

COMPASSIONATE AND COOPERATIVE ATTITUDES IN YUCATEC MAYAN PEOPLE: CULTURAL AND COGNITIVE ALTERNATIVES TO VIOLENCE

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ABSTRACT

Compassion is considered a prototypical moral emotion defined by feelings of sorrow elicited when perceiving suffering in other which motivate pro-social attitudes and actions. In recent years, some neurobiological and cognitive approaches have proposed compassion as a route to regulate aggressive and violent behaviors, as well as to develop actions to maintain the social welfare. In this work we present ethnographic descriptions and interpretations to identify cultural and cognitive elements to develop compassionate attitudes in the Mayan location of Kiní, Yucatán, which belongs to an ethnic group with a large history of cultural conflicts, but representing a remarkable cooperative system in one of the less violent geographical regions in Mexico. When perceiving expressions of sorrow or pain not only the other's expressions are relevant for Mayan observers, but the empathetic self-identified feelings too. Empathy for the other's suffering is differentiated from a sensorial and dichotomous quality: pain and sadness; the first is physical and the second one is emotional and more important to be solved. Human mind is considered as the essence of cooperation moving moods and thinking to regulate moral and empathetic inhibitions of aggressiveness. Education from both, school and family, is based on notions of equality, communal responsibility and a restorative sense of morality, while compassionate feelings are expressed as attitudes to maintain the other's and own welfare, equanimity and self-control of the emotions and moods. We propose that these cultural Mayan qualities may favor the understanding of cooperative systems regulating emotional and cognitive elements related with violent behaviors.

Keywords: Compassion, cooperative attitude, cultural, cognitive, violence.

*Just as wars begin in the minds of men,
peace also begins in our minds.*

Yamoussoukro Declaration on Peace in the Minds of Men (1989)



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RESUMEN

La compasión es considerada un prototipo moral de emoción definido por sentimientos de tristeza provocada al percibir el sufrimiento de otros que motivan actitudes y acciones pro-sociales. En los últimos años, algunos enfoques neurobiológicos y cognitivos han propuesto la compasión como una vía para regular los comportamientos agresivos y violentos, así como para desarrollar acciones para mantener el bienestar social. En este trabajo se presentan descripciones e interpretaciones etnográficas para identificar los elementos culturales y cognitivos para desarrollar actitudes de compasión en la localidad maya de Kini, Yucatán, que pertenece a un grupo étnico con una gran historia de conflictos culturales, pero que representa un sistema cooperativo notable en una de las zonas geográficas menos violentas en México. Al percibir expresiones de tristeza o dolor, no sólo las expresiones del otro son relevantes para los observadores mayas, sino que los sentimientos auto-identificados empáticos también. La empatía por el sufrimiento del otro se diferencia de una calidad sensorial y dicotómica: el dolor y la tristeza; el primero es físico y el segundo es emocional y el más importante que hay que resolver. La mente humana es considerada como la esencia de la cooperación en estados de ánimo en movimiento y el pensamiento para regular las inhibiciones morales y empáticas de agresividad. La educación de ambos, escuela y familia, se basa en las nociones de igualdad, la responsabilidad compartida y un sentido de restauración de la moral, mientras que los sentimientos de compasión se expresan como las actitudes que mantienen el bienestar del otro y propio, la ecuanimidad y el autocontrol de las emociones y estados de ánimo. Proponemos que estas cualidades culturales mayas pueden favorecer la comprensión de los sistemas cooperativos que regulan los elementos emocionales y cognitivos relacionados con los comportamientos violentos.

Palabras clave: compasión, actitud cooperativa, cultural, cognitivo, violencia.

INTRODUCTION

According to the World Health Organization (1996), violence can be defined as the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation. Sure, this definition of violence is controversial and can be considered as incomplete from several disciplinary points of views. For example, the difference between aggression and violence should be addressed from evolutionary interpretations, origins and motivation of violent cultures could be discussed from Social Anthropology, the intentionality of violent acts could be pondered from criminological perspectives, or the relevance assumed for interpersonal or structural violence should be deliberated between Psychology and Sociology. It is not the aim of this chapter to assess the discrepancies on the above given definition, since previous reports and revisions have presented the different views in a deeply manner (Adams, 2014; Mercadillo & Arias, 2010; Ramírez, 2003). Rather, we draw from the premise that violence is not biologically determined, as it is propositioned in The Seville Statement on Violence (UNESCO, 1989). Also, we consider that certain social conditions, such as poverty, economic inequality, and the breakdown of the family are related to violent acts (Caballero & Ramos-Lira, 2004).

Although all of us may disagree in our conceptions about violence, we may agree that the concept of “otherness” is an essential element not only to un-

derstand violent acts, but also to think on peaceful alternatives for conflict mediations. It is “the other” who directly experiences the consequences of our social or individual violent acts. This fact is clearly and crudely observed in the thousands of victims related to interpersonal, military, domestic or structural violence in Latin America during the last three decades (Imbusch, 2011). Specifically in Mexico, there were 63.000 homicides, at least 20.851 disappeared people, and 230.000 displaced people just between 2006-2012, and 39.000 kidnapped central American migrants between 2007-2010; all these cases as a consequence of major cultural and political problems, such as, drugs and arms trafficking, trafficking in persons, poverty, corruption, emigration, discrimination and inefficiency of institutions for justice (Enciso, 2015).

Nevertheless, the concept of “otherness” is also essential to comprehend behaviors factually opposed to violence. This is the case of “compassion” simply rationalized by the Spanish existentialist philosopher Miguel de Unamuno (1866-1936) as “a shared passion” or a faculty to share the other’s feelings and emotions.

To understand otherness and compassion from a scientific perspective we should consider that knowledge is manifested, at least, in three interrelated levels. An epistemological level offers a system of values to define what knowledge means; a biocognitive level implies that information is positioned in living organism developing knowledge to understand the world; a social-active level involves institutional

norms to regulate and define the function of knowledge in particular historical and cultural contexts (Mercadillo, 2012a). Even the three levels are equally important, this chapter emphasizes the biocognitive level since it implies “the self” or person who execute violent or compassionate acts based on proper cultural knowledge. Also, although the self may constitute an individual entity, its mental content and exhibited actions are necessarily related with collective realities required to build alternatives for violence.

In addition, the links between compassion and cooperative attitudes have increased the interest to investigate cognitive processes and attitudes contributing for the development of a Culture of Peace, such as, empathy, tolerance or solidarity (Keltner , 2010; Mercadillo & Arias, 2010). In this sense, recent experimental approaches to study compassion are based on the Moral Emotions Theory proposing a kind of emotions which subjective experience and motor expressions are elicited by the perception of violated social rules and moral values, and motivate pro-social and recuperative actions to maintain the welfare of the society as a whole. These emotions occur into public and cultural circumstances which influence both, the emotional expression and moral judgments (Haidt, 2003; Mercadillo, Díaz & Barrios, 2007). Compassion can be considered as a prototypical moral emotion defined by feelings of sorrow or grief elicited when perceiving suffering in other, and motivate attitudes and pro-social actions to alleviate or comfort the suffering party (Haidt, 2003; Lazarus, 1991).

One of the experimental routes to study compassion has applied neuroimaging

techniques to identify the brain function related to the experience of this emotion. Studies have included reading statements and watching pictures evoking compassion (Kim, Kim, Kim, Jeong, Park & Son, 2009; Mercadillo, Diaz, Pasaye & Barrios, 2011; Moll, De Oliveira & Eslinger, 2003), hearing narratives and imagining scenes about psychological and physical pain (Immordino-Yanga , 2009; Kedia , 2008), Buddhist love-kindness meditation (Lutz, 2008; Weng , 2013), and performing altruistic decisions (Moll , 2006). Based on these neurobiological findings, it has been proposed that compassion involves three interdependent neurocognitive systems exchanging neural information (see Figure 1). An empathetic system includes the insular cortex and the fronto-parietal mirror neurons system allowing the inference and contagion of other’s physical or psychological state.

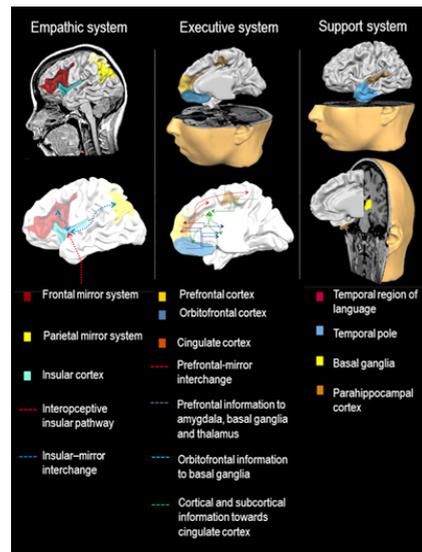


Figure 1. Representation of the three interdependent neurocognitive systems exchanging information while experiencing compassion (figure extracted from Mercadillo & Díaz, 2013).

An executive system involves the function in the prefrontal, orbitofrontal and anterior cingulate cortices, and it is related to decision making processes and moral reasoning. A third support system includes the function in basal ganglia involved in planning movement and motivation, and temporal regions related to language comprehension and spatial and social memory (Mercadillo, 2012b; Mercadillo & Díaz, 2013).

From the cultural, evolutionary and comparative perspectives proposed in the recent social neuroscience view (Beer & Ochsner, 2006; Grande-García, 2009; Todorov, 2006), the previous mentioned triple neurocognitive system can be understood as the interaction between nature and nurture. Both aspects are essentially manifested during human evolution and reflect the human ability to construct and reconstruct the culture in a dynamic way through flexible brain functions.

In addition, the also recent neuroanthropology discipline proposes the integration of different methodologies to assess cultural, psychological and neural elements affecting cognition and behavior, and considers that culture implies psychological mechanisms to transmit and share information between people holding biological needs (Dominguez-Duque, 2010; Lende & Downey, 2012).

In this work, we propose that investigations to identify neurobiological basis of compassion imply the search of anthropological and psychological basis too. Both, Anthropology and Psychology

refer to “the self” as the depository of emotional experiences and as an actor of moral judgments. The self refers to the entirety of an organism, includes its physical, biological, psychological, social and cultural constituents, and becomes an interpreter of its own brain function (Quinn, 2006).

Experimental studies on compassion tend to use externally validated and standardized stimuli, but these validations scarcely considers the inter-subjective variability and the individual’s context and history that may influence the perception of the stimuli. To assess this issue, we explored compassionate and cooperative attitudes among Yucatec Mayan people by applying ethnographic records and using visual stimuli previously employed to study neurobiological basis of compassion. We interpreted and discussed the results under the interactions of anthropological and psychological elements.

Besides the methodological and interdisciplinary interest, our study considered the peaceful and cooperative behaviors attributed to ancient and contemporary Mayan culture. So, we tend to appreciate a contemporary ethnic group, which may express interpersonal relations according to cooperative, empathetic and prosocial behaviors proposed for the development of a Culture of Peace (Adams, 2014). Our interdisciplinary view agrees with recent proposals to elucidate peaceful behaviors manifested in several cultural groups, in order to consider alternatives to develop strategies for conflict resolution (Kemp & Fry, 2004).

METHOD AND CONTEXT

Field research was carried out on 2010 at the village of Kiní, Yucatán, located 48 km from the city of Merida, the state capital, and 4 km from Motul, the municipal capital (see Figure 2). In that year, were 1414 inhabitants at Kiní (48.5% men, 51.5% women), the dominant language was Spanish, the five years old and older population were monolingual Spanish (51.3%), bilingual Mayan-Spanish (47.1%) and monolingual Maya (1.5%). The proportion of Mayan speakers has declined and it is common that children and adolescents do not speak it but learn the language in an indirect way when parents speak between

them if they do not want the children to understand their conversation.

We invited 10 adults (5 men, 5 women) to participate in the study who agreed to interact with researchers and who expressed interest in the investigation. Also, 12 students (6 men, 6 women) participated. In this case, researchers visited the school and explained the objective of the research to the scholar authorities and the students. We also invited two members of the research team who collaborated as Mayan-Spanish translators and interpreters, when needed.

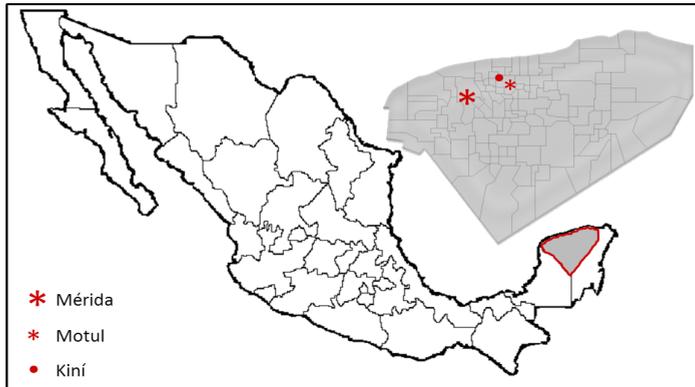


Figure 2. Location of Kiní in the Peninsula of Yucatán. Mérida is the State capital located at 40 km, and Motul is Municipal capital located at 4 km.

The mean age of the adult participants was 45.12 years, with a minimum of 21 and a maximum of 65 years old. Among the women, 3 were housewives and 2 were merchants. Among men, 2 were peasants and 3 were merchants. The mean age of the students was 13.11 years, with a minimum of 12 and a maximum of 15 years old. The members of the research team were 27 and 21 years old, and were

undergraduate students of Mayan linguistics and Law, respectively. For a general description of the participants see Table 1. Each participant watched five printed color pictures (15 x 20 cm) (see Figure 3) which integrates part of a previously visual-stimuli battery validated to study neural correlates of compassion in Mexican samples (Mercadillo, Barrios, & Diaz, 2007; Mercadillo, 2011).

Table 1. General characteristics of the participants.

Name	Gender	Age (yr.o.)	Occupation
Estrella	Women	12	Student in the basic secondary level at Kiní.
Carlos	Men	12	Student in the basic secondary level at Kiní.
Rosely	Women	13	Student in the basic secondary level at Kiní.
Felipe	Men	15	Student in the basic secondary level at Kiní.
Eurídice	Women	21	Undergraduate student of Law. Mayan-Spanish translator and interpreter during the research.
Edwin	Men	25	Owner of a drugstore at Kiní.
Marcelina	Women	27	Undergraduate student of Mayan Linguistics. Mayan-Spanish translator and interpreter during the research.
Antonia	Women	47	Housewife.
Nicolasa	Women	53	Housewife.
Blas	Men	61	Peasant.
Pascuala	Women	62	Housewife.
Olegario	Men	65	Peasant.

After watching each picture, the researcher realized a semi-structured interview previously designed according the perceptual, emotional and moral factors proposed in the Theory of the Moral Emotions (Haidt, 2003) and inferred through pre-

ceding neurobiological studies realized in Mexico. In the case of the two women members of the research team, we added questions about the way that participants' testimonials reflected the Mayan culture. The interview script is presented in Table 2.

Table 2. Script for the interview designed to evaluate the perception of suffering in others and the compassionate experience.

Perceptual elements

What do you see in the picture?

What is the most relevant in the picture for you?

Emotional experience

What do you feel when watching the picture?

Why do you feel (the feeling mentioned) when watching (the situation described) ?

Who do you feel for that sentiment (the particular character in the picture)?

(for the social pictures only)

Decision making and moral values

What would you feel if you see a similar circumstance at Kini?

What would you do if you see a similar circumstance at Kini?

Why would you (the action described)?

Empathy

How would you feel if you were a person in the picture?

Why would you feel (the feeling described)?

Who is the character in the picture that pays more you attention? Why?
(for the social pictures only)

How do you think the characters in the picture are feeling?

Why do you think so?

Why do you think they are feeling like that?

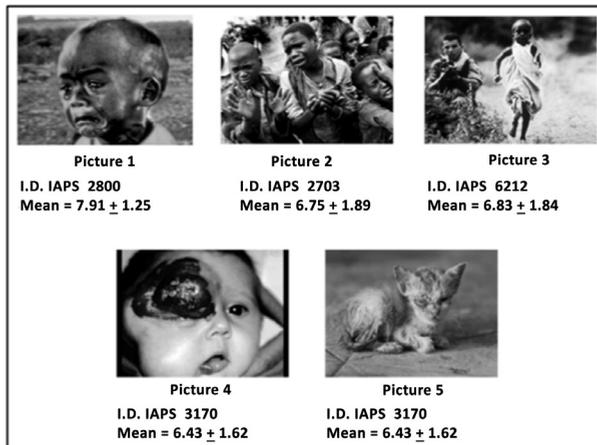


Figure 3. Pictures used in interviews about the compassionate experience. The pictures represent types of evoked compassion stimuli according to the results obtained in a previous psychometric validation: Picture 1, individual expressions of sorrow or illness without obvious context; Picture 2, expressions of sorrow or suffering in social contexts; Picture 3, harming associated to moral evaluations; Picture 4, representations of physical pain or diseases; Picture 5, representation of suffering in non-human characters. I.D. IAPS refers to the identity of the picture in the International Affective Picture System (Lang, Bradley & Curberth, 2005). Mean ± standard deviation indicates the psychometric results obtained in the validation study in Mexican samples to represent the experienced compassion in a range from 1 to 9 while viewing each picture: 1 = nothing, 3= low, 5= moderate, 7= high 9= intense (see Mercadillo , 2007).

The interviews were conducted in Spanish. In the case of adults were made individually and the interpreters were there to translate the Mayan testimonials into Spanish when the participants could best express their emotions in this language. For school students, three group sessions were performed (4 students in each session) in which the pictures were watched and the interviews were done. The group dynamics allowed the dialogue and discussion among participants about differences in perception, emotional experience, attitudes and related decisions. All the interviews were audio-recorded.

In a final interview, the participant's testimonials were discussed with Feliciano Sánchez Chan, a cultural Mayan promoter working at the General Direction of Popular Culture in Yucatán, with a long career as a Mayan writer, poet, teacher and intellectual. This interview focused on the Mayan culture elements and history expressed by the interviewees.

Participant observation was conducted throughout the field work. Observations in public spaces such as the central square, festivals and religious ceremonies, neighborhood meetings or school activities, as well as, life at homes, workplaces and meetings with people who accepted the direct conviviality with the researchers were recorded in a field diary. A photographic record of the community was also realized.

Following results constitute our interpretation of the interviews content and field observations. Semantic translations of the participants' testimonials are presented to illustrate our interpretations.

Perception and emotional experience

Perception can be considered as an essential process for awareness since it involves the integration of incoming sensorial information and memory to configure a meaningful representation (Overgaard & Mogensen, 2014). Through this integrative process the participants configured the scenes represented in the pictures to perceive the character's expressions of sorrow or pain. For example, for the question what do you see in the picture? "Lot of sadness, pain, much anguish, even I think that starvation. He is so sorrow" (Pascuala, 62 yr.o. for Picture 1).

"Anguish, misery, because the face they have, the gestures they express. They show that. As if they were feeling anguish. They have a completely wrinkled forehead, as if with their eyes they wanted to express what they are feeling" (Eurídice, 21 yr.o. for Picture 2).

Individuals do not perceive facial or bodily expressions, but a configuration of suffering. The characters' states represented in the pictures are interpreted through their expressions, as well as through the circumstances causing such state, which involves the moral assessment of compassion. For example, for the question what do you see in the picture?

"Poverty. Sadness" (Antonia, 47 y.o. for Picture 1).

"It is a child who is crying. I think that he has no food" (Nicolasa, 53 yr.o. for Picture 1).

Not only the character's expressions are relevant for the observers to identify their emotions, but the empathetic self-identi-

fied feelings are relevant too. So, emotion implies the association between the perceived stimulus and the own body state elicited after the perception (Damasio, 2006). This association includes personal experiences and assessments distinguishable in the participants when answer the question what do you feel when watching the picture?

“As I see that he is suffering, it makes me feel sadness” (Rosely, 13 yr.o. for Picture 1).

“I wonder about why these faces, because normally it is pain” (Edwin, 25 yr.o. for Picture 2).

Some behavioral and neurobiological studies attribute more empathetic and emotional reactions to women than men (Fischer, 2004; Rueckert & Naybar, 2008; Thomas & Maio, 2008). Accordingly, when asked to the young participants about gender differences, girls and boys attributed a greater empathetic capacity to women. For example:

“Girls are more sentimental [than men]. They help more. But women tolerate worse things than men. For example, when having a baby women carry on it during nine months. But if they were men, I think that they would not tolerate that, because when they [men] work hard and come home they tell ‘my back hurts’, and women carry on during nine months the baby and care for him and nurture him during years” (Rosely, 13 yr.o.).

In the case of women, empathy elicited by suffering situations seems to be related to a strength allowing her to endure first-hand pain and make them more sensitive to the other’s pain. In this sense,

Pascuala said that “women care more to those feeling anguish”. When asked why she alluded to the strength too:

“Women carry packages up to 40 kg. Women come forward and work a lot in cooperative to get the pig-breeding. If her husband gets sick they help him”.

Gender attributes and personal experiences influencing empathy involve a “like me” processes explained in neurocognitive approaches as similar emotional experiences when perceiving other’s suffering (Meltzoff, 2007) and allowing mutual recognition based on an egocentric perspective (Mercadillo, 2012b). Mutual recognition was manifested in answers given to the question what do you feel when watching the picture? For example:

“Sadness. Nostalgia. Pain. I don’t like those things. I feel they hurt me, even makes me want to cry. I think that they are suffering because you’re not going to cry ‘just because’. Sometimes you cry for joy or pain, but I think that you cry more when you’re sad, for something that is happening to you” (Marcelina, 27 yr.o. for Picture 1).

“I feel sadness because while they are suffering we have even a piece of bread” (Nicolasa, 53 yr.o. for Picture 2).

Suffering is configured through individual’s significant elements and this configuration is interesting since the pictures represented characters and contexts outside the immediate participant’s reality, which can be accessed through the media, especially television and also internet in the case of adolescents. That was the case of pictures representing people in Africa. Antonia (47 yr.o.) reveals this point when watching

the picture 2:

Researcher: "What do you feel when watching the picture?"

Antonia: "Sorrow, because I think that they have not food. They are the children who are there, in Africa".

On this point, Feliciano Sánchez Chan argued that "in the Mayan perception of life, all gender or species deserve the same respect for human beings. We know little about the general culture of Africa. What we have been showed through the media is about their suffering and the crisis situation in which they live, and as a human being, our empathy emerges". Thus, while the perception of suffering is encoded in a cultural domain, it is also supported in the recognition of bodily and facial expressions serving as a basic survival mechanism allowing the communication of pain. Accordingly and from the evolutionary Darwin's perspective manifested in *The Origin of Man* (2007/1871), this mechanism may play a fundamental role in the individuals' body configuration since it is constituted in a similar model along all the members of a species.

In the case of the picture 3, the suffering indicator is not the expression but hypothetical consequences of an action. So, the inference of the suffering implies a more complex perceptual process. For example, for the question what do you see in the Picture 3, Edwin (25 yr.o.) replied:

"Something is happening. I don't feel like in the other pictures. This child doesn't express a feeling. His face does not seem expressing pain".

Picture 3 represents a potential aggressor as the cause of suffering, so the perception and emotion are not restricted to compassion elicited by the suffering character, but also towards the aggressor, which may be part of the moral emotion of indignation defined as anger toward someone who violates a moral value (Haidt, 2003). Eurídice and Rosely responded in the following manner to the question what do you feel when watching the picture 3?

"Much anger toward the soldier, but especially towards the circumstance" (Eurídice, 21 yr.o.).

"Anger, because people kill others. A child does not hurt somebody to be killed. On several occasions, white people always want to end up with another color, black or brown, but the color should not be important. If you're white, black or brown, as you were, you are a person and you have feelings" (Rosely, 13, yr.o.).

Compassion and indignation include prosocial motivations to relieve the suffering and punishing the aggressor, respectively. Although the theoretical proposal of moral emotions considers the emotional experience and the motivated action as distinct constructs, the participants' responses show that motivation is inseparable from the emotion. Pascuala (62 yr.o.) illustrates this fusion linked to her personal history in response to the question what do you feel when watching the Picture 1?

"Compassion. I would pick him up with love, love of mother and father, with love I will pick him up to share the little things

I have. As for the same reason that I am a mother, it hurts me to see a child who walks from here to there, with no place to rest, with no loving parents, with any warm home. So, I will give to him the warm he needs”.

The variation among the terms used to communicate compassionate experiences has been observed in several Mexican samples (Díaz & Flores, 2001) and this variation is interesting in the Mayan case since there are no terms to translate “compassion” or “emotion” in Mayan language. Among the Yucatec Mayan, the more approximate word to express the western meaning of emotion is called “óol” which has been translated as heart, will, energy or spirit, and it is an attribute allowing human beings to interact with the rest of the inhabitants of the surrounding world (Hanks, 1990). It is a moral energy involving sensorial experience, willingness and intention to designate emotional or mind states by connecting a prefix to the particle “óol”. For example, “peksa óol” literally means move the mood, get excited or aroused (Jimenez-Balam, 2008). Even though the term compassion is a Spanish adoption, the participants’ testimonials show perceptual and emotional attributes linked to the social well-being as proposed in the Theory of the Moral Emotions. Edwin (25 yr.o.) illustrates this idea when answering what is compassion?

“A feeling of wanting to help someone, even you may not know him. You simply see him and feel that you want to help. But sometimes the ambition gets you. I don’t know how to explain that, but I relate compassion with feelings towards a strange person”.

Otherness, pain and suffering

Besides to be considered as a moral energy, “óol” constitutes an empathetic element of otherness in the Mayan emotional experience. In the words of Feliciano Sánchez Chan “... óol is linked to the birth and to the designation of the new human being. In the physical world, óol means offspring. If you cut a stem, you don’t kill the plant completely, it has a shoot, and that is óol too. When a woman gives birth she is related to óol, alluding to the same person, not to the product, not to the new human being who is growing, but to the shoot of the birth. The new human being is the extension of one’s own and that causes a profound sense of love”.

The configuration of empathy for the other’s suffering can be differentiated from a sensorial and dichotomous quality: pain and sadness. The first is physical and the second one is emotional. Rosely and Felipe illustrates it as follows:

“Pain hurts you but sadness is because you’ve lost something” (Rosely, 13 yr.o.); “something you love” (Felipe, 15 yr.o.).

Thus, referring to the questions about how they think the character in the picture is feeling, the participants responded: “This is a sensation [for Picture 4] the other is like a feeling [for Picture 1]” (Edwin; 25 yr.o.).

“He may feel pain on his eyes, but is not a feeling” (Marcelina, 27 yr.o.; for Picture 4).

Suffering related to feelings is perceived as more relevant than that caused by physical pain. As suggested by Feliciano Sánchez Chan, this may be due to that in Mayan culture “suffering does not lie in

the body as matter, but are the soul and the mood what are soaked”.

Therefore, Marcelina indicated for Picture 1 that:

“I think that he is suffering. You do not cry just because. Sometimes you cry because for joy or pain, but I think that you cry more when you are sad, because something is happening to you”.

Empathy may involve the contagion of other’s physical or psychological state and it allows identifying the other’s state through a similar first person experience (Iacoboni, 2009). For example, for Picture 1:

Researcher: “What do you think the child in the picture is feeling?”

Eurídice: “He is so sad. I don’t know. Maybe he is watching something ugly. Maybe his mother left him. It makes me feel much pity. His eyes are tearful and weeping. He has a very sad gesture and I think he has many reasons to cry”.

Researcher: “Why do you think he is crying for?”

Euridice: “For example, have you ever feel that a loved one dies and you know that he will not return? That is the kind of the child’s suffering”.

The configuration of the suffering perceived in others includes the own projection of a personal story influencing the empathetic interpretation. Again with the Picture 1:

Researcher: “What do you think the child in the picture is feeling?”

Nicolasa: “Pain. Desperation”.

Researcher: “Do you think he is feeling something like you?”

Nicolasa: Well, I think so. Because as I ‘m a mother, you are seeing that your child is crying. I feel that kind of despair and weep just like him because I don’t have something to give him. I have lived this situation as well. I have lived it myself when we were kids with my dad and my brothers, because we didn’t have food. My dad used to buy it [food] and he used to give two tacos to each son. He used to buy butter, a little of salt, and we prepared our taco and we ate it. I have seen that”.

Researcher: “What do you feel?”

Nicolasa: “I feel sadness, they are away from us. They are from other region, from Africa.”

Researcher: “Would you feel the same if they were here in Kini?”

Nicolasa: “I would feel it stronger, because what can I do if they are a lot and if I don’t have any to give them and if I have my children too? And that’s going to make me feel more, because I can’t give enough to my family and to them too”.

Motivation to help and morality

Helping each other is the more evident pro-social behavior linked to compassion, and involves the moral values and the motivational reinforcement associated with this emotion. Nevertheless, although motivation is reinforced by external social codes, it is also considered an intrinsic factor (Bradley , 2001; Crowson & DeBaccker, 2008). To understand the notion of

helping behaviors expressed by the participants, we asked where does the wish to help is generated?

"In my mind. You already born with it" (Olegario, 65 yr.o.).

"From the heart" (Felipe, 15, yr.o).

"Inside us there is a kind of energy, as if in the heart would be something like little words saying to you 'help', 'understand', 'love', and when you see people like that [like in the picture] those words emerge" (Rosely, 13 yr.o.) and "It [the words] propels you" (Carlos, 12 yr.o.).

To consider the heart as the essence of motivation and as the core which energy moves the mood and the thinking, is a common trait in the Mayan people. As such, it is associated with intrinsic mental entities constituting human beings and making them a "person", from birth and even before (Gossen, 1989; Groark, 2008; Guiteras, 1986; Pitarch, 1996). In this sense, epigraphic analysis provides evidence to think that people living in Mesoamerican cultures did not distinguish between direct perception, cognition and decision (Houston & Taube, 2000). Thus, the participants' testimonials around the origin of helping may be based on ancient Mayan conceptions about the affective-thinking relationship, and on mental qualities manifested from birth allowing the building of persons. The word "mind" declared by Olegario may show how the concepts used in western cultures are integrated in Mayan speakers, particularly in relation to child development.

It is possible to infer that while considering the heart and the mind as an auto-

matically and intrinsically motivation to face suffering, the learning of moral codes characterizing compassion and cooperation are not integrated. However, answers to questions about the decision to help illustrate that this is not the case. Nicolasa (53 yr.o.) reveals this point while watching the Picture 2:

Researcher: "Why would you help the people in the picture?"

Nicolasa: "Because they make me feel compassion, oótzí. It is the sadness. That's why we say oótzí, little poor"

Researcher: "Does everyone feel it the same way?"

Nicolasa: "There are people who feel it, there are people who don't. They have a hard heart. You are born like this, you want to help. My dad told me: daughter, when you prepare food give bean to someone, to the poor asking for charity. If you don't have money, you give them a french [kind of typical baguette of Yucatán] an egg. So I say to my children"

Moral and empathetic inhibitions of aggressiveness are presented in compassion when unfair actions are perceived (Mercadillo & Arias, 2010). To the question about why the participants think the soldier will shoot the child represented in Picture 3, Edwin (25 y.o.) replied:

"He has no compassion. He has not that feeling. He kills for money. He shuts to someone for money. Where are those feelings telling you don't do it?"

Those feelings and moods are derived from óol and allude to cognitive and affec-

tive mechanisms regulating individual's behavior. In the Mayan culture, these moods are established at birth, and probably before, and it passes into the blood to reach the heart. Thus, anger is understood as "you got blood to the head" (se le subió la sangre a la cabeza). Balance or stability - which also might be called equanimity - must be kept and is based on respect and responsibility towards each other in the community. Among other things, equanimity involves the avoiding of strong emotional reactions causing psychical imbalance that may result in diseases (Groark, 2008; Jimenez-Balam, 2008).

It is suggested that natural selected brain structures and functions, as well as the cultural codes regulating our behavior, are manifested in empathetic experiences framed in a social cooperative and reciprocal system (Flack & de Waal, 2000; Mercadillo & Arias, 2010). The protection for people requiring care is remarkable in this cooperative system and is illustrated in the care for Mayan children through restrictions to visit infants and women under certain conditions, and the contingent attention of mothers to their infants crying even if they interfere with her work (Cervera & Méndez, 2006). Also, it is shown in a currently Mayan ceremony described by Feliciano Sánchez Chan:

"When a new human being is 3 years old, he is leaving to a trunk of 'ceiba' [the sacred Mayan tree] and his feet are implanted on it. The contours of his feet are marked and the bark of the ceiba is removed. People entrust the baby to the 'mother tree' spirits in case he die before reaching their destination. There is a certain stage

in the human life in which a man is considered done, independent from other members, but the child as child, requires more affection and attention".

The moral elements of compassion are presented in the Yucatec Mayan to ensure the well-being of others, and these elements rather refer an attitude than valued norms and standards follow-up to what ought to be. This attitude is observed among Tzeltal Mayan too (Abarbanell & Hauser, 2010). Unlike non-indigenous populations, Mayan people consider equivalent both, the action and the omission of acts harming others, and their system of justice is more recuperative than punitive. From a cognitive perspective, Abarbanell and Hauser (2010) suggest that the small number of people characterizing Mayan communities favor the individual to build intersubjective relations between members. But the authors do not consider the history and world view of indigenous people as either their legal systems. Rather, the intersubjective relationships built by Mayan people privilege the personal interdependence and the individual's responsibility, and both circumstances are manifested from childhood (Mosier & Rogoff, 2003). Interdependence and responsibility influencing the communal notion and the recuperative value of morality was observed in some answers to the question what would you do if you saw a real scene as the Pictured 3? Blas (man, 61 yr.o.) responded as follow:

"If there is a possibility to defend him, so we defend him. We can help the child so that they [the soldiers] do not kill him. They are innocent [the children], they should not be killed".

Blas's response involves the idea of an individual responsibility to point out that given the chance, he could defend the child. But the subject who performs the action would be "us", not "me". Blas refers to a community sense and not strictly an individual action so, it involves a group responsibility for vulnerable beings, as can be the case of a child requiring care and protection.

Education, nurturing, and compassion

The relation between nurturing and compassion is distinguishable in the Origin of Man (Darwin, 2007/1871. p. 40): "Any animal, endowed with pronounced social instincts, would inevitably acquire a moral sense or a conscience as soon as their intellectual faculties have had developed as well, or nearly as well as, in man" ⁵.

This acquiring is possible, according to Darwin, because individuals experience empathy and desire to help. Later, these capabilities become instinct in the brain. Once language is acquired, the feeling is expressed in public. Finally, the instinct is reinforced by habit since it becomes a social norm.

Nevertheless, in the line to Darwin's perspective, helping behaviors culturally shaped as attitudes do not necessarily imply the explicit access to social codes or moral values, but may emerge from the individual's story in a unconsciously manner. When asked about how does he know that children and young people in the pictures feel sorrow, Olegario (man, 65 yr.o.) replied:

"Because I have lived that. When I was living with my dad [when he was a boy] circumstances were hard. We have not coffee. Men had to work to get coffee, but here [in the picture] I think that even they have not that. We must help. We don't have much, but we can revive ourselves". When asked if young people at Kiní would help people in the picture he mentioned: "Those who have not been hit will not understand it. But someone already studied will understand, because we learn like that".

Olegario means that one who has been hit, "who has lived", can empathize in a more sensitive manner with the other's suffering. For Olegario, as for the rest of the Mayan people, "the already studied..." does not refer to an academic education, but to the accumulation of experiences throughout life, framed in a culture of respect and responsibility originated at home (Cervera, 2013; Rogoff, 2003). Blas responded to the same question but incorporating the school instruction:

"Because in the course of our life we see things, and realize what it is happening. Teachers instructed us at school. Because we were younger and they were elder, they knew more things and they began to explain to us what must be done. Thus we start to learn".

The respect to teachers not necessarily comes from their hierarchy, but from the degree of experience representing their position compared to the group of students. In the same way, the elderly people

⁵ Author's translation from Spanish to English.

are considered as having the knowledge, as it is manifested in the hierarchies of the village and in ancient Mayan documents, such as the Popol Vuh, the book explaining the origin of the world according to the Mayan culture. When asked to Blas if he has taught his children how to help, he responded:

“Well, yes. I tell them what their ancestors said, their grandparents. I explain to them in order to make them aware of what they do. I tell them that they have to care each other and that if someone needs help, so they have to help”.

To realize or to be aware implies an essential factor of consciousness as a generator of knowledge and experience (Díaz, 2007). This conscious factor allows a sense of responsibility which, linked to the experience, facilitates attitudinal changes necessary to modify a reality causing suffering. In this sense, family is the first space constituting the child’s developmental niche, and plays a central role in the process of awareness and responsibility. Mayan families use horizontal educational system, opposed to the hierarchical vertical system presented in the educational institutions in Mexico, and in general in the western world. In the horizontal system, the child is explained and is talked to understand and to account. Also, children are assigned with responsibilities and are instructed to respect parents and grandparents as transmitters of knowledge since their early years (Cervera, 2013; Chavajay, 2006; Chavajay & Rogoff, 2002). Antonia and Nicolasa illustrate her experience about this:

Researcher: “How did you learn to help?”

Antonia: “Thus I was taught by my parents”.

Researcher: “Did you teach your daughter?”

Antonia: Yes. As with an elderly lady, if she has no place to rest or as well, you have to help her, I used to tell her.

Researcher: “Were you taught at home to help?”

Nicolasa: “I was told that we must be respectful of elders, with children who are on the street, which has no clothes. Thus we have lived”.

Family was also mentioned by young participants when answer to the question about where they have learned to help, but they mentioned the school too:

“At home. My mom told me to help my sister to go to school, so she could learn more” (Felipe).

“At home and at school. Through civic education we learn to not discriminate people neither for their color or their economic position” (Estrella).

“My grandparents. They help me, but they tell me: so I’m helping you, you have to help when you were required too. Never discriminate persons, because we are all equal inside” (Rosely).

Education from both school and family, contribute to the cultural construction of equality, which is evident in the communal Mayan sense in which the empathetic system is situated. Equality implies a

collective responsibility, which in words of Feliciano Sánchez Chan refers to “fulfill his destiny rather than in the sense of how much you’ve made or accomplished. It means to incorporate knowledge and skills, abilities to develop yourself in harmonic terms with society. To be one within the society”.

The relationship between responsibility and destiny plays a central role in the Mayan parental ethno-theories, understood as the ideas that parents build around childhood, fatherhood and motherhood to frame their experiences in the collective history of the cultural community, and are expressed in rearing practices (Harkness & Super, 1992; Super & Harkness, 1997). In this understood, responsibility arises from the “entendimiento” (understanding), a Mayan concept of child development. The “entendimiento” emerges at birth through the ability to understand the world and includes the perception of the developmental niche features. Later, the child understands the meaning to be aware, to be respectful, obedient, cooperative, and a good worker. This process is conceived as gradual, natural and, basically, as internal forces of destiny (Cervera, 2007, 2013). The relationship between understanding, responsibility and destiny is manifested in the participants’ testimonials around compassion as “something that already is brought” but that is learned too.

Mayan mothers describe their children behavior as good or bad modes. Children with good modes are generous, obedient and respectful, while bad modes are described as being rude, disobedient, uncooperative, and should be avoided or corrected. Parents should explain and

advise their children so they can learn to distinguish bad from good modes, but also learn to observe and participate in family dynamics. For this reason, learning involves not only an abstract concept but an attitude internalized in the family dynamics. One of the concepts to express the child cognition is the *u k ‘ahal u yik’*, which is used by Mayan mothers in the ritual of *Hetsmek* at 3-4 years old to become the child to person. Literally means “to remember his wind, his breath”, is used as an idiomatic expression to remember something that somebody had forgotten, and also means that family indicate the child to remember his responsibility (Cervera, 2007).

As mentioned before, equanimity is another attitude encouraging cooperation and empathy in Mayan people, is related with polite relationships, promotes nonviolent conflict resolution and is a positively valued quality (Groark, 2008). In this regard, Feliciano Sánchez Chan describes a letter chronicling ancient Mayan attitudes against newcomers conquerors: “During the Spaniards arrival, three Maya dignitaries discussed about what to do with them. The more wrathful said: exterminate them, because they came and took our land, took our women and our territory. We have to finish with them. Another said: No, we are going to expel them to return from they have come. The third dignitary said: we have to understand that is inevitably, whether we like it or not. They already settled to live with us. They have properties and children with us. They produce their life here. They are with us. Why not we sit down to negotiate with them? The attitude of the third dignitary exemplifies the general Mayan thinking, meaning that they

[the conquerors] are living beings too. The written letter said: we urge to you to reconsider your attitude to us, because of continuing a war will be, but if you change your attitude then will be peace.”

Feliciano Sánchez Chan also suggests that “we [Mayan people] have learned violence form outside, we have reproduced models”. In this sense, Mayan people, as other native communities in the world, have learned social models through the vertical educational systems emphasizing compliance based on hierarchies. Additionally, current political situations devalue local forms of teaching and learning and, therefore, make it difficult for the child to become familiar with their cultural and communal knowledge and practices (Morelli, Rogoff, & Angelillo, 2003). An example of these situations is the favored education in Spanish language within the schools and the difficulty to learn Mayan language inside the family due to the discrimination towards Mayan speakers (Cornejo & Bellon, 2009).

Also, it is reported that globalization has adversely impacted the Mayan family organization by interfering with the transmission of traditional information, especially when women are incorporated to remunerated activities outside the community, for example, when working in “maquiladoras”⁶, and the Mayan emigration to tourist areas in the Mexican Caribbean or to United States since the 1980’s (Ramírez, 2006).

The affective-cognitive process of compassion

Compassionate feelings declared by Mayan participants can be explained in a “self-placed” conception and expressed as a movement of the spirit through the *óol*. The term compassion is a Spanish adaptation, but the experience reported by the participants includes the empathetic and the pro-social motivation represented in the western Theory of the Moral Emotions. Nevertheless, unlike the conceptual address in experimental research, the other’s suffering is declared as a perceptual configuration involving the individual’s story and the cultural history of the community. In this sense, to complement the neurobiological approaches to study compassion, researchers could consider and interpret the self-placed anthropological proposals and the intersubjective representations culturally constructed and contained in the human mind (Quinn, 2006). These cultural representations influence and constitute altruistic behaviors manifested as attitudes to maintain the other’s and own welfare, and are based on a restorative sense of morality, a communal responsibility and self-control of the emotions and moods. Therefore, rather than the passive subject experiencing emotions implicitly showed in experimental researches, the individual must be considered as a “person” and as an agent capable to perform his own experience. This is a remarkable issue since the notion of “person” has been commonly displaced from current

⁶ Maquiladora refers to assembly and manufacturing plants in Mexico that are owned by foreign interests, mainly from American enterprises.

cultural analysis, but from a psychological perspective always falls on the basis of internalized elements, either explicitly or masked declared (Frank, 2006).

The self or the person considered as “agent” was conspicuous in the gender differences observed in the study. Participants described a greater empathetic sensitivity in women than men, attributed to a superior women’s strength allowing her to endure suffering. However, this sensitivity is not exclusively feminine, but depends on the experience, that is to say, on “the most studied” (los más estudiados) meaning the accumulation of experiences in the framework of a culture of respect and responsibility, either if people are men or women. We also observed that motivation to pro-social actions elicited by both, compassion and indignation, is linked to the perception of suffering and injustice. The communal sense identified in the participants’ attitudes is linked to cooperation and pro-social actions required to maintain the group cohesion and addressed in evolutionary and psychosocial approaches inscribed in Anthropology and Psychology (de Waal, 2007; Mercadillo, 2012). Accordingly, the recognition of the other’s psychological and physical states may forward the parental and cultural constructions of equality and strategies to solve the vulnerability of the group.

In this respect and from an evolutionary perspective, Darwin explains the establishment of cooperative attitudes in the following way (2007 / 1871: p. 44)⁷ :

“The impression of pleasure in the society is probably an extension of the family

affects, which can be mainly attributed to natural selection and partly to the habit... At the moment of action, man can obey the most powerful mobile and although this fact encourages him at times to reduce the most noble acts, will lead them more ordinarily to satisfy their own desires at the expense of others. But after the enjoyment, when compared the impression... with the most enduring social instincts, he will find his compensation. He will feel disgusted with himself and will take the decision... to act otherwise in the future”.

Darwin’s quotation is particularly interesting in social neuroscience and anthropology since it combines psychosocial mechanisms presented in an individual naturally and culturally evolved. The brain and the cognitive human structures to process emotions and moral information are activated only by the impression of cultural elements linked to well-being, parenting and family in the case of compassion. Thus, the agent, the self-placed and active person performing an action, becomes the interpreter of his brain function and his internalized external world. The field researcher can access to his world when the individual becomes aware of his own emotions and behavior under a notion of responsibility.

The ancient and current Mayan construction of reciprocity is portrayed in the Popol Vuh while showing the creation of human beings with understanding to remind them that they were created by gods. Also, Mayan notion of reciprocity is presented in the human-nature relation based on its own worldview, as occurs in other Mesoamerican cultures (López-Austin, 1994). For

⁷ Author’s translation from Spanish.

example, is clearly manifested in the milpa⁸ either in the fallow or while request and gratitude rituals to God and nature (Terán & Rasmussen, 1994).

Reciprocity is also presented in the Mayan communal sense and in public conflict mediation, which reflects the horizontal parental and educational system, and emphasizes the social responsibility and decisions based on personal interdependence. In the emotional sphere, the equanimity positively valued and the rejection of reactive emotional expressions allows polite and respectful relationships. Parenthood is an essential element since parents help children to aware their bad modes, to avoid them and change them. Various rituals previously mentioned, such as, the hetsmek' or the feet implantation on the sacred ceiba tree look for fostering cognitive development, responsibility, and care to others.

Culture of war and culture of peace expressions

Until the 1970 decade, the idea of the ancient and contemporary Mayan societies as peaceful was prevalent. Nevertheless, Mayan people represented one of the recent wars performed in the current Mexican territory. This bellicose movement known as the "Guerra de Castas" cost approximately 200.000 lost people and constituted a conflict involving the Mayan people living in Yucatán and the federal Mexican army. The conflict initiated at 1847 and finished in 1901, but remarkable collective memories of suffering and perceived transgressions are manifested by the current Mayan people, some of which consider that the war is not yet finished. The motivation for

the Guerra de Castas was not as simplest as an inter-ethnic conflict, but implicated several social factors, such as, poverty conditions of Mayan people living in Yucatán and the lack of economic and social rights which were restricted to criollos and some mestizos.

About the ancient Mayan culture, some archeological studies on the Classical period (250-850 a.C.) show artistic representations of war, urban devastation, and weapons and tools used to compete between dynasties and city-states (Aoyama, 2006). It is necessary to say that these studies has been centered in the elites of the government and part of the discussion is focused in the non correctly named "Mayan crash" which have not included a more integrative vision of the world. In this sense, an act considered as violent from typical western views is the auto-sacrifice practiced by the Mayan governs, which include the perforation of certain parts of the body in order to collect blood as offerings for the gods and for expressing gratitude for important events, such as, the building of a temple or a child's birth. This practice and the sacrifice of other people are part of the reciprocal relation between men and gods (Schele y Miller, 1992) and it is presented in the Popol Vuh as the idea that Gods created a living being with "understanding" in order to be remembered.

Both, ancient and contemporary Mayan societies manifested clear expressions of a culture of war, such as, the representation of enemies and armies. Nevertheless, these expressions are accompanied with attitudes favoring a Culture of Peace.

⁸ Milpa refers to the cultivation and sow of corn (maíz).

For example, reciprocity is still manifested in contemporary Mayan people and is linked to their idea of responsibility, as expressed in rituals for gratitude and demands during the sowing (Terán y Rasmussen, 1994), and in the communal sense of responsibility and conflict mediation as a public expression. Also, these notions are manifested in the members of the society participating in the nurture system and the horizontal education performed inside the families' emphasizing the social responsibility and decision making's based on the interdependence with the other members of the community. This last item is interesting since it is also reflected in the Declaration of Human Right to Peace arguing the premise considering that "the other is me" (UNESCO, 1997). It is also opposed to the social inequality as generator of violence in Latin America, as it is well exemplified by the Colombian anthropologist Eliane Cárdenas (2008) when describing the context of youths, women, violence and drug trafficking. According to this last author, violence produces a structurally stable chaos; this chaotic structure found a fertile environment in social inequality and this inequality modifies the concept of otherness.

As showed in the testimonials about the emotional spheres, equanimity is positive valued and reactive expressions are culturally rejected favoring polite and empathetic and respectful interpersonal relations, and self-control for anger and aggressive manifestations.

Temporality and interdisciplinary work

Historical and ontogenetic times are essential contributions from Anthropology and Psychology to understand human continuity and cultural change. The igno-

rance of these temporal views rebounds to consider static individuals commonly showed in transversal experimental methodologies used in most of neurobiological studies.

An example of the importance to consider temporality is the settlers of the henequen Mayan region of Yucatan who have constantly adopted different productive forms. Today, much of Mayan people economy rests on paid work, either in maquiladoras close to their localities, or in immigrants working in the tourist areas of the Mexican Caribbean or in the United States. Many people have returned to sow the milpa and many others are working in "what they can" (lo que se pueda), as it was reported by several families at Kiní during the study. These economical processes related to structural violence in Mexico have influenced the expectations that parents have on their children and the children and youth's expectations. Parents expect the school to serve their children to have a good job, i.e. an office work, but while many children and young people agree many also drop out because they observe that with or without full studies, people work in places with bad social reputation and low salaries in Mexico, for example, as construction workers (Lizama, 2007).

Historical transformations and the increased participation in other cultural communities, either face-to-face or virtually through internet and television, are part of the construction of new social models. For example, more than 70% of the houses in Kiní were "modern style" in 1997, but this number has been growing since the past few years (see Figure 4) affecting the typical physical space in which family dynamics is manifested. Also, groups of

women in livestock work have increased, as well as and new forms of organization promoted by the federal government or by NGOs, such as, local crafts, botanical

gardens, cooperatives, and training centers (Quintal , 2003), which may influence on the social gender differences perceived by the participants.



Figure 4. Traditional Mayan house (right) and modern style house (left) representing historical transformations at Kini.

The integration of cultural and biological factors is an eminent cognitive challenge to organize small elements in a gestalt, which function as a code in the human working memory and establish set of related codes conforming different and variable networks in a community (D'Andrade, 2001). To consider the cultural self as agent of compassion, emotion and morality may involve embodied experiences (Csordas, 1990) to complement the neurobiological view and considering the brain as part of the biological body expressed in culture. This view allows the understanding of cultural notions, such as the notion of person, moods and *óol* in Mayan people, in distinguishable times and physical spaces influencing biological and cognitive features (Lutz, 1998). This view allows the understanding not only about the networks imbued with culture, but in the neural function laying social cognition.

Based on the integrative socio-cognitive ideas mentioned above, we agree that violence is not biologically determined, as stated in the Seville Statement on Violence mentioned at the beginning of this text. But, this last premise is not enough

to cultivate a Culture of Peace. Certainly, war is not part of human nature, war is an invention and human can rationally decide to invent peace, but only through the development of attitudes emphasizing the notion of equality between humans, inserted in horizontal educational trainings and quotidian life.

We need to revise the premises manifested in the Seville Statement on Violence. This revision should consider cultural and biological factors to create bio-cultural models to assess violence and peace as bio-cognitive mechanisms to establish peaceful behaviours.

The abolition of the culture of war requires a change in the organization of current societies, which does not follow automatically from changes in the consciousness of individuals and local communities. It is necessary to propose models to change not only the organization, but also the attitude influencing the peaceful decisions making through a strong and organized academic international network, as proposed in the The Jerusalem Statement on Science for Peace, 1997.

REFERENCES

- Abarbanell, L., & Hauser, M. D. (2010). Mayan morality: an exploration of permissible harms. *Cognition*, 115(2), 207-224.
- Adams, D. (2014). *Cultura de Paz: Una utopía posible*. (R.E. Mercadillo, Ed.). México, D.F.: Herder
- Beer, J. S., & Ochsner, K. N. (2006). Social cognition: a multi level analysis. *Brain Research*, 1079(1), 98-105.
- Bradley, M. M., Codispoti, M., Cuthbert, B. N., & Lang, P. J. (2001). Emotion and motivation I: defensive and appetitive reactions in picture processing. *Emotion*, 1(3), 276-298.
- Caballero, M. A. & Ramos-Lira, L. (2004). *Violencia: Una revisión del tema dentro del marco de trabajo de investigación en el Instituto Nacional de Psiquiatría*. *Salud Mental*, 27 (2), 21-30.
- Cárdenas, E. (2008). *Marcando calavera. Jóvenes, mujeres, violencia y narcotráfico*. México: Plaza y Valdés Ed./Universidad de Quintana Roo.
- Carrillo-Flores, F. (2007). Seguridad Ciudadana en América Latina: un bien público cada vez más escaso. *Revista Pensamiento Iberoamericano*. n. 0,181-198.
- Cervera, M. D. (2007). El hetsmek como expresión simbólica de la construcción de los niños mayas yucatecos como personas. *Revista Pueblos y Fronteras Digital*, 4, 1-34.
- Cervera, M. D. (2013). Studying Yucatec Maya children through the eyes of their mothers. In V. Pache, E. Guillermet & C. E. de Suremain (Eds.), *Production politique et institutionnelle de l'enfance autour du monde/Politics and institutional production of childhood around the world* (pp. in press). Liège, Belgium: Les Presses Universitaires de Liège.
- Cervera, M. D., & Méndez, R. M. (2006). Temperament and ecological context among Yucatec Mayan children. *International Journal of Behavioral Development*, 30(4), 326-337.
- Cornejo, I., & Bellon, E. (2009). Cuando alguien habla maya, se nota que son pobres. *Revista Paz y Conflictos*, 3, 6-22.
- Crowson, H. M., & DeBacker, T. K. (2008). Belief, motivational, and ideological correlates of human rights attitudes. *Journal of Social Psychology*, 148(3), 293-310.
- Csordas, T. J. (1990). Embodiment as a paradigm for anthropology. *Ethos*, 18(1), 5-47.
- Chavajay, P. (2006). How Mayan mothers with different amounts of schooling organize a problem solving discussion with children. *International Journal of Behavioral Development*, 30(4), 371-382.
- Chavajay, P., & Rogoff, B. (2002). Schooling and traditional collaborative social organization of problem solving by Mayan mothers and children. *Dev Psychol*, 38(1), 55-66.

- D'Andrade, R. G. (2001). A cognitivist's view of the units debate in cultural anthropology. *Cross-Cultural Research*, 35(2), 242-257.
- Damasio, A. (2006). En busca de Spinoza. *Neurobiología de la emoción y los sentimientos*. (J. Ros, Trans.). Barcelona: Crítica.
- De Waal, F. (2007). *Primates y filósofos. La evolución de la moral del simio al hombre*. (V. Casanova, Trans.). Barcelona: Paidós
- Díaz, J. (2007). *La conciencia viviente*. México, D.F.: Fondo de Cultura Económica.
- Dominguez-Duque, J. F., Turner, R., Lewis, E. D., & Egan, G. (2010). Neuroanthropology: a humanistic science for the study of the culture-brain nexus. *Social Cognitive and Affective Neuroscience*, 5(2-3), 138-147.
- Enciso, F. (2015). *Nuestra historia narcótica. Pasajes para (re)legalizer las drogas en México*. México, D.F.: Debate.
- Fischer, A. H., Rodriguez Mosquera, P. M., van Vianen, A. E., & Manstead, A. S. (2004). Gender and culture differences in emotion. *Emotion*, 4(1), 87-94.
- Flack, J., & de Waal, F. (2000). Being nice is not a building block of morality: cross-disciplinary perspectives. In L. Katz (Ed.), *Evolutionary perspectives of morality* (pp. 261-236). U.S.A.: Imprint Academic.
- Frank, K. (2006). Agency. *Anthropological Theory*, 6, 281-302.
- Gossen, G. H. (1989). *Los chamulas en el mundo del sol*. México, D.F.: Centro Nacional para la Cultura y las Artes e Instituto Nacional Indigenista.
- Graham, K. & Fry, D.P. (Eds.) (2004). *Keeping the peace: Conflict resolution and peaceful societies around the world*. New York: Routledge.
- Grande-García, I. (2009). *Neurociencia social: El maridaje entre la psicología social y las neurociencias cognitivas. Revisión e introducción a una nueva disciplina*. *Anales de Psicología*, 25(1), 1-20.
- Groark, K. P. (2008). Social opacity and the dynamics of empathetic in-sight among the tzotzil maya of Chiapas, Mexico. *Ethos*, 36(4), 427-448.
- Guiteras, C. (1986). *Los peligros del alma: Visión del mundo de un tzotzil*. (2nd ed.). México, D.F.: Fondo de Cultura Económica.
- Haidt, J. (2003). The moral emotions. In R. J. Davidson, K. Scherer & H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 852-870). Oxford: Oxford University Press.
- Hanks, W. F. (1990). *Referential practice: Language and lived space among the Maya*. Chicago: University of Chicago Press.
- Harkness, S., & Super, C. M. (1992). Parental ethnotheories in action. In I. E. Sigel, A. V. McGillicuddy-Delisi & J. J. Goodnow (Eds.), *Parental belief systems: The psychological consequences for children* (2nd ed., pp. 373-391). Hillsdale, NJ: Erlbaum.
- Houston, S., & Taube, K. (2000). An archeology of the senses: perception and cultural expression in ancient Mesoame-

- rica. *Cambridge Archeological Journal*, 10(2), 261-294.
- Iacoboni, M. (2009). Imitation, empathy, and mirror neurons. *Annual Review of Psychology*, 60, 653-670.
- Imbusch, P. (2011). Violence research in Latin America and the Caribbean: A literature review. *International Journal of Conflict and Violence*, 5(1), 87-154.
- Immordino-Yanga, M. H., McColla, A., Damasio, H., & Damasio, A. (2009). Neural correlates of admiration and compassion. *Proceedings of the National Academy of Science*, 106(19), 8021-8026.
- Jimenez-Balam, D. P. (2008). Los movimientos del ánimo (óol): Estudio sobre la concepción de las emociones entre los mayas de Felipe Carrillo Puerto, Quintana Roo., Thesis. Facultad de Psicología, Universidad Autónoma de Yucatán, Mérida.
- Kedia, G., Berthoz, S., Wessa, M., Hilton, D., & Martinot, J. L. (2008). An agent harms a victim: a functional magnetic resonance imaging study on specific moral emotions. *Journal of Cognitive Neuroscience*, 20(10), 1788-1798.
- Kim, J. W., Kim, S. E., Kim, J. J., Jeong, B., Park, C. H., Son, A. R., (2009). Compassionate attitude towards others' suffering activates the mesolimbic neural system. *Neuropsychologia*, 47(10), 2073-2081.
- Lang, P., Bradley, M.M., & Curberth, B.N. (2005). *International affective picture system (IAPS): Instruction manual and affective ratings*. Gainesville, FL. University of Florida.
- Lazarus, R. S. (1991). Progress on a cognitive-motivational-relational theory of emotion. *American Psychologist*, 46(8), 819-834.
- Lende, D. H., & Downey, G. (2012). Neuroanthropology and its applications: an introduction. *Annals of Anthropological Practice*, 36, 1-25.
- Lizama, J. (2007). *Estar en el mundo. Procesos culturales, estrategias económicas y dinámicas identitarias entre los mayas yucatecos*. México, D.F.: Porrúa-CIESAS.
- López-Austin, A. (1994). *Tamoanchan y Tlalocan*. México, D.F.: Fondo de Cultura Económica.
- Lutz, A., Brefczynski-Lewis, J., Johnstone, T., & Davidson, R. J. (2008). Regulation of the neural circuitry of emotion by compassion meditation: effects of meditative expertise. *PLoS ONE*, 3(3), e1897.
- Lutz, C. A. (1998). *Unnatural emotions: Everyday sentiments in a Micronesian atoll and their challenge to western theory*. Chicago: The University of Chicago Press.
- Mercadillo, R. E. (2012a). ¿Todo es reducible a la ciencia? *Ciencia y paz/cerebro y cultura*. *Ludus Vitalis. Revista de Filosofía de las Ciencias de la Vida*, 20(38), 67-98.
- Mercadillo, R. E. (2012b). *Retratos del cerebro compasivo. Una reflexión en la neurociencia social, la policía y el género.*: Centro de Estudios Filosóficos, Políticos y Sociales Vicente Lombardo Toledano.
- Mercadillo, R. E., & Arias, N. (2010). *Violence and compassion: a bioethical insight into their cognitive bases and so-*

- cial manifestations. *International Social Science Journal*, 61(200-201), 221–232.
- Mercadillo, R. E., Barrios, F. A., & Díaz, J. L. (2007). Definition of compassion-evoking images in a Mexican sample. *Perceptual and Motor Skills*, 105(2), 661-676.
- Mercadillo, R. E., & Díaz, J. L. (2013). Neuroscience and ethnography: an interdisciplinary revision and a cognitive proposal based on compassion research in Mexico. *International Journal of Psychological Research*, 6, 94-108.
- Mercadillo, R. E., Díaz, J. L., & Barrios, F. A. (2007). Neurobiología de las emociones morales. *Salud Mental*, 30(3), 1-11.
- Mercadillo, R. E., Diaz, J. L., Pasaye, E. H., & Barrios, F. A. (2011). Perception of suffering and compassion experience: Brain gender disparities. *Brain and Cognition*, 76(1), 5-14.
- Moll, J., de Oliveira-Souza, R., & Eslinger, P. J. (2003). Morals and the human brain: a working model. *Neuroreport*, 14(3), 299-305.
- Moll, J., Krueger, F., Zahn, R., Pardini, M., de Oliveira-Souza, R., & Grafman, J. (2006). Human fronto-mesolimbic networks guide decisions about charitable donation. *Proceedings of the National Academy of Science*, 103(42), 15623-15628.
- Morelli, G. A., Rogoff, B., & Angelillo, C. (2003). Cultural variation in young children's access to work or involvement in specialized child-focused activities. *International Journal of Behavioral Development*, 27(3), 264-274.
- Mosier, C. E., & Rogoff, B. (2003). Privileged treatment of toddlers: Cultural aspects of individual choice and responsibility. *Developmental Psychology*, 39(6), 1047-1060.
- Overgaard, M., & Mogensen, J. (2014). Visual perception from the perspective of a representational, non-reductionistic, level-dependent account of perception and conscious awareness. *Philosophical Transactions of the Royal Society of London B Biological Sciences*, 369, 20130209.
- Pitarch, P. (1996). *Ch'ulel: Una etnografía de las almas tzeltales*. México, D.F.: Fondo de Cultura Económica.
- Quinn, N. (2006). The self. *Anthropology Theory*, 6, 362-384.
- Quintal, E. F., Bastarrachea, J. R., Briceño, F., Medina, M., Repetto, B., Rejón, B., (2003). U lu'umil maaya wíiniko'on: La tierra de los mayas. In A. M. Barabas (Ed.), *Diálogos con el territorio. Simbolizaciones sobre el espacio en las culturas indígenas de México*. (Vol. 1, pp. 274-352). México: Instituto Nacional de Antropología e Historia.
- Ramírez, J. M. (2003). *Human aggression: a multifaceted phenomenon*. Madrid: Centreur.
- Ramírez, L. A. (2006). Impacto de la globalización en los mayas yucatecos. *Estudios de Cultura Maya*, 27, 73-97.
- Rogoff, B. (2003). *The cultural nature of human development*. New York: Oxford University Press.

- Rueckert, L., & Naybar, N. (2008). Gender differences in empathy: the role of the right hemisphere. *Brain and Cognition*, 67(2), 162-167.
- Super, C. M., & Harkness, S. (1997). The cultural structuring of child development. In J. W. Berry, P. R. Dasen & T. S. Saraswathi (Eds.), *Handbook of cross-cultural psychology* (2 nd ed., pp. 1-39). Needham Heights, MA: Allyn and Bacon.
- Terán, S., & Rasmussen, C. (1994). *La milpa de los mayas*. Mérida, Méx.: DANIDA-Gobierno del Estado de Yucatán.
- Thomas, G., & Maio, G. R. (2008). Man, I feel like a woman: when and how gender-role motivation helps mind-reading. *Journal of Personality and Social Psychology*, 95(5), 1165-1179.
- Todorov, A., Harris, L. T., & Fiske, S. T. (2006). Toward socially inspired social neuroscience. *Brain Research*, 1079(1), 76-85.
- Weng, H. Y., Fox, A. S., Shackman, A. J., Stodola, D. E., Caldwell, J. Z., Olson, M. C., (2013). Compassion training alters altruism and neural responses to suffering. *Psychological Science*, 24(7), 1171-1180.