

# The Emotions in Consumers' Decision Making: Review of Empirical Studies

Mikel Alonso López

**Abstract**—This paper explores, in depth, the idea that emotions are present in all consumer decision making processes, meaning that purchase decisions have never been purely cognitive or as they traditionally have been defined, rational. Human beings, in all kinds of decisions, has "always" used neural systems related to emotions along with neural systems related to cognition, regardless of the type of purchase or the product or service in question. Therefore, all purchase decisions are, at the same time, cognitive and emotional. This paper presents an analysis of the main contributions of researchers in this regard.

**Keywords**—Emotions, decision making, consumer behavior.

## I. INTRODUCTION

CONSUMER behavior is one of the fields of marketing that has aroused more interest among experts in the field. To understand the reasons that drive the consumer to behave in one way rather than another is the main way to get the most efficiency when setting the mix of marketing for any product or service.

Within consumer behavior, this research focused on the decision-making process. What reasons lead the consumer to opt for a particular option discarding the rest? This question, which seems simple, has for decades been researched by a number of marketing personalities.

In this long period of study, researchers have been focusing mainly on the so-called "rational component" of decision-making. Under this approach, the consumer, when assessing the various options, does an analysis of them, choosing the one whose final value is higher. According to this traditional view, emotions are considered external elements that influence negatively on the rational analysis of various options, attributing more or less value to some attribute of the product or service than what a consumer would give by being able to "isolate themselves from emotions". Therefore, in principle, the theories on this matter considered that when making a decision with respect to consumption, the correct position was rational deliberation through an analysis and its subsequent decision [3], [15].

## II. REVIEW OF FIRST EMPIRICAL STUDIES

One of the first researchers that highlighted the importance of emotions in decision-making is [17]. In order to show that preferences could be formed on the basis of simple familiarity, meaning on the basis of mere exposure, he projected some

images on a screen so fast that viewers could not perceive them consciously. When selecting, immediately afterwards, a group of images, the subjects of the experiment proved unable to identify which they had seen before. However, if you ask them what they prefer, they choose precisely those that had been shown before. The image must have been processed at some point in the brain, but they were unaware of it. If the subjects were asked to tell why they preferred those images, they claimed all sorts of reasons, but these answers could not be treated as more authentic explanations, because other people said very similar things about completely different images. The only thing in common between the images preferred by the subjects was the fact of being previously perceived, even if not consciously. The unconscious form of reminiscing usually manifests consciously as a feeling. If the subliminal memory has not been tagged with any emotion in particular, if the event that caused it was perceived in an emotionally neutral state, then the mechanism of the unconscious memory will contemplate the memory in question in a positive light. The subjects of the experiment did not perceive the images during a particularly good state of mind, but the subliminal elicit a positive response.

Reference [7] surveyed American students intending to find out whether or not they were in favor of greater control over the possession and use of firearms. Half of the students were induced with a positive mood by showing them five minutes of a comedy TV series. The others saw an excerpt of a documentary about wine, which is neutral in emotional terms. Then, each group was presented with an argument defending a thesis on the control of firearms contrary to their own opinions. Those who were in favor of increasing gun control read an argument that was opposed to such restrictions, while those who were against read an argument in favor. Some students were told that the person who exposed the argument was an expert, while others were told that the ideas presented corresponded to a freshman student. Half of them were presented with flawed arguments and the other half, with logically consistent arguments. Moreover, some students were given a short period of time to read the argument, while others were given the time they needed. After reading the story, he turned to question students to see if they had changed their views on gun control. In general terms, the influence of good arguments revealed higher than the bad. Now, for those who were in a positive mood and had little time to think, the difference was very small. While all other groups found much less convincing the weak arguments, for those who were in good spirits and were in a rush, the bad arguments were nearly as persuasive as the good. Further tests showed that this group

Mikel Alonso López is with the Complutense University, Madrid Faculty of Commerce and Tourism, c/Islas Filipinas nº3, 28003 Madrid, Spain (e-mail: malonsz@ucm.es).

had given much more importance to the reputation of the sender when reading the argument. The fact that they were happy and could take all the time they needed made them find the weak arguments as unconvincing as those who were in a bad mood, seems to infer that the crucial time variable weighs more than the mood. However, when the authors compared the time actually used by the two groups that didn't have any time limit, proved that those who were in a good mood actually invested more time than the others that were not in a good mood. They inferred that in a positive mood we let ourselves be convinced more easily by faulty arguments, but most people seem to be aware to some extent of this circumstance, and tend to compensate automatically, by taking longer time to think the things when their critical faculties are dulled by happiness. The authors' research suggests that there are two ways to make judgments about complex issues, one is slow but very accurate, and the other is quick but murky. The slow but accurate is essentially based on logic, and the quick and murky form relies greatly on emotion. Reason and emotion can be thought of as two complementary mechanisms of the human brain to make decisions.

When it is important to reach the correct answer and we have enough time and information available, we can use the slow and clean method of reasoning things. When time and information are scarce or it does not matter so much to get the right answer, it is possible to change to the fast and economical method which is to follow our feelings.

In [9], the authors showed subjects two slides of angry faces. The projection of a slide was accompanied by the emission of an unpleasant buzzing sound, which guaranteed that the memory of that face would cause a negative affect marker by association. The other face of anger was presented without any background noise. In the next phase of the experiment, one of the slides was projected at full speed, immediately followed by a slide of an expressionless face. This is what is known as "retrospective masking", since the perception of the second slide masks the perception of the first. When asked what they had seen, the subjects reported seeing the second slide but not the first. However, they did not say much about what they saw the first, the subjects had to perceive at some unconscious level, as their brain activity was different depending on whether the first slide was associated or not with the unpleasant noise. In other words, the first slide was perceived subliminally. The authors noted that the main brain region associated with unconscious recognition of a negatively charged face turns out to be the right amygdala.

Reference [3] considered that the regulatory decision theories argue that people have consistent and well-defined preferences, no matter how these are caused. The author presents the evaluability hypothesis, which states that separate evaluations of objects are often influenced by easy-assessing attributes rather than those that are important. The experiences suggest that preferences are constructed ad-hoc and can be influenced easily through a subtle contextual manipulation. Reference [3] believes that when a person judges an option in an isolated manner, judgment is influenced more by the

attributes that are easy to assess than those that are difficult, even if the latter are more important.

An attribute is considered difficult to assess whether the decision maker is not aware of information distribution, and consequently does not know whether the given attribute value is good or bad. An attribute is considered easy to assess if the information distribution, its source, is known. The evaluation of a gift is influenced by the attribute 'relative position' and not the current value (such as price).

Reference [3] argues that when two people evaluate an object in isolated manner, they often think of other objects in the same category and compare the stimulus object with them. In this study, four empirical studies were made, obtaining interesting results in this regard:

- If they are valued separately, a person that gives a \$45 scarf, the most expensive, is perceived as more generous than one that gives a coat of \$55, the cheapest. This study found that people, in addition to the value of the gift (scarf or wrap), take into account the relative value of the gift in its own category of products (the most expensive scarf and the cheapest coat). When two comparisons are made together, the attribute that has more weight changes, because then you can compare the value of gifts, and coat becomes the most valued gift.
- An ice cream in a container filled with 7 oz is valued better than a cone in an 8 oz full container. First you would question how much you would pay for each separately, and then both together. It is easier to assess how full the glass is than the amount of ice cream, at it's more difficult to differentiate between 7 and 8 oz. Therefore, the 7 oz container alone gets better grades than the 8 oz. When put together, as you can compare, the 8oz tends to have better results.
- Separately, a 24 intact pieces' tableware set plus a few broken pieces is better than one with only 24 the intact pieces, the reference value being the number of units. However, when assessed together, the reference value becomes that the second set of dishes are imperfect, and therefore it has the worse value.

In all studies of the article, the interest value was difficult to assess, and its 'relationship with the reference' (better than, worse than or the same than the reference) was easy to assess. That's why assessments of stimuli-options by separate were dominated by the attribute 'relationship with the reference'. The results corroborated the growing evidence in the literature of descriptive decision making, and are that preferences are not consistent or established; they are made ad-hoc and rely heavily on the comparison information available at the time of doing so.

### III. EMPIRICAL STUDIES OF EARLY 2000

Reference [2] reexamined the inverse relationship between perceived risk and perceived benefit. They propose that this relationship occurs because people are based on emotions to judge. They suggest that people tend to use heuristics emotions that increase efficiency in judgment by emotional

reactions to stimuli of the subject in question. People consult their emotional list, containing the associated positive or negative labels consciously or unconsciously. Just as imagination, memory and similarities serve as aids for probability judgments, emotions also serve as an aid to judge. Using an emotional impression may be easier and more efficient to weigh the pros and cons or searching in memory many relevant examples, especially when the required judgment or the decision process is complex or the mental resources are limited.

Although the risks and benefits may be positively related to the environment, numerous studies have shown that they are negatively related in people's minds [13], [14]. Moreover, in conditions of time pressure, the inverse relationship becomes even stronger, increasing the emotional options and the cognitive options are reduced. Confidence in the heuristic emotion is exposed more clearly, because the opportunity for people to analytic deliberation is reduced and an efficient way of thinking in order to decide quickly is needed.

In [13], that studied the manipulation of emotions by providing information about benefits and risks, the authors observed that by giving information to the study subjects on the high profits in a subject such as nuclear energy, the risk perception lowers considerably. On the contrary, by indicating that the benefit involved is low, the perception of risk increases. If the decision would be made cognitively, the fact that the benefit is high should not lead them to conclude that the risk is low, since they have not been provided with any information on it.

According to [13], people consult their overall emotional evaluation of an object to judge the risks and benefits, considering a path guided by the influence of emotions in decision-making.

Reference [6] claims that traditional finance theories suggest that the price of securities in financial investments must be according to their fundamentals and technical values. Research indicates that there are other different factors among participants to measure their value: the images and the emotions associated with them.

According to [6], the errors that occur when using market forecasts are partly due to the strategies of judgment on the evolution of values that eventually fail. The accuracy of estimates and its judgments are influenced by cognitive biases that increase when the processing of complex information is simplified. For example, a stock with a positive emotional evaluation tends to be seen as good, because other specific attributes such as the quality of its managers or its long-term projection of financial success. But the basis of this emotional judgment may be more associated with the appealing qualities of the industry and the image of the company. That makes the information that should be incorporated into judgment on its overall quality to be eliminated. They [6] conducted the following study: After providing images and emotional evaluations to groups of companies, the participants having been exposed to them, they judged the probability of investing in them. The judgment was little or moderately correlated with the current market. The results suggest that the images and

emotions are part of a coherent psychological structure to assess the types of values, but the structure could have a very limited validity for prediction. Moreover, they argue that though it seems that solid and concrete information about a financial offer may dilute the role of images and emotions, it's not like that, because the more information available, the more the human judgment tends to rely on rules that simplify the processing, and the more it takes advantage of partial information or it processes information in an incomplete form. With lots of information and complicated task, more weight is given to affective factors, rather than technical indicators.

Reference [4] defends its position that positive thinking braids the positive material in memory, making it faster and accessible in mind. It also makes for broader and more diverse range of responses to neutral words and associated thoughts. In this article, the authors did the following empirical study: The participants were divided into two groups. In one of the groups, positive emotions were instilled in them, by receiving a small gift, putting them 5 minutes of a comedy TV show, or inviting them to an iced tea. The other group is not invited in order to not generate any emotions. Then both groups were invited to complete a test of creativity and association. In the results, it can be seen that those in which positive emotions were induced, generated more pleasurable and diverse responses of association and responded better to the creativity test.

#### IV. RECENT EMPIRICAL STUDIES ON CONSUMER BEHAVIOR

In [1], the author investigates the nature and consequences of brand love. According to the same research, brand love should be based on analyzing how consumers actually experience this phenomenon. For it, he carried out two qualitative studies to discover the different elements of the prototype of consumer that develops love for a specific brand. Then, he uses a structural equation model in survey data in order to analyze the results. The model considers seven elements: Brand integration itself, behaviors guided by passion, positive emotional connection, long-term relationship, the general attitude of positive valence, certainty and confidence in attitude (strength), and early separation anguish. In addition to these seven basic elements of the brand, the model also includes results: The beliefs of perceived quality as a background, history of love for the brand, brand loyalty, and resistance to negative information. Two studies were conducted: The first study consisted of 70 structured telephone interviews with a duration of 10 to 60 minutes each, and 10 in-depth follow-up interviews lasting 2-4 hours each. Respondents were aged between 23 and 45 years old, high education, of urban environment, and an almost equal number of men and women. It was researched the types of non-interpersonal love, including brand love, but also others, such as love for objects of consumption, and activities such as eating and dancing. In the interviews conducted in depth, they compared those items they wanted and those who did not want, as well as interpersonal and non-interpersonal love. The second study focused specifically on beloved brands (such as Apple or Victoria Secret, for example). 18 in-depth

interviews with college students were included with a duration of 2 hours each. The respondents examined the brands of their own choice in several categories (e.g., electronics, clothing, etc.) or the ones that fulfilled certain conditions (for example, a brand that has been used for a long period of time).

According to [16], emotion regulation (ER) includes various mechanisms destined to emotional modulation of conscious responses, including cognitive reappraisal (REAP) or inhibition of the expression of emotions and behavior (expressive suppression; ESUP). However, despite the importance of these ER strategies, previous studies of functional magnetic resonance imaging (fMRI) had not sufficiently detached the specific neural impact of cognitive reappraisal and the expressive suppression of brain responses to different types of emotional situations [10], [15]. Moreover, though they had observed different effects for stimulus valence (positive vs negative), no studies had systematically investigated the way in which ER can change the emotional processing as a function of particular stimuli containing variables (i.e., social vs. non-social).

Reference [16] conducted an fMRI study with which they compared directly in the brain the activation process, by observing different visual scenes while using different ER strategies and also examined the effects of ER based on social or non-social content of the observed scenes. The results revealed that several prefrontal cortical areas were used during cognitive reappraisal and expressive suppression, regardless of the valence and the content of images. In addition, selective modulations were found in terms of the negative valence of scenes (medial fusiform gyrus, the anterior insula, dmPFC), and its non-social aspect (in the insula center) or social (amygdala, bilateral, prefrontal medial cingulate cortex, the posterior). Moreover, a significant lateralization in the amygdala to the effect of two different ER strategies was observed, with a REAP predominant modulation on the left side was observed, but through ESUP on the right side. Together, these findings not only highlight the distributed nature of neural changes, but also reveal the specific impact of different strategies (REAP or ESUP), and the specific locations involved by the different dimensions of emotional information (social or negative).

According to [8], it has been recently demonstrated that cognitive strategies that are typically involved in the regulation of negative emotions also influence the positive emotions associated with monetary rewards. However, it is less clear how they influence behavior when defining strategies. The authors [8] investigated whether the use of emotion regulation strategies during the presentation of a stimulus reward has an influence in the process of decision making. For this, they asked participants to make financial decisions as they tried to regulate their emotions, and in another group, they did so without any emotional regulation. The participants who used cognitive regulation, according to the assessment of subjective values of perceived success and ease in implementing strategies, they took fewer risks options compared to the trials in which decisions were taken in the absence of cognitive regulation. In addition, the BOLD

responses in the striatum dimmed during decision making as a function of regulation of success as an emotion. These findings suggest that exercising cognitive control over emotional responses allows to modulate neural responses associated with reward processing (e.g. the striatum), and illustrate the potential importance of cognitive strategies in reducing risk behaviors.

Reference [5] investigated whether deciding to bet in situations involving a potential monetary gain or loss, a subjective feeling of pressure can influence the evaluation of expected utility associated with each option of choice. The authors explored how game decisions, psychophysiological and neural aspects were modulated by a sense of urgency to respond, which influences decision times and activates heart rate responses, based on the expected value on each bet. Using functional magnetic resonance imaging, [5] found that this interaction is related to changes in the activity of the striatum, a critical region for reward and choice, and the insula, a region involved in the substrate of affective feelings that influence behavior. The results provide a bridge between psychophysiological and neurobiological models of value representation, identifying the striatum and the insular cortex as the fundamental substrates of decision making under risk and urgency.

According to [15], the strategies of emotion regulation can alter the physiological and behavioral responses to emotional stimuli and the neural correlates of responses in regions such as the amygdala and the striatum. In this article, brain systems involved are investigated when a technique of emotion regulation is used during financial decisions. In decision-making, the regulation of emotions that are focused on reassessing strategies that promote the adoption of a different perspective reduce the fear of loss.

Reference [15] conducted with functional magnetic resonance imaging, it is observed that the behavior of loss aversion correlates with amygdala activity in response to losses relating to profits. Success in the regulation of loss aversion is also correlated with the reduction in amygdala responses to it, but not to profits. Moreover, the authors [15] note that the reconsideration strategy increases the reference activity in the dorsolateral and ventromedial prefrontal cortex and the striatum. The similarity of the neural circuit observed, when analyzed in emotional regulation, even though the tasks are different, serves as further evidence of the role of emotions in decision-making, and the power of reconsideration to change the value assessments and therefore the options.

Reference [2] points out that the processing of information is often excluded in other areas of the choice of options, such as emotions and values rationally allow some options to consider, but tends to shorten the deliberation. In the same vein, [6] exposes that the "emotion heuristic model" is a theory of how emotions influence and guide decision making. According to [6], emotions ease the integration of information on resolutions and decisions, providing a reasoning guide and prioritizing between goals. According to the authors, each individual is different emotionally, and has a different way of reacting to the stimulus, and different conditions. The heuristic



is a mental shortcut emotion, and emotion leads to knowledge and choice. Reference [5] argues that people have clear preferences on topics that are familiar, simple and straightforward "experienceable". This allows them to perform operations of trial and error, and justify the answers to decision-making as a matter of values, such as habits and traditions, so the study of preferences in decision-making is complex and variable. Reference [30] also highlights the importance of emotions on consumer behavior, especially in the post-purchase period, taking into account the degree of satisfaction depends on the ability to represent the emotional content of the experience of consumption.

Reference [7] considers that some important attributes are not used by a decision maker, unless it can be moved accurately to an emotional reference frame. It also proposes that positive emotions improve problem solving and decision making, leading to a flexible, innovative, creative, complete and efficient cognitive processing, and further believes that emotions play an important role in cognitive processes and great influence on the thoughts. He also claims that there is no evidence that people with positive emotions are reduced cognitive ability, and on the other hand, are more open, organized, and with clearer thoughts. The effects of these decisions are observed more in the important and interesting than those who are boring or unimportant decisions. The implication of the decision maker in this regard is crucial for their influence. In the same vein, also [28], consistent with [26], argues that emotions play an important role in human behavior. In this regard, researchers have been interested in their impact on decision making, even suggesting in some cases that most values are derived from the emotions [30]. According to [28], emotions or feelings are defined as physical or mental feelings of the decision maker with positive or negative, and influence the decision of two ways: making process (information processing) or structure (representation of the decision problem), i.e., the attractiveness of the information. Reference [28] suggests that somatic or affective markers accelerate decision with a sense of survival and saving energy. The reactions and emotional responses can accelerate the decision, but can also decelerate if the emotional reactions are in conflict with each other or with their cognitive components. Reference [23] believes that strict criteria for the decision of rationality in the way of consistency and coherence does not seem to be as important as in the practice of personal satisfaction. When the context changes, preferences change. Reference [18] suggests that the body uses emotional information when the decision-making process is significant, and minimizes its influence when it is not. Also [17] believes that making strategies deliberation historically been regarded as the safest form of effective decisions. However, recent evidence and theory suggest that affective strategies can be equally effective: it focuses on feelings instead of data do not take complex decisions of higher quality. These results suggest that emotional decision strategies can be more effective than rational deliberation strategies needed to make some tough decisions.

## V. CONCLUSION

As it has been noted in this research, since the beginning of the 80s, numerous publications presented emotions as essential elements for an adequate, productive and efficient decision making [19]-[22], [24], [25], [27], [29].

In the early eighties and the subsequent years, research articles that related emotions and the achievement of objectives in making began to appear in the most important journals of Marketing. The process of establish a start date when emotions are considered as useful in marketing, is complicated and controversial, due to the diversity of approaches. Intelligent behavior has a very strong unconscious component and is based on the management of images that can be visual, auditory, olfactory, etc. These images are not stored as we see or hear, but an approximate reconstruction is stored in the early sensory cortices of the brain, which acts as a model of neural firing of the main features of the image, and serves to identify it though is not complete. According to the hypothesis of the somatic marker, when it will make a decision for a moment is generated in the brain image of each possible option, and so feel the emotions that would occur in every situation, marking a positive or negative label. After this process, it could carry out a rational, or cost / benefit of each of the options analysis, but the presence of emotions in the process would be inevitable, and as mentioned, positive. This process of emotional labelling in decision making, could be consciously or even unconsciously, because the body can generate weaker images and evaluate also positively or negatively, producing attitudes of acceptance or rejection. This would be the scientific basis of intuition, considered and supported by a significant number of researchers.

In the following decades, researches have deepened in the study of the human brain, the hypothesis of the importance of unconscious processes in brain functioning has been highlighted by research in neuroscience, currently observing mental conscious processes only as the small tip of a large iceberg, in which 90-95% of the jobs run into unconsciousness.

The importance that today have the useful, reliable, systematic, fast, comprehensive and periodically data for proper decision-making in a business environment is contrasted would not be discussed under any circumstances. There is a need to reduce the risk leads firms to invest large financial amounts in studying the micro and macro-environment in detail, in order to meet consumer needs. However, traditional research techniques are able to dig into that amount of information, mainly emotional, that the client is unable to communicate because it is not aware of it.

There are projective methods, which come from the field of clinical psychology, which are able to learn about feelings and beliefs indirectly, and which are used to overcome the barriers of awareness, education and irrationality, by interpreting the behavior of others, completion of sentences, etc. [10].

Given the volume and importance of the information we're talking about, these techniques seem clearly insufficient, much more when the detail and reliability pursued should be maximized to make decisions for successful marketing, in

which the benefit is based and corporate survival. In this sense, companies increasingly turn their emotional communications products and seek the customer feel, live the brand, it relates to a more intense way. And of course, they must also find techniques to investigate the feelings of the target audience: Which are the feelings for the brand? How is the customer experience? Companies increasingly must have relationships with the emotions of the customer also as receivers, listening to that new emotional channel with reliability and detail.

When marketing and emotions join, they bring the possibility of investigating the market more fully and adequately, since it allows completely overcome the barrier of consciousness and examine the emotional processes consumer through based on neuroscience techniques such as functional magnetic resonance imaging, electroencephalogram, magnetoencephalogram, etc. [11].

Recent advances in brain-related knowledge detect addiction, pleasure, aversion, social relations and many other emotions directly reciprocated, present in all decision-making consumer areas.

The possibility of obtaining direct information using marketing and emotions measurement techniques, allows the client to perform their tasks purchasing, tanking decisions at the point of sale and allows the company to collect data and information about preferences, tastes and assessments by its main source: the brain.

The individual provides information that is not capable of being produced when unconsciously, as defined in the theory of the somatic marker. This brings the process of obtaining information much more to its authentic human nature, cerebral, that the use of consciousness to obtain it.

In any case, this is not the renunciation of classical research techniques, which can provide useful consciously on consumer behavior information [12]. When studying marketing and emotions together, the recent researches highlight the importance of emotions in all processes of decision making, but when it has full information on the company, the right choice would be the use of traditional techniques, such as focus group, questionnaires, projective techniques along with techniques that involves marketing and emotions, and detailed and getting inquire into the unconscious.

#### REFERENCES

- [1] Bagozzi, R.P., Gopinath, M. y Nyer, P.U. (1999). *The role of emotions in Marketing*. Journal of the Academic in Marketing Science. Spring. Pgs. 184-206.
- [2] Etzioni, A. (1988) *Normative-affective factors: toward a new decision-making model*. Journal of Economic-Psychology, vol 9, pp. 125-150.
- [3] Finucane M.L., Peters E. y Slovic P., (1988): *Judgment and decision making: the dance of affect and reason*. Emerging perspectives on Judgment and Decision Research. Cambridge University Press pp. 327-364.
- [4] Finucane M.L., Alhakami A., Slovic P. Y Johnson S.M. (2000): *The affect heuristic in Judgments of Risks and Benefits*. Journal of behavioral Decision making. Jan/Mar;13,1 pp. 1-17.
- [5] Fischhoff B., Slovic P. y Lichtenstein, S. (1988): *Knowing what you want: Measure labile values*. Cambridge University Press pp. 398-421.
- [6] Gupta R., Kosciak T., Bechara A., Tranel D. (2011). *The amygdala and decision-making*. Neuropsychologia 49 760-766.
- [7] Hsee, C.K. (1998). *Less is Better: when low-value options are valued more highly than high-value options*. Journal of Behavioral Decision Making. Vol 11, pp. 107-121.
- [8] Isen A.M., Labroo A.A., Durlach P., (2004). *An influence of product and brand name on positive affect: implicit and explicit measures*. Motivation and emotion, Vol 28, n°1, March pp. 43-63.
- [9] Jones C., Minati L., Harrison N., Ward J. y Critchley H. (2011). *Under Pressure: Response Urgency Modulates Striatal and Insula Activity during Decision-Making under Risk*. Plos one June 2011 Volume 6, Issue 6.
- [10] López, M. A. (2016). *The Functional Magnetic Resonance Imaging and the Consumer Behaviour: Reviewing Recent Research*. World Academy of Science, Engineering and Technology. Vol:10 No:04 2016
- [11] López, M. A. (2016). *The Role of Emotions in the Consumer: Theoretical Review and Analysis of Components*. World Academy of Science, Engineering and Technology, International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, 10(3), 890-894.
- [12] López, M. A., López, M. F. B., & Ayala, V. M. (2016). *Neuromarketing: Discovering the Somathyc Marker in the Consumers Brain*. World Academy of Science, Engineering and Technology, International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, 10(2), 503-509.
- [13] Mac Gregor Donald G., Slovic P., Drenan D. Y Berry M. (2000): *Imagery, affect and financial Judgment*. Journal of Psychology and financial Markets, Vol 1, n°2, pp. 104-110.
- [14] Mackie D. Y Worth L. (1989): *Processing deficits and the mediation of positive affect in persuasion*. Journal of personality and Social Psychology, 57, pp. 27-40.
- [15] Maddock R.J., Garrett A.S. y Buonocore M.H. (2003). *Posterior cingulate cortex activation by emotional words: fMRI evidence from a valence decision task*. Hum Brain Mapp; 18:30-41.
- [16] Martín M, y Delgado L. (2011). *The Influence of Emotion Regulation on Decision-making under Risk*. J Cogn Neurosci. September; 23(9): 2569-2581.
- [17] Mikel J., Maglio S., Reed A.y Kaplowitz L. (2011). *Should I Go with My Gut? Investigating the Benefits of Emotion-Focused Decision Making*. Emotion 2011, Vol. 11, No. 4, 743-753
- [18] Mitchell D. (2011). *The nexus between decision making and emotion regulation: A review of convergent neurocognitive substrates*. Behavioural Brain Research 217 (2011) 215-231
- [19] Morris J.S., Ohman A. y Dolan R.J. (1998). *Conscious and unconscious emotional learning in the human amygdala*. Nature, 393/6684 pp. 467-470.
- [20] O'Doherty, J., Kringelbach, M. L., Rolls, E. T., Hornak, J. y Andrews, C. (2001). *Abstract reward and punishment representations in the human orbitofrontal cortex*. Nature Neurosci. 4, 95-102.
- [21] Ongur D., Ferry A. T., Price J.L. (2003). *Architectonic subdivision of the human orbital and medial prefrontal cortex*. The Journal of Comparative Neurology. Vol 460, Issue3, 425-449.
- [22] Pessiglione, M., Seymour, B., Flandin, G., Dolan, R.J., y Frith, C.D. (2006). *Dopamine-dependent prediction errors underpin reward-seeking behaviour in humans*. Nature 442, 1042-1045.
- [23] Schneider J.A. y Barnes. L.L. (2003): *What do people really want? Goals and context in Decision Making*. Emerging perspectives on Judgment and Decision Research. Cambridge University Press pp. 394-427.
- [24] Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2007). *The affect heuristic*. European journal of operational research, 177(3), 1333-1352.
- [25] Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2004). *Risk as analysis and risk as feelings: Some thoughts about affect, reason, risk, and rationality*. Risk analysis, 24(2), 311-322.
- [26] Snell, R. (2005). *Clinical neuroanatomy for medical students* (6th ed). Lavoisier.
- [27] Sokol-Hessner P., Camerer C.F., Phelps E.A. (2012). *Emotion regulation reduces loss aversion and decreases amygdala responses to losses*. Social Cognitive and Affective Neuroscience Advance.
- [28] Svenson, O. (2003). *Values, affect and processes in Human Decision Making. A differentiation and consolidation theory perspective*. Emerging perspectives on Judgment and Decision Research. Cambridge University Press pp. 287-326.

- [29] Vrticka P., Sander D., Vuilleumier P., (2011). *Effects of emotion regulation strategy on brain responses to the valence and social content of visual scenes*. Neuropsychologia. 49 1067-1082.
- [30] Zajonc R. (1980): *Feeling and thinking: Preferences need no inferences*. American Psychologist, 35, pp. 151-175.