VALENCES IN VOTERS' EMOTIONAL RESPONSE: EXPERIMENTAL DESIGN WITH NEUROSCIENCE

Valências na resposta emocional dos eleitores: design experimental com neurociência

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ABSTRACT

This work aims to quantitatively and qualitatively evaluate the valence of voters' emotional response to changes in the scenarios in videos of political propaganda. The experiment was conducted in a laboratory with a fictitious candidate and content. We used four different scenarios: one with a completely white background, one simulating a library, one with a popular house, and one with luxury houses. We use the Facial Action Coding System (FACS) as an instrument to measure emotions. We found statistical differences between the intensity of the valences throughout the video (n=108). The work empirically demonstrated that the scenarios can enhance the emotional effects of this type of advertising.

Keywords: Facial expression. Emotion. Political advertising. Non-textual elements. Neurosciences.

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RESUMO

Este trabalho tem como objetivo avaliar quantitativa e qualitativamente a valência da resposta emocional dos eleitores às alterações dos cenários nos vídeos de propaganda política. O experimento foi conduzido em laboratório com um candidato e conteúdo fictícios. Utilizamos quatro cenários diferentes: um cenário com fundo completamente branco, um simulando uma biblioteca, um com casa popular e outro com casas de luxo. Utilizamos o Sistema de Codificação de Ação Facial (FACS) como um instrumento para medir emoções. Encontramos diferenças estatísticas entre a intensidade das valências ao longo do vídeo (n = 108). O trabalho permitiu a demonstração empírica de que os cenários podem potencializar os efeitos emocionais desse tipo de publicidade.

Palavras-chave: *Expressão facial. Emoção. Publicidade política. Elementos não textuais. Neurociências.*

1 INTRODUCTION

It is widely known that electoral strategists make use of various resources to stimulate the electorate. Among the many resources available, videos have stood out – mainly after the internet became universally accessible, allowing users to freely and widely share videos, as compared to the audience and costs of television. Authors like PARK, C. and THORSON, E. (1990), among several others, are already studying the impact of television commercials in order to understand the behavior of consumer proxies. However, much of the work on commercial advertisements on television addresses the tone or content of the argument. As highlighted by DAIGNAULT et al. (2011), audiovisual elements may contain properties whose purpose is to increase credibility and liveliness, and even make the advertisement more convincing.

In this study, we quantitatively and qualitatively looked into the question of whether the scenarios in which the candidates are presented alter the response of the valences (basic emotions) of the prospective voters who watched different political advisement videos. Facial expressions were used as indicators of emotional response. Such expressions were analyzed using the Facial Action Coding System (FACS).

The choice of explanatory variables of a biological nature, still little used by the applied social sciences, stemmed from the fact that they are extremely accurate. The measures of emotion emanating from the autonomous central nervous system (SNCA) are also comparable, as long as the autonomic responses eliminate the subjectivity implicit in the individual interpretation of emotional sensations.

In this work, due to the ease of controlling external variables, we chose to compare the different emotional valences found among individuals who watched political propaganda videos, whose only difference was the scenario in which the candidate presented himself. Authors such as DUMITRESCU et al. (2015) have pointed out that non-verbal information is the most important in electoral environments—that is, non-verbal communication influences voters' perceptions and interferes with eligibility.

REDLAWSK and PIERCE (2017) highlight that research on emotion in political behavior is fragmented primarily into two approaches. The first, called the dimensional approach, employs a dimensional conceptualization of emotion, in which the key property of interest is the valence – positive or negative – of someone's emotional state (Lavine, Johnston, 2012; Lodge, Taber, 2013). The second approach focuses on discrete affective reactions, such as anger, anxiety, and fear (Brader, 2005; Stewart & Svetieva, 2017). It is important to highlight that this paper's objective is not to analyze our data in light of any of the theoretical approaches that explain electoral behavior. As a result, we chose to discuss the results of the valences, as do theorists who adopt the dimensional approach to emotions in political behavior.

2 LITERATURE REVIEW

Until the end of the 1990s, much of the literature about the impact of advertising (whether commercial or political) on emotions addressed the phenomenon in an intangible way, the measure of which was provided by the response of the investigated individuals.

Considering that cognitive and emotional elements play a decisive role in human interactions and social processes, understanding how these aspects act in/influence the processes involving the voting decision of a voter or consumer becomes an issue of fundamental importance in the study of behavior.

It is from the end of the 1990s, but especially from the 2000s onward, that authors such as BECHARA et al. (2000), LOEWENSTEIN; LERNER (2003), NAQVI et al. (2006), and ZEELENBERG et al. (2008), among others, started describing the role of emotions and the respective cortical processes involved in decision-making.

In this sense, it is increasingly clear that it is not possible, through the traditional methods of the social sciences, to understand and evaluate emotional aspects and their relationship with rational and emotional cognitive aspects and the contributions of subconscious factors involved in electoral buying behavior and people's communication (OHME et al., 2009). Therefore, in the authors' opinion, neurophysiological measures seem to be an objective supplement for the analysis of declarative data characteristic of the social sciences.

2.1 Emotions: Phenomenon or construct?

Since the work of DAMÁSIO (2005), it has become clear that reason and emotion are inextricably linked in decision-making processes. According to the author, the Western-coined dichotomy between reason and emotion is non-existent from the point of view of the biological processes that participate in decision-making. The author says that what goes on in the brain is mental operations; this influences the body in the same way that the body influences mental operations.

However, there is still no consensus in the social sciences regarding what emotions are. As pointed out by SCHERER (2005), the social sciences have enormous difficulty building consensus on constructs that are common sense, and the attempt to arbitrate concepts can jeopardize the empirical progress of knowledge to the extent that the discourses can halt the advances. However, according to the author, the advancement of interdisciplinary studies around the role of affective phenomena requires the construction of minimal consensus. EKMAN et al. (1982) and BELZUNG (2007) go in the same direction and point to the absence of a definition of what is an emotion.

However, when examining the recent literature, we found several authors (BELZUNG, 2007; EKMAN, 2011; JOHNSTON; OLSON, 2015, among others) who point in the same direction. In general, contemporary literature has not even built a certain consensus around the definition presented by EKMAN (2011). According to the author:

> emotion is a process, a specific type of automatic assessment, influenced by our evolutionary and personal past, in which we feel that something important to our well-being is happening and a set of physiological changes and emotional behaviors influence the situation. (EKMAN, 2011 p. 31)

From this definition, it is possible to distinguish emotions and feelings. According to BELZUNG (2007), emotions are phenomena whose responses are triggered by environmental stimuli (external to individuals). Feelings, on the other hand, designate a subjective component

of emotion and do not refer to behavioral and physiological components. According to DAMÁSIO (2004), feelings would be the perception of a state of the body as well as the perception of a certain way of thinking about certain themes.

In this sense, DAMÁSIO (2004) distinguishes between primary and secondary emotions and the feelings associated with them. According to the author, primary emotions would involve innate dispositions to respond to certain classes of stimuli and would be controlled by the limbic system. Secondary emotions would be those that are learned and that incorporate the categorizations of representations we make of stimuli, based on responses to past experiences that we evaluate as good or bad.

Thus, basic emotions would be an exclusive response of the autonomic nervous system. The second type of emotion would be produced by the association of primary memories with the memory. Feelings, on the other hand, would be the products of the experience of primary and secondary emotions associated with mental images of the situation.

As EKMAN (2011) points out, the main function of emotions is to prepare ourselves to deal with important events without having to think about what to do. This is because, according to the author, we have also developed automatic tracking mechanisms in the environment. These automatic mechanisms are activated by emotional triggers— that is, phenomena that trigger responses that aim to guarantee our well-being.

Because basic emotions are responses of the autonomic nervous system, they are not influenced by people's memory or experience, which makes them universal.

2.2 Facial expressions of emotion

The reflection on facial expressions and their respective meanings is not recent. In 1872, the work "The Expression of the Emotions in Man and Animals", by Charles Darwin, pointed, for the first time, to facial expressions as an element of human evolution and correlated these expressions with psychological processes.

In a classic study in the early 1970s, EKMAN; FRIESSEN (2013co), carried out a cross-cultural investigation showing that people could recognize emotion in other people's facial behavior. The study also showed that culturally distinct peoples, including pre-literate cultures, agreed that a basic set of prototypical facial expressions was associated with certain emotions.

Throughout the 1960s, the authors exhibited photographs of facial expressions of emotion to individuals from different parts of the world (New Guinea, Borneo, Brazil, and Japan). The results of the experiment showed high levels of identification of emotions. Ninety-seven percent of the participants identified happy, for example. Although the results were different in each region studied, and also different for each emotion, the authors pointed out that six basic emotions (happy, sadness, anger, fear, surprise, and disgusted or contempt) are cross-culturally identified.

TABLE 1: SOME OF THE RESULTS FOUND IN THE EXPERIMENT CARRIED OUT BY Ekman and Friesen (1971). Adapted from Paul Ekman et al. (2013)

Emotion	Japan	Brazil	Chile	Argentina	US
Happy	87	97	90	94	97
Fear	71	77	78	68	88
Surprise	87	82	88	93	91
Anger	63	82	76	72	69
Disgusted / Contempt[1]	82	86	85	79	82
Sad	74	82	90	85	73
nº of individuals	29	40	119	168	99

In a later work, EKMAN et al. (1983) studied six emotions (surprise, disgust, sadness, anger, fear, and happiness) caused by two tasks (direct facial action and recollected emotion). During both tasks, facial behavior was recorded on videotape and five physiological measurements were taken at each second: (1) heart rate, (2) left and right hand temperatures, (3) conductance of the skin, and (4) flexor or forearm muscle tension. By combining the results of the two tasks, the authors demonstrated evidence of differences in ANS physiological responses between four negative emotions: In the directed facial action task, repulsion was differentiated from fear and sadness, while in the task of revived emotion, anger was different from fear and sadness was different from heartbreak. Besides this evidence, the authors demonstrated that anger and fear, despite having similar increases in heart rate, differed in peripheral vascular function.

Furthermore, the authors found evidence that facial muscle contractions at the time of each emotion occurred through specific autonomic activity for each of these emotions. Although the process by which autonomic muscle contraction took place was not yet clear at the time of the finding, the authors postulated, in light of the available literature, that this could occur both through peripheral feedback on facial movements and through a direct connection between the motor cortex and the hypothalamus, which translates the prototypical expression of emotion on the face and the specific pattern of emotion in the SNA.

The works of the authors allowed the elucidation of several issues related to facial expression. In a review by EKMAN; OSTER (2013), the authors describe studies which demonstrate that: a) observers identify certain facial expressions of emotion in the same way, regardless of culture, and b) members of different cultures show the same facial expressions when they experience the same emotion unless specific culture rules interfere.

EKMAN; OSTER (2013) also point to other evidence regarding the development of facial expressions of emotion. According to them, several studies have shown that: (1) the facial musculature is complete and functional at birth, (2) facial expressions similar to those of adults are already present in early childhood, (3) children aged three to four months show different responses to facial expressions, (4) the imitation of some facial movements is possible even in very young children, (5) kindergarten children know what the most common facial expressions are, what they mean, and what types of situations they usually cause, and (6) facial expression plays an important role in the development of social communication.

2.3 The objectivity of the measures of basic emotions in the human face

From the findings mentioned above, EKMAN; FRIESEN (2002) developed a human face coding system. The Facial Action Coding System (FACS) was developed for use in measuring all visible facial behavior in any context, not just actions related to emotion. From the point of view of its structure, the FACS is an anatomically based facial measurement system that measures all visually discernable facial movements. The FACS describes all facial activity visibly distinguishable based on 44 unique units of action (AUs), as well as various categories of positions and movements of the head and eyes (EKMAN; ROSENBERG, 2005).

As pointed out by STEIMER-KRAUSE et al. (2005, 2012), Friesen and Ekman established a set of "event rules" to build the EMFACS[1]. These rules allow the observer to register facial expressions within a continuous flow of behavior that is part of an "event" as an expression of affection. The observer decides whether two AUs are part of the same event or represent two different emotional events in a hierarchy of conditions. In this context, the minimum requirements are established in relation to the temporal overlap of the AUs, the maximum intervals between the beginning of the innervations, and fluctuations in the intensity of the innervation.

2.4 Facial emotion expressions in works on political behavior

There are recurring demonstrations in the literature of the applicability and safety of the coding of emotions of the FACS. In recent years, several works have used facial expressions of emotion as explanatory variables for the analysis of political or electoral behavior.

LITTLE et al. (2007) have demonstrated that differences in facial expressions between candidates can predict who wins and who loses in an election. Furthermore, in the context that the voter makes this kind of choice (whether war or peace, for example) facial expressions do impact who receives more votes. The authors highlight the role of the face in electoral behavior and the role of personal attributions in facial perception. They also show that there are no general features of faces that cause candidates to win votes, demonstrating that facial features and information about the environment interact in determining the choice of candidate.

Using a facial discrimination task, designed to measure perceptions of threat (versus non-threat) and dominance (versus submission), VIGIL (2008) showed that Republicans have a greater tendency to interpret ambiguous facial stimuli as more threatening and more dominant expressions than Democrats. The findings suggest that political ideology may be associated with basic social perceptual sensitivities.

POUTVAARA et al. (2009) demonstrated that competent-looking political candidates do better in U.S. elections and that babyfaced individuals are generally seen as less competent than mature individuals. According to the authors, being babyfaced is negatively related to the competence inferred in politics. Despite this, depending on the sample of candidates, babyfacedness is not directly related to electoral success.

MA; LUO (2013) explored automated emotion recognition techniques through facial expressions in photos during elections. Then they used a trained robot to recognize the feeling of facial expressions. Three types of feelings that are of primary interest were examined: flattering, neutral, and unflattering. The authors concluded that the method used is sufficiently effective for analyzing the facial expression of images of candidates for election and, therefore, could also be used to assess public opinion during an election.

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1 The EMFACS is the tool that brings together all the facial events that make it possible to identify emotions through the face.

MCDUFF et al. (2015) analyzed the electors' facial responses to electoral debates in the U.S., automatically measured by the Internet. The authors showed that significantly different responses can be detected from viewers with different political preferences. The authors also showed that similar expressions, at significant moments, can have very different meanings depending on the actions taken later. The authors tested a method for predicting voters' preference, regardless of their declaration, based on automatically measured facial responses and the viewers' self-declared preferences. The results showed that it was possible to correctly identify the voter's preference with an average accuracy above 73%.

HERRMANN; SHIKANO, (2015) showed evidence that voters can infer candidates' political orientations through their faces. The authors observed voters making errors of judgment, attributing their own political opinions to attractive or competent-looking candidates. The results also suggest that being good-looking can help extremist candidates present themselves as more moderate.

DUMITRESCU et al. (2015) demonstrated that although both the aspects related to the quality of the message and non-verbal communication can influence voters' perception of a candidate, the non-verbal communicative elements have a more significant role in eligibility.

SHIN; BAEK (2015) demonstrated that in an environment marked by the presence of sadness and anger, due to a great social commotion, there is a change in voter behavior. According to the authors, anger provoked a tendency toward rapprochement between independent voters and supporters of the opposition. Sadness, on the other hand, triggered a tendency to bring independent voters and supporters of the ruling party closer together. At the same time, the authors observed a negative association with the tendency to avoid action (withdrawal/polarization) among supporters of opposing parties.

STEWART; SVETIEVA (2017) examined the impact of Donald Trump's non-verbal demonstrations of emotion on how viewers assessed his key competence and reliability leadership traits. The measures were taken three weeks before the election and four days before the election. The influence of Trump's fear micro-expressions during his speech, accepting the nomination of the Republican National Convention, was experimentally tested. The results of the sample collected three weeks before the elections indicated that these micro-expressions (of fear) had generally positive effects for Trump's assessments, particularly when viewers were first exposed to his opponent, Hillary Clinton. However, the sample collected four days before the election suggested that the participants had largely established their perceptions of these traits (competent leadership and reliability). The study shows the importance, in highly polarized elections, of non-verbal elements in determining perceptions of the candidates' competence.

The works presented here serve to briefly illustrate the growing importance of the measurement of emotions through facial expressions in academic research related to voter behavior.

3 MATERIALS AND METHODS

This study was carried out in a single experiment. We chose to conduct it in the laboratory—thus, with controlled environmental conditions, a fictitious candidate, and voters selected by accessibility.

In the applied experiment, the independent variables consisted of the four scenarios applied to the video recorded with the candidate (fictional). The scenarios were: (1) a white background, (2) a library, (3) a popular house, and (4) a luxury one. The dependent variable of the experiment was the facial expressions (and their respective valences) of the test units.

In a reserved room in the library of the Senac Minas Faculty, a computer with a 22-inch screen, earphone, and internet connection was installed. The equipment was arranged in such

a way as to not allow the test unit to divert his/her attention throughout the experiment (see Figure 1).
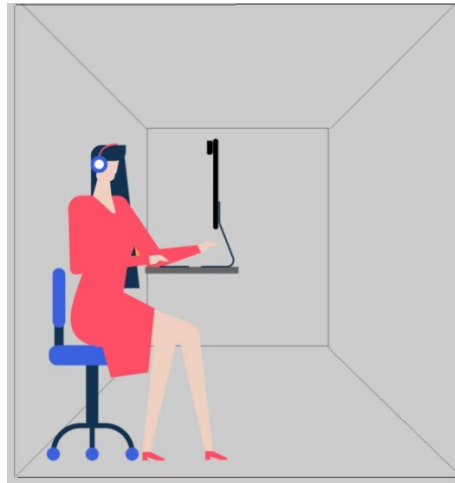

Figure 1: PROJECTION ROOM SCHEME USED FOR PILOT EXPERIMENT DATA COLLECTION.

Procedures
Preparatory steps
Recording videos with the candidate

A male actor was used. He had never been a political candidate or participated in any mass advertising campaign or TV programs. The actor recorded a 30-second political commercial. The text of the commercial is available in Appendix 1. The recording took place against a suitable background for the subsequent application of the scenarios, as detailed below, thus retaining the content of the message.

Video editing

The backgrounds of the recordings were edited in order to incorporate the four different scenarios: the white background, the library, the popular house, and the luxury house. These scenarios were arbitrarily defined. Figure 2 illustrates the video editions with the respective scenarios included.

Figure 2: IMAGES OF THE CANDIDATE WITH THE TREATMENTS USED IN THE EXPERIMENT. FROM RIGHT TO LEFT AND FROM TOP TO BOTTOM, THE IMAGES REPRESENT, RESPECTIVELY, THE WHITE, THE LIBRARY, THE POPULAR HOUSE, AND THE LUXURY HOUSE SCENARIOS.

3.1 The development of an online platform for data collection

An online platform for data collection was developed. The data collection system was developed on a web platform to replicate the experiment without geographical limitations. The platform is hosted at the following address on the World Wide Web: https://afip.iops.com.br/.

3.2 Data collection and treatment

The prospective voters were selected, randomly, among students of the Administration and Accounting Sciences courses at Faculdade Senac Minas located in Contagem, Minas Gerais[2].
Prospective voters watched only one of the edited videos (the video watched was randomly selected). While the video was played, images of the voter's face were recorded using an HD camera.
The recording of voter images using the Web platform (developed exclusively for this purpose) facilitated the synchronized marking between what the individual saw and his expression, as well as the collection of information resulting from his preferences, thus facilitating a subsequent comparative analysis between the explored variables.

3.3 Image analysis

The images were analyzed by the FaceReader® software. The results were exported to spreadsheets so that we could proceed to the statistical treatment[3].

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2 The students had the following characteristics: a) aged between 18 and 55 years, b) a maximum monthly income of five minimum wages and, c) residents of the Metropolitan Region of Belo Horizonte. Participation was voluntary and disclosure was made verbally by the faculty in their classes.
3 To analyze the valences over time, the Wilcox test (HOLLANDER; WOLFE, 1999) was used. The software used in the analyses was R (version 3.5.1).

4 RESULTS

Images of 108 individuals were considered. The groups of scenarios tested had the following configuration: white 24, popular home 28, luxury home 26, and library 30 individuals.

We performed a temporal analysis of the valences throughout the video. For better performance of this comparison, the time was divided into three segments: from 00:00:00 to 00:00.10.533, from 00:00:10.600 to 00:00:21.200, and from 00:0021.266 to 00:00:31,666. It should be noted that there is a statistically significant difference between the scenarios studied when the p-value found is less than 0.05. Table 2 shows the P values for the mean values in each of the analyzed sections of the video.

TABLE 2: COMPARISON OF THE VALUES OF P BETWEEN THE TESTED SCENARIOS

| | | 00:00:00 - 00:00:10.533 | | | 00:00:10.600 - 00:00:21.200 | | | 00:0021.266 - 00:00:31.666 | | |
		Library	White	Luxurious	Library	White	Luxurious	Library	White	Luxurious
Valence	Library	-	-	-	-	-	-	-	-	-
	White	<0,001	-	-	<0,001	-	-	<0,001	-	-
	Luxurious	<0,001	<0,001	-	<0,001	<0,001	-	<0,001	<0,001	-
	Popular	0,119	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001

4.1 Segment 1: Time 00:00:00 - 00:00:10.533

In this excerpt, the candidate says the following text: "We need to transform our country into a better place. This requires political will and candidates with a history of life committed to work and honesty."

In this excerpt from the video, we found a statistically significant difference (p-value <0.05) in the valence of emotions ("Valence") among all groups, with the popular house group presenting the highest valence average, followed by the measures obtained in tests with the library, white, and luxury house settings, respectively.

In Figure 3, it can be seen that the average values of the valence, in this first excerpt of the video, among the individuals who watched the video with a luxury house setting and a white setting is noticeably lower than the others. It is important to note that higher valences involve a higher intensity of positive emotion (happy) and a lower intensity of other emotions (negative). Therefore, in this case, there is a more pronounced presence of negative emotions in the luxury house and white scenarios. If we consider that valences are a relevant indicator of the presence of emotions, we can infer that we will find significant differences between negative emotions in this same excerpt.
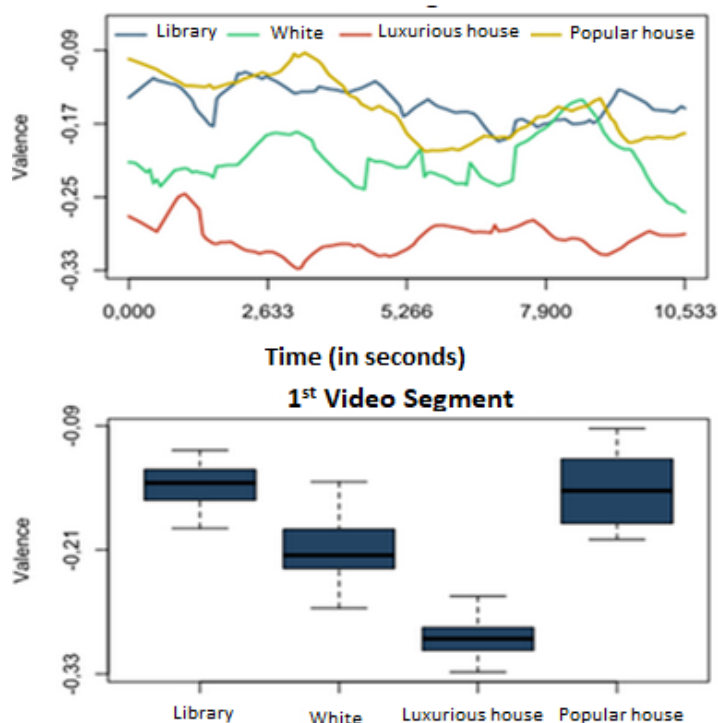
Figure 3: VALIDITY INTENSITY DISTRIBUTION IN THE FIRST VIDEO SEGMENT.

4.2 Segment 2: Time 00:00:10.600 - 00:00:21.200

In this excerpt, the candidate says the following text: "I have been working for many years defending the rights of the citizen and the well-being of countless families. Your life will improve."

Valence intent measures ("Valence") obtained for this part of the video showed a statistically significant difference (p-value <0.05) among all groups, with the library group having the highest average, followed by the groups: popular house, white, and luxury house, respectively. Like the findings of the previous segment, these data pointed in the direction of corroborating the central hypothesis of this work: that the scenarios over which political messages are transmitted alter the voter's receptiveness. It is important to note that higher valences involve a greater intensity of positive emotion, (happy) and a lower intensity of other emotions (negative). Note that in this second excerpt, the values obtained in the analysis of the groups of individuals who watched the video with the library scenario were greater than the values obtained by examining the group of individuals who watched the video in which the scenario was a popular house. However, so far, the data show that these two scenarios (library and popular house) stimulate more positive emotional responses.
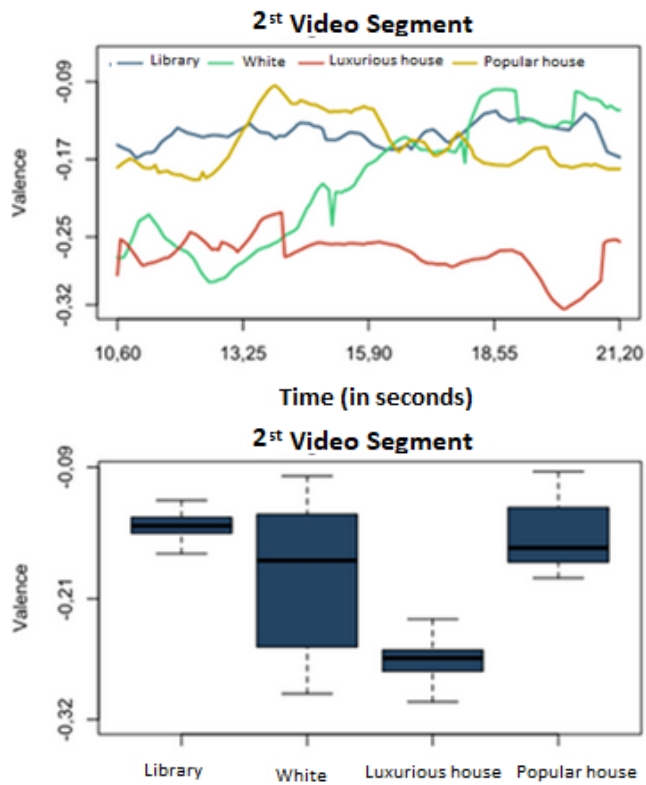
Figure 4: VALIDITY INTENSITY IN THE SECOND SECTION OF THE VIDEO.

4.3 Segment 3: Time 00:0021.266 - 00:00:31.666

In the third video segment, the candidate says the following text: "Have confidence. My party and I know the situation and we know what needs to be done. What we want is to contribute to the construction of a more just society."

We found a significant difference (p-value <0.05) for the valence ("Valence") between all the tested scenarios. The individuals who watched the video with the white scenario presented the highest average, followed by the individuals who watched the videos with the library, popular house, and luxury house scenarios, respectively.
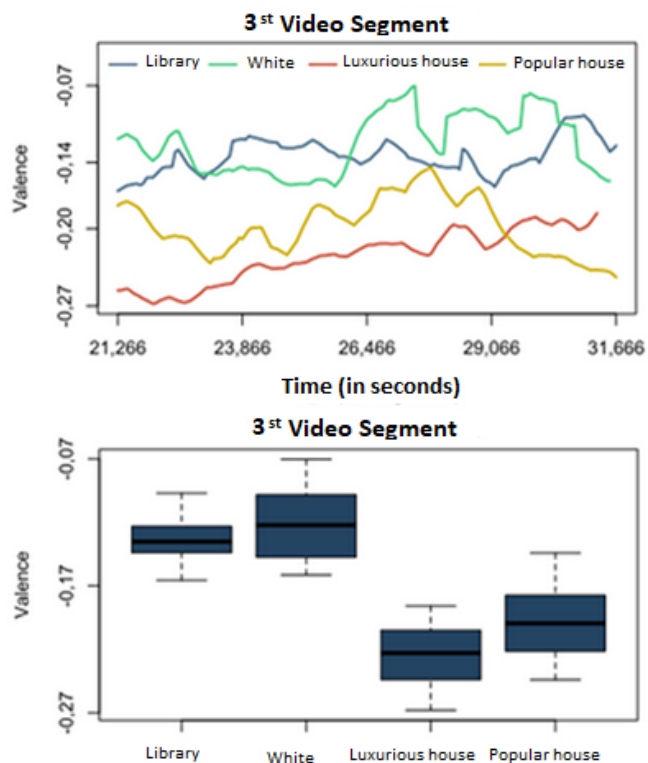
Figure 5: VALIDITY INTENSITIES FOR THE THIRD VIDEO SEGMENT

The results presented here suggest that, in fact, the insertion of audiovisual elements into the political message alters the perception of its content, changing voters' emotional response to this advertisement, as BRADER (2005) and DAIGNAULT et al. (2011) have suggested.

5 DISCUSSION

As already mentioned in previous sections, traditionally, the approach to emotions in the study of political or electoral behavior is based on self-reports of emotional states, which requires the use of memory. Some authors, such as ROBINSON, M. D.; CLORE (2002), have demonstrated that retrospective assessments of previous emotional states can be influenced by particular traits or current emotional states.

The data collected in this work do not originate from self-reports. They were collected through the facial expressions of emotion at the exact moment at which the voters were presented with the propaganda, completely eliminating the interferences in the emotional responses reported in the literature.

As we may observe, the voters' responses to the videos express different valences according to the scenario, both qualitatively and quantitatively. The extent of the data collected has not yet allowed us to analyze these values in light of positive emotions and the most intense negative emotions for each scenario.

It is possible to assume that the video with a popular house scenario—which presented statistically higher average values than the others—produced a more positive emotional response than the other tested scenarios.

The trends in the curves of each scenario also make it very clear that the individuals who watched the video with a luxury house scenario showed a lower valence than all the other

individuals throughout the video. This implies that the difference between the happy emotion and the negative emotion of greater intensity has lower values for those who watched the video with a luxury house setting than the others.

If we consider the previous contributions by Bechara et al. (2000) and A. R. Damásio (2005), that positive emotions play an important role in decision-making processes, we can believe that our findings indicate that these differences in valence must have a direct implication in the expected reaction to a video of this kind. To the extent that the video with a luxury house setting has lower values, it is expected that its contribution to the decision-making process does not contribute to the choice of the candidate.

It is important to be clear that it is not the aim of this paper to determine whether or not voters would vote for this candidate. Complex decision-making involves countless other cognitive (memory and emotional state, among others) and environmental elements that have not even been verified.

The data analyzed in this work allow us to infer that, in fact, the scenarios play a role in the viewer's perception.

The options we have implemented to control the external variables that involve the emotional response imposed on us several limitations regarding the conclusions of this work. We chose to work with data collection in the laboratory in order to match all environmental and technological conditions experienced by all tested individuals. This measure ended up restricting the participants of the experiment, as it is practically impossible to build a laboratory with identical conditions in different locations.

Similarly, we chose to build fictitious political propaganda. The actor/candidate had never participated in any election campaign or any radio and TV advertising. The text was constructed randomly, incorporating elements of political-oriented propaganda from the left as well as from the center and right. The option for this strategy served to eliminate the memory variable, either on the part of the candidate or on the part of the content—that is, on the part of any partisan connection. Thus, the data we collect concern only the population examined and do not serve as a reference for analyzing any electoral behavior of the population in general.

The restricted sample size (n=117) caused the standard deviation values to be very large, significantly decreasing the number of differences identified. Still, the distribution of the averages we presented gave us indications that the differences between the intensities of emotions are present beyond what we were able to demonstrate.

Another important limitation concerns the software's own limitations (FaceReader®). Limits to the covered face (by the hands), glasses with more robust frames, and skin color (black individuals showed high rates of poor-quality image in the software) meant that several collected data had to be discarded due to the software's inability to read the AUs.

The limited amount of data did not allow us to assess the dimension examined by studies that focus on discrete affective reactions, such as anger, anxiety, or fear (Brader, 2005; Stewart & Svetieva, 2017). Nevertheless, this is an ongoing analysis process.

SUGGESTIONS FOR NEW RESEARCH

As we have pointed out, the data that we have collected can still be much more greatly explored. We believe that we can use other models of statistical analysis to try to explore more meanings.

There are still new challenges ahead of us. How much do these scenarios interfere with the emotional response of real political propaganda? As presented in the discussion of the litera-

ture, we already know that the tone of voice, the shape of the face, and, now, the scenario interfere in the emotional response of political propaganda. Do songs interfere? Is there a difference in emotional response between a radio advertisement and a video?

Another question that concerns us is how these scenarios act to modify the voter's emotional response. Do the points of attention change according to the scenario? In this respect, the use of investigation techniques using eye tracing is essential.

Assessing the correlation between implicit attitudes and these scenarios is also placed on the horizon of investigation. This correlation can show us how much of our memory (and, why not our heuristics?) interferes in these choices from our system of beliefs.

Finally, the application of a similar experiment in a real election environment, in which the voter is immersed in a campaign environment, presents itself as a relevant issue. In these situations, how are the scenarios important?

The challenges that arise in political communication are challenges that transcend the interest of a single discipline. Given the delimitation we have made in this work, we chose to explore the work carried out in the field of neuroscience. However, it is essential to transcend the disciplinary fields, so that we can truly understand the role of political communication in our decisions.

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APPENDIXES

Appendix 1

Text of a recorded message by the author

We need to make our country a better place. This requires political will and candidates with a history of life committed to work and honesty. I have worked for many years defending the rights of the citizen and the well-being of countless families. Your life will improve. Have confidence. My party and I know the situation and we know what needs to be done. What we want is to contribute to the construction of a more just society.

Contribution of authors

Contribution	[Author 1]	[Author 2]	[Author 3]
1. Definition of research problem	√	√	√
2. Development of hypotheses or research questions (empirical studies)	√	√	√
3. Development of theoretical propositions (theoretical work)	√		
4. Theoretical foundation / Literature review	√		
5. Definition of methodological procedures	√	√	√
6. Data collection	√		
7. Statistical analysis	√		√
8. Analysis and interpretation of data	√		√
9. Critical revision of the manuscript			√
10. Manuscript writing	√		
11. Other (please specify)			