad para discapacitados a través de la traducción audiovisual), sus líneas de investigación incluyen percepción visual y traducción audiovisual.