

<https://doi.org/10.5559/di.32.4.03>

SHAPING IMPRESSIONS OF THE SPACE: EFFECTS OF STREET ART/GRAFFITI IN DIFFERENT PUBLIC SPACE CONTEXTS

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UDK: 712.25:75

711.5:75

Original scientific paper

Received: September 5, 2022

Art plays a prominent role in shaping urban aesthetic value, image and identity of public spaces. This paper aimed to examine the role of street art and graffiti in shaping impressions of the space using a correlational and experimental design in an online study with 874 participants (69% female, aged 15 to 66 years). The participants rated their impression of the space on an 8-item scale for a series of photographs of street art/graffiti and public space combinations. The results showed that street art/graffiti changed the impression of the space from rather neutral to more comfortable, appealing, playful, interesting, and safe. While the tag mostly had no significant effects, style writing and the mural had strong and positive effects. Implications of the study's results provide input for the rehabilitation and design of public spaces.

Keywords: street art, graffiti, tag, style writing, mural, public space, subjective impression



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Numerous studies as well as anecdotal evidence have shown that street art and graffiti cause quite diverse reactions. On one hand, some forms are perceived as threatening and a sign of disruption of orderly society. On the other hand, for many the same forms represent legitimate artistic expression and rightful rebellion in exercising the right to the city. As being openly accessible to everyone, street art and graffiti often serve as a powerful mode of communication of ideas, sympathies, and demands, especially in uncertain times. In recent years, everyday life was marked worldwide by the COVID-19 pandemic and in Croatia, additionally, by strong earthquakes. It is interesting to note that in these uncertain times street art was used as a powerful symbol and a means for expressing gratitude, hope and perseverance (e.g., "Glavu gore [Chin up]" by Nebitno¹ on the main square in the capital or "Srce [Heart]" by Voona).²

Street art and graffiti have been explored by various disciplines, e.g., art history, sociology, ethnography, criminology, urban anthropology, with the main focus on its content, creators, and their motivation. In this research, using the environmental psychology perspective, we focused on residents and visitors, i.e., on the role that street art and graffiti have in shaping their impressions of different public spaces.

URBAN LANDSCAPE: ART, SPACE, AND THE PLACE

Public spaces do not have inherently tied value and meaning, but they are continuously developed and recreated (Henderson, 2009; Kwon, 2004; Moores, 2012). French anthropologist Marc Augé (1995) writes about *the place* as something meaningful for the community that contributes to shaping and maintaining territoriality, identity, collective memory, and heritage values. Similarly, Edward Relph (1976) describes *the place* as a significant centre of our immediate experiences that provides the opportunity to live authentic, original, and meaningful lives. Modern cities, due to the pressures of modernity through mass consumption, standard planning, and alienation, often produce *placelessness* (Relph, 1976), i.e., spaces that lack in aspects that can provide opportunities for meaningful connection. As a similar effect of modernity Augé (1995) sees *non-places* – functional spaces, mostly with transitory nature but without meaning that could induce identity or relationship to the space. In contrast to these authors, Moores and Metykova (2009) show that people can create a sense of place despite the experience of constant mobility and massive technological changes. Also, Moores (2012) questions the concepts of *placelessness* and *non-places* due to their deterministic view that some places are inherently placeless and that developments in media and transportation undoubtedly weaken the sense of place.

Regardless of "the how" in the placemaking, there is an agreement that "a place, to be a place, necessarily must have meaning" (Henderson, 2009, p. 539), and numerous examples have shown that placemaking has a potential to induce positive social change (Strydom et al., 2018). One of the important venues in that process is the artwork (e.g., Evans, 2016; Kwon, 2004). Art in the public space can leave a mark in people's memory as it awakens feelings and draws attention to the space. In contemporary cities art in the streets has become increasingly used as a tool for regenerating and promoting urban public spaces through city branding, urban revitalisation, and placemaking efforts (Campos & Sequeira, 2020; Evans, 2016).

Public art, as other complex social ideas, has numerous place and production-oriented definitions (Hein, 1996; Soares Neves, 2016). Broadly defined, it represents various art forms located outside of the conventional art spaces like galleries and museums (Miles, 2005). Waclawek (2011) further explained the diversity of public art stating that it can include murals, community projects, memorials, civic statuary, architecture, sculpture, ephemeral art (dance, performance theatre), subversive interventions, but also graffiti and street art. Other scholars also agree that graffiti and street art are rightfully considered to be public art as they are usually done in the shared social space and are free for the public to see (e.g., Ross, 2016). But the authors point out that public art is more often legal and commissioned in comparison to street art and graffiti.

To this date multiple interpretations of the "graffiti" and "street art" concepts have been discussed. At some instances those definitions are complementary and in others competing or overlapping with different classifications based on content, general type, location, design style, method of production, legality status, and the artists' motivation (Gottlieb, 2008; Taylor et al., 2010). Notwithstanding differences, for most authors the unsanctioned (unofficial or unsolicited) nature is a central characteristic for both street art and graffiti (Ross et al., 2017). The term graffiti is in contemporary literature usually associated with *style writing*, i.e., name writing in the form of smaller name tags or bigger elaborated (master)pieces (Blanché, 2015). The term street art is usually used for the art forms evolved from graffiti over time and now usually refers to self-authorized wall paintings, characters, and other forms (e.g., sculptures, installations, stencils, stickers) created in or applied to surfaces in the urban space (Blanché, 2015; Ross, 2016). Therefore, graffiti are more connected to written letters, ornamental name writing, and communicating self-affirmation within a closed community while street art is more involved with symbols and pictorial communication intended to convey broader messages to wider audiences (Blanché, 2015; Wac-

lawek, 2011; White, 2001).³ In recent years murals have become a substantial part of the street art displayed in the cities. In street art terms, mural represents large, often multicoloured, and labour-intensive creations including wall, airbrush and spray can paintings and are more often sanctioned than other forms of graffiti/street art (Philipps et al., 2017).

Perception and reactions to street art and graffiti

Attitudes of city residents and the authorities towards graffiti/street art are rapidly changing in recent years and are often ambiguous regarding surveillance, prosecution, protection, and celebration of these art forms and its creators (Evans, 2016). Street art and graffiti have been related to the broken windows theory (Kelling & Wilson, 1982) that predicts a downward spiral of urban decay if visual evidence of minor infractions is allowed. According to this theory, visual cues of disorder (e.g., graffiti, broken windows, public intoxication, trash) create an atmosphere of lawlessness that attracts further offenders who assume that the usual societal rules do not apply. Some authors and city authorities see graffiti and street art as a sign of urban decay and, in terms of the broken windows theory, as a threat to the residential quality of life and to the prosperity of private property and businesses (White, 2001). However, this theory has never been thoroughly tested and empirically verified (Harcourt, 2009). For example, the theory predicts that rapid removal of graffiti would eventually lead to its eradication. Conversely, field-based comparison of graffiti removal and non-removal zones did not determine that prompt graffiti removal prevented the return of graffiti (Gorsek, 2004). Moreover, the number of graffiti increased in the removal area, directly contradicting the broken windows theory presumptions.

Rather than in terms of the broken windows theory, empirical results imply that graffiti and street art are perceived variously due to a variety of reasons such as perceived damage, permanency, aesthetics, threat, and understandability. Some forms of street art/graffiti are less permanent and physically damaging, e.g., yarn bombing or guerrilla gardening, and are perceived more favourably in comparison to more permanent forms such as tags (Conklin, 2012). Murals are characterised by mainstream artistic expression – vibrant colours, symbols, and iconographic images, which helps the wider audience to see them as more familiar and understandable as well as more aesthetically pleasing and better integrated into the surroundings (Conklin, 2012; Gottlieb 2008; White, 2001). Blanché (2015) stresses that even if a mural is not sanctioned, it is less likely to be considered vandalism in comparison to style writing, because it is more easily understood by the general public. On the contrary, style writing uses a cryptic form

of expression and is understood mostly within a subculture. Finally, although tags have a prominent place in the street art/graffiti culture (Snyder, 2016), observers and visitors report that for them tags can make the spaces look dirty and contribute to the more intense perception of threat leading to less favourable impressions of the space (Conklin, 2012; Dovey et al., 2012).

The current study

Contemporary graffiti began to appear in Croatia after World War II, mostly in the form of political slogans (Lalić et al., 1991). In the late 1970s and early 1980s, territorial, music and football clubs' fan graffiti began to appear (Burić, 2013). One of the milestones of the Croatian street art and graffiti history was the development of the graffiti tradition on the wall in Branimirova Street (Zagreb) in 1987, publishing the first graffiti magazine in 1995 and exhibitions in Zagreb that followed (Tenžera, 2004). In the last twenty years, the street art and graffiti scene has flourished and established its firm place in Croatian popular culture. In the legal context, laws and regulations do prescribe sanctions for unsanctioned writing on public and private property, but only when it significantly alters the surface (Criminal code, 2022), represents an offense against public order and peace (Misdemeanour act, 2023) or expresses racial, ethnic, gender or other discrimination (Anti-discrimination act, 2012). Additionally, each local government unit prescribes sanctions for graffiti as well as procedures for allowing artistic expression on the external parts of the building visible from the public area (e.g., Communal Order of the City of Zagreb, 2022).

Scholarly work on this topic is still scarce and can mostly be found in Bcc or Master theses. The most scientifically researched topics about street art/graffiti are classification of the content (e.g., Burić, 2013), writers' perspective (Knežević, 2016), cultural heritage (Šabić, 2017) and linguistic analysis of street art (Błachowicz-Wolny & Błachowicz, 2017). In this study we shift focus onto the observer and examine the role that street art/graffiti has in shaping the impressions of public spaces.

First, we tested the differences in participants' opinions about street art/graffiti forms in terms of increasing or decreasing visual appearance of the space. Second, we experimentally tested the effects that street art/graffiti forms (tag, style writing, mural) have on the impression of different public spaces (park, playground, promenade, pedestrian underpass). Third, we tested the role of participants' gender and age in previous analyses.

Hypothesis 1. We expected for tags and style writing to be evaluated as a means of decreasing and murals as a means of increasing the visual appearance of the space.

Hypothesis 2. We expected for street art/graffiti forms to have significant effects on the overall impression of the public spaces with murals having the strongest positive effects, style writing less pronounced but also positive effects, while expecting negative effects for tags in comparison to empty space.

Hypothesis 3. We expected that the participants' age and gender would have moderate effects on the results with older and female participants showing less positive opinions in comparison to younger and male participants.

MATERIALS AND METHODS

Participants

In total, 897 participants completed the questionnaire. Those who reported living outside Croatia ($n = 18$) and were under 15 years of age ($n = 5$) were excluded before the analysis. In the final sample ($N = 874$) there were 603 (69%) female, 270 (31%) male participants and one participant reported their gender as "other". Participants were aged 15 to 66 years ($M = 28.32$, $SD = 11.88$). Almost 40% of participants reported living in the City of Zagreb County. The rest of the counties were represented with at least one participant (0.1%; Lika-Senj County) to a maximum of 99 participants (11%; Split-Dalmatia County). In the total sample, 55 participants (6%) reported that they were involved in street art/graffiti either directly by creating art or by documenting it. Other sociodemographic characteristics are presented in Table 1.

↪ TABLE 1
Sociodemographic
characteristics for the
total study sample

		<i>f</i>	<i>%</i>
Place of residence size	< 5 000 inhabitants	189	22
	< 10 000 inhabitants	126	14
	< 100 000 inhabitants	261	30
	< 500 000 inhabitants	100	11
	> 500 000 inhabitants	198	23
Education level	< elementary school	2	< 1
	elementary school	52	6
	secondary school	373	43
	bachelor's degree	170	19
	master's degree	235	27
Working status	PhD	42	5
	student (school)	90	10
	student (university)	399	46
	employed	345	39
	unemployed	32	4
	retired	8	1

Note. Percentages do not add up to 100% as they were rounded to whole numbers.

Measures

Sociodemographic characteristics: age, gender, place of residence size, county, educational level, working status, and involvement in street art/graffiti.

Effects of street art/graffiti on visual appearance of the space. Participants were presented with six photographs (2 tags, 2 style writing, and 2 murals in public space) and rated on a 5-point scale if the presented art forms decreased (1) or increased (5) the visual appearance of the space.

Impressions of the space. Participants were presented with four photographs of public spaces in combination with street art/graffiti (Table 2, Figure 1) and reported their *impressions of the space* on 8 items with 5-point semantic differential scales (uncomfortable-comfortable, unappealing-appealing, undesirable-desirable, serious-playful, tense-relaxing, low visibility-high visibility, unsafe-safe, dull-interesting). Exploratory factor analysis (principal component) showed that these eight items represent a unidimensional scale. The number of factors was determined for each street art/graffiti-public-space combination photograph using the Guttman-Kaiser criterion. For all photographs only one factor had eigenvalues greater than one and explained more than 50% of the variance. Internal consistency measured by Cronbach's alpha coefficient was high for all photographs ranging from $\alpha = 0.86$ to $\alpha = 0.96$. The total score was calculated as the item mean for each photograph with a higher result indicating a better overall impression of the space.

Procedure and study design

The data was collected via the online survey tool Google Forms and using snowball sampling. We reached out to participants through web sites and social networks inviting them to share the survey link further. The participants were provided with informed consent and agreed to participate in the study anonymously and voluntarily.

First, socio-demographic information was collected. Second, the participants reported their opinions about the street art/graffiti impact on the visual appearance of the space. Third, the participants reported their impression of the public spaces with street art/graffiti presented in photographs. Photo material was created by digitally embedding street art/graffiti forms (none, tag, style writing, mural) into different public spaces (park, playground, promenade, pedestrian underpass). All photographs of street art/graffiti and public spaces were taken in Zagreb by the authors. In choosing street art/graffiti and public spaces examples we tried to retain the realistic quality of the study material by choosing existing spaces and art, but also by selecting typical and generic examples as much as it was possible. In total, the number of photographs was too

large to be judged by each participant. Therefore, we used confounded factorial mixed design. We systematically partitioned the photograph sample into subsets consisting of four photographs as shown in Table 2 and Figure 1.⁴

TABLE 2
Photograph subsets used in the study

	Photograph 1	Photograph 2	Photograph 3	Photograph 4	<i>n</i>
Subset 1	A0	B1	C2	D3	191
Subset 2	D0	A1	B2	C3	182
Subset 3	C0	D1	A2	B3	322
Subset 4	B0	C1	D2	A3	179

FIGURE 1
Example of photographs used for one subset in the study

Note. Public spaces: A = park, B = playground, C = promenade, D = pedestrian underpass; Street art: 0 = no art, 1 = tag, 2 = style writing, 3 = mural.



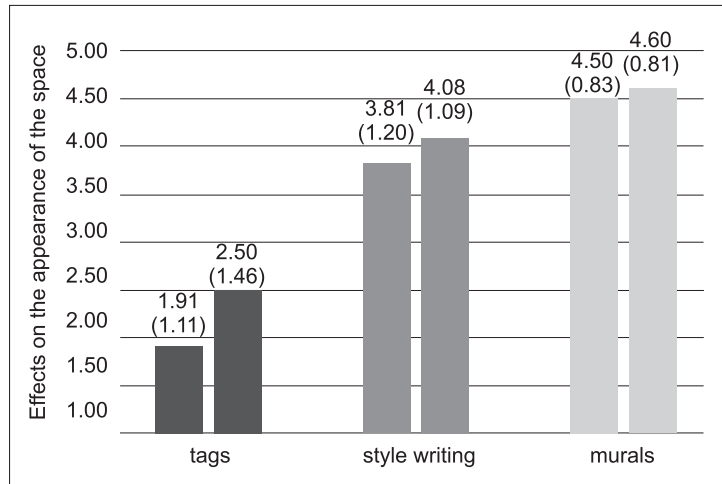
Note. Participants were presented with each photograph separately and all photographs were in colour.

RESULTS

Street art/graffiti and visual appearance of the space

Repeated measures ANOVA results showed that participants' ratings of street art/graffiti forms were significantly different ($F(3.05, 2662.27) = 1466.86, p < 0.001, \text{partial } \eta^2 = 0.63$). On average, participants consider mural and style writing as a means of increasing and tags as a means of decreasing the appearance of the space (Figure 2).

➔ FIGURE 2
 Street art/graffiti forms
 as a means of increas-
 ing vs. decreasing the
 visual appearance of
 the space



Note. 1 = decreasing; 5 = increasing. Means are indicated above the bars with standard deviation in the brackets.

The ratings of some street art/graffiti examples significantly correlated with participants' age and gender (Table 3). Older participants were more inclined to perceive almost all examples as something that decreases the appearance of the space in comparison to younger participants. Male participants were slightly more inclined to consider the signature tag, one style writing example and one mural as a means of increasing the appearance of the space in comparison to female participants. Female participants rated higher the second tag example that stated "Good luck at work mom! <3" in comparison to male participants. However, it is important to note that all these correlations, although statistically significant, were rather small.

➔ TABLE 3
 Correlation between
 participant's age and
 gender with ratings of
 the effects of the street
 art/graffiti on the
 visual appearance of
 the space

	Participant's age		Participant's gender	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Tag 1	0.00	0.991	0.15**	0.000
Tag 2	-0.25**	0.000	-0.12**	0.000
Style writing 1	-0.05	0.169	0.08*	0.019
Style writing 2	-0.07*	0.037	0.04	0.218
Mural 1	-0.14**	0.000	0.01	0.888
Mural 2	-0.12**	0.000	0.07*	0.041

Note. 1 = female; 2 = male.

Impressions of the public space – street art/graffiti combination

A preliminary analysis showed statistically significant, but small differences in participants' gender $\chi^2(3, 873) = 9.65, p = 0.022$ and age ($F(3, 870) = 3.43, p = 0.017, \text{partial } \eta^2 = 0.01$) across four experimental conditions (Table 4). In subsequent analysis

the participants' age was entered as a covariate and gender as an additional independent variable.

TABLE 4
Participant's age and gender across study subsamples

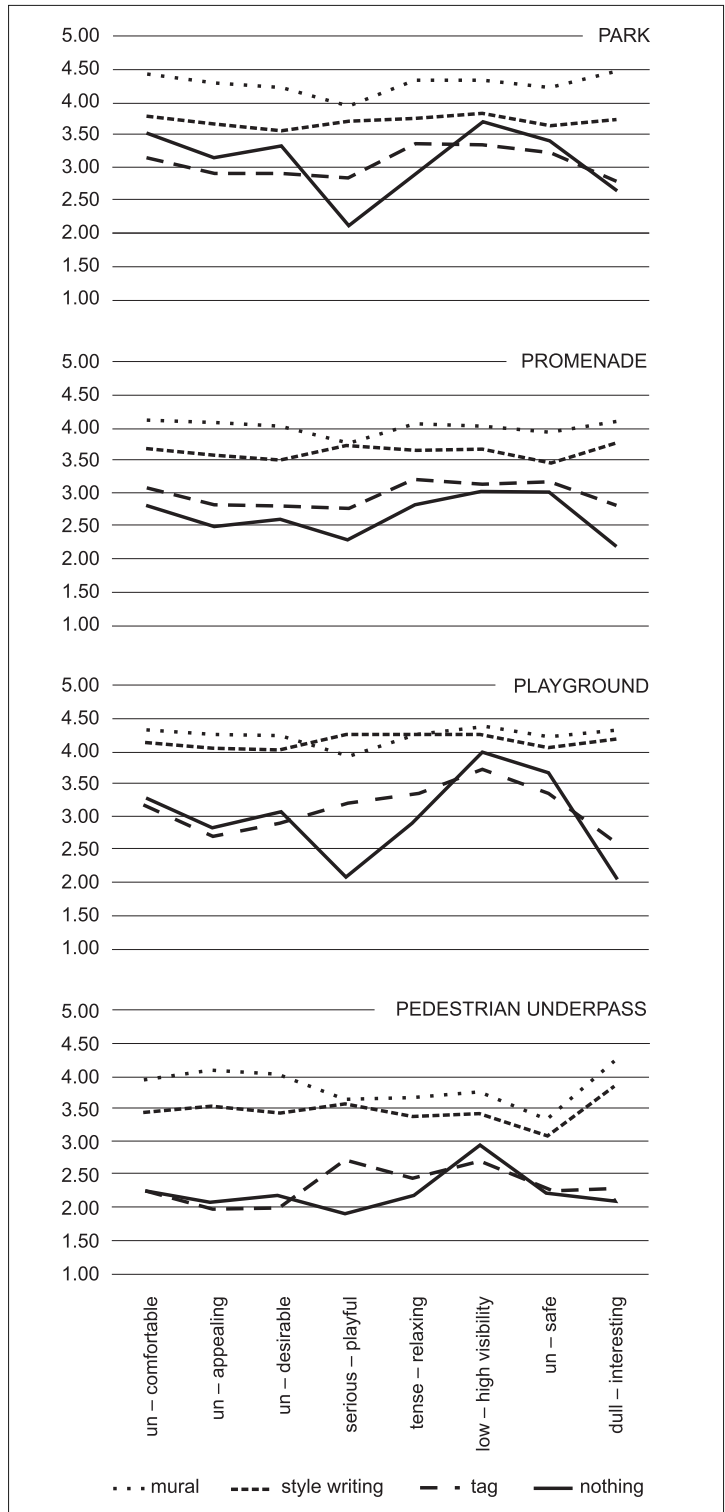
		Subset 1	Subset 2	Subset 3	Subset 4
Gender [f (%)]	female	115 (60)	126 (69)	234 (73)	128 (72)
	male	76 (40)	56 (31)	88 (27)	50 (28)
Age	M	27.16	26.70	29.80	28.58
	SD	10.52	10.77	12.70	12.54

Before further analysis, we tested differences in the overall impression of the space between four public spaces without street art/graffiti presented in the photographs. The results of the univariate ANCOVA showed that impressions of the empty public spaces differed significantly ($F(3, 864) = 34.74, p < 0.001, \text{partial } \eta^2 = 0.11$). Estimates for the park and the playground were the highest and did not differ significantly. The promenade was rated significantly lower than the aforementioned ones, and the participants' overall impression was the lowest for the underpass (Figure 4). Participants' gender had a significant but small effect on the impression of the space – males reported higher ratings than women ($F(1, 864) = 12.00, p = 0.001, \text{partial } \eta^2 = 0.01$). Participants' age was not a significant covariate ($F(1, 864) = 0.35, p = 0.554$), and the interaction between public space and gender was not significant either ($F(3, 864) = 0.35, p = 0.787$). Considering the differences in baseline impressions of the space, further analysis was done separately.

Mean values for each component of the impression of the space presented in Figure 3 showed that almost all components' ratings of public spaces with no street art/graffiti forms were neutral, with the pedestrian underpass being rated rather negatively. The addition of tags was the most evident in changing the rates for playfulness – participants rated public spaces more playful with tags in comparison with empty spaces. But besides playfulness, other ratings for places with tags were almost the same as for the empty space. The addition of style writing had similar effects to murals – participants' estimates were higher and moving towards more comfortable, appealing, desirable, playful, relaxing, higher visibility, safe and interesting in comparison to empty spaces.

To test the statistical significance of these effects univariate ANCOVA was conducted with overall impression of the space as a dependent variable, participants' age as a covariate, and forms of street art/graffiti and participants' gender as independent variables for each type of public space separately (Table 5).

➔ FIGURE 3
Effects of the street art/graffiti on each component of the public space impression



Public space	Effect	Df	F	p	partial η^2
Park	Street art/graffiti	3	67.33	0.000	0.19
	Gender	1	6.35	0.012	0.01
	Age	1	0.15	0.696	0.00
	Street art/graffiti x gender	3	1.32	0.266	0.00
	Error	864			
Playground	Street art/graffiti	3	129.93	0.000	0.31
	Gender	1	0.00	0.995	0.00
	Age	1	7.95	0.005	0.01
	Street art/graffiti x gender	3	0.38	0.770	0.00
	Error	864			
Promenade	Street art/graffiti	3	91.26	0.000	0.24
	Gender	1	0.01	0.904	0.00
	Age	1	15.67	0.000	0.02
	Street art/graffiti x gender	3	2.05	0.105	0.01
	Error	864			
Pedestrian underpass	Street art/graffiti	3	91.26	0.000	0.24
	Gender	1	0.01	0.904	0.00
	Age	1	15.67	0.000	0.02
	Street art/graffiti x gender	3	2.05	0.105	0.01
	Error	864			

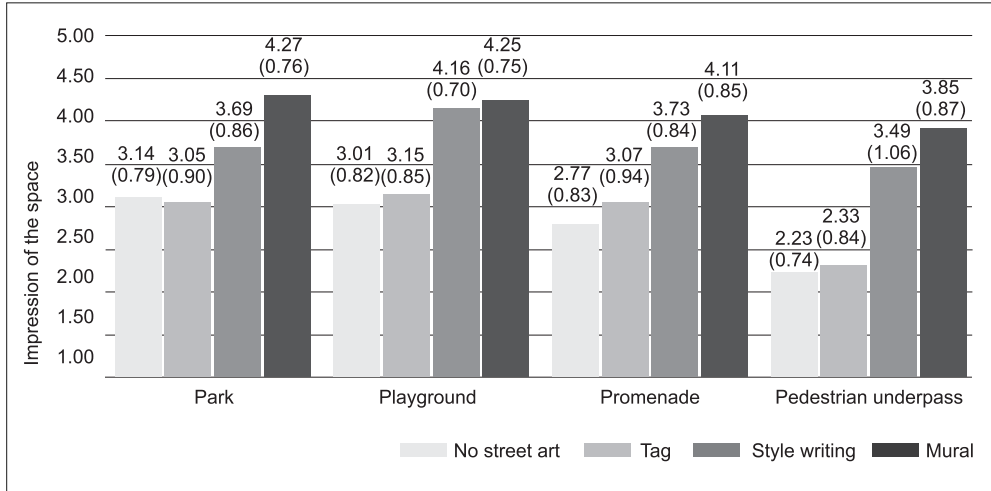
TABLE 5
Results of univariate ANCOVA for effects of street art/graffiti and participant's gender on overall impressions of the public space with participant's age as covariate

The results showed that street art/graffiti had significant effects on the overall impression of all public spaces included in this research (Table 5). It is interesting to note that these effects were stronger for the playground, the promenade, and the pedestrian underpass in comparison to the park. Effects of gender were only significant for the park, where male participants showed higher ratings in comparison to female participants. The interaction between street art/graffiti and gender was not significant for any of the public spaces presented. Participants' age was not a significant covariate for the park, but was significant for playground, promenade, and pedestrian underpass, where older participants showed lower ratings in comparison to younger ones. However, both gender and age had small size effects.

Pairwise comparisons of street art/graffiti forms showed that there was no significant difference between empty space and the same space with the tag for all four examples of public space (park: $\Delta^5 = 0.04, p = 1$; playground: $\Delta = 0.13, p = 0.745$; promenade: $\Delta = 0.19, p = 0.190$; pedestrian underpass: $\Delta = 0.08, p = 1$). On the contrary, in all four public spaces the addition of the style writing (park: $\Delta = 0.56, p < 0.001$; playground: $\Delta = 1.13, p < 0.001$; promenade: $\Delta = 0.90, p < 0.001$; pedestrian underpass: $\Delta = 1.17, p < 0.001$) and the mural (park: $\Delta = 1.10, p < 0.001$; playground: $\Delta = 1.25, p < 0.001$; promenade: $\Delta = 1.29, p < 0.001$; pedestrian underpass: $\Delta = 1.55, p < 0.001$) altered the impression of the space significantly in comparison to the same space

with no street art/graffiti interventions. Finally, only for the playground there was no difference between style writing and murals ($\Delta = 0.12, p = 0.851$), and for the rest of the public spaces the additions of murals altered the overall impression significantly more positively in comparison to style writing (park: $\Delta = 0.54, p < 0.001$; promenade: $\Delta = 0.40, p < 0.001$; pedestrian underpass: $\Delta = 0.38, p < 0.001$).

FIGURE 4
Effects of the street art/graffiti on the overall impression of the public space



Note. Means are indicated above the bars with standard deviation in the brackets.

DISCUSSION

Urban landscapes can adopt numerous meanings and functions depending on the connections established between the spatial settings and the individual users. The art in public spaces has a prominent role in these connections through shaping urban aesthetic value, image, and identity. This study aimed to examine the role of a specific art form, i.e., street art and graffiti, in shaping the impression of public spaces. Overall, our results showed that street art/graffiti forms have the potential to transform space from rather neutral to more comfortable, appealing, playful, interesting, and safe. However, differences between the observed art forms were noticeable. While tag mostly had neutral or negative effects, style writing and mural had strong and positive effects. Both gender and age had either nonsignificant or small size effects.

Street art/graffiti and visual appearance of the space

Overall, our results showed that participants mainly did not consider street art/graffiti as something that threatens the visual aspects of the space. As tags, style writing, and murals are considered different in terms of damage, aesthetics, and understandability, the results showed different effects.

As predicted, participants considered murals as a means of increasing the visual appearance of the space. This art form uses symbols understandable to the wider audience, which make it more familiar, aesthetically pleasing, and less threatening in comparison to other forms (e.g., Blanché, 2015). Although style writing uses symbols understandable mostly within a subculture, the examples of style writing used in this study were rated as a means that improve the visual aspect of the space.

Even though tags are the most unfamiliar and negatively perceived (Conklin, 2012; Dovey et al., 2012), our results showed a difference regarding the tag content. Both examples of tags were rated as a means of decreasing the visual appearance of the space, but the tag with the likable message was rated somewhat more favourably in comparison to the typical signature tag. The difference in the effects that tags, style writing, and murals have on the subjective evaluation of the visual appearance of the space was further corroborated in the experimental part of the study.

Impressions of the public space and street art/graffiti

It is useful to interpret the examples of the public spaces used in this research in terms of Augé's (1995) *non-place* and Relph's (1976) *placelessness*. Regarding opportunities for meaningful connection, we could define the park and playground as having more potential for forming a sense of place, while the promenade could be seen as a space that can produce *placelessness*, and the pedestrian underpass, with its transitory nature but without many opportunities to produce meaning, as a *non-place*. Baseline ratings of our examples with no street art/graffiti presented in the photographs can confirm the proposed distinction. Ratings for the park and the playground were slightly positive and differed significantly from the neutral rating for the promenade and the slightly negative for the pedestrian underpass. The addition of the street art/graffiti transformed these rather negative or neutral impressions towards more pleasant ones. Although we have not used a direct measure of the sense of the place, we can argue that more comfortable, appealing, playful, interesting, and safe spaces offer more opportunity for making meaningful connections to the space and forming a sense of place.

Murals and style writing generated substantial positive change in the impression of the space in all examples of public spaces, while the addition of tags did not change the overall impression except for the raise from seriousness towards playfulness. Based on the previous findings, we primarily expected tags to have negative effects (Conklin, 2012; Dovey et al., 2012), but it seems that our participants mostly did not

take them into consideration when forming their impression of the space. Blanché (2015) argues that passers-by often overlook or ignore street art and graffiti as forms of visual noise and recognise them only in case of big murals. Moores and Metykova (2009) write how senses of place can be especially instigated when habitualness is disrupted and the process of reconstitution is ongoing. Likewise, it is reasonable to assume that our participants did not notice signature tags because they are so omnipresent and paid attention to them mostly when explicitly asked to (as in the questions about visual appearance of the space), or when confronted with tags that convey positive or negative messages they can relate to. In spite of ignoring tags overall, the rise from seriousness towards playfulness is interesting since it can be seen as an indication of unconscious benevolence towards tags that may exist along with the common outright notion of tags as "bad" and murals as "good".

Contrary to the results for tags and in line with previous results (Blanché, 2015; Conklin, 2012; Gottlieb 2008; White, 2001), murals altered the overall impression and did so significantly more positively in comparison to style writing for most of the examples. Only in the case of the playground was there no difference in the positive effect of style writing and murals. This result brings forward Banksy's "the right piece, at the right time, and in the right place" motto of street art. In other words, it is important to have in mind that although murals and style writing produce positive effects, certain forms are better suited for certain types of public space.

Furthermore, based on the presented results, we can conclude that the addition of both style writing and murals is particularly valuable for public spaces with qualities of *non-place* and/or *placelessness*, such as promenades and pedestrian underpasses. Art in these types of public spaces provides the much-needed novelty to help people in creating value, meaning and relationship to the space. Perovic and Kurtovic Folic (2012) in their exploration of the visual perception of public open spaces found that spaces without a clearly defined visual identity and monofunctional spaces were the most negatively evaluated. Our results offer empirical evidence for one possible way of making those types of spaces more welcoming for creating identity connections and possible multifunctionality. Finally, previous research showed that the addition of street art/graffiti forms can prevent the decay of the public space (Craw et al., 2006), which brings additional support for using street art and graffiti as a means of transforming public spaces from not-noticeable or negative to more comfortable, appealing, playful, interesting, and safe.

Age and gender differences

We expected participants' age to have moderate effects, but the results showed mostly small or nonsignificant effects. Previous research suggested that street art/graffiti is a generational phenomenon, i.e., people under 35 years of age were more likely to positively rate different forms of street art/graffiti in comparison to older individuals (e.g., Conklin, 2012). In line with those results, our older participants lean somewhat more towards seeing street art/graffiti as a means of decreasing the appearance of the space. Nevertheless, our results showed overall positive impressions regardless of participants' age for all forms of street art/graffiti, which may have appeared due to the rather young, urban, and well-educated total study sample. Overall positive impressions could have also stemmed from familiarity with the studied examples among a large proportion of participants from Zagreb.

Previous results on gender differences are not straightforward but generally indicate somewhat more positive stances on street art/graffiti among men in comparison to women. Similarly, our results did not show clear consistency in the patterns of gender differences. In most cases there were no gender differences, but in some instances male participants were slightly more inclined to rate street art/graffiti forms as a means of increasing the appearance of the space in comparison to female participants. This can be explained by men's historic greater involvement in street art/graffiti (e.g., Macdonald, 2016), which can make them more familiar with this culture and hence more likely to form positive impressions. Additionally, perceived safety rated by women is more sensitive to the form and content of street art/graffiti in comparison to the ratings done by men (Austin & Sanders, 2007), which can also contribute to more favourable impressions of street art/graffiti among men. Finally, gender differences in territorial behaviour can also help in explaining these results. Men are generally more inclined to territorial behaviour (e.g., Mercer & Benjamin, 1980), so they could rate signature tag more positively than women based on the interpretation of this kind of tag as a territorial marker. On the other hand, the tag with the message could have been rated more positively by women in comparison to men due to using the word "mum" in the phrase.

Limitations and future research

Several limitations that apply to the present study can be useful guidelines for future studies. Our results may be limited due to online methodology with no in-built duplicate protection and snowball (non-probabilistic) sampling. Our participants had higher education and economic status than the

average. Also, as expected for the on-line survey (e.g., Smith, 2008), participants were mostly female, young adults (76% were less than 35 years old), and lived in big urban areas. Since these characteristics may be relevant for forming impressions of the space regarding street art/graffiti (e.g., Austin & Sanders, 2007), future studies should include a more diverse sample to appropriately cover the differences in experiences among age, gender, and socioeconomic sub-groups.

The strength, but also a limitation, of this study is using existing street art/graffiti examples and public spaces from Zagreb. This adds to the ecological validity of the study, but at the same time it could have evoked more positive or negative impressions for the participants who are already familiar with the used examples. Due to experimental design, we assume that participants' previous experiences with street art/graffiti had been distributed evenly throughout experimental groups. However, further studies could benefit from including the control variable of familiarity as well as the direct measure of the sense of place to strengthen the possible conclusion. Also, findings from this experimental and quantitative approach would be advanced by an ethnographic and qualitative approach in line with "walking diaries" from the works of Krajina (2017) or Moores and Metykova (2009).

Considering that street art is context and content specific, it would be useful to explore how different age groups perceive street art in the public spaces they use frequently (e.g., children in playgrounds, elderly in retirement homes; students in campuses), and how different content of the art form shifts the impression of the space. In this research, a neutral content of street art/graffiti forms was chosen purposefully in order to put more accent on the art form and to avoid the connotations that street art/graffiti content carries regarding the social situation, politics-ideology, the Homeland war, sports or historical figures/events that are frequent in Croatia.

CONCLUSION AND IMPLICATIONS

One of the basic principles in environmental psychology is that the relationship between human behaviour and the environment is a reciprocal process (Bell et al., 2006). Environmental context influences and constrains behaviour while, at the same time, behaviour induces and shapes changes in the environment. Having this principle in mind, our results can be used as guidelines for the rehabilitation of existing public spaces as well as for the design of new spaces in the city landscape. Our results showed that street art and graffiti are not perceived as signs of urban decay. Moreover, the addition of street art/graffiti can transform neutral or rather negative im-

pressions of the space towards more positive ones. In the domain of good design and thoughtful planning, the implementation of street art/graffiti interventions in forms of art panels, designated walls, and installations can be used to design more comfortable public spaces with more possibility for constructive connections between the spatial settings and the individual as one of the stepping stones towards positive urban identity.

As Moores (2007) states "architects and planners may seek to facilitate place-making, but it is ultimately the inhabitants of any built or natural environment who have the capacity to constitute it as a lived space through their activities and emotions" (pp. 13). Thus, it is important to bear in mind that although street art/graffiti interventions can help in the promotion of local rehabilitation (e.g., Sequeira, 2016), it seems that they are also increasingly becoming a tool for gentrification (e.g., Mathews, 2010; Schacter, 2014). In other words, when street art and graffiti interventions are solely directed towards beautification without a sensibility towards local community issues, they can potentially bring more harm than good and lose one of their important features as an independent and critical form of art.

NOTES

¹ <https://licegrada.hr/wp-content/uploads/2020/03/glavu-gore-250320-20-04.jpg>

² <https://static.jutarnji.hr/images/live-multimedia/binary/2020/3/24/8/Srce.jpg>

³ In this paper we will use "street art/graffiti" when we discuss general findings and argumentation from the literature that did not make a clear distinction between them. We will use specific terms when discussing findings related to distinct art forms in this area.

⁴ The Google Forms tool has no in-built system for randomising questionnaire forms. Thus, we used a separate question where participants chose a number and based on their answer were directed to one of the photograph subsets. To counterbalance the tendency to choose the third option, the subset/answer combinations were changed every few days. However, we have not achieved the same number of participants per subset. The online questionnaire is available upon request.

⁵ Mean difference (univariate).

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Oblikovanje dojmova o prostoru: učinci ulične umjetnosti/grafita u različitim kontekstima javnog prostora

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Umjetnost ima istaknutu ulogu u oblikovanju urbane estetske vrijednosti, dojma i identiteta javnih prostora. Cilj istraživanja bio je ispitati ulogu ulične umjetnosti/grafita u oblikovanju dojma o prostoru putem korelacijske i eksperimentalne metode u on-line istraživanju s 874 sudionika (69 % žena, dobi od 15 do 66 godina). Sudionici su procjenjivali dojam prostora putem skale od osam čestica za fotografije različitih kombinacija ulične umjetnosti/grafita i javnih prostora. Rezultati su pokazali da ulična umjetnosti/grafiti mijenjaju dojam prostora iz relativno neutralnog u ugodniji, privlačniji, razigraniji, zanimljiviji i sigurniji. Dok tag uglavnom nije imao značajne učinke, *style writing* i mural su imali snažne i pozitivne učinke. Implikacije rezultata istraživanja daju smjernice za obnovu i planiranje javnih prostora.

Ključne riječi: ulična umjetnost, grafiti, tag, *style writing*, mural, javni prostor, subjektivni dojam



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