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VII. Colour in Culture and Society

The complexity of the creative process in urban colour design

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Abstract

This article presents the development of an urban colour design intervention for the Jardim Ruyce Staircase in Diadema, Brazil, examining how chromatic structuring reorganizes spatial perception and activates the sensory, material, and social layers of the urban environment. The methodological process combined photographic surveys, analysis of existing material conditions, colour palette extraction, chromatic synthesis, 3D modelling, and augmented reality prototyping, revealing a multispheric design field in which each design decision affects the overall configuration. The findings indicate that chromatic interventions grounded in the site's existing layers can clarify continuities, increase spatial legibility, and strengthen local identity and a sense of belonging. In this context, colour does not operate as an isolated element but functions as a mediating component that articulates relationships between the body, space, atmosphere, and memory. Ultimately, the study suggests that urban colour design can support more situated and sensitive approaches to the transformation of contemporary public spaces.

Keywords: urban colour design, spatiality and atmosphere, chromatic design process, colour narratives, augmented reality in urban design

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1 INTRODUCTION

In urban spaces, colour acts as an active agent in creating atmospheres and mediating between the body, materiality, and memory. In dense and socially complex areas such as the Jardim Ruyce Staircase in Diadema, a municipality in the Brazilian state of São Paulo, colour is not limited to an aesthetic gesture; it affects the journey, modes of use, atmosphere, and sense of belonging. Intervening in this type of place requires dealing with topographical irregularities, multiple layers of paint, degraded surfaces, and local visual narratives that overlap over time.

Traditional approaches to chromatic intervention tend to simplify this complexity by treating colour as either a decorative or a normative component. This article starts from the premise that urban chromatic design is a multispheric process, in the sense proposed by Peter Sloterdijk:[1] A field in which perceptions, materiality, community expectations and digital tools influence each other, producing continuous and non-linear adjustments.

The study presented here derives from an experimental project developed for the Jardim Ruyce Staircase (Fig. 1), consisting of a photographic survey, perceptual analysis of the material, extraction of the chromatic components focused on hue and chroma, visual synthesis, three-dimensional modelling, and the use of digital verification tools. As the intervention has not yet been physically executed, this article does not discuss post-construction results. Instead, it formulates well-founded hypotheses about the symbolic, perceptual, and methodological potential of the process, contributing to an understanding of the sensitive dynamics that structure urban chromatic design as a creative and methodological process.

[1] Peter Sloterdijk, Foams: Spheres III, trans. Wieland Hoban (Semiotext(e), 2016).

Figure 1. Overview of the Jardim Ruyce Staircase in Diadema, Brazil, with analytical annotations indicating zones of textural differentiation as identified during the material characterization phase. The superposed lines supported subsequent chromatic mapping and design decision-making. Courtesy of the author.

2 THEORETICAL BACKGROUND

The spatial experience cannot be reduced to geometric coordinates; rather, it consists of the relationship between the body, atmosphere, materiality, and day-to-day use. Jean-Paul Thibaud[1] and Michel Lussault[2] describe spatiality as a sensitive and relational field formed by rhythms, operators, artefacts, tensions, and interactions that structure lived space. Within this framework, chromatic interventions act as active elements in creating atmospheres and urban legibility by modulating depths, planes, limits, and perceptual continuities.

In dialogue with this approach, Darío Suárez, et al.[3] understand environmental colour as a psychophysical phenomenon that manifests

[1] Jean-Paul Thibaud, "The Sensory Fabric of Urban Ambiances," Senses and Society 6, no. 2 (2011), https://hal.science/hal-00978343v1.

[2] Michel Lussault, L'homme spatial: La construction sociale de l'espace humain (Seuil, 2007).

[3] Darío Suárez et al., "The Role of Environmental Colour in the Experience and Identity of the City," in Proceedings of the AIC 2018 Interim Meeting: Colour and

itself in relation to lighting, materials, textures, and the heterogeneity of the surroundings. Colour does not operate in isolation; rather, it is articulated in layers and produces effects of welcome, recognition, or strangeness, directly participating in the construction of belonging in urban space. Anne Petit et al.[4] reinforce this perspective by demonstrating how chromatic tensions, contrasts, and rhythm structure spatial readings and influence the formation of everyday visual narratives.

The theory of spheres and foam, proposed by Sloterdijk,[5] offers a relevant conceptual apparatus for understanding systems composed of multiple interdependent layers. For Sloterdijk, spheres coexist in states of sensitive proximity, maintaining their internal integrity while continuously adapting to the pressures exerted by other distinct entities. When applied to the creative process, this approach allows us to interpret urban colour design as a multispherical configuration—a field in which colour choices, perceptual dynamics, material constraints, community expectations, and digital technologies remain autonomous yet relational, influencing one another through ongoing negotiation and reorganization.

Peter Zumthor[6] and Juhani Pallasmaa[7] expand on this line of thinking by situating colour within the realm of multisensory perception. Zumthor argues that atmospheres emerge from the precise articulation of material surfaces, chromatic densities, light modulation, and spatial enclosure, shaping subtle sensory climates that affect bodily perception. Pallasmaa, in turn, emphasizes that architectural experience engages the whole body, not only vision, activating tactile, kinaesthetic and emotional responses. Together, these contributions reinforce the idea that colour and atmosphere are

Human Comfort (International Colour Association, 2018).

4 Anne Petit et al., “Couleurs et paysages: Une nouvelle approche de planification de la couleur par les effets chromatiques,” VertigO 18, no. 3 (2018), https://doi.org/10.4000/vertigo.25106.

5 Sloterdijk, Foams.

6 Peter Zumthor, Atmospheres: Architectural Environments, Surrounding Objects (Birkhäuser, 2006).

7 Juhani Pallasmaa, The Eyes of the Skin: Architecture and the Senses (John Wiley & Sons, 2012).

inseparable dimensions of urban experience and not just decorative additions to space.

In the Latin American context, urban colour also carries cultural tensions, collective memories and ways of life marked by material heterogeneity. Suárez et al.[8] highlight that colour expresses the stories, desires and signs of everyday life—a dimension that is particularly evident in popular territories where permanence, improvisation and successive chromatic layers shape the visual landscape.

In her earlier research,[9] the author of this article proposed a relational model based on the interaction between visual language elements and perceptual, material and social layers initially applied to audio-visual design, and subsequently extended to environmental design. The model shows that visual elements, such as colour, movement, atmosphere, materiality and trajectory, do not operate in isolation, but in continuous correlation. This perspective guides the reading of the urban chromatic project as an interdependent system, in which each adjustment produces overall effects.[10]

Thus, the theoretical framework that guides this study integrates four fundamental pillars:

- Spatiality is conceived as a sensitive, relational and lived field.
- Colour is considered a complex psychophysical phenomenon full of meaning.
- The multispherical model of foam theory is applied to the creative process.
- An atmospheric and multisensory approach is adopted for architecture and design.

Combined, these pillars form a framework capable of situating urban chromatic design as a sensitive and relational practice based on interactions between materiality, perception, atmospheres and cultural

[8] Darío Suárez et al., “The Role of Environmental Colour.”

[9] Anamaria Amaral Rezende Galeotti, “A espuma, um modelo possível para os elementos de linguagem do design audiovisual e suas relações” (PhD diss., University of São Paulo, 2014).

[10] Anamaria Amaral Rezende Galeotti, “Foundations for the Development of a Chromatic Project for Renewable Urban Areas Using Virtual and Augmented Reality Technologies” (unpublished postdoctoral report, Faculty of Architecture and Urbanism, University of São Paulo, 2023).

dynamics. This conceptual framework supports the interpretation of the challenges and potentialities involved in the chromatic project developed for the Jardim Ruyce Staircase.

3 METHODOLOGY

The creative process underlying the colour design for the Jardim Ruyce Staircase[11] was structured into five interdependent stages: Collection, Comprehension, Concept, Creation, and Communication/Verification articulated as an analytical framework in dialogue with theoretical references on spatiality, environmental colour, atmospheres, and multisphericity. This methodology does not aim to establish a rigid linearity, but rather a dynamic process in which each stage feeds back into the others, configuring a system of sensitive decisions similar to Sloterdijk's "foams": multiple layers in dynamic equilibrium.

3.1 Collection

The collection stage involved conducting a systematic photographic survey of the Jardim Ruyce Staircase and its immediate surroundings, recording not only the surfaces, but also the material conditions that structure the route. This included plans, steps, landings, walls, façades, graffiti, vegetation, shadows and different states of repair, all of which were documented, highlighting successive layers of colour and irregularities that are characteristic of the site. The variation in sunlight incidence throughout the day, differences in value and opacity, and the presence of urban interference were also recorded. This set of observations formed the basis for understanding the materiality, microatmospheres and visual dynamics that would guide the next stages of the process.

3.2 Comprehension

The comprehension stage involved a detailed analysis of the photographic footage with the purpose of identifying the material and chromatic layers that make up the staircase. Surfaces with residual hues from previous paint jobs, areas of wear and tear, moisture stains, vegetation coverings and chromatic overlaps resulting from daily use

[11] Galeotti, "Foundations."

were mapped. This mapping guided the formulation of the chromatic and perceptual categories used in the subsequent stages.

The comparison between the colours derived from the photographic surveys and those present in the semantic panels (Fig. 2) enabled the identification of significant chromatic similarities between different surfaces of the staircase and its surroundings. This visual material synthesized the initial hypotheses about rhythms, tensions and chromatic pattern occurrences on the site and served as the basis for the subsequent stages of the process.

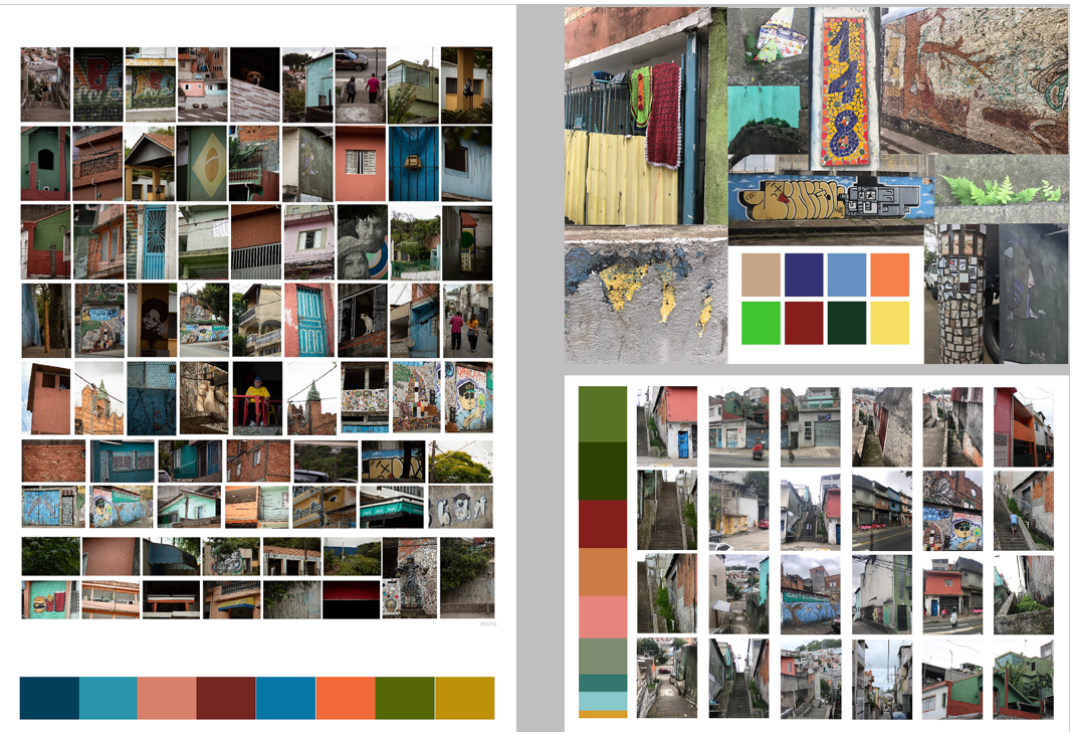

Figure 2. Initial chromatic analysis based on semantic panels and interpretative colour mapping. The extracted palette does not aim at a literal correspondence with the photographs, but at identifying perceptual and atmospheric fields through qualitative colour grouping and relational mapping, which informed subsequent design decisions. Courtesy of the author.

This chromatic synthesis articulated the conceptual guidelines of the project by highlighting the relationships of proximity, contrast and continuity between the surfaces of the staircase. From this, it was possible to recognize which arrangements of hue, value, and chroma demonstrated the contextual coherence of the site and which ones created tension in its atmospheric reading. This mapping guided

the definition of design principles such as perceptual continuity, appreciation of the existing materiality, and respect for the layers of accumulated use.

3.3 Concept

The conceptual guidelines arose from the need to translate the initial diagnosis into guidelines capable of producing visual and atmospheric coherence throughout the staircase. Based on the analysis conducted in the previous phase, it became essential to preserve the existing colours that held symbolic value for the community, re-establish visual continuities that had been interrupted by repainting or wear and tear, and minimize chromatic disturbances that undermined the interpretation of the ensemble.

The intervention was also conceived to integrate the graffiti and material elements already present, understanding the stairway as a succession of interconnected scenes rather than isolated surfaces.

The conceptual formulation was consolidated as a kind of "chromatic foam," composed of material, perceptual and social layers that need to coexist in balance.

In this logic, decisions involving hues, chroma, contrasts and rhythms were treated as interdependent adjustments, always considering the continuity of the route, the houses and buildings, and the atmosphere of the passage itself. The conceptual synthesis, presented in Fig. 3, organized these principles and guided the development of the initial chromatic versions that were tested later in the process.

Figure 3. Chromatic synthesis derived from the analysis of the surfaces of the staircase and its surroundings. Courtesy of the author.

3.4 Creation

The creation stage consisted of applying the conceptual guidelines to a detailed three-dimensional model of the staircase developed to visualize how colours behave on irregular surfaces, inclined planes, irregular walls and false guardrails considering variations in light, differences in depth and discomfort caused by the local topography. Figure 4 shows an example of these simulations.

The use of the 3D model, initially conceived as a verification tool, progressively highlighted the inherent interdependence of the chromatic system: Subtle alterations in hue, value, and chroma, even when applied to small areas, had a magnified effect on the perception of the climb, requiring successive adjustments. At this stage, visual coherence throughout the ascent or descent, continuity between distant planes and the calibration of chromatic tensions became decisive criteria, reinforcing the need to think of the staircase as a sensitive continuum rather than as isolated fragments.

This experimentation made it possible to test scenarios that were impossible to evaluate using photographs or two-dimensional drawings alone offering precise insights into the impact of chromatic choices and guiding subsequent iterations of the project.

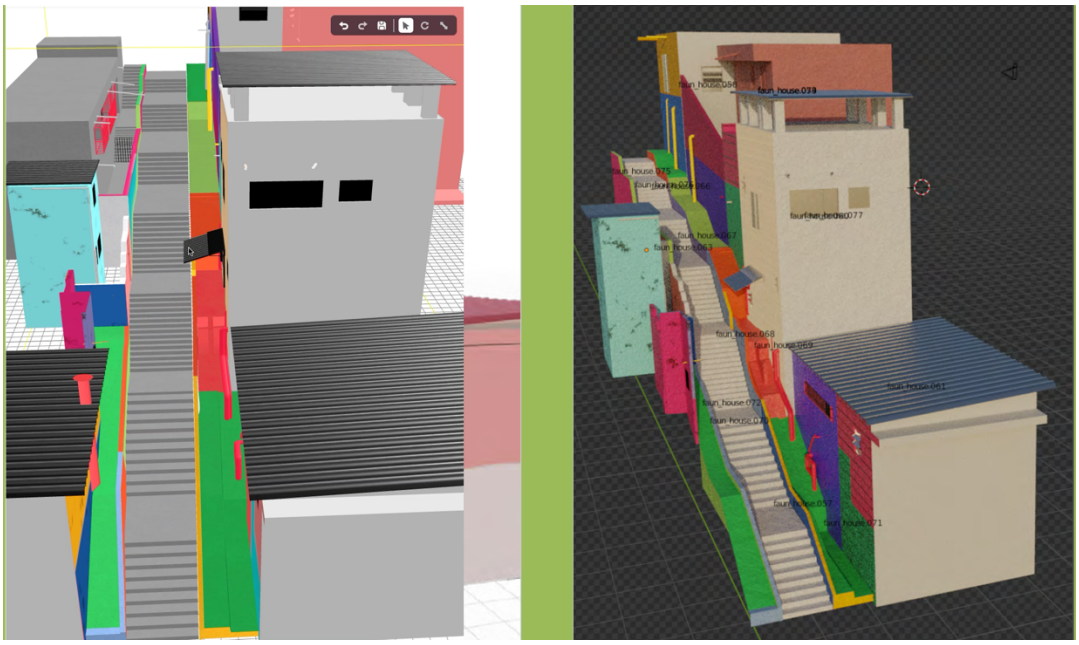

Figure 4. Three-dimensional model of the staircase used as an iterative instrument for chromatic experimentation and verification. Courtesy of the author.

3.5 Communication / Verification

The communication stage involved developing and presenting colour proposals to a select group of local community representatives. For this session, A3 and A4 printed boards containing views of the two chromatic versions, complete staircase drawings, and QR codes for accessing augmented reality (AR) visualizations were produced. Figure 5 shows an example of the digital prototypes used.

Figure 5. Augmented Reality (AR) prototypes and printed boards presented at the Jardim Ruyce Cultural Centre as part of the communication and preliminary verification stage with local community representatives. Courtesy of the author.

The printed boards played a central role in the chromatic and spatial understanding of the proposal. They allowed for a direct comparison between the designed versions and the existing staircase materials, facilitating the reading of the relationships between surfaces, the route and the organization of the palette derived from the previous stages.

The participants' receptivity was immediate: The cardboards functioned as direct mediation devices, enabling clear interpretation of the two chromatic alternatives presented.

Three-dimensional modelling was equally fundamental to this process as it provided the technical basis for the production of images and digital simulations. Although the initial intention included using AR and VR for the project presentation, these tools did not function properly on site due to slow internet speed and limitations of the equipment available at the Jardim Ruyce Cultural Centre. Despite this, AR could later be accessed at the staircase, confirming its power as a verification tool.

This situation underlined the complexity and unpredictability inherent in technological mediation processes in peripheral urban areas typical of Latin America, where digital infrastructure is frequently disrupted. This scenario reiterates the importance of employing multiple visual communication strategies, especially the use of printed materials capable of ensuring understanding of the project, regardless of the existing technical conditions. The reactions recorded during the session,[12] including spontaneous comments and demonstrations of enthusiasm, offered relevant qualitative evidence about the perceptual viability of the proposals and the ability of the presented material to communicate continuity, chromatic coherence, and a sense of belonging.

4 RESULTS AND DISCUSSION

As the chromatic intervention on the Jardim Ruyce Staircase has not yet been implemented, the results presented here refer to chromatic analyses, three-dimensional simulations, digital experiments, and

[12] Anamaria Amaral Rezende. Guia para intervenções cromáticas em espaços públicos com modelos em RA e RV [A Guide for Chromatic Interventions with Augmented and Virtual Reality Technologies] (University of São Paulo, Department of Design, 2023), 103.

preliminary participatory validation carried out with community representatives. Rather than evaluating an implemented intervention, the following results examine how chromatic decisions emerge, evolve, and stabilize throughout a situated and multispherical creative process. This qualitative evidence allows the formulation of consistent hypotheses about how colour can reorganize the sensory experience of the space.

4.1 Chromatic structures and their perceptual implications

Chromatic analyses identified the striking presence of worn earthen hues typical of exposed ceramic bricks, as well as greys intensified by dirt and humidity. There were also surfaces with spontaneous interventions, such as graffiti, irregular repainting, and material patches. The combination of opaque areas, matte surfaces, and low-chroma colours produces a heterogeneous visual environment, tending to fragment the perception of the staircase when viewed as a whole.

The chromatic synthesis obtained from the semantic panels and colour extractions (Fig. 2, Fig. 3) revealed, however, a coherent chromatic base of ochres, earthy tones, greyish blues, and muted greens. These colours appear repeatedly along the route, organized by natural contrasts between shadow and light, steps and walls, and rough and smooth surfaces. These findings suggest that effective chromatic interventions do not depend on the introduction of colours external to the context, but on the reorganization and careful treatment of the colours and their characteristics that already belong to the place.

4.2 Continuity and reorganization of spatial relationships

Three-dimensional simulations (Fig. 4) demonstrated that making specific adjustments to the distribution of the palettes, especially between the side planes, guardrails, and upstands, produced significant perceptual changes. In these simulations, continuity of hues between distant surfaces was observed to reinforce depth perception and guide the gaze along the course; however, abrupt contrasts tended to interrupt this fluidity and alter the perceived spatial rhythm.

These aspects emphasized the relevance of the multispherical framework: Each chromatic adjustment, even if localized, affects the

behaviour of the entire scene. Throughout the iterations between chromatic synthesis, the 3D model and AR, the interdependence of these elements became apparent, requiring successive calibrations to preserve coherence, legibility, and atmosphere.

4.3 Atmosphere, body, and movement: emerging perceptions

The proposals were presented using printed boards (Fig. 6) and complementary digital visualizations. Four A3 boards were made available with the elevations of versions A and B, while four A4 boards featured QR codes that provided access to augmented reality (AR), in addition to a link to the immersive web environment. In Figure 7 displays an example of how to access the AR using a smartphone camera.

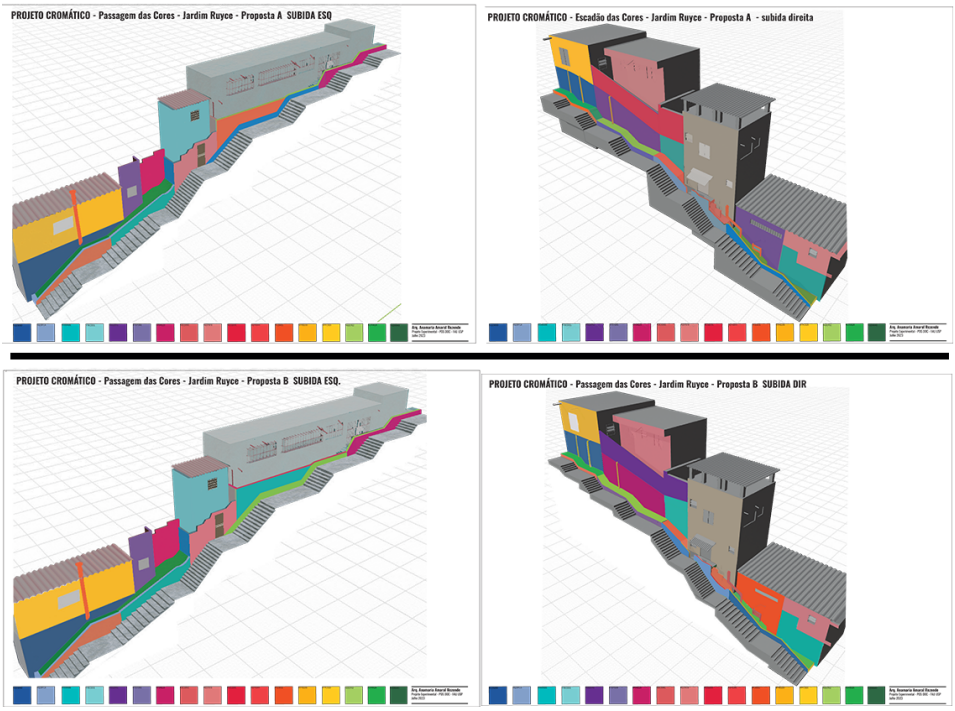

Figure 6. Comparative printed boards presenting two alternative chromatic proposals for the stairway walls. The upper row corresponds to Proposal A and the lower row corresponds to Proposal B. These subtle variations between the proposals reflect a phase of fine chromatic adjustments during the iterative design process. Courtesy of the author.

Figure 7. This QR code leads to an augmented reality (AR) prototype used to visualize the chromatic proposals in situ, allowing readers to superimpose the simulated colour scheme onto the staircase environment for spatial verification. Courtesy of the author.

The AR could be viewed in both the meeting room and on the stairs and functioned adequately as a spatial verification tool. The VR experience, however, could not be carried out due to the slow local internet connection. This limitation did not compromise the presentation, as the printed boards provided an immediate, clear, and accurate representation of the proposals.

The feedback was positive and showed strong identification with the proposed designs. There was direct recognition of the real elements of the staircase on the boards, and interest in the projected possibilities. Cultural agents expressed a desire to promote the project to the entire community when conditions allow for its implementation. This feedback suggested that the combination of printed materials with digital simulations could work as an effective mediator of collective understanding about chromatic interventions in urban spaces.

4.4 References, belonging and identity

Although the presentation was restricted to a small group of representatives, the interactions that took place during the session provided valuable clues about the social potential of the colour proposal. The immediate familiarity with the printed images and the enthusiasm expressed in the comments suggested that the proposal resonated with elements already present on the staircase, valuing the material and visual references that are part of the area's everyday memory.

This identification did not derive from the introduction of colours foreign to the context, but from a sensitive reorganization of colours that breathed new life into their characteristics. These are still preliminary hypotheses which can only be confirmed after materialization, when the physical experience of the route can be fully explored.

Even so, the feedback obtained indicated that a sensitive chromatic intervention could operate as a resource for mediating between memory, the expectation of transformation, a sense of belonging and recognition of the identity of the territory.

4.5 Multispherical model

The stages of the process—audiovisual research, chromatic synthesis, 3D modelling, AR/VR testing and presentation of the boards—did not follow a linear sequence, but rather a system of continuous interaction. The metaphor of foams proposed by Sloterdijk[13] offers a pertinent interpretation: Each stage of the process acts as a relational cell that presses and reorganizes the others.

The chromatic analysis guided adjustments to the 3D model; the 3D model, in turn, redefined communication choices; and the digital and printed visualizations influenced the spatial understanding of the interlocutors. Instead of a sequential flow, we see a relational matrix in which perception, materiality, technology, and ways of presentation are dynamically correlated.

This multispheric framework not only describes how the process works, but also reveals its power. Urban colour design is not treated as the mere application of colour to surfaces, but is understood as a situated configuration sensitive to existing material layers, spatial logics and technical conditions. In this dynamic arrangement, each gesture reorganizes the system, producing new tensions, continuities and possible readings of the space, even if only partially.

5 CONCLUSiONS

This study demonstrates that chromatic design in complex urban environments operates as a situated and relational practice in which perceptual, material, atmospheric and social dimensions are continuously negotiated. Rather than producing definitive solutions,

[13] Sloterdijk, *Foams*.

the process allowed the identification of decision patterns, feedback loops and sensitive criteria that shape chromatic configurations in real urban contexts, offering methodological insights into how colour can act as a structuring agent in the production of space.

The articulation between materiality, perception, spatiality, and mediation technologies configured a multispherical relational matrix in which each layer of the project (colour, light, texture, rhythm, material memory, and modes of use) reorganizes the complex. In this arrangement, the designer acts as a mediator between sensitive, social, and material forces, moving between expectations, technical limitations, the characteristics of the place, and the identities and meanings that are reconfigured with each iteration.

Preliminary validation, carried out during a presentation restricted to representatives of the Jardim Ruyce Cultural Centre, indicated immediate recognition of the visualizations and acceptance of the proposals. Although this feedback does not represent the entire community nor constitute a post-work evaluation, it suggests that chromatic operations anchored in careful readings of existing surfaces favour perceptual continuities and activate references to identity, sense of belonging and local memory. Tensions, divergences or counterpoints, which are to be expected in urban interventions, remain as future hypotheses dependent on physical implementation to be properly evaluated.

The design outcomes and analytical findings of the project indicate the methodological relevance of the five stages adopted—Collection, Understanding, Concept, Creation, and Communication/Verification—especially in view of the material irregularities, microatmospheres, and sociocultural dynamics that characterize the staircase. The integration between digital visualizations and printed materials proved essential to broaden spatial understanding and support participation processes in contexts where technological infrastructure is unstable.

This study contributes to the field of urban colour design by proposing a theoretical-methodological framework capable of articulating sensitive, atmospheric, technological, and community dimensions by situating colour as a relational agent in the production of space. Future research includes the implementation of the intervention, conducting post-work evaluations, and carrying out

comparative studies in other territories marked by chromatic overlaps and complex materiality.

This design experiment confirms the idea that colour plays a role that extends far beyond purely aesthetic attributes. It acts as a mediator between visual elements, physical forms, routes, memory and identity. This type of project requires perceptual precision attentive listening, as well as the ability to operate in multiple spheres simultaneously while keeping up with the sensitive nuances that make up contemporary urban life.

REFERENCES

Galeotti, Anamaria Amaral Rezende. "A espuma, um modelo possível para os elementos de linguagem do design audiovisual e suas relações" [Foam: A Possible Model for the Language Elements of Audio-Visual Design and its Relations] PhD diss., University of São Paulo, 2014. http://www.teses.usp.br/teses/disponiveis/16/16134/tde-24062015-092831/.

Galeotti, Anamaria Amaral Rezende. "Foundations for the Development of a Chromatic Project for Renewable Urban Areas Using Virtual and Augmented Reality Technologies." Unpublished postdoctoral report. Faculty of Architecture and Urbanism, University of São Paulo, 2023. https://www.fau.usp.br/wp-content/uploads/2023/02/CPq_2022_RELATORIO-ANUAL-revisado.pdf.

Lussault, Michel. *L'homme spatial: La construction sociale de l'espace humain*. Seuil, 2007.

Noble, Ian, and Russell Bestley. *Visual Research: An Introduction to Research Methodologies in Graphic Design*. AVA Publishing, 2005.

Pallasmaa, Juhani. *The Eyes of the Skin: Architecture and the Senses.* John Wiley & Sons, 2012.

Petit, Anne, Daniel Siret, and Nathalie Simonnot. "Couleurs et paysages: Une nouvelle approche de planification de la couleur par les effets chromatiques." *VertigO* 18, no. 3 (2018). https://doi.org/10.4000/vertigo.25106.

Rezende, Anamaria Amaral. *Guia para intervenções cromáticas em espaços públicos com modelos em RA e RV* [A *Guide for Chromatic Interventions with Augmented and Virtual Reality Technologies]*. University of São Paulo, Department of Design, 2023. Issuu, Uploaded September 10, 2023. https://issuu.com/anarezendeg/docs/guia_anna_rezende_2023.

Sloterdijk, Peter. *Foams: Spheres III.* Translated by Wieland Hoban. Semiotext(e), 2016.

Suárez, Darío, Marcelo Balián, Sara Kenny, and Laura Suez. "The Role of Environmental Colour in the Experience and Identity of the City." In *Proceedings of the AIC 2018 Interim Meeting: Colour and Human Comfort*, 209–213. International Colour Association (AIC), 2018.

Thibaud, Jean-Paul. “The Sensory Fabric of Urban Ambiances.” *Senses and Society* 6, no. 2 (2011): 203–215. https://hal.science/hal-00978343v1.

Zumthor, Peter. *Atmospheres: Architectural Environments, Surrounding Objects*. Birkhäuser, 2006.

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