# Attitudes and Gazes from Graffiti

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**Abstract**

Place-making is the process of building a 'place' through relationships, practices, and representations of meanings of a varied nature and with the participation of different actors. These actors play different roles as neighbours, producers, recipients, passersby and visitors. Place-making includes all these actors in their relationship with that 'place' and in their interrelationships, practices and in the processes of construction of meaning. Within the stimuli from which people build a sense of a place are the semiotic products that are on the street, for example, commercial signs, advertising, graffiti and urban art. In 2018, we began a project to archive and analyse the semiotic landscape of neighbourhoods in Costa Rica and Chile. Based on this work, two specific aspects caught our attention: people's attitudes and semiotic competence regarding graffiti and street art. We understand semiotic attitudes as an evaluative mental disposition towards the representation of a semiotic object, particularly tags, throw-ups and pieces. This evaluative mental disposition can guide the acts and reactions of people towards those objects and spaces. Semiotic competence is conceptualised as the ability to produce and understand different semiotic products. In the case of this work, we focus on the gaze of throw-ups and the recognition of graphemes. For this paper, we present the preliminary results of two specific objectives of the research that we are developing: first, determining the semiotic attitudes of international and Costa Rican people regarding tags and throw-ups; second, identifying the reading routes and the recognition of graphemes in pieces in people outside the environment of graffiti and hip-hop culture. For the first objective, focus groups were held in Costa Rica with Costa Ricans and Germany with individuals of different nationalities. These focus groups were transcribed and analysed using the appraisal theory of linguistics. For the second objective, an eye tracker experiment was designed to record eye movements and responses regarding the graphemes of the graffiti. The partial results show people's negative attitudes towards tags and throw-ups, as well as different reading patterns in the eye tracker between those who identified graphemes and those who did not.

**Keywords**

Appraisal; Attitudes; Eye tracking; Gazes; Graffiti

## 1. Introduction

The semiotic landscape of cities is composed of different texts, such as commercial or institutional signage, shop windows, and graffiti. The latter are stimuli perceived by people who live, work, or walk through the city. They activate and generate representations in their minds, which determine people's attitudes, evaluations, and practices. Precisely, our objectives are: first, identifying how individuals react to tags and throw-ups, which we call here semiotic attitudes, and second, determining, through eye tracking, whether there are different reading patterns in the process of identifying graphemes in pieces[1].

1 Part of this study is inserted in the project Development of Reading Comprehension of Multimodal and Multimedia Texts in Highschool in Costa Rica, financed by the *Espacio de Estudios Avanzados* of the University of Costa Rica.

In the project *Linguistic landscape of urban neighborhood and its perception in people*[2], after photographing commercial signage and graffiti in public spaces in neighbourhoods of San José, Costa Rica, and Santiago, Chile, we noted that there was a higher amount of graffiti in a wealthy neighbourhood in San José (Escalante) compared to a less wealthy (Desamparados). Based on this observation, we created an online questionnaire with images from the neighbourhoods, asking participants to indicate their level of agreement or disagreement with statements about the public spaces where the graffiti and commercial signage were located.

After analysing the results obtained from the questionnaire, we executed focus groups in Costa Rica (with Costa Rican participants) and Germany (with international participants) to identify the semiotic attitudes and evaluations of the individuals (for more details, see Section 3). The relevance lies in understanding the attitudes that are components of the place-making process in urban spaces. Furthermore, they reveal the evaluations and representations, including stereotypes, that individuals hold about the urban space, graffiti artists, and the graffiti itself. Within the results of these focus groups, there were aesthetic appreciations of the graffiti and assessments of the capabilities of graffiti artists. This led us to question whether there was a multimodal literacy (skills to produce and comprehend multimodal texts) among individuals, specifically regarding the perception and understanding of graffiti.

To answer that question, we developed an experiment that was implemented using an eye tracker, with the purpose of exploratively observing reading patterns when tasked with recognising graphemes (letters) in graffiti pieces of varying levels of difficulty (see Section 3). Reading patterns were determined by the number and duration of fixations, as well as the frequency of regressions (backward eye movements) for each grapheme. Informants were recruited from two groups: art students and students from other disciplines.

In the following sections, we first present the results regarding the semiotic attitudes towards the tags and throw-ups from the online questionnaire and the focus groups. Second, we provide partial results obtained from the reading patterns of art students and students from other disciplines, as well as those who correctly identified the graphemes and those who did not.

## 2. Theoretical Brushstroke

### 2.1. Urban Linguistics, Attitudes and Appraisal Theory

*Urban linguistics* is a research approach that investigates the linguistic expressions (e.g., road signs, street names, place names, advertising billboards, commercial shop signs, public signs on government buildings and language variations in the city), which have traditionally been their main focus, in the urban landscape (e.g., Franco Rodriguez, 2013; Gorter, 2006; Landry & Bourhis, 1997; Pickenhayn, 2007; Pons Rodríguez, 2012; Shohamy et al., 2010). However, for this investigation, we consider the multimodality[3] (Bateman, 2008; Kress & van Leeuwen, 2001) of the semiotic landscape, which we define as any communicative or artistic expression (produced by individuals or public or private entities) arranged in public areas, intended to be perceived by passersby. An important concept within urban linguistics is *place-making* (Busse & Warnke, 2015): the process of constructing a place through relationships, practices and representations of meaning, which are varied in nature and serve as a space for the interaction of different actors.

From the above, we are interested in the construction of meaning and attitudes of people outside a neighbourhood based on specific semiotic expressions: graffiti. We understand the attitudes as an evaluative mental disposition towards a psychological object (Ajzen, 2001; Oskamp & Schultz, 2005). In other words, attitudes are evaluations that can determine our actions and reactions towards *attitude objects* (i.e., groups of people, spaces, situations, ideas, and actions) (Oskamp & Schultz, 2005). For this research, we propose using a broader concept than linguistic attitudes (McKenzie & McNeill, 2023), *semiotic attitudes* (Klinkenberg, 2006), which encompasses all evaluative dispositions generated from a semiotic realisation. We focus on the attitudes generated when observing the public space, from

2 This project is coordinated by Adrián Vergara-Heidke and the participants are: Valentina Tretti-Beckles and Héctor Morales-Gutiérrez.

3 The multimodal approach differentiates from traditional urban linguistic works because we do not focus exclusively on the verbal.

which we hypothesise that the attitudes generated by these multimodal texts will be triggered by the graffiti, the sector of the city where it is located and the people who produced it.

For studying the attitudes, in this research, we used a digital valuative questionnaire (Trochim & Donnelly, 2006) and focus groups. The transcriptions of what was expressed by the people who participated in the focus groups were analysed through the *appraisal theory* (Martin & White, 2005; Molina Valverde & Tretti-Beckles, 2021; Oteíza & Pinuer, 2019; White, 2015). This theory proposes a systematisation of the evaluative expressions generated and implied in the texts according to three domains: attitude, engagement and graduation. From attitude, we consider three subdomains (see also Table 1): affect, express sensations or feelings of the speaker; judgement, those that evaluate persons, groups of people or institutions or objects with agentive characteristics; appreciation, those that evaluate processes and objects. Engagement is the expression from which the evaluations are constructed, whether they are the sender's own or are taken from other sources or voices. The graduation domain refers to the intensity and salience of the evaluations. For this research, we only considered the attitude domain. From its subdomains, we applied affection and judgement (categories considered by Molina Valverde and Tretti-Beckles (2021)). The following new categories: integrity, quality, complexity and social impact, were established for the appreciation subdomain because the original ones (Martin & White, 2005; Oteíza & Pinuer,

| Subdomain | Category | Explanation | Example |
|---|---|---|---|
| **Affect** | In/security | Expression of a feeling of security or insecurity of the speaker about himself/herself. | *I feel **insecure.*** |
| | Dis/inclination | Expression of attraction or not to an object, process or person. | ***I like it*** very much. |
| **Judgement** | Integrity (social sanction) | Evaluative expression of a person or group of people based on moral or legal sanction criteria. | *They are **vandals.*** |
| | Capacity (social esteem) | Valuative expression on the intellectual, physical, social, political, professional, and technical capabilities of a person or group of people. | *He does his job like a **true professional.*** |

| | | | |
|---|---|---|---|
| **Appreciation** | Integrity | Valuative expression of an object or process from the moral or legal sanction. | *That state of the object is **vandalism.*** |
| | Quality | Valuative expression about qualities, characteristics or properties of an object or process. This includes aesthetic appraisals. | *This place is **dirty** and **ugly.*** |
| | Complexity | Valuative expression about the composition and production process of an object or the difficulty of a process. | *That is **complicated.*** |
| | Social impact | Valuative expression about an object or process based on the consequences it may have for people and society. These consequences can be direct or associated with these objects or processes. | *That place is **dangerous.*** |

**Table 1.** Attitude domain and categories used in the study.

2019; White, 2015) did not allow for a clear classification and display of graffiti and urban space assessments[4].

2.2. Graffiti

Graffiti, along with other texts, make up the semiotic landscape of (almost) every city in the world. They contribute to the process of constructing the identities of zones, neighbourhoods, and cities. Graffiti is a semiotic expression of graffiti artists and a manifestation of public space, thus contributing to place-making (Busse & Warnke, 2015). In most cases, graffiti is produced and funded by individuals or private institutions (bottom-up), and sometimes, it is created illegally or confrontationally. This has historically led to the persecution and punishment of graffiti artists and graffiti itself (Castleman, 2013; Touborg, 2021). The global expansion of contemporary graffiti in different areas of cities (Castleman, 2013; Chang, 2014; Figueroa Saavedra, 2006) has led to a less negative perception and a diminished association with secrecy, transgression, or illegality. Different classifications of graffiti can be found in the literature (Gottlieb, 2008); however, the most common criterion is the style. Based on Castleman (2013) and Touborg (2021), considering the style, the following distinctions are made:

- *Tag:* Small-sized text with few graphemes, usually representing the author's alias. It is typically created with a single colour and line, using spray paint or markers.
- *Throw-up:* Text that, like the tag, features the author's alias, but with larger letters, a combination of colours, and a filled-in appearance. The graphemes are easily identifiable.

4 The *appraisal theory* is not a closed list of categories, instead it allows the construction of new emerging categories from what is identified in the analysis material.

- *Piece:* Text with large-sized graphemes that have more details than throw-ups. Pieces often have low legibility.
- *Wildstyle:* Text with large-sized graphemes that are nearly impossible to recognise or decipher due to their intricate and complex style.
- *Street art:* Text accompanied by illustrations or abstract/iconic drawings made on walls. Different materials such as paint, spray paint, and stencils can be used for its creation.
- *Message:* Text conveying a social, political, or personal message (often related to love) and created using various materials.

For this research, we are only interested in tags, throw-ups, and pieces due to a methodological decision in which not all types of graffiti that were found could be approached, and the most representative and less complex ones were chosen from a multimodal perspective (without illustrations or abstracts).

2.3. Multimodality and Multimodal Literacy

The concept of multimodality refers to the presence of different modes (words, images, colours, supports) in texts, where semiotic resources serve as stimuli for the construction of meaning by the receiver (Bateman, 2008; Kress, 2010; Kress & van Leeuwen, 2001). This concept draws attention to the complexity of texts and the relevance of all their components. It avoids reductionism by not focusing exclusively, for example, on words or images alone. Graffiti is a multimodal form of text that combines graphemes, words, colours, typography, styles, illustrations, materials, and supports to convey semantic, political, and aesthetic content. For example, Figure 3 shows the multimodality of graffiti in the use of background colour (yellow, red and black), words with ornaments (e.g., s), symbols (e.g., asterisks at the beginning and the end), different types of graphemes and colours (compare with Figures 1 and 2).

Furthermore, we understand multimodal literacy as the ability to produce and comprehend multimodal texts.

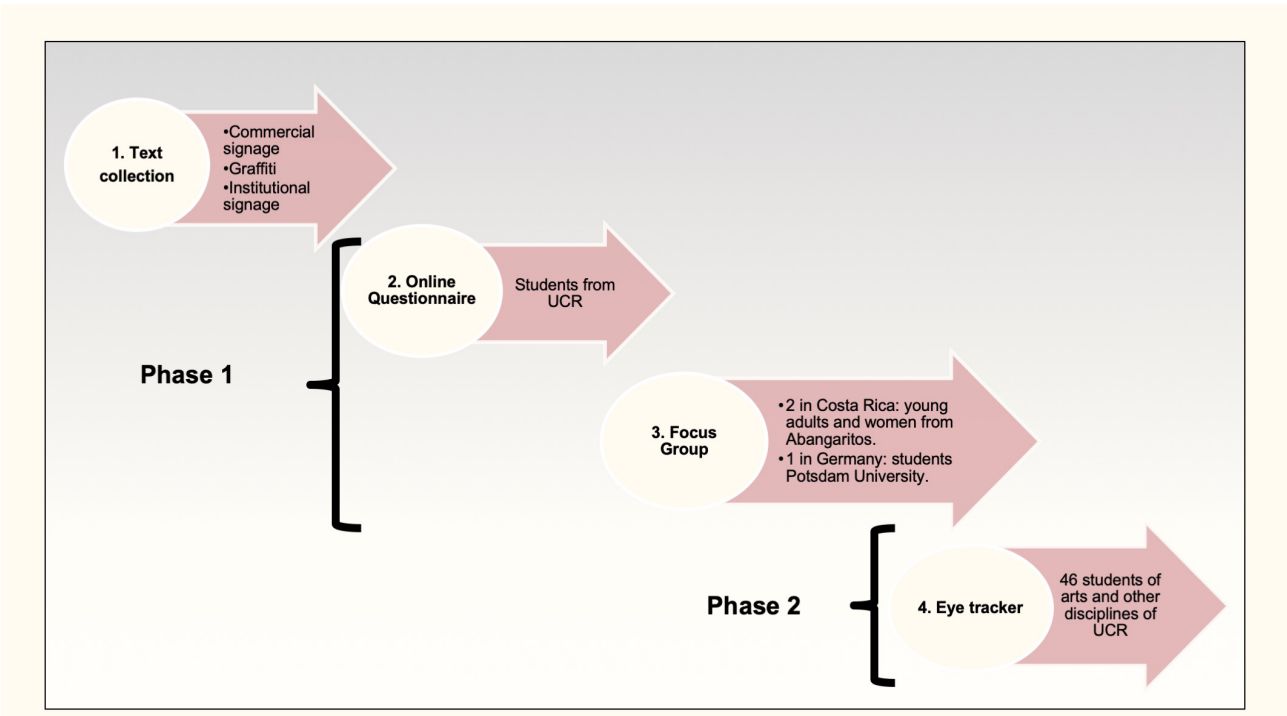


**Figure 1.** Method phases flowchart.

Multimodal literacy goes beyond the skills of using different semiotic resources to create a multimodal text; it also includes the processing and understanding of these texts. These skills are developed through socialisation and formal and informal education processes (Kress, 2010). We believe that both producing, reading, and understanding (including evaluations) graffiti require that individuals develop specific skills (multimodal literacy for graffiti). One method to approach the study of these skills is through instruments that allow us to explore semiotic attitudes and the process of reading graffiti, such as eye tracking to track eye movements.

### 2.4. Tracking the Gaze

Eye tracking is a method that allows for direct tracking of gaze while individuals perceive a stimulus (text). This method involves recording, using a device (sensor technology), where the gaze stops (fixations) and moves (saccades) in real-time. This approach eliminates the need for individuals to process the texts and provide their opinions about what they did while reading them, thus avoiding the risk of bias or social desirability influencing their responses (Sülflow et al., 2019). Behind studies using eye trackers and texts lies the eye-mind hypothesis: when the gaze stops on a word or image, the person is processing the information of what they are seeing (Just & Carpenter, 1980). Accordingly, it is said that the longer the duration of the fixation, the higher the processing cost of the visual stimulus (words or images).

## 3. Methods

The results presented in this text were extracted from two phases, each with its own methodology: first, semiotic attitudes and appraisal, and second, eye tracking. These two phases will be presented separately.

### 3.1. Phase 1: Semiotic Attitudes and Appraisal

This study explores the semiotic attitudes that different types of graffiti generate in Costa Rican people. Attitudes are approached through an indirect method, as we used an online questionnaire and conducted three focus groups. In these instruments, images of graffiti and commercial signage are combined so that the participants did not know which responses to the stimuli we were interested in. The images used are part of a photo collection that was acquired between July and December 2018 in two neighbourhoods in the city of San José, Costa Rica (Escalante and Desamparados), and two neighbourhoods in the city of Santiago, Chile (Italia and Franklin)[5,6].

In December 2018, the online questionnaire was "digitally circulated" among university students in Costa Rica. In this way, a total of 56 anonymous responses were obtained. Of those participating in the online questionnaire, none of the respondents lived in the neighbourhoods where the images were collected. The items had the following structure: a photograph of a graffiti or sign accompanied by six statements (see below), which were rated according to the degree of agreement or disagreement on a Likert scale (Trochim & Donnelly, 2006).

After a review of the results obtained, we observed more negative associations towards urban space based on graffiti stimuli, which surprised us, given that there were more graffiti in wealthy neighbourhoods in Costa Rica. In order to better understand the causes of these negative associations, we conducted two focus groups in Costa Rica in 2022 and one in Germany in 2023.

The first focus group was examined with seven university students between 24 and 37 years from the University of Costa Rica, Rodrigo Facio Campus, San José; the second with four women between 40 and 58 years from the town of Abangaritos, Puntarenas; and the third with four students between 22 and 31 years[7] from the University of Potsdam, Germany. In all three cases, the persons signed an informed consent, allowing the audio recording of the meeting, and we committed to maintaining their anonymity. We

5 Barrio Escalante and Barrio Italia are wealthy and commercial (restaurants, design shops, pubs) neighbourhoods, their growth occurred over the last 15 years. Desamparados and Franklin less wealthy and commercial (shops, small restaurants and beauty salons) neighbourhoods, which have been in existence for more than 70 years.

6 See Vergara-Heidke and Morales-Gutiérrez (2020) for more details about the neighbourhoods.

7 From Taiwan, Argentina and India.

hypothesised that different attitudes might occur among people from different origins, which is why the focus groups have a different composition; however, this was not the case because the difference was not significant between these groups. Therefore, we present the results together below. The focus groups were audio recorded, and then the responses and comments motivated by graffiti images were transcribed.

Applying the *appraisal theory* (see Table 1), the transcripts of the focus groups were analysed and systematised, in which the manifestations of semiotic attitudes and their evaluative segments were identified. Excel software was used for this purpose.

3.2. Phase 2: Gaze Movement

We created an experiment with 14 different images: 3 stimuli of interest and 11 fillers (distracting images, such as fake news, collages and commercial signs). Additionally, the

**Figure 2.** Piece which reads "DESK". Photograph taken by Adrián Vergara-Heidke in Escalante, Costa Rica, March 2023.

**Figure 3.** Piece which reads "MUSH". Photograph taken by Adrián Vergara-Heidke in Escalante, Costa Rica, April 2023.


**Figure 4.** Piece which reads “RUSTE”. Photograph taken by Adrián Vergara-Heidke in Escalante, Costa Rica, April 2023.

**Figure 5.** Eye Tracker SMI RED500 (image taken from the IMOTIONS website.)

stimuli of interest were photographs of real graffiti pieces from San José, Costa Rica. The pieces have varying degrees of difficulty in identifying the graphemes.
Some of the images were followed by questions about the content of the image. In the case of the three pieces (see Figures 2, 3 and 4), the questions were about "what you read" in the graffiti, specifically focusing on the larger letters. The non-graffiti images appeared on the screen for 5 seconds, while the pieces were displayed for 8 seconds. This difference in the times is due to the fact that if they were all 8 seconds, the experiment would be very long.

The equipment used was the RED500 by SMI company (https://imotions.com/products/hardware/smi-red), with an applied instrument sensitivity of 500 Hz (see Figure 4).

Data were collected at the Faculty of Letters and the Faculty of Arts of the University of Costa Rica. The volunteer participants were divided into two groups: Group 1 consisted of 23 students from the Faculty of Letters, which incorporates various disciplines with a focus on humanities, while Group 2 consisted of 23 students from the Faculty of Arts who were at least in their third year of the arts program with any of its emphases. The selection of these locations was based on the hypothesis that individuals with an arts literacy, and therefore a more developed visual literacy compared to other disciplines, might be better at identifying the graphemes of the graffiti pieces and would have particular reading patterns of graffiti[8].

The data were collected between April and May 2023. The experiment involved participants viewing the images on a computer screen while their eye movements and responses to the questions were recorded. The duration of each session was between 5 and 8 minutes, depending on the time needed to answer each question. All participants signed an informed consent form authorising the use of the collected data.
The data analysis was divided into several steps: first, the correct responses (all graphemes must be correctly classified) regarding the identification of the graphemes were observed and compared between the two participant

8 It has been proven that there are different reading patterns depending on the motivations and previous knowledge of the person (Vergara et al., 2021; Villalobos Fernández et al., 2020).


**Figure 6.** Graffiti graphemes—"DESK".


**Figure 7.** Graffiti graphemes—"MUSH".


**Figure 8.** Graffiti graphemes—"RUSTE".

groups. Second, the data on fixations, fixation durations, and regressions of participants from both groups were cleaned. In this step, individuals with a tracking ratio (percentage of detected gazes) below 80 % and those who did not stop at all graphemes were excluded. It is important to note that individuals who did not stop at all graphemes were excluded because it was required to have at least one fixation on each letter to ensure that the entire graffiti was read. Third, the results were compared between the students from the arts group and the other students. Fourth, the results were compared between the students who correctly identified the graphemes and those who did not, regardless of their academic field.

Each step aimed to provide insights and comparisons related to the participants' performance, considering both their identification of graphemes and their eye-tracking data. We have only conducted a descriptive statistical analysis of the results, as they are still considered to be partial results.

**4. Analysis and Results**

In this section, we present the results obtained after applying the questionnaire and conducting the focus groups, as well as the instrument with the eye tracker.

4.1. Attitudes and Appraisal

These results are organised based on the degree of negativity in attitudes towards different types of graffiti, as depicted in the images used in the questionnaire and focus groups.

4.1.1. Tags

In this section, we will show the results obtained, with respect to the tags, in the questionnaire and the focus groups. Figure 7 displays an example used in the two instruments used.

Table 2 shows that 67 % of the participants of the questionnaire think that the place where the tag is located is unsafe, and 74 % consider it not to be a good place to live. Additionally, 66 % of the participants contemplate that this is not a place to go for a walk, eat or drink; additionally, 65 % appraise it as a sector of the city without stores for shopping. Moreover, 53 % believe this is not a cosmopolitan (multicultural) neighbourhood, and 64 % agree that it does not have a lot of cultural or artistic activities.

Regarding linguistic expressions, Table 3 reveals that Costa Rican participants do not like tags, and they believe that the urban space is unsafe and insecure. In the international group, participants did not express any dis/inclination over the tags; however, they also appraised the place

**Figure 9.** Example of a tag: Photograph taken by Adrián Vergara-Heidke in Escalante, Costa Rica, August 2018.

| When I see this, I think: | Agree | Neutral | Disagree |
|---|---|---|---|
| "This must be an unsafe part of the city". | 67 % | 19 % | 14 % |
| "It must be good to live here with the family" | 5 % | 21 % | 74 % |
| "To this neighbourhood I would go for a walk, eat or drink." | 9 % | 25 % | 66 % |
| "This must be a cosmopolitan (multicultural) neighbourhood" | 13 % | 34 % | 53 % |
| " It must be a sector of the city plenty of stores for shopping." | 11 % | 24 % | 65 % |
| "In this neighbourhood there should be a lot of cultural and artistic activities (museums, theatres, art galleries, cultural centres…)." | 12 % | 24 % | 64 % |

**Table 2.** Results of online questionnaire on tags.

| Subdomain | Category | Linguistic Expressions in Costa Rica | Linguistic Expressions in Germany | Valued object or person |
|---|---|---|---|---|
| **Affect** | Dis/inclination | "I wouldn't like it" (–) | –– | graffiti |
| **Judgement** | Moral integrity | "*vandals*"(–) | –– | graffiti artists |
| **Appreciation** | Integrity | –– | "vandalism"(–) | graffiti |
| | Quality | "abandoned area"(–), "place of passage"(–), "dirty"(–), "it smells very bad"(–), "they smell like homeless people's poop"(–), "where homeless people are"(–), "those who can live there are thieves, drug addicts or something like that"(–) | "imagine this place dirtier than the previous ones" (–), "place dirty" (–), "pretty busy area" (+–) | urban space |
| | | "less aesthetic"(–) | "art" (+), "not so tidy or so decent" (–), "messiness" (–), "not so good" (–) | graffiti |
| | Social Impact | "insecure"(–), "dangerous"(–) | "most unsafe (–)" | urban space |

**Table 3.** Valuative words according to categories and objects valuated from tags.

as unsafe. No judgmental expressions regarding graffiti artists were made by international participants, which was not the case with Costa Ricans, who considered them negatively as "vandals". Nonetheless, the international group contemplated as vandalism the integrity of the graffiti, which was not observed in the Costa Rican group. Moreover, in both groups, participants made positive and negative linguistic assessments regarding urban space and graffiti. Furthermore, Costa Rican participants produce more negative appreciations regarding the social impact of the urban space than the internationals.

From the responses obtained in the questionnaire, it is confirmed that insecurity is negatively valued, and it is striking that the tags are not related to residential, commercial, cultural or gastronomic areas. Then, it is worth asking in what urban spaces one would expect to find this type of graffiti, taking into account, as noted above, that in the collection of graffiti in San José, Costa Rica, it was found that in Escalante, a neighbourhood characterised by its offer of restaurants and bars and by its security, there was much more graffiti than in more popular and commercial areas such as the downtown of Desamparados.

Moreover, there is evidence of the negative attitude that the tags generate through the association with citizen insecurity. In other words, the presence of these multimodal semiotic expressions activates a representation related to unsafe urban spaces in the minds of the participants. This type of negative attitude is also present in the focus groups, in which 72 % of the evaluations expressed were negative in the Costa Rican group and 80 % in the international group.

Neutral evaluations were made in both groups, Costa Rican 28 % and international 10 %; the Costa Rican group made no positive evaluations in contrast with the international 10 %. Thus, it is evident that tags generate mainly negative attitudes. However, these attitudes vary with respect to the object evaluated. In the focus groups, three elements were observed when people gave their opinions based on an image of a tag: the graffiti, the urban space and the people who created it (graffiti artists). An example of the focus groups is presented below.

1. "The truth is that I see it **all dirty,** it's like **there's a lot of garbage on the sidewalk,** so I see it as **a little dangerous too,** but during the night, during the day, **I would walk around a little more carefully,** but I do feel that it **smells pretty bad**"[9] (P1G1 [10]). [11]

In this fragment, after seeing the image of a tag, a participant evaluates the urban space as "dirty", with garbage ("there is a lot of garbage there on the sidewalk") and that "it smells pretty bad", in other words, they evaluate the hygiene of the place negatively. Likewise, reference is made to insecurity with expressions such as "a little dangerous" and "yes, I would walk around a little more carefully". All these evaluations are consistent with a negative representation of the area in which a tag could be located. On the other hand, it is evident that these attitudes determine the actions of these people since the person affirms that "yes, I would walk more carefully", that is, I would walk according to these representations. These attitudes correspond to the category of quality and social impact within the appraisal subdomain of the appraisal system.

In addition, in the Costa Rican and international groups, participants produced linguistic expressions as "a place of passage or to pass by" to refer to the urban space. This construction of the urban space as a "passing by place", perhaps, explains the results obtained in the questionnaire regarding the fact that the space was neither residential, commercial, cultural, nor gastronomic, since it was not a place to stop, but a 'passing-by place'. These places where people circulate, where they do not stop, are the places they represent in their minds when they see a tag.

9 The bold font is used in the fragments of the focus groups to emphazise the valuative elements.

10 The code identifies the participant (PX) and the focus group (GX).

11 Translated from original: "yo la verdad es que lo veo todo sucio es como ui que de fijo hay como un montón de basura ahí en la acera entonces si lo veo como medio peligrosillo también, pero durante la noche en el día sí andaría como más como con un poco más de cuidado pero ahí sí siento que huele bastante mal" (P1G1).

**Figure 10.** Example of a throw-up. Photograph taken by Adrián Vergara Heidke in Escalante, Costa Rica, August 2018.

| When I see this, I think: | Agree | Neutral | Disagree |
|---|---|---|---|
| "This must be an unsafe part of the city". | 55 % | 29 % | 15 % |
| "It must be good to live here with the family" | 6 % | 26 % | 68 % |
| "To this neighbourhood I would go for a walk, eat or drink." | 16 % | 27 % | 57 % |
| "This must be a cosmopolitan (multicultural) neighbourhood" | 24 % | 35 % | 41 % |
| " It must be a sector of the city plenty of stores for shopping." | 12 % | 30 % | 58 % |
| "In this neighbourhood there should be a lot of cultural and artistic activities (museums, theatres, art galleries, cultural centres…)." | 24 % | 33 % | 43 % |

**Table 4.** Results of questions about throw-ups.

4.1.2 Throw-ups

The results obtained in the questionnaire and focus groups regarding throw-ups are presented in this section.

In Table 4, we can observe that 56 % of the participants of the questionnaire agree that the place where the throw-ups are located is unsafe, and 68 % consider it not a good place to live. In addition, 57 % believe that they would not go to this neighbourhood to walk, eat or drink. In addition, 58 % think that this location must be in a sector of the city that does not have stores. Further, most of the participants are neutral (35 %) or agree (21 %) with the fact that this place is a cosmopolitan or multicultural neighbourhood. Similarly, participants believe that this is a neighbourhood with cultural and artistic activities (24 % agree, and 33 % are neutral).

| Subdomain | Category | Linguistic Expressions in Costa Rica | Linguistic Expressions in Germany | Valued object or person |
|---|---|---|---|---|
| **Affect** | Dis/inclination | "I don't like it"(–), " I don't dislike it"(+–), "I certainly prefer the graffiti to the grey wall"(+), "I like it"(+), " I do like it "(+), "for someone to paint it for me in a T-Shirt "(+) | "not as strong emotions" (–), "I don't like it that much" (–), "I appreciate it as a whole" but it doesn't give me a very strong emotion of like or dislike(+–), "I quite like it" (+), "I don't dislike it" (+–), "in terms of style I like this piece" (+), "I don't like how the yellow looks" (–), "I like it, I like that it dives out a feel of movement of speed" (+) | graffiti |
| | In/security | "I have been afraid"(–), "insecurity"(–) | "it's not necessarily safer or less safe; it makes me feel like there are fewer people around" (–+), "I feel safe" (+), "I would not necessarily feel unsafe here" (+–) | urban space |
| **Judgement** | Moral integrity | "*sketchy person* there is a sketchy" (–), "vandals that are painting walls"(–), "vandals"(–), "it doesn't necessarily have to be vandalism"(+), "it belongs to a gang or a clique"(–), "who was there"(–) | –– | graffiti artists |
| | Capacity | "this is their art"(+), "very amateurish and it is like from school"(–) | –– | graffiti artists |

| | | | | |
|---|---|---|---|---|
| **Appreciation** | Integrity | "vandalism"(–) | —— | graffiti |
| | Quality | "smell of urine"(–), "abandoned places"(–), "cleanliness"(–), " abandoned building"(–), "poop and urine"(–), "under the bridges where there are homeless people and those walls are there"(–) | "transit place" (+–), "not a nicer place" (–), "somewhere around the office space" (+–), "very busy place"(+–), "pretty old like it's been washed away with time"(–) | urban space |
| | Complexity | "not planned"(–), "very amateurish and yes it's like from school"(–), "this is art is their art"(+), "yes it was thought"(+) | "art"(+), "illustration"(+), "fancy" (+), "Bold"(+), "pretty elaborate"(+), "it's better than the previous one" (+) | graffiti |
| | Social Impact | "and I say people are rushing by"(+–), "insecure"(–), "I pass running"(–) | "fewer people will pass" (–), "people go around but not stay for long they just pass by" (+–), "very isolated place" (–) | urban space |

**Table 5.** Valuative words according to categories and valued objects from throw-ups.

Table 5 shows that participants of the focus groups demonstrate either positive or negative affection, dis/inclination regarding the throw-ups, they either like or dislike them. In this case, international participants produce more neutral or positive expressions regarding urban space insecurity than Costa Ricans, which are only negative. Moreover, Costa Ricans make judgments regarding the moral integrity and capacity of graffiti artists, which are mostly negative. In contrast, the international group did not produce any of these valuations. Participants show appreciation for the quality of the urban space; in the case of Costa Ricans, they do it with negative expressions and internationals with both neutral and negative. Additionally, they refer to the quality of the graffiti with positive, negative or neutral expressions. Further, Costa Rican participants evaluate the complexity of the graffiti either negatively or positively; in contrast, internationals rate them positively. Finally, both groups refer to the social impact of urban space negatively or neutrally, mostly considering that these throw-ups are located in places where people pass by.

The answers of the focus groups show that there is a majority of negative evaluations (52 %), compared to neutral (30 %) and 18 % of positive evaluations in the Costa Rican group; however, in the international group, the majority are positive 52 %, 26 % are neutral and 21 % negative.

Thus, unlike the tags, the people participating in the focus groups expressed negative attitudes, but in a lower percentage than with respect to the tags. In both groups, but especially in the international group, participants made positive evaluations, which was not seen with the tags. Below is an example of what was said in the focus groups.

2. "But it's not that there are many people who dedicate themselves to drawing on walls, so it doesn't necessarily have to be **vandalism**" (P1G2).[12]

This example presents a positive evaluation of graffiti and, at the same time, in an implicit (evoked) way of graffiti artists: "it does not necessarily have to be **vandalism**". These positive

12 Translated from original: "pero no es que hay muchas personas que se dedican a andar dibujando paredes entonces no no necesariamente tiene que ser vandalismo" (P1G2).

attitudes generated by throw-ups are observed, not only but now towards other elements such as graffiti and graffiti artists. Nonetheless, there are also negative evaluations of the urban space, see Table 5, with expressions regarding the cleanliness of the public space. This shows that even though participants value graffiti artists and throw-ups positively (compared to tags), the spaces where they are located are still unsafe, dirty, and "passing by places".

In addition, from Table 5, we would like to draw attention to the evaluations of the complexity of the throw-ups. Among them, they refer to "not planned", "very amateur and yes, it is like school", "this art is, art of them [graffiti artists]", and "yes, it was thought". It is observed that planning is an element that is considered to value the complexity of these graffiti ("not planned", "yes, it was thought out"). It can be argued that the more semiotic resources such as colours, brightness, filling, among others, the greater the planning and, therefore, the better the quality. On the one hand, this greater planning involves the need for the graffiti artist to have made a previous sketch (design), as well as to have foreseen the colours and space required to make the throw-up. Moreover, it is considered that expressions such as "very amateur and yes, it is like school", "this is art is their art", "pretty elaborate", and "too basic" refer to complexity, since they are associated with the technique and the ability that the graffiti artist manifested in his work. On the other hand, these evaluations could indicate specialised knowledge or skills (multimodal literacy) of the individuals who made those statements. We will address this in the following section.

4.2. Gazes and Fixations

In this section, we present the partial results obtained from the data recorded with the eye tracker while applying an experiment with pieces. The aim is to evaluate the recognition of graphemes and observe reading patterns, comparing art students and students from other disciplines, as well as between those who identified the graphemes and those who did not.

| | Participants | ***RUSTE*** | | ***DESK*** | | ***MUSH*** | |
|---|---|---|---|---|---|---|---|
| | | Correct | Incorrect | Correct | Incorrect | Correct | Incorrect |
| Arts | 23 | 48 % (11) | 52 % (12) | 13 % (3) | 87 % (20) | 4 % (1)* | 96 % (22) |
| Other disciplines | 23 | 61 % (14)* | 39 % (9) | 22 % (5)* | 78 % (18) | 0 % (0) | 23 (100%) |

**Table 6.** Identification of graphemes according to disciplines of study.

4.2.1. Comparison Between Students of Arts and Other Disciplines

The first review of results involved comparing the responses and eye movements of art students and students from other disciplines. First, the correct or incorrect identification of each graffiti was observed. Subsequently, the means of the number of fixations, fixation durations, and number of regressions were compared among those students from both groups who made at least one fixation on all graphemes of each piece.

Table 6 shows that more individuals identified the graphemes in the graffiti "RUSTE" (a total of 25 people), followed by "DESK" (8 people), and finally, "MUSH" (only one person). It is also evident that more students from other disciplines correctly identified all the graphemes in "RUSTE" (61% vs. 48%) and "DESK" (22% vs. 13%), while only one art student identified "MUSH". Excluding the exception of the student who recognised all four graphemes in "MUSH," students from non-art disciplines had a higher accuracy in identifying the graphemes.

On the other hand, we compared the mean number of fixations, fixation durations, and regressions between

art students and students from other disciplines who had fixations on all the graphemes of each graffiti, in order to observe if there was any pattern that distinguished the reading process between the two groups. However, we did not find any significant differences in these data. Therefore, we can conclude that art students and students from other disciplines do not differ in these three aspects.

Based on the previous results, we can conclude that, first, in the field of arts, it appears that the multimodal skills for identifying graphemes in graffiti are not developed. Second, if there is a different multimodal literacy among students from different disciplines, it is not evident in the recognition of graphemes or in eye movements (fixations, fixation durations, and regressions) when presented with pieces stimuli.

4.2.2. Comparison Between Those Who Identified the Graphemes and Those Who Did Not

In the second review of results, we compared the means of the number of fixations, fixation duration, and number of regressions between those who correctly identified the graphemes and those who did not. We only considered those individuals who had made at least one fixation on all the graphemes of each graffiti. Additionally, we excluded the piece "MUSH" since only one person managed to identify all the graphemes. Out of all the analysed data so far, only the mean fixation duration shows a clear behavioural pattern that distinguishes individuals who identified all the graphemes from those who did not.

| | Participants | R | U | S | T | E |
|---|---|---|---|---|---|---|
| | | Time fixation average | Time fixation average | Time fixation average | Time fixation average | Time fixation average |
| **Incorrect** | 9 | 108.88 ms | 129.57 ms | 126.82 ms | 161.30 ms | 134.52 ms |
| **Correct** | 9 | 211.80 ms* | 148.24 ms* | 180.08 ms* | 183.06 ms* | 210.07 ms* |

**Table 7.** Fixations and time according to correct and incorrect answers of "RUSTE".

| | Participants | D | E | S | K |
|---|---|---|---|---|---|
| | | Time fixation average | Time fixation average | Time fixation average | Time fixation average |
| **Incorrect** | **20** | 218.21 ms | 219.34 ms | 196.26 ms | 188.27 ms |
| **Correct** | **5** | 310.28 ms* | 230.97 ms* | 240.21 ms* | 200.23 ms* |

**Table 8.** Fixations and time according to correct and incorrect answers of "DESK".

When examining Tables 7 and 8, a trend becomes evident among individuals who successfully identify the graphemes: they spend more time per fixation on each grapheme. In other words, individuals who recognise the graphemes do not make more fixations or regressions, but their fixations last longer. This can be explained by a higher cognitive effort (Just & Carpenter, 1980) to achieve grapheme identification. This could reinforce the idea that participants in the experiment did not possess multimodal literacy for graffiti, as even those who recognised the graphemes had to exert cognitive effort to do so.

## 5. Conclusions

After analysing the semiotic attitudes and appraisals of Costa Ricans in focus groups conducted with both Costa Ricans and an international group living in Berlin (but of students of Potsdam University), it was observed that in Costa Rica people have negative attitudes and appraisals towards graffiti, particularly tags and throw-ups, graffiti artists, and the public spaces where these texts can be found. On the other hand, participants in the focus group conducted in Berlin showed fewer negative semiotic attitudes and explicit negative appraisals towards the same stimuli. This difference may be because graffiti is more widespread and easily seen in any neighbourhood in the city of Berlin. This would make people more accustomed to these texts, so neither the graffiti nor the public spaces generate semiotic attitudes or many negative appraisals. We cannot rule out the possibility that the fact that the international group did not share some cultural elements made them more cautious when making appraisals.

The results obtained through eye tracking did not show any difference in the identification of graphemes or reading patterns between individuals with a visual or multimodal literacy in the field of arts and students from other disciplines. This could be explained by the fact that the arts program does not specifically develop skills for recognising graffiti but rather focuses on other forms of visual artistic and cultural expressions. Therefore, we reject the hypothesis that students in the arts program would have developed skills that would enable them to identify graphemes better and exhibit their own reading patterns.

The difference in partial results regarding reading patterns between those who correctly identified the graphemes and those who did not showed a longer duration of fixations. This longer fixation time may indicate a higher cognitive effort from individuals to identify each grapheme. It suggests that these individuals do not possess a multimodal literacy for graffiti, as they required more cognitive effort. This assumption is based on the idea that individuals with the skills to perceive something (the literacy for it) require less time in their fixations when observing the text. The relationship between fixation time and cognitive effort in multimodal texts should be addressed in future research.

One of the limitations of this work is that by filtering the data to include only individuals who fixated on all the graphemes, the number of partial results obtained was significantly reduced. Furthermore, very few of these individuals correctly identified the graphemes, so we cannot make statistical generalisations based on these data. Finally, the stimuli were presented on a screen, which is a laboratory setup that does not correspond to the real-world perception of graffiti in a public space.

We still have pending tasks to review the data obtained using other criteria. For example, we need to subdivide the graphemes internally to observe if a specific part is more frequently observed. We also need to analyse the sequences of fixations to identify any reading patterns and apply more complex statistical formulas. Additionally, we have plans to conduct the same experiment with graffiti artists from outside the country, as those in Costa Rica are familiar with each other and may recognise the graphemes. Furthermore, we intend to conduct a new experiment using graffiti pieces from another city and apply it to Costa Rican graffiti artists.

In future studies, on the one hand, we would like to use eye-tracking glasses to directly record gaze patterns on graffiti in the public space. Additionally, we plan to conduct graffiti workshops to assess and measure grapheme identification using an eye tracker before and after the workshop. This will allow us to observe if there is a development of multimodal literacy specific to graffiti. On the other hand, we should research semiotic attitudes in which the stimuli (in questionnaires or focus groups) show more elements of the spatial contexts in which graffiti appear and that delves into assessments and constructions of other related topics (youth, music, violence, crime, pollution), in order to address more factors that determine the social perception of graffiti.

**Conflict of Interest**

The authors declare no conflict of interest.

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