Journal of Architectural and Planning Research
39:3 (16-29, 2026) 16

STREETSCAPES SCENES: AESTHETIC EVALUATIONS AND PREFERENCES REGARDING APPEARANCE AND AS A PLACE TO LIVE BY PEOPLE WITH DIFFERENT LEVELS AND TYPES OF COLLEGE EDUCATION

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This paper evaluates the appearance and identifies the preferences for streetscape scenes regarding their appearance and as a place to live by three groups of people and analyzes the relationship between these preferences. Questionnaires in the LimeSurvey software were used to collect data and were filled in by 250 people as follows: 62 architects, 169 non-architects college graduates and 19 non-college graduates. A total of 12 scenes of streetscapes characterized by blind walls, blind walls with vegetation, garage doors and walls with openings were grouped into four sets with three scenes each. Non parametric statistical tests such as Kruskal-Wallis, Kendall W and Spearman's rank correlation coefficient were used to analyze the data. Among the paper's contribution to the field and its practical architectural and planning implications are that architects tend to have a higher preference for scenes including buildings with doors and windows with a direct relationship with the street while non-architects tend to have a higher preference for streetscapes with the presence of vegetation. Nonetheless when the streetscape is characterized by blind walls or garage doors, with no vegetation or no clear visualization of vegetation, it tends to be rejected by the three groups. Moreover, the findings are clearly in line with Gestalt theory regarding the primary importance of direct and immediate sensory experience in explaining the streetscapes evaluations and preferences.

Keywords: *streetscapes scenes, aesthetic evaluations, preferences regarding appearance, preferences as a place to live, aesthetics and college education*

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https://doi.org/10.66033/japr2025-302

INTRODUCTION

The streets are not only the main spaces in the functioning of cities, but also in the aesthetic experience of their users. The original meaning of the term 'aesthetics' is intrinsically related to the process of perception, since it derives from the Greek words "aisthanesthai", "aistheta" and "aesthesis", which mean, respectively, "perceive", "perceptible things" and "perception through the senses" or "perceive" [Cold, 2001, Porteous, 1996]. Aesthetics is also related to perception according to the definition "the science of the conditions of sensual perception" by the philosopher Immanuel Kant (1724-1804) [Porteous, 1996], while the philosopher Alexander Baumgarten (1714-62) includes the focus on beauty as a constituent of aesthetics, along with the process of perception through the senses ('anesthesia') [Berleant, 1999]. It follows that the definition of aesthetics as a combination of sensory perception and beauty, formally introduced by Baumgarten, is understood as the origin of modern aesthetics and related to its definition by the New English Dictionary, namely, the 'philosophy or theory of taste, or the perception of the beautiful in nature and art' [Porteous, 1996]. However, as highlighted by [Carlson, 2000], much of our aesthetic appreciation is not limited to art, but addresses the world at large.

The importance of aesthetic appreciation of the world in general, and in particular, for users of public open spaces, has been evidenced in several studies [Cooper Marcus & Sarkissian, 1986, Kaplan et al., 1998, Reis & Lay, 2003, Weber et al., 2008]. In addition to people's attitudes and well-being, the aesthetic quality can influence people's behaviors as we are attracted to come and go to aesthetically attractive environments and to avoid or refuse to go to aesthetically unpleasant places [Nasar, 1992a, Nasar, 1998]. The value of a continuous aesthetically pleasing urban experience has also been understood as one of the three main goals of city design, in addition to social and economic efficiency and biological health [Porteous, 1996], and it is intrinsically related to the aesthetic quality of streetscapes. In this sense, traditional urban settings, such as those in central historical areas of Prague and Lisbon, streetscapes are characterized by buildings facades along the sidewalk, with doors and windows facing the street [Bentley et al., 2005, Reis, 2014a, Reis, 2014b], with a direct relationship between buildings and public open spaces. On the other hand, modernist urban settings tend to be characterize by buildings located inside the blocks with distinct setbacks and, frequently, with blind walls facing the streets [Reis, 2014a, Reis, 2014b, Trancik, 1986].

Moreover, front facades' ground floor, which is the most important space in the relationship between the building and the street [Gehl, 2010, Gehl, 2011], has been used as garage in many cities. Additionally, gated condominiums characterized by a closed perimeter of walls have spread out in many areas around the world, including traditional urban areas characterized by buildings facades with doors and windows facing the street, negatively affecting the use and the aesthetics of public open spaces (e.g., [Becker & Reis, 2004, Bentley et al., 2005, Gehl, 2010, Jacobs, 1984]). Nonetheless, such gated condominiums with blind walls facing the street and buildings with ground floor used as garage continue to be built in many cities, including Brazilian cities and it is not known how far these visual barriers would affect preferences for a place to live, what indicates the need for more research. In this sense, although the positive effect of vegetation on people has been demonstrated (e.g., [Kaplan et al., 1998, White & Gatersleben, 2011]), it is not clear to what extent blind walls covered with vegetation would have a similar effect.

In its turn, some controversy has been revealed between the existence [Fawcett et al., 2008, Nasar, 1994] and the inexistence [Reis et al., 2017] of significant differences between the aesthetic evaluations by architects and by lay people. In a study about aesthetic evaluation of 40 houses, [Nasar, 1994] mentions that the projects best rated by architects were those worst rated by other professionals and vice versa. In contrast, other studies (e.g., [Reis et al., 2017]) show that aesthetic responses clearly tend to be positive when visual order and stimuli are noticeably perceived, regardless of type and level of academic background of the respondent. In addition, there is no conclusive evidence about the relationship between aesthetic preference and preference as a place to live by residents of different cities. Therefore, there is a need to deepen the knowledge regarding

the aesthetic evaluations, the relationship between aesthetic preference and preference as a place to live by people with different levels of college education living in cities of distinct countries.

Moreover, the existence of some established knowledge about urban aesthetics, as shown above, has not prevented many buildings in several cities around the world, including many Brazilian cities, from ignoring such knowledge with respect to the most appropriate relations between buildings and streets. Additionally, there is no conclusive support for the similarity or lack of similarity of aesthetic evaluations of streetscapes among residents of cities in different countries and regions, since most of the literature regarding urban aesthetics comes from Europe and the United States. Therefore, there is a need for more evidence generated through research as well as the dissemination of such evidence in publications, in order to inform the public and those responsible for urban planning and design about the most appropriate relationships between buildings and public open spaces according to residents with different levels and types of college education living in cities outside Europe and the United States in order to test for the universality of findings regarding urban aesthetics.

Hence, the objective of this paper is to evaluate the appearance and identify the preferences for the appearance of streetscape scenes characterized by blind walls, blind walls covered with vegetation, garage doors and walls with openings and with distinct proximity to the street, and the preferences for these scenes as a place to live by three groups of people with different levels and types of college education and living in a city in Brazil. Moreover, it is analyzed the relationship between preference for a scene's appearance and preference for a scene as a place to live.

METHODOLOGY

In order to collect the data and fulfill the objectives of this paper, three groups of potential respondents namely, architects, non-architects college graduates and non-college graduates were invited to complete an online questionnaire made available in the LimeSurvey software. This invitation was sent by e-mail to unions of employees of three federal educational institutions, to the Deans and Departments of many Faculties at the Federal University of Rio Grande do Sul, and to educational institutions in the city of Porto Alegre in charge of preparing for the university entrance examination. In total, 250 questionnaires were completed, as follows: 62 by architects, 169 by non-architects college graduates and 19 by non-college graduates. A total of 12 scenes of streetscapes characterized by blind walls, blind walls covered with vegetation, garage doors and walls with openings with distinct proximity to the street were included in the questionnaire, grouped into four sets with three scenes each (Set 1 – Figure 1; Set 2 – Figure 2; Set 3 – Figure 3; Set 4 – Figure 4). Each streetscape scene consists of two edited and compatible color photographs of one side of some streets in Porto Alegre, due to the difficulty of having a clear streetscape, showing both street sides, with only one photo. Color photographs have been used to simulate a real environment in studies involving aesthetic evaluations (e.g., [Sanoff, 1991]). The photos that make up the scenes have different perspectives (including distinct sidewalks and lanes widths) due to the fact that these photos were taken from different points in order to have an adequate visualization of one side of a street. The selected points varied from street to street due to the different types of obstacles and existing visual barriers (e.g., trees, rubbish bins, poles and light wires). These different viewing angles do not have a significant effect on the aesthetic evaluations, since the existing architectural elements are the determinants for such evaluations [Stamps, 2000]. In this respect, the variations among the scenes' perspectives did not affect preferences for scenes in the pilot tests carried out to verify the suitability of the scenes to represent the different streetscape categories. Items that affected the aesthetic evaluation of the streetscapes were removed from the scenes in the Adobe Photoshop CS6 program, such as: distinct skies, pedestrians, garbage cans, light poles and wires, and some cars and vegetation. The scenes also have similar levels of natural lighting, with little or no solar incidence, so as to avoid great contrasts and

shadows in the buildings. In order to obtain the right combination of two photographs in each streetscape scene and the adequate questions, three pilot testes were carried out.

Scene A1 - buildings inside the blocks with no direct relationship with the street

Scene B1 - buildings on the block perimeter with doors and windows facing the street

Scene C1 - buildings with blind walls facing the street

Figure 1: Set 1: streetscape scenes A1, B1 and C1.

Scene A2 - gated condominiums' walls facing the street

Scene B2 - gated condominiums' walls facing the street and buildings on the block perimeter with doors and windows facing the street

Scene C2 - buildings on the block perimeter with doors and windows facing the street

Figure 2: Set 2: streetscape scenes A2, B2 and C2

Scene A3 - gated condominiums' green walls facing the street

Scene B3 - gated condominiums' green walls facing the street and buildings on the block perimeter with doors and windows facing the street

Scene C3 - buildings on the block perimeter with doors and windows facing the street

Figure 3: Set 3: streetscape scenes A3, B3 and C3


Scene A4 - garages´ doors facing the street


Scene B4 - garages´ doors facing the street and buildings on the block perimeter with doors and windows facing the street


Scene C4 - buildings on the block perimeter with doors and windows facing the street

Figure 4: Set 4: streetscape scenes A4, B4 and C4

Simple-choice questions about the aesthetic evaluations of the 12 streetscape scenes, as well as multiple-choice questions about the preference for a scene's appearance and as a place to live and justifications for such preferences were part of the questionnaire, such as: "Do you think the appearance of the scene is: [ ] Very beautiful, [ ] Beautiful, [ ] Neither beautiful nor ugly, [ ] Ugly, [ ] Very ugly]"; "Rank scenes from the most (1) to the least (3) preferred in appearance: [ ] Scene A, [ ] Scene B, [ ] Scene C"; "Please state the main reasons that justify the most preferred scene's appearance: [ ] Presence of buildings with openings facing the street, [ ] Direct relationship of the buildings with the street, [ ] Others: ....."; "Please, state the main reasons that justify the least preferred scene: [ ] Presence of walls, [ ] Lack of direct relationship between buildings and the street, [ ] Others: ....."; "Rank scenes with the places, from the most (1) to the least (3) preferred to live: [ ] Scene A, [ ] Scene B, [ ] Scene C"; "Indicate the main reasons that justify the most preferred scene to live in: [ ] Presence of buildings with openings facing the street, [ ] Direct relationship of the buildings with the street, [ ] Others: ....."; "Indicate the main reasons that justify the least preferred scene to live in: [ ] Presence of walls, [ ] Lack of direct relationship between buildings and the street, [ ] Others: ....". The data in the LimeSurvey software were transferred to and analyzed in the PASW Statistics 18 software through non parametric statistical tests, such as Kruskal-Wallis, Kendall W, and Spearman's rank correlation. The first identifies the existence of a statistically significant difference (sig. ≤ 0.05) among the evaluations of each of the three scenes in a set by the three groups of respondents. The second reveals the existence of a statistically significant difference among the evaluations of the three scenes in each of the four sets by each of the three groups of respondents. The latter shows the existence of correlations between preference for a scene's appearance and for a scene as a place to live.

RESULTS

The best rated scenes (B1, C2, C3, C4) (Table 1) tend to be those most preferred by architects, either concerning appearance (B1, A1, C2, C3, C4) or as a place to live (B1, A1, C2, C3, A3, C4) (Table 2) and the worst rated scenes (C1, A2, B3, A4) tend to be the least preferred in terms of appearance (C1, A2, B3, A4) and as a place to live (C1, A2, B3, C3, A4).

The best evaluated scenes (A1, C2, A3, C4) (Table 1) by non-architects college graduates also tend to be the most preferred in relation to appearance (A1, C2, A3, C4) and as a place to live (A1, A2, C2, A3, C4) (Table 2), while the worst rated scenes (C1, A2, B2, B3, A4) tend to be the least preferred by this group concerning appearance (C1, A2, C3, A4) and as a place to live (C1, C2, A2, C3, A4). Moreover, the best rated scenes (A1, C2, A3, C4) (Table 1) tend to be the most preferred by non-college graduates concerning appearance (A1, A2, C2, A3, C4) and as a place to live (A1, A2, A3, C4) (Table 2), and the worst evaluated scenes (C1, A2, B2, B3, C3, A4) tend to be the least preferred in terms of appearance (B1, C1, B2, C3, A4) and as a place to live (B1, C1, C2, C3, A4). Hence, in general, preference for a scene, either regarding its appearance or a place to live, coincides with its best appearance evaluation, and the least preference for a scene, either regarding its appearance or as a place to live, correspond to its worst appearance evaluation.

Table 1: Evaluation of appearance of streetscape scenes

	Very Beautiful	Beautiful	N beautiful nor ugly	Ugly	Very ugly	mrv Kendall	mrv K-W
Architects – number of respondents in each scene: A1=62; B1=56; C1=52; A2,B2,C2 = 49; A3=48; B3=48; C3 =49; A4=47; B4=47; C4=49							
A1	2 (3.2)	12(19.4)	25(40.3)	16(25.8)	7(11.3)	2.15	103.15
B1	3(5.4)	18(32.1)	23(41.1)	11(19.6)	1(1.8)	2.43	140.24
C1	0.0	3(5.8)	9(17.3)	23(44.2)	17(32.7)	1.41	84.46
A2	0.0	3(6.1)	9(18.4)	15(30.6)	22(44.9)	1.38	61.02
B2	0.0	3(6.1)	18(36.7)	21(42.9)	7(14.3)	1.80	75.36
C2	9(18.4)	27(55.1)	11(22.4)	1(2)	1(2)	2.83	103.18
A3	6(12.5)	19(39.6)	16(33.3)	6(12.5)	1(2.1)	1.97	61.93
B3	1(2.1)	18(37.5)	20(41.7)	9(18.8)	0.0	1.74	83.48
C3	9(18.4)	27(55.1)	11(22.4)	1(2)	1(2)	2.29	103.18
A4	0.0	0.0	5(10.6)	28(59.6)	14(29.8)	1.15	73.32
B4	0.0	5(10.6)	27(57.4)	13(27.7)	2(4.3)	1.98	98.22
C4	9(18.4)	27(55.1)	11(22.4)	1(2)	1(2)	2.87	103.18
Non-architects college graduates – number of respondents in each scene: A1=169; B1=163; C1=146; A2,B2,C2 = 130; A3=124; B3=124; C3=130; A4=120; B4=120; C4=130							
A1	9(5.3)	55(32.5)	66(39.1)	31(18.3)	8(4.7)	2.44	129.30
B1	5(3.1)	27(16.6)	61(37.4)	54(33.1)	16(9.8)	1.95	106.88
C1	1(0.7)	13(8.9)	44(30.1)	63(43.2)	25(17.1)	1.61	108.38
A2	6(4.6)	28(21.5)	40(30.8)	42(32.3)	14(10.8)	1.77	104.95
B2	2(1.5)	28(21.5)	50(38.5)	42(32.3)	8(6.2)	1.77	100.45
C2	19(14.6)	64(49.2)	27(20.8)	17(13.1)	3(2.3)	2.47	90.94
A3	42(33.9)	66(53.2)	14(11.3)	2(1.6)	0.0	2.49	100.56
B3	3(2.4)	58(46.8)	45(36.3)	16(12.9)	2(1.6)	1.64	92.48
C3	19(14.6)	64(49.2)	27(20.8)	17(13.1)	3(2.3)	1.88	90.94
A4	1(0.8)	2(1.7)	29(24.2)	64(53.3)	24(20)	1.44	91.12
B4	0.0	10(8.3)	49(40.8)	52(43.3)	9(7.5)	1.83	81.92
C4	19(14.6)	64(49.2)	27(20.8)	17(13.1)	3(2.3)	2.72	90.94
Non-college graduates - number of respondents in each scene: A1=19; B1=16; C1= 11; A2,B2,C2 = 10; A3,B3,C3 =10; A4,B4,C4 = 10							
A1	6 (31.6)	5(26.3)	5(26.3)	3(15.8)	0.0	2.41	164.66
B1	2(12.5)	7(43.8)	3(18.8)	4(25)	0.0	2.27	153.47
C1	0.0	3(27.3)	6(54.5)	2(18.2)	0.0	1.32	157.27
A2	2(20)	2(20)	4(40)	2(20)	0.0	2.00	132.10
B2	1(10)	4(40)	2(20)	2(20)	1(10)	1.80	120.35
C2	1(10)	8(80)	0.0	1(10)	0.0	2.20	107.70
A3	6(60)	3(30)	1(10)	0.0	0.0	2.50	121.15
B3	2(20)	5(50)	2(20)	1(10)	0.0	1.75	117.85
C3	1(10)	8(80)	0.0	1(10)	0.0	1.75	107.70
A4	0.0	2(20)	5(50)	3(30)	0.0	1.50	137.20
B4	0.0	4(40)	5(50)	1(10)	0.0	2.00	130.65
C4	1(10)	8(80)	0.0	1(10)	0.0	2.50	107.70

Notes: N beautiful nor ugly = neither beautiful nor ugly; mrv Kendall = mean rank values (values should be compared for each of the three respondent groups; higher value indicates prettier looking scene) obtained through Kendall W Test - set 1 (architects - test statistic = 39.487, sig. = .000; non-architects college graduates - test statistic = 74.968, sig. = .000; non-college graduates - test statistic = 9.0, sig. = .011) - set 2 (architects - test statistic = 68.038, sig. = .000; non-architects college graduates - test statistic = 60.504, sig. = .000) - set 3 (architects - test statistic = 12.330, sig. = .002; non-architects college graduates - test statistic = 70.542, sig. = .000) - set 4 (architects - test statistic = 80.049, sig. = 0.000; non-architects college graduates - test statistic = 140.768, sig. = 0.000; non-college graduates - test statistic = 7.692, sig. = 0.021); mrv K-W = mean rank values (values should be compared for each of the three scene types; higher value indicates prettier looking scene) obtained through Kruskal-Wallis Test - set 1 (A1 - test statistic = 13.127, sig. = .001; B1 - test statistic = 16.12, sig. = .000; and C1 - test statistic = 16.41, sig. = .000) - set 2 (A2 - test statistic = 29.735, sig. = .000; B2 - test statistic = 10.823, sig. = .004) - set 3 (A3 - test statistic = 25.655, sig. = .000) - set 4 (A4 - test statistic = 16.315, sig. = 0.000; B4 - test statistic = 12.50, sig. = 0.002); values between brackets represent percentages in relation to the total number of respondents in each scene; the number of respondents may vary in relation to the evaluation of each scene, since some questions were not answered by everyone in each of the three groups.

Table 2: Preference for streetscape scene regarding appearance and as a place to live

architects			non-architects college graduates			non-college graduates		
Scene	mrv K	mrv K-W	Scene	mrv K	mrv K-W	Scene	mrv K	mrv K-W
Scenes' appearance								
(48)			(139)			(11)		
A1 (78)	1.62	122.48	A1 (180)	1.29	92.99	A1 (13)	1.18	81.45
B1 (81)	1.69	69.69	B1 (314)	2.24	108.50	B1 (27)	2.45	124.09
C1 (129)	2.69	115.28	C1 (343)	2.47	95.42	C1 (26)	2.36	82.14
Scene as a place to live								
(46)			(139)			(11)		
A1 (76)	1.65	124.80	A1(181)	1.30	92.09	A1(11)	1.00	69.50
B1 (83)	1.78	73.53	B1(311)	2.24	105.40	B1(28)	2.55	127.00
C1(118)	2.57	108.07	C1(342)	2.46	95.86	C1(27)	2.45	91.91
Scenes' appearance								
(49)			(126)			(10)		
A2 (134)	2.73	116.27	A2 (284)	2.26	86.67	A2 (18)	1.80	58.80
B2 (98)	2.00	86.87	B2 (260)	2.08	93.82	B2 (22)	2.20	103.60
C2 (62)	1.27	74.67	C2 (211)	1.66	98.29	C2 (20)	2.00	116.10
Scene as a place to live								
(49)			(124)			(10)		
A2 (128)	2.62	118.39	A2 (247)	1.98	84.58	A2 (16)	1.60	64.70
B2 (98)	2.00	92.48	B2 (247)	1.99	91.78	B2 (20)	2.00	92.40
C2 (67)	1.38	65.74	C2 (254)	2.02	100.78	C2 (24)	2.40	120.10
Scenes' appearance								
(48)			(121)			(10)		
A3 (101)	2.13	117.55	A3 (168)	1.38	79.73	A3(14)	1.40	82.05
B3 (105)	2.23	93.28	B3 (258)	2.17	87.66	B3(20)	2.00	76.10
C3 (77)	1.64	56.38	C3 (292)	2.45	99.61	C3(26)	2.60	107.25
Scene as a place to live								
(47)			(121)			(10)		
A3 (96)	2.04	108.10	A3 (184)	1.51	83.19	A3 (14)	1.40	78.40
B3(101)	2.15	94.81	B3 (247)	2.06	87.81	B3 (19)	1.90	76.00
C3 (85)	1.81	62.63	C3 (292)	2.43	97.38	C3 (27)	2.70	112.35
Scenes' appearance								
(47)			(114)			(10)		
A4 (133)	2.83	94.24	A4 (302)	2.65	83.39	A4 (25)	2.50	77.05
B4 (93)	2.02	84.27	B4 (233)	2.04	86.23	B4 (20)	2.00	82.80
C4 (53)	1.15	77.70	C4 (153)	1.32	88.44	C4 (15)	1.50	96.15
Scene as a place to live								
(46)			(113)			(10)		
A4 (125)	2.72	91.88	A4 (289)	2.58	82.71	A4 (23)	2.30	70.60
B4 (91)	1.98	83.82	B4 (227)	2.00	86.12	B4 (19)	1.90	77.75
C4 (60)	1.30	79.50	C4 (163)	1.42	86.12	C4 (18)	1.80	106.05

Notes: mrv K = mean rank values (values should be compared in the column, considering the lowest value as an indicator of the highest preference) obtained through Kendall W Test - set 1 [(scene's appearance: architects - test statistic = 34.125, sig. = .000; non-architects college graduates - test statistic = 107.324, sig. = .000; non-college graduates - test statistic = 11.091, sig. = .004) (scene as a place to live: architects - test statistic = 22.435, sig. = .000; non-architects college graduates - test statistic = 104.993, sig. = .000; non-college graduates - test statistic = 16.545, sig. = .000)] - set 2 [(scene's appearance: architects - test statistic = 52.898, sig. = .000; non-architects college graduates - test statistic = 23.747, sig. = .000) (scene

as a place to live: architects - test statistic = 38.164, sig. = .000)] - set 3 [(scene's appearance: architects – test statistic = 9.489, sig. = .009; non-architects college graduates - test statistic = 73.882, sig. = .000; by non-college graduates - test statistic = 7.200, sig. = .027) (scene as a place to live: non-architects college graduates - test statistic = 51.950, sig. = 0.000; non-college graduates - test statistic = 8.600, sig. = 0.014)] - set 4 [(scene's appearance: architects - test statistic = 64.478, sig. = .000; non-architects college graduates - test statistic = 99.770, sig. = .000) (scene as a place to live: architects - test statistic = 45.957, sig. = .000; non-architects college graduates - test statistic = 75.446, sig. = .000)]; mrv K-W = mean rank values (values should be compared in the line of each scene, considering the lowest value as an indicator of the highest preference) obtained through Kruskal-Wallis Test - set 1 [(scene's appearance: A1 - test statistic = 16.675, sig.= .000; B1 - test statistic = 21.031, sig.= .000; C1 - test statistic = 7.048, sig.= .029) (scene as a place to live: A1 - statistical test = 22.746, sig.=0.000; B1 - statistical test = 15.876, sig.=0.000)] - set 2 [(scene's appearance: A2 - test statistic = 19.159, sig. = 0.000; C2 - test statistic = 12.150, sig. = 0.002) (scene as a place to live: A2 - statistical test = 20.661, sig.=0.000; scene C2 - statistical test = 22.030, sig.=0.000)] - set 3 [(scene's appearance: A3 - test statistic = 25.735, sig. = .000; C3 - test statistic = 31.032, sig. = .000) (scene as a place to live: A3 - statistical test = 11.302, sig.=0.004; C3 - statistical test = 21.761, sig.=0.000)]; the values in parentheses next to the scene represent the sum of the points given to it by each group of respondents, points ranging from 1 (for the preferred scene) to 3 (for the least preferred scene); thus, the smaller the value in parenthesis, the greater the preference for the scene.

Additionally, correlations between preference for scene's appearance and preference for scene as a place to live were found regarding preferences by each group of respondents for each of the twelve scenes, with exception of the lack of correlations concerning preferences for scenes A1 and A3 by non-college graduates (Table 3), indicating the clear relevance of a place appearance for one's selection of a place to live.

Table 3: Correlation between preference for scene appearance and preference for scene as a place to live

Scene - Spearman's rank correlation coefficient - sig. - N (number of cases)			
A1-0.781-0.000-46	A2-0.431-0.002-49	A3-0.635-0.000-47	A4-0.630-0.000-46
A1-0.848-0.000-138	A2-0.529-0.000-125	A3-0.699-0.000-121	A4-0.678-0.000-112
A1-no correlation-11	A2-0.737-0.015-10	A3-no correlation-10	A4-0.763-0.010-10
B1-0.742-0.000-47	B2-0.612-0.000-49	B3-0.811-0.000-47	B4-0.674-0.000-46
B1-0.875-0.000-139	B2-0.605-0.000-123	B3-0.772-0.000-119	B4-0.658-0.000-112
B1-0.971-0.000-11	B2-0.825-0.003-10	B3-0.885-0.001-10	B4-0.818-0.004-10
C1-0.771-0.000-46	C2-0.560-0.000-49	C3-0.639-0.000-47	C4-0.672-0.000-46
C1-0.869-0.000-138	C2-0.528-0.000-124	C3-0.741-0.000-119	C4-0.669-0.000-113
C1-0.828-0.002-11	C2-0.707-0.022-10	C3-0.818-0.004-10	C4-0.691-0.027-10

Note: correspondence between the three lines in each scene type and the respondent's group: 1a. line - architects; 2a. line - non-architects college graduates; 3a. line - non-college graduates

The differences among the aesthetic evaluations and the preferences for scenes (in relation to their appearance and as a place to live) in each of the four sets (Figures 1-4) by the three groups of respondents are statistically corroborated (Kendall W test, Tables 1 and 2), confirming that scenes characteristics affected their evaluations and preferences, with the following exceptions:

- evaluations and preferences (regarding scene's appearance and as a place to live) by non-college graduates, and preferences (as a place to live) by non-architects college graduates, for streetscape scenes A2, B2 and C2 (Figure 2, Tables 1 and 2)
- evaluations by non-college graduates and preferences (as a place to live) by architects for scenes A3, B3 and C3 (Figure 3, Tables 1 and 2)

- preferences (concerning scene's appearance and as a place to live) by non-college graduates for scenes A4, B4 and C4 (Figure 4, Tables 1 and 2).

Therefore, in these exceptions clearly predominate evaluations and preferences by non-college graduates, indicating that such judgments were less affected by the differences in the scenes' attributes than those of the other two groups.

The differences concerning 21 (out of 36) aesthetic evaluations and the preferences (in relation to appearance and as a place to live) for the twelve scenes (Figures 1-4) among the three groups of respondents are statistically supported (Kruskal-Wallis test, Tables 1 and 2), while no such support was found regarding the following 15 assessments: evaluation of streetscapes C2, C3, B3, C4; preference for scenes B2, B3, A4, B4 and C4, concerning appearance and as a place to live; and preference for scene C1 as a place to live. Nonetheless, the statistically confirmed differences are mostly related to the existence of vegetation in the scene and not to building attributes. In turn, all twelve scenes were better rated by non-college graduates, while 7 scenes (A1, C1, A2, B2, A3, B3 and A4) were worse rated by architects and 5 (B1, C2, C3, B4 and C4) were worse evaluated by non-architect graduates (Table 1).

The most preferred scenes [appearance - B1(23), A1(22), C2, C3,C4; as a place to live - B1(22), A1(19),C2, C3(21), A3(21),C4] (Table 2) by architects are mainly due to the existence of buildings with a direct relationship with the street, with openings facing the street, although the existence of grassy areas and trees also explains architects preferences for a scene as a place to live. The least preferred scenes [appearance - C1, A2, B3, A4; as a place to live - C, A2, B3(12), C3(12), A4] (Table 2) by architects are largely due to the presence of walls, followed by lack of trees and grassy areas, and by lack of direct relationship between buildings and the street.

In its turn, the most preferred scenes [appearance - A1, C2, A3, C4; as a place to live - A1, A2(54), C2(51), A3, C4] (Table 2) by non-architects college graduates are mainly due to the presence of trees and grassy areas, to buildings with openings facing the street and to buildings with a direct relationship with the street. The least preferred scenes [appearance - C1, A2, C3, A4; as a place to live - C1, C2(55), A2(51), C3, A4] (Table 2) by non-architects college graduates are mostly due to the presence of walls, followed by lack of direct relationship between buildings and the street, and the lack of trees and grassy areas.

The most preferred scenes [appearance - A1, A2(4), C2(4), A3, C4; as a place to live - A1, A2, A3, C4] (Table 2) by non-college graduates are mainly due to presence of grassy areas and trees, followed by buildings with openings facing the street, and buildings with a direct relationship with the street. Although the scene with condominiums' walls facing the street (A2) is among the most preferred by non-college graduates, as well as by non-architects college graduates (as a place to live), such preference is due to the presence of vegetation in the scene and not to the gated condominiums' blind walls. The least preferred scenes [appearance - B1(6), C1(4), B2, C3, A4; as a place to live - B1(6), C1(5), C2, C3, A4] (Table 2) by non-college graduates are primarily due to the presence of walls, the lack of direct relationship between buildings, and the lack of grassy areas.

DISCUSSION AND CONCLUSIONS

The evaluations and preferences for the scenes in each of the four sets indicate that scene characteristics had a smaller effect on non-college graduates' perceptions than on the perceptions of the other two groups with college education. In addition, those with college education, particularly the architects, tend to be more rigorous in their aesthetic evaluations than non-college graduates, as revealed by the fact that all the distinct streetscapes scenes are better evaluated by this group. This result is in line with that revealed by Gjerde about:

> "... a consistent tendency for change professionals to be more critical in their opinions about buildings and streetscapes [than lay people]. Although the preferences expressed by both groups were similar, the opinions of change professionals were less positive when both groups liked a building or streetscape and more negative when they did not." [Gjerde, 2015]

Hence, future aesthetic evaluations could focus on evaluations of people with college education, since a positive evaluation on the part of these would imply a positive evaluation on the part of non-college graduates. Moreover, at least in the case of aesthetic evaluations carried out in Brazil as revealed by this and other studies (e.g., [Reis et al., 2017, Reis et al., 2016]), the rate of return on questionnaires made available via the internet has been much lower for non-college graduates than for those with college education.

Results provide further evidence for the importance of streetscapes characterized by buildings with a direct relationship with the street, by buildings with openings facing the street, as well as of streetscapes with the presence of vegetation. These corroborate results from other studies in the American and European cities about the relevance of visually permeable buildings in close proximity to the sidewalks (e.g., [Gehl, 2010, Metha, 2009]) and the importance of vegetation [Nasar, 1998, Weber et al., 2008] for a pleasant aesthetic experience in public open spaces, and emphasizes the widespread importance of these aspects. The visual stimulus generated by the presence of such doors and windows and vegetation can be related to the desirability of complexity on Nasar's findings on peoples' evaluation of residential street scenes [Nasar, 1992b]. In this regard, it has been highlighted the relevance of visual connections: "It is desirable to be able to see out of buildings – and preferably into them – so that the activities inside the buildings and outside in public space are connected visually and thus can enrich and inspire each other." [Gehl et al., 2006]; "Ground floor facades provide an important link between these scales [large and small scales] and between buildings and people. For public space and buildings to be treated as a whole, the ground floor facades must have a special and welcoming design. This good, close encounter architecture is vital for good cities." [Gehl et al., 2006]. Moreover, the relevance of such visual stimulus, either for the urban experience as well as for an individual's health, is emphasized by the strong positive association between the presence of ground floor windows and perceived walkability of a streetscape scene found in a study by [Oreskovic et al., 2014]. Yet, as already pointed out in other studies (e.g., [Gehl, 2010, Jacobs, 1984]), the very presence of people in public open spaces makes these spaces more attractive to other people.

In this respect, although it has been mentioned that "... in the urban environment we must accept that there is a degree of contamination in the [aesthetic] experience." [Isaacs, 2000], the cognitive experience of respondents in this study did not generate significantly different aesthetic evaluations of streetscapes from those of respondents with distinct cognitive experience in other countries. Hence, results confirm that aesthetic assessments tend to be fundamentally based on the process of perception, on sensory stimuli, on unmediated experience of presentational properties, and not on values, previous experiences and cultural aspects that characterize the process of cognition. This is in line with the fact that the process of perception can be considered independent of influences exerted by an individual's cognitive schemes, of meanings associated with the percept [Weber, 1995] and so, with Gestalt theory regarding the primary importance of direct and immediate sensory experience, but not with Transactional Theory which emphasizes the role of previous experience in the perception process (e.g., [Lang, 1987]).

Nonetheless, architects tend to have a higher preference for buildings with a direct relationship with the street, with openings facing the street, while non-architects, either with or without college education, tend to have a higher preference for streetscapes with the presence of vegetation. Therefore, the sensory stimuli generated by the existence and proximity to the sidewalks of doors and windows tend to explain the positive aesthetic evaluations, mainly by those with academic training that deals with aesthetics and composition of buildings. On the other hand, the presence of natural elements tends, mainly, for those without training in architecture, to play a fundamental role in the explanations of aesthetic reactions and can even generate positive

aesthetic responses on the part of non-architects when the presence of doors and windows is eliminated, greatly reduced or moved away from the streets. Consequently, the consideration of type and level of college education of the respondent in this research allowed the identification of some differences in the preferences of these groups that were not previously identified in studies that did not consider differences in college education among respondents, where higher degrees of naturalness resulted in increased preference for a scene [Ulrich, 1981, White & Gatersleben, 2011].

Nevertheless, when the green disappeared and the visual and physical barriers were maintained, as in the scene with garages' doors facing the street, the scene was the worst evaluated and the least preferred, either regarding scene's appearance or as a place to live, by any of the three groups. The justifications for such preferences are similar among these groups, corroborating the results of other studies about the negative aesthetic effect of presence of walls, such as those of gated condominiums [**?**] and blind walls of nearby buildings [Reis et al., 2016]. The existence of such visual barriers causes a lack of visual stimulation as already evidenced in other studies (e.g., [Becker & Reis, 2004, Reis et al., 2016]), and do not attract pedestrians and, so, do not favor movement and permanence of people in public open spaces, clearly reducing the potential for urban aesthetic quality.

Although statistically significant differences were found in 58% of the judgments of the twelve scenes among the three groups, these differences tend to be mostly related to the existence of vegetation in the scene which is not a specific building attribute. Hence, the results of this paper tend not to support those that reveal the existence of significant differences between the aesthetic evaluations of buildings by architects and by laypeople (e.g., [Fawcett et al., 2008, Nasar, 1998]) and to corroborate those results that reveal no significant differences among aesthetic evaluations of buildings by architects, non-architects college graduates and non-college graduates when such buildings are characterized by the idea of order and visual stimulus (e.g., [Reis et al., 2017]). In its turn, differences in perspectives and widths of streets and sidewalks did not affect the preferences for the scenes and their justifications, corroborating the argument that the angles of vision used for the photographs do not have a significant effect on aesthetic evaluations [Stamps, 2000].

The existing correlations between preference for scene's appearance and preference for scene as a place to live in 83% of the twelve scenes emphasizes the relevance of a place appearance for one's selection of a place to live, and a clear preference for residential streets characterized by buildings with doors and windows facing the street and/or by the presence of vegetation.

Therefore, this study further evidences that it is possible to have buildings that tend to please groups with different levels and type of college education, being in line with a previous study: "It is possible to create buildings that delight both themselves [architects] and the public; several buildings in this sample of 42 were given very high overall aesthetic ratings by both groups" [Gifford et al., 2002]. Additional corroboration and explanation is given by later studies [Reis et al., 2017] that show that either a set or individual buildings, when characterized by the idea of order and visual stimulus, are positively evaluated by people with distinct levels and type of college education. Moreover, a contemporary example that shows the possibility of putting such architectural and urban design ideas into practice is the new Västra Hamn neighborhood in Malmö, Sweden, built since 2001 in a previous industrial area, with most buildings with 5 floors and doors and windows facing the street, and ground floors generally with residential or commercial/service activities.

However, several new buildings and new urban interventions around the world, including those in many Brazilian cities, tend to neglect such knowledge regarding urban aesthetics and to repeat the presence of visual barriers at ground floor, what tends to reflect an urban planning and design following the modernist approach, with buildings considered as individual objects, with no clear relationship with other buildings and with the street. Moreover, it seems that in many schools of architecture in different countries emphasis has been given to the modernist approach. In this sense, Nikos Salingaros asserts that: "We have overwhelming evidence

revealing the type of living urban structure that is responsible for a higher quality of life, and it is the opposite of the Corbusian model... Schools continue to teach the same modernist city destroying typologies to their students." [Editorial, 2013].

Therefore, it is necessary to publish new evidence, such as those presented in this paper regarding the relationship between buildings and the streets, in order to try to influence urban policies, urban planning and design, and teaching in architecture schools. This dissemination of knowledge may help to promote planning and design approaches that qualify the streetscapes for users with different levels and types of college education.

ACKNOWLEDGMENTS

This research was conducted with scientific initiation scholarships by CNPq (National Council for Scientific and Technological Development), a Brazilian governmental institution sponsor of scientific and technological development. Additionally, thanks are due to the following undergraduate students in architecture and scientific initiation scholarship holders for taking part in this research: Isadora Martinez Diniz, Ana Flávia Panzenhagen, and Victoria Luvizetto Gerson.

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Manuscript revisions completed 24 February 2026.