

Visiting the Modern Wunderkammer: Social-spatial Inequalities in Ways of Knowing

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Abstract

Based on the assumption that museums have been spatially transformed in recent decades in the course of globalization, decolonization, and mediatization, we investigate from a socio-spatial perspective what influence this has on visitor experience and whether it leads to inequalities in ways of knowing. To this end, we conducted a visitor study in a science exhibition in a newly opened museum complex in Berlin, by using a mixed methods approach combining movement tracking, visitor survey and ethnographic observation. By analyzing the spatial practice in and spatial perception of the exhibition, we developed parameters along which spatial appropriation in the museum differs and correlated them with variables relating to museum spatial knowledge and scientific expertise. By integrating the spatial and social data using a multiple correspondence analysis protocol, we show that the legibility of museum space varies according to the visitors' cultural and specific symbolic-spatial capital. As this unequal access to the museum space has a direct influence on ways of knowing, the study shows that inequalities are reproduced by the current spatial refiguration of the museum.

Keywords: Visitors tracking; socio-spatial approach; MCA; refiguration of spaces; exhibition design

Introduction

Museum spaces have evolved through modern times (see introduction to this special issue). Their spatial transformation is related, among other things, to changes in the way in which the museum visitor has been conceived from a curatorial perspective. Many recent debates call for a critical mediation that imply a sovereign visitor empowered to shape their own museal experience: visitors do not have to be led through the exhibition, rather they are encouraged to co-construct the exhibition during their visit, based on their own interest, knowledge and emotions. This recent discourse on critical mediation has, in the past decades – this was our initial assumption – led to a reordering of museum spaces: here, circulation and movement through the exhibition is less guided; the exhibition is conceived as associative, multiperspective, multimodal and deconstructive, often with an open plan layout.

This paper takes curatorial transformations as a starting point to theorize the recent reordering of museum spaces, focusing on the interrelationship between museological debates and innovations in exhibition design (part 1.1). Given the concomitant conceptual renegotiation of the visitor's position in this refiguring of museum space (part 1.2), we ask: how do visitors deal with an experimental exhibition design, as in the specific case of the Humboldt Labor (part 1.3)? How do they move around? And how do they perceive the museum space? To investigate curatorial and design effects in dialogue with visitors' experience, we conducted a visitor study from a socio-spatial perspective using an experimental mixed methods approach combining movement tracking, visitor survey and ethnographic observations (part 2). Based on the assumption that space is an active agent in the co-production of knowledge in museums,

we can show that the appropriation of the museum space is related to social inequalities: visitors' spatial practices (movement patterns, spatial perception) differ in correlation to distinct spatial knowledge (museum familiarity) and cultural-symbolic capitals (education, scientific expertise) (part 3).

1. Democratizing the Museum? Toward a Spatial Reordering of Exhibition Space

Notions such as participation, openness, diversity and multiperspectivity are currently ubiquitous across museum sectors, hinting towards changing museological conceptualizations of publicness. This trend is tied to recurrent calls since the 1970s from diverse positions to democratize the museum and scrutinize its future role in light of transforming societies (e.g. Vergo 1989; Bast *et al.* 2018). In this spirit, many curatorial and design interventions have been undertaken at the level of display and spatial layout to realize the contentious visions of such a democratic museum. Yet, little reflection in museum studies has focused on how space influences the co-production of knowledge in museums (MacLeod 2005; Hillier and Tzortzi 2006; Lake-Hammond and Waite 2010; MacLeod 2013). Our study addresses this gap by focussing on a science exhibition that was spatially designed along such curatorial discourses: the Humboldt Labor in Berlin.

1.1 Curating Spaces for Everyone: In-Between (neo)liberal Openness and Critical Museology

Efforts to make the museum a space for everyone depart from pre-existing attitudes. While traditional curatorial positions have started to offer educational programs (e.g. guided tours, audio guides, etc.) in order to broaden audiences, approaches such as *new museology* and *critical mediation* fundamentally contest conceptualizations of *publicness*, *knowledge* and *mediation* that have shaped 'curatorial cultures' (cf. von Oswald 2022) for centuries.

Instead of striving for the social inclusion of 'other publics' into existing knowledge orders and practices, these critical approaches have exposed the Eurocentric and bourgeois-exclusive contingencies of such patriarchal ideas of democracy, radically asking to 'whose culture, and whose education' they refer (Sternfeld 2019), and instead formulated agendas that are domination-critical, deconstructive and thus transformative in nature (e.g. Vergo 1989; Sternfeld 2018). In doing so, they have contributed to the interrogation of central museological paradigms: curatorial authority, representation and knowledge mediation. At the same time, this querying converged with the neoliberal restructuring of cultural institutions insofar as interventions and transformations in the museum fit well into the economization of museums (Sternfeld 2018: 15ff).

As a result, and in line with a broader *educational turn in curation* that conceives of visitors as more agentic and knowledge production as processual (see Hooper-Greenhill 2006; Jaschke *et al.* 2012), the power laden relations between museum, visitors, and educational approach are generally refiguring (Büchel 2022: 22; 35). Different aspirations to make the museum a place for all have led to increasingly dynamic understandings of knowledge and its mediation – and here we want to emphasize a broad understanding of mediation (cf. Krasny 2016). Insights developed as part of *the crisis of representation* showed that knowledge is always mediated and therefore co-produced in different, more or less critical, ways. In the museum, this also happens at the display and spatial level, as has been analyzed in regard to the poetics and politics co-constituted by presentational and perceptual regimes (e.g. Bennett 2006; Kratz 2011; Muttenthaler and Wonisch 2015): how and in which spatial-aesthetic form something is shown is equally constitutive for ways of knowing,¹ value, and meaning-making. As calls for democratization refigure the museum dispositive, they manifest in the pursuit to design for multiperspectivity, multimodality, associativity, and more open spaces. Exhibitions that feature these attributes are, however, quickly framed as reflexive practice. Critical design practice is therefore equally needed to reflect and renew the politics and poetics of display, spatial arrangements and perceptual schemas in relation to their respective contents (Karp and Lavine 1991).

1.2 Mediation via Exhibition design

In the wake of the emerging profession of exhibition design, numerous attempts to match ideas of accessibility and representation have led to the designed and spatial re-ordering of exhibitions (Lake-Hammond and Waite 2010). By shaping the communication between curator and the imagined audience, exhibition designers organize ‘[...] [museum space] so as to best elicit the kinds of responses that exhibition-makers intend’ (Macdonald 2007: 157). Lately, emphasis has been given here – linked to a general turn in design – to an audience-centred approach (Miles *et al.* 1988; Buchanan 2004; Lake-Hammond and Waite 2010). This has led to ‘[...] an increased emphasis on the collaborative development of strong exhibition concepts, contextual setting and meaningful narratives, formulated to accommodate a variety of diverse audience groups and connect visitors with the exhibition information’ (Lake-Hammond and Waite 2010: 90). Similar to reflexive curatorial approaches, audience-centred design thus seems, on the one hand, to respond to charges of elitism and hegemony in order to meet the demand for ‘democratic’ access to institutionalized knowledge (Lake-Hammond and Waite 2010: 79). On the other hand, ‘with regard to [the] commercialisation [of exhibitions], their connection with the tourist industry, and their representation function’ (Richter 2010: 37), exhibition design has been harshly criticized as merely driving an increase in numbers: ‘the key measure of things’ for museums (Richter 2010: 37).

Following on from this ambivalence, it is still very interesting to note that the urge for multiperspectivity, multimodality, associativity, and openness coming from curatorial discourses was concomitant with attempts at spatial translation by exhibition designers – hoping to create the conditions for a more accessible, distributed co-production of knowledge. ‘From the [...] exhibition designer’s perspective, one of the key constituents of this interpretive context is *the gallery space*, which imposes specific practical constraints and shapes issues of *scale, orientation and movement*’ (Lake-Hammond and Waite 2010: 91, underlined by the authors).

Inspirational for the field of exhibition design has been the pioneer work of the architect Lina Bo Bardi in the MASP in São Paulo in the 1970s, with her open-plan exhibition space facilitating an associative, non-linear, and deconstructive reception of the art works (see Figure 1). Such experimental exhibition designs have proliferated over the last two decades, challenging more conventional linear spatial narratives (Richter 2010: 35ff.). One thinks of the Louvre-Lens Museum (see Figure 2), where the concept of strolling was privileged over that of a guided route, or more recently in the Berlin urban exhibition *Living the City*, where the spatial design of the exhibition emphasized a change of perspective through the possibility of urban *dérive* through the exhibition (see Figure 3) (for a spatial analysis of the monospace museum, see Hansmann 2024 in this issue).

These examples point out the on-going dynamic of spatial transformation of the museum space – which yet coexists with traditional hierarchically structured layouts. At this point, a productive parallel can be drawn with Claire Bishop’s thesis on the contemporaneity of the museum, where she points out a tension between different understandings of temporality, between ‘presentism’ on the one hand and ‘dialectical contemporaneity’ on the other, understood as ‘a dialectical method and a politicised project with a more radical understanding of temporality’ (Bishop 2014: 6). Drawing upon the analogy between the temporal and the spatial, we see these experimental spatial re-arrangements of the exhibition spaces as a ‘dialectical spatiality’, establishing a new relationship between the curatorial knowledge, the exhibits, and the visitor’s experience.



Figure 1: Lina Bo Bardi exhibition design, São Paulo 2018 (Alisa Giesler).



Figure 2: Musée du Louvres-Lens, Lens 2014 (Freddy de Hosdent for Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Musée_du_Louvre-Lens.jpg, CC BY-SA 4.0).

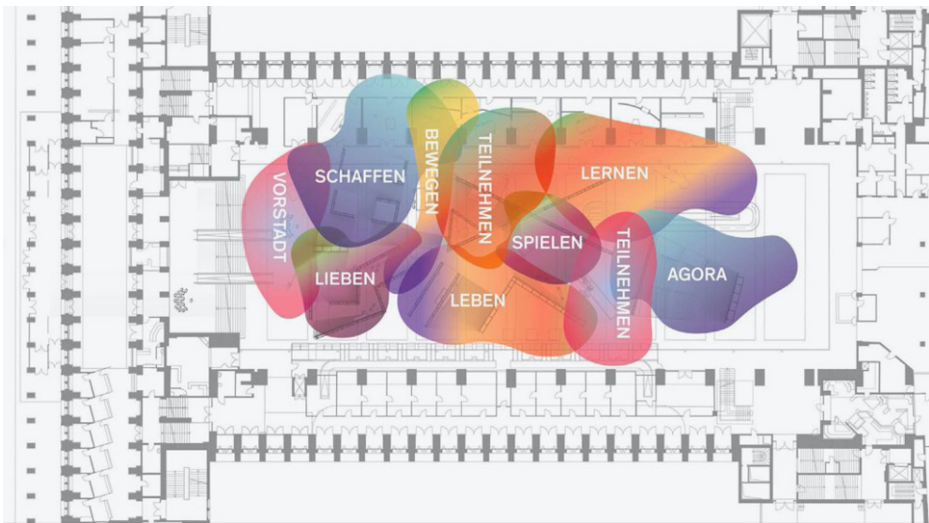


Figure 3: Exhibition *Living the City*, Berlin 2020 (TheGreenEyl, <https://livingthecity.eu/>).

1.3 Experimentalized Mediation: The Case of the Humboldt Labor in Berlin

In light of the previously elaborated developments, our research case, the Humboldt Labor, in the newly opened Berlin museum complex called Humboldt Forum, represents an integrated reflection on how to display scientific collections through curatorial and design collaboration. The mission to critically and procedurally mediate the practice of scientific knowledge production is reflected by its specific aesthetic-spatial form as a modern chamber of wonders.

In summer 2020, the *Humboldt Forum*² opened in the centre of Berlin. On the former site of the socialist Palace of the Republic and the former Prussian Palace of the Hohenzollerns, the new building recreates large parts of the historic Prussian façade. It has sparked controversy both in terms of city planning (see Misselwitz *et al.* 2005; Binder 2009) and the Humboldt Forum's cultural and museum agenda: adapting a 'strategic reflexivity' (von Bose 2016), it advocates for diversity, multiperspectivity and cultural dialogue, while in an era of critical postcolonial museology the ethnographic collections of its main players are displayed in an imperial and centralist architecture. On architectural as well as programmatic levels, the museum complex as such is permeated by complex contradictions and juxtapositions, manifesting powerful fixations that may appear harmonious or dissonant to visitors.

In this setting the Humboldt University Berlin has a 750 square meters exhibition space, the Humboldt Labor, intended as 'equally an interface, transfer point and a hub between science and society'.³ This curatorial project comes at a time of increasing emphasis on 'science communication', articulated by *third mission* programmes (Kunst 2020; cf. Weingart 2005). While the aim is to represent Berlins' 'spectrum of excellent science', a conceptual emphasis is placed on the notion of the laboratory (Pieken 2020). This is not random, but in line with a broader turn towards scientific, theoretical and historical interests in scrutinizing the construction of knowledge (e.g. through laboratory studies).

Within the exhibition field, the notion 'laboratory' signals, above all, a pursuit of process openness and participatory and artistic elements with the intention not simply to display knowledge, but to 'explore [...] the conditions of the production of knowledge through the objects and collections on display [...]' (von Bose 2017: 348). To question conditions of knowledge production aligns with experimenting with and reflecting the poetics and politics of display in the knowledge space of the exhibition. Alongside disturbing and challenging conventions, such curatorial approaches aim to go beyond the representational: as '[...]

spaces of research and knowledge generation, as well as spaces of inquiry' (von Bose 2017: 349), they suggest the potential for the exhibition format as a generative rather than merely presentational mode of knowledge production.

Offering a processual and practice-based perspective on science and conceiving the space of the Humboldt Labor as multi-use and dynamic for different practices and changing exhibits has provided essential impulses on the design level. The scenographic staging is inspired by the concept of the chamber of wonders (*Wunderkammer*) which is at the same time a reference to the beginnings of various university collections in the historic Berlin *Kunstammer*. More than this however, its modern interpretation draws on the idea of bringing disciplinary practices into exchange by placing objects that have been differently categorized and disciplined into proximity with one another (*Multiperspectivity*). The open spatial layout of the main space, free of defined visitor routes, reflects the curatorial approach for 'networked thinking' (Pieken 2020: 23): it uses spatial association and an open all-encompassing vista to narrate and metaphorically invoke the paradigm of interdisciplinarity, a paradigm that is central to third missions' *grand challenges* – with the effect of de- and relinking science-historical relations (*Openness*). The open layout similarly links to democratic ideals of accessibility (cf. Tzortzi 2014: 328). Multiple modes of presentation and a strong emphasis on motion (in kinetic displays, moving exhibits and the interactions of other visitors), underline the generative moment of scientific knowledge production as well as an understanding of knowledge as fundamentally in-motion (*Motion, Multimodality*).

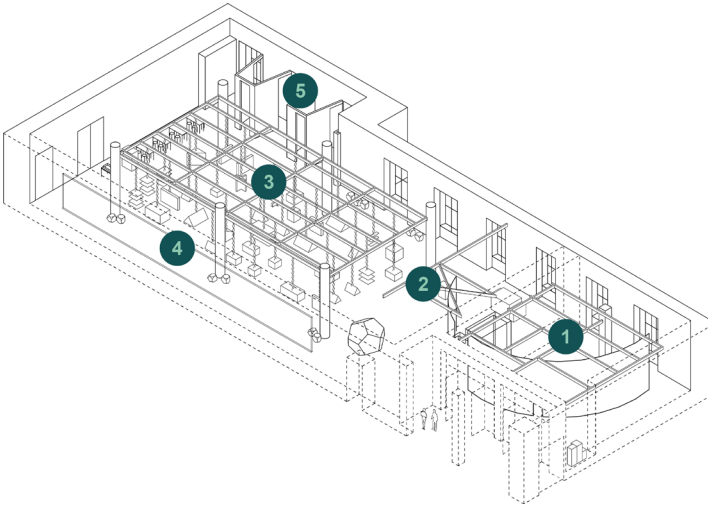


Figure 4: Axonometric view of the Humboldt Labor (Ines Gartlinger 2022).



Figure 5: View of the vitrine field in the exhibition space of the Humboldt Labor (Sarah Etz 2021).



Figure 6: View of the research wall in the exhibition space of the Humboldt Labor (Sarah Etz 2021).

The inaugural exhibition *After Nature* presents a complex narrative, connecting large themes such as the anthropocene, climate change, and the crisis of democratic orders. It unfolds as such (see Figure 4): in the foyer (1), the visitor is led into a series of seven didactic screen presentations about Berlin's clusters of excellence (prestigious third part funding projects) and one critical contribution by students, playfully countered by a motion-sensitive installation of a fish swarm on a room-sized curtain. Entering the main space, the exhibition is presented in an open layout: the gridded hanging display cases in the centre of the main room (3) and the audiovisual research wall that continuously diffuses interviews, charts, and images into the exhibition space (4) – bring different exhibits (scientific models, art, archival material, natural objects or everyday 'waste') into juxtaposition with one another and the visually powerful, at times cinematic presentation of the kinetic research wall. This multiplies visual associations, diversifying lines of sight in contrast to conventional strategies that provide a single focal point to direct visitors' attention. Slightly detached from this spatial and metaphorical 'openness' are the semi-secluded archive rooms (5), which, occupying only a tiny fraction of the exhibition space, act like an exhibition in their own right, presenting dense collections in dialogue. Similarly, the research station (2), sets a playful tone with its hands-on character.

2. Visitor Studies from a Sociospatial Perspective

Our more general, spatial theoretical assumption – space matters in the mediation of knowledge within the museum – is narrowed as follows in relation to the case of the Humboldt Labor: with regard to the open layout and the specific aesthetic staging of the exhibition space, we wanted to investigate which types of appropriation of the exhibition occur, and how these are linked to the museal spatial knowledge and sociodemographic characteristics of the visitors. Or, in other words: is the exhibition (based on the democratic non-guided layout design) equally appropriated by all visitors, or do different social dispositions result in specific appropriations, and which ones?

2.1 Space-related Visitors Studies

Our empirical study is embedded in the longer tradition of visitor research in the field of museum studies, with the specific approach of conducting it from a spatial perspective. In the literature on visitor research, which has been established as a field since the 1990s (Tröndle 2014), two strands of discourse can be distinguished (Macdonald 2007): the first one focuses on the sociodemographic belonging of visitors and the corresponding (non)access to the museum. Bourdieu and Darbel's work from the 1960s on field-specific perceptual and taste dispositions of art audiences is the starting point here (Bourdieu *et al.* 1991; and see also Bourdieu's larger work on class and taste, 1984). This approach of 'counting and mapping' (see Falk *et al.* 2006) has seen a surge in studies on the mechanisms of inclusion and exclusion in the field of art museums (Wuggenig and Kockot 1994; Zahner 2010; Munder and Wuggenig 2012; Behnke 2012; Zahner 2012; Hanquinet 2013) even though it has been theoretically challenged by other socio-theoretical approaches – especially with the analysis on 'cultural omnivores' (Peterson and Kern 1996), 'experiential milieu' (Schulze 1992) and 'lifestyles' (Kirchberg 2004). We embed ourselves here in this first discourse and investigate the social-distinctive inclusion and exclusion mechanisms that continue to be at work in the museum (Wegner 2016).

The second strand of discourse in visitor studies scrutinizes visitor behaviour in exhibitions,

Like time spent reading labels, time spent before 'visitor fatigue' sets in, spatial movements – such as the tendency to turn right upon entering an exhibition, and social interaction such as amounts of time spent talking with other visitors (see Dean 1994 and Falk and Dierking 2000 for coverage of the various relevant studies) (Macdonald 2007: 152).

It aims to 'empirically grasp these subtle moments of aesthetic experience' (Kirchberg and Tröndle 2012: 437), by taking 'social, personal, or physical characteristics (pre-visit parameters)

that influence the visit experiences (satisfying, confirming, or aesthetic)' (Kirchberg and Tröndle 2012: 442) into consideration.

In our research we brought these two strands together by following the assumption that not only do social factors influence the visitors' ways of knowing, but also that the specific spatial experience plays a central role. This space-related visitor research is embedded in a sporadic tradition, beginning with Robinson's (1928) study of movement patterns in museums; and then in the early 1980s by Levasseur and Veron (1983) with their visitor typology of ants, fish, butterflies, and grasshoppers. An important contribution is the work of space syntax scholars, who have analyzed the spatial structure based on patterns of access and visibility, entangled with curatorial intentions (Hillier and Tzortzi 2006); also the research project *eMotion*, which has investigated the influence of architectural and curatorial layouts on the attention of visitors (Kirchberg and Tröndle 2012; Tröndle 2014).

Embedded in these discourses, we call for a relational understanding of space (Löw 2001). Space realizes itself in *space-making*, which not only entails the design of space, but also the social constitution of space in accordance with certain practices, contexts, meanings, or attributions. By visiting an exhibition, visitors dynamically place and are being placed in relation to objects and other visitors, thereby co-producing the museum space. Personal experience in the museum relates to the synthesizing of space, i.e., it refers to a certain set of spatial and embodied knowledge about museums that builds on previous experiences and institutionalized knowledge. We consider here that visitors are bringing spatial knowledge about museums (depending on their familiarity with museums) and are moving/acting/relating to, i.e., enacting the exhibition space during their visit. By following a socio-spatial perspective, we want to integrate *spatial structures* (as in spatial layout, design, and atmosphere), *spatial knowledge* and *spatial practices* of the visitor. This syntactic approach places curatorial and design intentions in dialogue with the social uses of space, through the analysis of specific 'museum visiting cultures', and correlates them with socio-structural factors.

2.2 Experimental Methodical Approach

Mixed Methods Experimentation

In order to investigate the differing types of appropriation of the exhibition, the spatial knowledge of the visitors and their sociodemographic characteristics, we developed a mixed-methods research design, integrating the following methods: firstly, indoor tracking of visitor movement through the exhibition; secondly, a survey including sociodemographic data and the spatial perception of the exhibition; and thirdly, ethnographic observations in the exhibition from September 2021 to June 2022, including several interviews with the current and the former curators as well as the exhibition designers. This set of heterogeneous data allowed us to analyze the (intentionally designed) spatial structures of the exhibition space, as well as the visitors' spatial knowledge and spatial practices.

For the integrative analysis of this rich data set, we conducted a Multiple Correspondence Analysis (MCA): this geometric modelling technique discloses underlying structures in categorized data by representing both modalities of questions and individuals as points in a multidimensional Euclidean space (Le Roux and Rouanet 2010). In line with Hanquinet,

we advocate the use of MCA for three reasons. First, it enables us to carry out an analysis with a large amount of detailed information on [spatial appropriation] [...] and convey cultural and social differentiation within a rather homogeneous population. Second, MCA permits us to deal with the idea that the space of [spatial] preferences may be simultaneously structured by different principles. Third, it focuses on underlying dimensions, so that it can provide an interpretation of the findings in terms of relational differentiation that does not lean too heavily on the specific items used (Abbott 1988; Atkinson 2011) (Hanquinet *et al.* 2014, emphasis added).

Data Set and Precoding Processes

The visitor research took place in November 2021 and July 2022. Data were collected through standardized surveys, handed out on a tablet to individual visitors or small groups over the age of 18. Before entering, participants were also handed the tracking device. Our sample consists of 450 completed sociodemographic surveys and 289 visitor trackings, as well as 223 follow-up surveys on the exhibition experience. All three data sets are linked by an identifier, so that a participants' sociodemographics, movement, and exhibition experience can be linked.

We precoded the social and spatial data for running the MCA as follows: the sociodemographic answers were precoded according to occupational sector and job title into a variable about 'occupational status', using the *Standard International Occupation Scale* after Ganzeboom and Treiman (2003). The sociodemographic questions were precoded depending on the highest completed educational qualification, with a coding privileging high education due to the overall highly educated audience we surveyed (non-academic/in training/BA/MA/PhD). Following a coding example for an 'art index' (Kohl 2006), we precoded the questions on competence and involvement in science into what we called a 'science index': distinguishing between visitors that are unfamiliar with science, that represent an interested public, are citizen scientists or professional scientists. Lastly, the motivation to visit was coded by crossing different motivations (Education/Education and Entertainment/Entertainment/Architecture and Entertainment/Architecture/Architecture and Education) (Treinen 1991; Wegner 2016).

Furthermore, we classified data that showed how the space was perceived and that tracked movement. This is where the originality of our method lies: we precoded the movement pattern and the spatial perceptions to integrate them into the MCA.

Precoding Movement:

The open plan layout of the Humboldt Labor did not specify any routes for visitors at the time of our study.⁴ Consequently, visitors were left to 'fend for themselves' in the main space; the curatorial pedagogy of 'networked thinking' (Pieken 2020: 24) was expected to be conveyed through the spatial-aesthetic staging alone. While the overview text at the entrance of the main space referenced the three distinct areas of *research objects*, *archives*, and *research wall*, it became clear during participant observation that this textual guide for orientation was not always comprehended in its spatial arrangement. The curatorial and design intention that visitors would engage with in their own 'process of the narrative construction of meaning' (Pieken 2020: 23) thus builds very much on the affective design of the exhibition yet is similarly driven by a democratic idea of the autonomous and engaged visitor (e.g. Tzortzi 2014: 328).

Through a manual and visual coding process, realized within intersubjective data sessions,⁵ we compared the visitors' individual routes through the exhibition and built a typology of paths along a) *movement patterns* and b) *intensity of the visit* (see Figures 7 and 8). We identified four movement patterns: **Grid**, for a rather systematic movement between the exhibits and zones; **Tangle** for a more ping-pong-like motion between the different exhibition parts; **Circle** for a movement that stays predominantly on the periphery; and **Isle** for visits that focus on specific parts of the exhibition. The intensity of the visit was classified as high or low. We could witness a solid distribution across categories.⁶



Figure 7: Intersubjective Data Session for the precoding of movements.







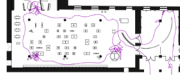
| Pattern | Intensity high | Intensity low |
|---------|---|--|
| Grid |  <p>Date 21.11.2021 ID 162443AF4E63</p> |  <p>Date 01.11.2021 ID 0307676F273E</p> |
| Tangle |  <p>Date 01.11.2021 ID 4068869B9F42</p> |  <p>Date 26.11.2021 ID 4275C8469762</p> |
| Circle |  <p>Date 21.11.2021 ID 1004746AF4EC9</p> |  <p>Date 01.11.2021 ID B21FE1D38CA</p> |
| Island |  <p>Date 03.11.2021 ID DC781EAA1C67</p> | |

Figure 8: Movement Matrix: Patterns and intensities.

Precoding Spatial Perception:

In the survey, we asked visitors to describe their perception of the atmosphere, architecture, and presentation of exhibits in the exhibition space using semantic differentials scored in five digit Likert scales (see Figure 9). To correlate the different modalities of these variables, we ran a Principal Component Analysis (PCA) without weighting that let us distinguish different perception profiles. By bringing all three spatial layers (atmosphere, architecture, and presentation) together, we could identify different spatial syntheses (Lów 2001: 158) of the museum space, i.e., with what kind of spatial representations of museums the Humboldt Labor was associated by the visitors: the PCA clearly revealed four types of spatial representations, well distributed among visitors: as a universal modern museum being *spacious, large, bright, high, big*; as a library being *colourful, calm, quiet, sorted*; as a chamber of wonders being *gloomy, colourless, cool, loud, bustling, confusing*; and as an archive being *dense, small, dark, low* (see Figure 10).

1. At first glance, how did the Humboldt Labor appear to you?

This is about the atmosphere. Please do not consider the categories as evaluative.

| | | |
|-----------|-----------|--------------|
| repellent | ○ ○ ○ ○ ○ | inviting |
| calm | ○ ○ ○ ○ ○ | bustling |
| sincere | ○ ○ ○ ○ ○ | loose |
| ordinary | ○ ○ ○ ○ ○ | unique |
| cool | ○ ○ ○ ○ ○ | warm |
| loud | ○ ○ ○ ○ ○ | quiet |
| gloomy | ○ ○ ○ ○ ○ | light-filled |

2. How do the exhibition spaces appear to you?

This is about the architecture. Please do not consider the categories as evaluative.

| | | |
|-----------|-----------|----------|
| dark | ○ ○ ○ ○ ○ | bright |
| small | ○ ○ ○ ○ ○ | large |
| dense | ○ ○ ○ ○ ○ | spacious |
| low | ○ ○ ○ ○ ○ | high |
| modern | ○ ○ ○ ○ ○ | antique |
| colorless | ○ ○ ○ ○ ○ | colorful |

10. How did you find the presentation of the exhibition?

This is about your opinion of the contents.

| | | |
|-----------|-----------|------------|
| confusing | ○ ○ ○ ○ ○ | sorted |
| classical | ○ ○ ○ ○ ○ | innovative |
| foreign | ○ ○ ○ ○ ○ | familiar |
| rational | ○ ○ ○ ○ ○ | sensual |

Figure 9: Digit Likert scale used in the survey.

| | | | |
|----------------------|--------------------------|---|--|
| ACTIVE | Museum Spatial Knowledge | frequency of museum visits | 1 per year; 2-3 per year; 4 or more per year |
| | | type of museum | art; natural history; science & technology; history; complex |
| | | motivation for visit | edu; edutainm; entertain; architainm; archi; eduarchi |
| | | position towards the Humboldt Forum | crit_castle; pos_castle |
| | | knowledge of cultural-political discourse | inform+; inform- |
| | Spatial Practices | movement pattern | grid; tangle; circle; isle |
| | | intensity of visit | INT+; INT- |
| | | perception of the space of visit | WUNDK; MOMA; ARCHIV; BIB |
| | | perception of the outside | Out+; Out-; N_Out |
| | | preferred mode of display | SCREEN_CLAS; INTERACT_STAT;VITRI;SCREEN_KINET;INTERACT_AUDIO |
| Proximity to Science | proximity to science | dist_sci; int-pub; citiz_sci; profi | |
| | education | non-aca; BA; MA; PhD | |
| PASSIVE | Sociodemo graphics | age | <24; 24-34; 35-44; 45-54; 55-64; >65 |
| | | gender | m; f; d |
| | | occupational prestige | in edu; prestige+; prestige++; prestige+++ |
| | | income | <850; 850-1499; 1500-2499; 2500-4000; <4000 |

Figure 11: Architecture of the MCA relating social and spatial variables.

The MCA enables all the individuals in the sample to be positioned in relation to each other by crossing all the variables.

On the basis of an *Individuals x Variables* table, the first step in the [MCA] consists in the construction of a cloud of points representing individual persons. The next step consists in reducing the size of the cloud by researching its main axes (Lebaron 2021: 128).

Each axis is interpreted for the themes, questions, and categories on the variance of each axis, using the table of contributions and coordinates. For this, we used an MCA for the n=228 active individuals and n=222 supplementary individuals in the combined database, without weighting. There was a total of 3 themes, 12 questions and 44 active categories. We analyzed the first three axes, representing a cumulative modified rate of 56.5 per cent (see Figure 12).

| Axis | Modified rate | Cumulative modified rates |
|------|---------------|---------------------------|
| 1 | 30.7 | 30.7 |
| 2 | 14.1 | 44.8 |
| 3 | 11.7 | 56.5 |

Figure 12: Benzecri's modified rate and cumulative modified rates of our MCA.

3. Social-Spatial Inequalities in Ways of Knowing

The results of our study show that the legibility of the experimentalized museum space depends on visitors' cultural and specific spatial capital. The capacity to 'read' the space as intentionally designed influences the appropriation of the exhibition: it impacts how visitors move around but also how they synthesize the space. The results show that in contradiction to the intended curatorial purposes of democratization and broad access, inequalities are reproduced in ways of knowing by the current spatial transformation of the museum (see Figures 13 and 14 for graphic representation in the form of clouds of categories and individuals). We will demonstrate these results in three main theses.

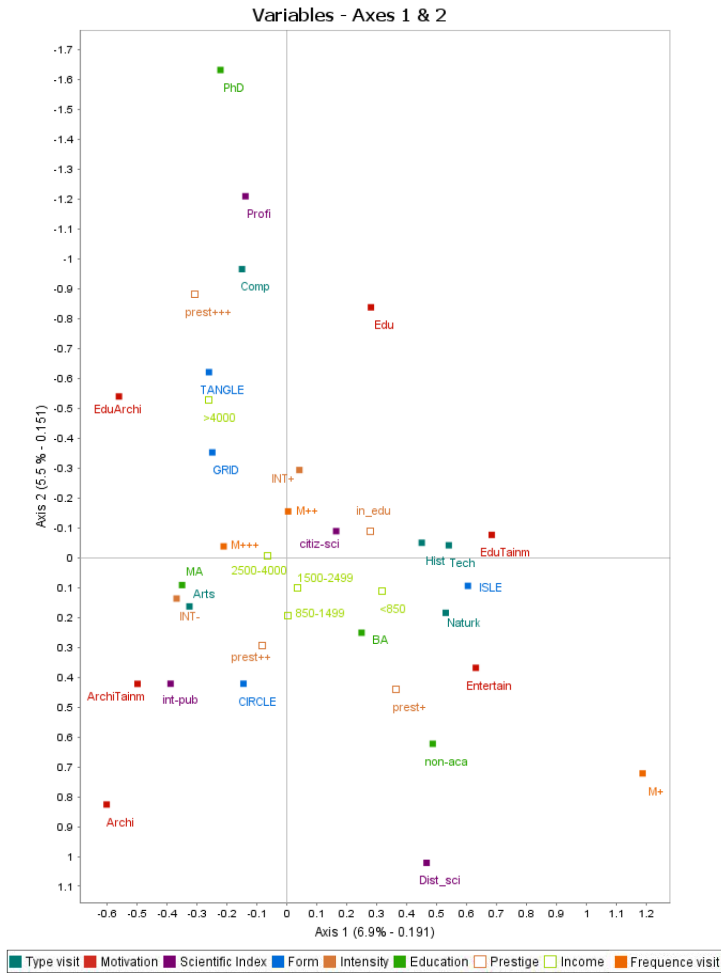


Figure 13: Cloud of categories along the axis 1 and 2.

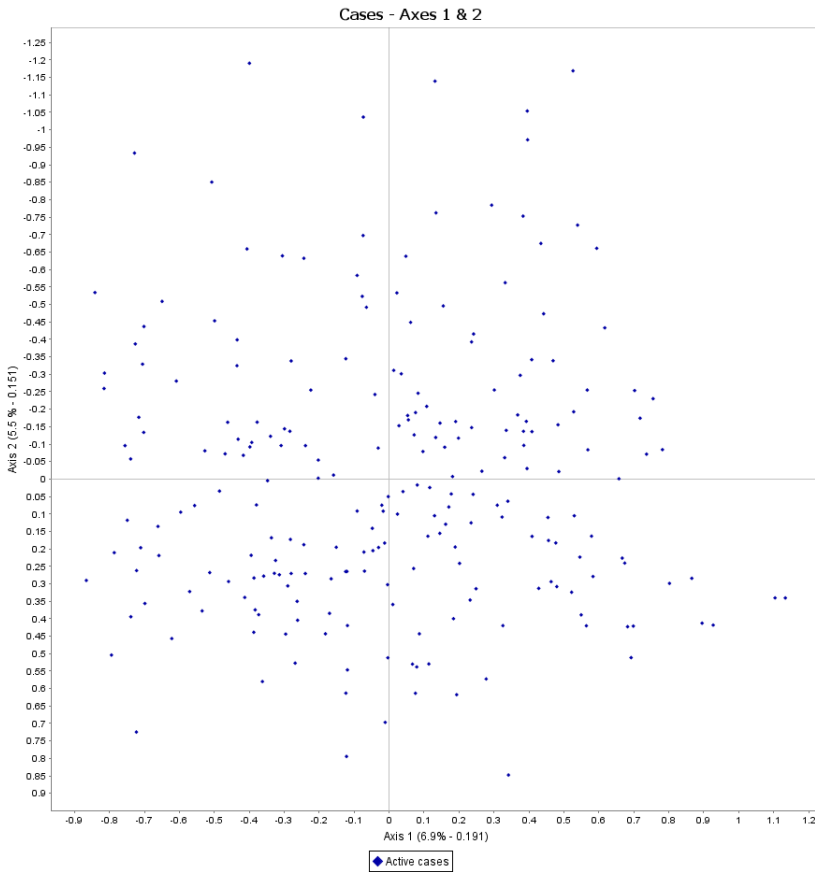


Figure 14: Cloud of individuals along the axis 1 and 2.

Thesis 1: Correlation Between Social Position and Movement

Axis 2 (see Figure 13) shows a vertical distribution of the variables relating to social position (income, occupational status) along with the variables relating to scientific expertise (science index and education): the indicators of social position show an increase from low capital endowment (*bottom*) to higher capital endowment (*top*) in relation to income (1500-2499, 2500-4000, <4000), and professional status (*prest+*, *prest++*, *prest+++*). This distribution of social position is further emphasized by the variable that records affinity with and knowledge of science (*Dist_sci*, *int-pub*, *citiz_sci*, *Profi*) and educational level (*PhD/MA/BA/non-acad*).

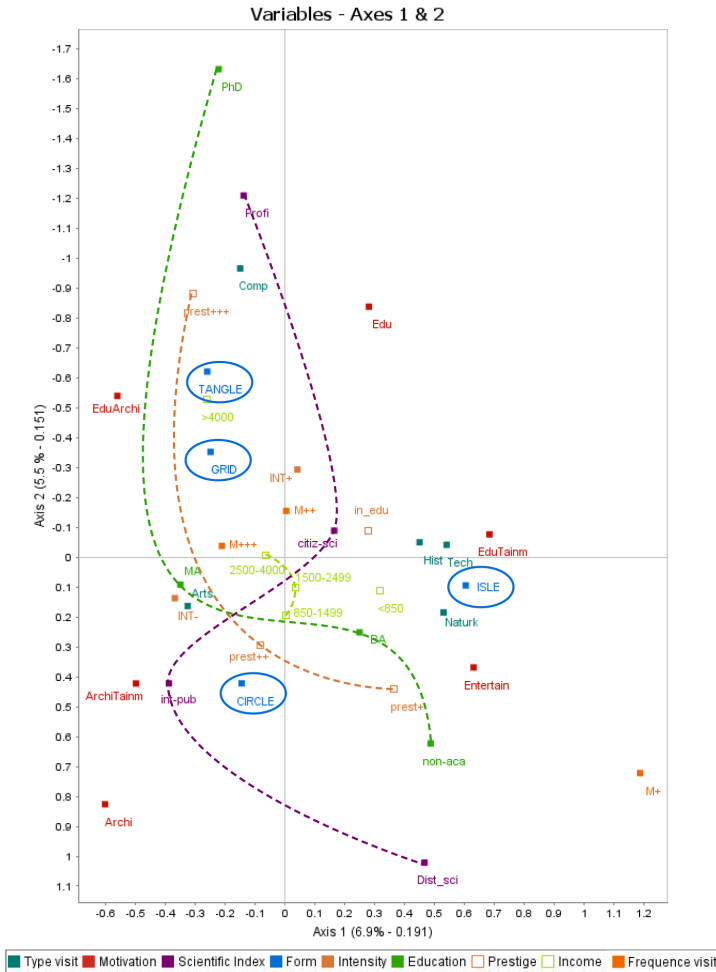


Figure 15: Visual analysis of the correlation between social position, science index and movement pattern (cloud of variables).

It is notable that distinctive social positions correspond with specific spatial practices, specifically the visitors' pattern of movement and level of engagement: visitors with lower capital endowment (*bottom*) tend to follow a circular pattern of movement (*CIRCLE*) whereas visitors with higher capital endowment (*top*) tend to follow a grid (*GRID*) or tangle (*TANGLE*) pattern of movement through the exhibition. This correlation is an indicator that the curatorial and aesthetic openness of the exhibition (designed space) does not lead to equal accessibility (practised space) – understood here in a very physical sense – of exhibition content. Put frankly, it means that the people circling around the hanging display cases are 'missing' the heart of the exhibition due to their reluctance to enter the dense space of the display cases.

Accordingly, the movement pattern (*CIRCLE*) of visitors with lower capital endowment correlates to a non-intensive and small-scale engagement with the exhibition contents (*INT-*); whereas at the other end of the axis, the other movement patterns (*GRID*, *TANGLE*, *ISLE*)

of visitors with higher capital endowment correlate to a high intensity engagement with the exhibition contents (*INT+*). This is further in accordance with the visitors' experience of science – that is, their specific symbolic capital, recorded as their scientific expertise. The modality indicating no knowledge or experience of science (*Dist_sci*), i.e., people who stated that they do not even follow science journalism, is closer to a circular pattern and therefore a non-intensive engagement in the exhibition, typical of lower capital endowment; whereas the modality indicating professional and amateur participation in science (*Profi and citiz-sci*) is closer to the GRID and TANGLE movement modalities and therefore the higher education profiles of visitors typical of higher capital endowment.

The fact that visitors with lower capital endowment tend to stay at a 'certain distance' from the exhibits and do not perform the 'networked thinking' envisioned in the exhibition concept, is particularly interesting from a socio-spatial perspective. It indicates the mediation of meaning and knowledge through the aesthetics of the exhibition space – and by this we mean the design and the atmosphere, as well as the layout. Modes of visitation are inherently shaped by traditional aesthetic-spatial museum orders and their perceptual schemata (see editorial), i.e., referring back to a certain spatial knowledge and spatial synthesis, having a disciplining effect (Zahner 2015). We argue that when these spatial norms are challenged by new curatorial approaches, it becomes more difficult to read the exhibition, i.e. to access the content displayed, especially for people not bringing a differentiated museal spatial knowledge: these aptitudes for reading variations of exhibition spaces correlate with specific sociocultural dispositions (cf. Dawson 2014). Or to put it more simply: the capacity to leave behind traditional modes of perception and knowledge in the experimentalized museum space is related to social position.

Thesis 2: Alignment of the Synthesis Performances Between Inside and Outside

Along axis 1 we can see a strong polarization between an affirmative (*Pos_Castle*) and a critical (*Crit_Castle*) assessment regarding the re-construction of the Prussian architecture of the Humboldt Forum, suggesting a split among visitors in line with the Forum's cultural-political controversy, referred to in part 1.3. It correlates strongly with the degree of awareness about the cultural-political discourse on the Humboldt Forum (*inform+*, *inform-*): the visitors who are informed about the debate are critical of the reconstruction, whereas those who are less informed manifest a positive position towards it.

Interestingly, these positionalities towards the architecture correspond with the exhibition experience of the Humboldt Labor: a positive attitude towards the reconstruction of the Prussian architecture (*Pos_Castle*) correlates with a perception of the interior of the Humboldt Labor along the lines of a modern universal museum (*MOMA*, *BIB*). A critical attitude towards the reconstruction of the Prussian architecture (*Crit_Castle*) correlates with a perception of the interior of the Humboldt Labor that diverges from or contrasts with the attributes of a modern universal museum (*WUNDK*, *ARCHIV*).

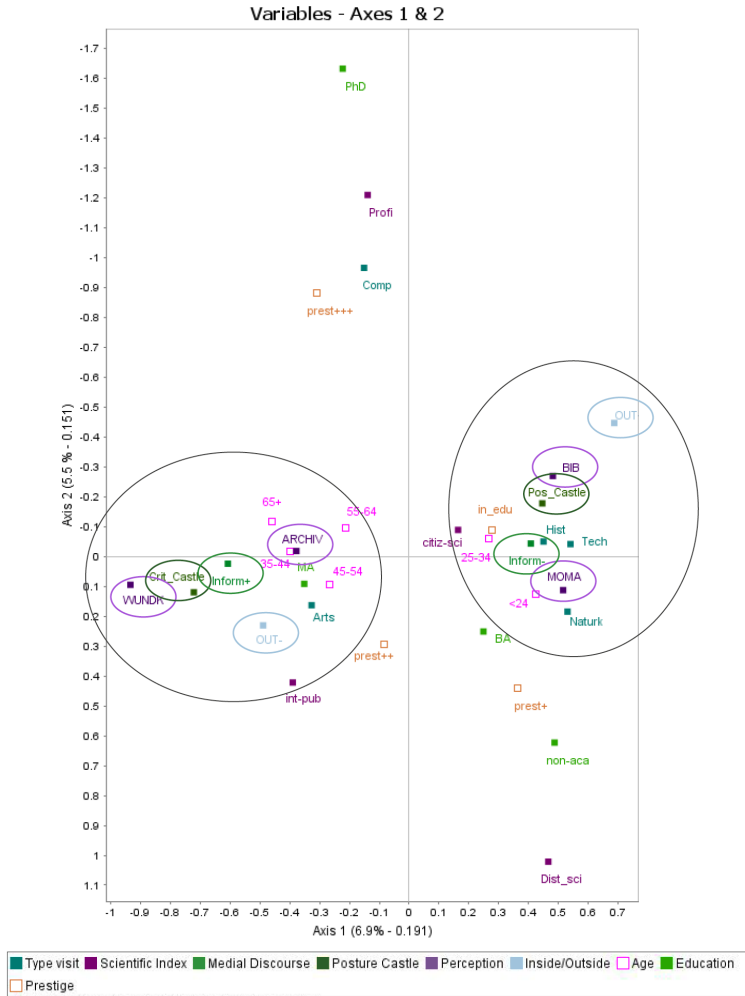


Figure 16: Visual analysis of the alignment of the synthesis performance between inside and outside (cloud of variables).

This indicates an alignment between the perception and understanding (i.e. the synthesis performances) of the exterior and interior space: the preconception (whether positive or critical) seems to exert a direct influence on the synthesis performance of the museum space of the Humboldt Labor – that is, on the way visitors perceive and associate the space within their existing body of spatial knowledge. For visitors with a positive attitude towards the overall architecture of the Humboldt Forum, the visit is characterized by a harmonious experience: marked by the late classicist architecture of the Prussian facades, with their high and neo-baroque elements, they ‘read’ the interior of the Humboldt Labor as they would expect to do so in other classical museums (such as in the British Museum or the old museum in Berlin), as *spacious, large, bright, high, colourful, calm, quiet, sorted*. For them, the Humboldt Labor must be part of the monumental architecture of the Humboldt Forum. Interestingly, these visitors

also say that the palace architecture is present in their minds during their visit (OUT+), which reinforces the thesis of an alignment of spatial synthesis between inside and outside. For visitors who are critical of the overall architecture of the Humboldt Forum, the visit is marked by a dis-harmonious experience: they 'read' the interior of the Humboldt Labor without much expectation, as *dense, small, dark, low, cool, gloomy, colourless, loud, bustling, confusing*. Enhancing this interpretation, these visitors also say that the palace architecture is not present in their minds during the visit (OUT-).

In terms of spatial theory, it is interesting to think about the effects of multi-scalarity on synthesis performance. This applies to inside/outside, but can certainly also be extrapolated to other scales (e.g., neighbourhood/city; local/global, etc.). It opens a very interesting field of study when one thinks about all the star-architecture museums that have been built over the past decades.

Thesis 3: Correlation Between Museum Spatial Knowledge and Preference for Mode of Display

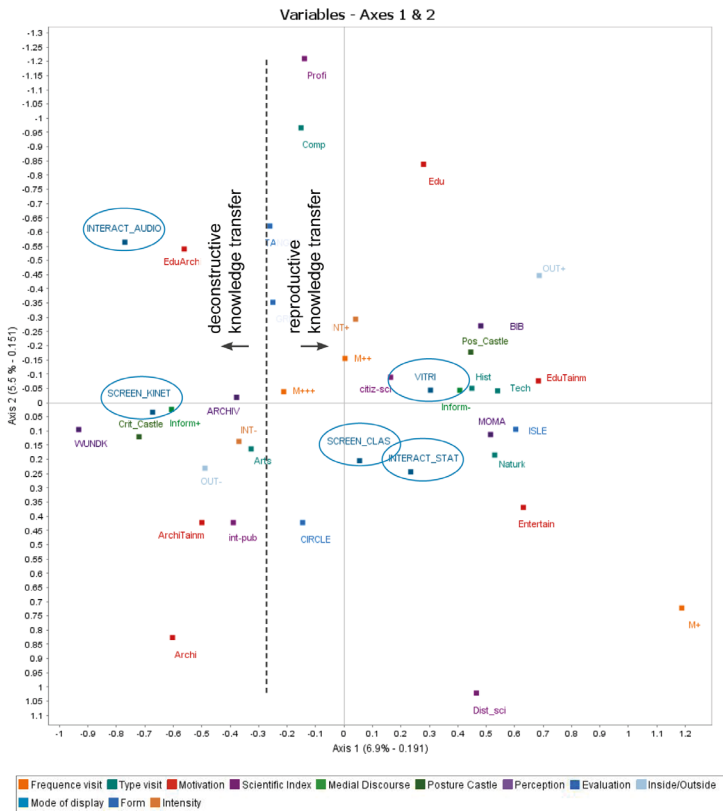


Figure 17: Visual analysis of the correlation between social position and preference for modes of display (cloud of variables).

A specific characteristic of the Humboldt Labor is the integration of diverse modes of presentation (see also 1.3.), which correspond to different intentions behind different types of mediation and levels of interpretation. The execution of these different ways of mediating can be explored with the help of Camen Mörsch's analysis of the directionalities of art mediation.⁷ Here, Mörsch distinguishes between affirmative, reproductive, deconstructive and transformative modes of mediating knowledge. Although the mediatory gestures within the spatial subdivisions of the exhibition areas of the Humboldt Labor are not entirely coherent, tendencies can be noted:

a) In the *foyer*, the display is characterized by the screen presentations of the research clusters and countered by the room-sized swarm projection, which is 'first of all intended to draw people into the exhibition'.⁸ During participant observation it became apparent that attention was predominantly given to the screen presentations, while less attention was paid to the swarm projection. The screen presentations are clearly didactic-affirmative presentations about the current production of science in Berlin. The swarm installation refers primarily, on a visual-affective level, to the topic of human-environment relationships, but also symbolically to science as a practice of 'swarm intelligence' i.e. shaped by intense cohesion and collaborations; a short introductory exhibition text guides this reading. Despite these different display styles, both modes of mediation can be understood as reproductive methods of addressing a non-expert audience.

b) In the *vitrine space*, each object is accompanied by three different modes of reading (along the concepts of 'visibilities', 'orders', 'temporalities'), 750-character explanatory texts and one 'visual comment'. These object texts thus convey a deconstructive moment of curatorial authority through the presentation of three different perspectives. However, apart from these different perspectives, the three texts are very similar in style and tone, so that the deconstructive potential of the presentation in terms of multiperspectivity is not entirely successful, but rather reproduces curatorial authority.⁹

c) The *interactive station* with the two exhibits 'NeuroCure' and 'the Robofish', both featuring interactive hands-on displays, make little use of deconstructive meditation, but rather follow a partly playful and at the same time largely uninterpreted model that oscillates between affirmative appeal to an expert audience and reproductive communication to interested visitors.

d) The *research wall*, with its striking and room-filling audiovisuality featuring topical and political references to the current state and agenda of research, is less definite in mediatory terms. While the statements made by the interviewed Berliner professors on screen convey a still reproductive and authoritative discourse, their tone is rather critical and therefore part of a more generally deconstructive script that features reflections on the social conditions of scientific knowledge production.

e) Ultimately, the *archive area* presents a particularly dense selection of visual and auditory material from three different archives, which, due to the exhibitionary juxtaposition, can be approached from multiple perspectives. This exhibitionary potential makes way for new epistemic insights, thus having a profoundly generative (research) character.¹⁰ This kind of display thus primarily intends (with the exception of some quizzes) to present a multi-layered critical mediation and deconstruction of disciplinary bodies of knowledge and their historical ideologies.

We can see a horizontal distribution of preferred display modes in correlation with the degree of museum spatial knowledge, that is, the familiarity with museal spaces. Linear reproductive knowledge transfer in the sense of object texts (vitrines, exhibition text in the foyer) and didactic video presentations (cluster screens in the foyer) as well as the interactive station (INTERACT_STAT) correspond with lower specific symbolic capital related to the museal

experience (in terms of frequency of visit but also in the type of museum visited); whereas the preference for the rather unconventional and deconstructive displays of the multimodal research wall and the dense and interactive archives (*SCREEN_KINET*, *INTERACT_AUDIO*) correspond with a higher specific symbolic capital related to the museal experience.

The curatorial project to address different levels of meaning-making through diverse modes of display intrinsically calls for multiperspectivity in exhibition design. Yet our investigation shows that, in line with other research, the complex multiple modes of display are less accessible for visitors with lower capital resources.

4. Conclusion

Critical reflections in curatorial and museological thought have intervened in the ways in which exhibitions are produced and designed. A broad desire for open and accessible exhibitions and museum spaces for diverse audiences (*democratization*) has fostered new approaches in curation and exhibition design that seek multiperspective, associative, multimodal, and generally more open spatial layouts. Whilst deconstructive and transformative potentials associated with critical mediation are understood as 'promises for qualitative gain and new meaning',¹¹ the question of their implications on display strategies remains under-researched (Lake-Hammond and Waite 2010; Prinz 2020). That is exactly what we wanted to empirically tackle in this paper.

By means of a mixed methods investigation on an experimentalized museum space (the Humboldt Labor in the Humboldt Forum in Berlin), we have shown that a spatial reordering of the museum reproduces inequalities in ways of knowing between visitors. Visitors' movement, perception, and experience of the exhibition space are highly correlated to individual positioning towards cultural politics and exhibition contents, leading to distinct appropriation and perception of the designed space.

The ideals of an accessible and non-predetermined exhibition reading, as intended by means of the open layout of the Humboldt Labor, do not contradict this, but neither do they lead to increased interaction and access per se. Spatial and cultural knowledge to decode exhibition arrangements and aesthetics draws on the cultural practice of museum visiting that is nonetheless highly codified on all levels of mediation, not least in spatial terms.

Notes

- ¹ With 'ways of knowing', we mean the co-production of knowledge happening in the museum when the curated displayed knowledge is understood and interpreted by visitors, that is re-negotiated and re-modelled in multiple ways.
- ² It hosts several exhibitions and activities by four partners – the Stiftung Preußischer Kulturbesitz with the Ethnologisches Museum and the Museum für Asiatische Kunst der Staatlichen Museen zu Berlin, the Stadtmuseum Berlin together with Kulturprojekte Berlin, the Humboldt-Universität zu Berlin and the Stiftung Humboldt Forum im Berliner Schloss.
- ³ Humboldt Labor Mission 2020. <https://www.humboldt-labor.de/de/labor/mission>, accessed 10 April 2023.
- ⁴ This was the initial intention (Pieken 2020: 24). By the end of our project, thematic tours were offered in the form of flyers and coloured arrows visible on the exhibition floor.
- ⁵ In the intersubjective data sessions (Tuma *et al.* 2013: 87), we – a team of four people – interpreted the individual graphs in order to cluster them into this typology.
- ⁶ The types are distributed as such: Tangle (32 per cent): Intensity high (21 per cent), Intensity low (11 per cent); Circle (35 per cent): Intensity high (16 per cent), Intensity low (19 per cent); Grid (16 per cent): Intensity high (10 per cent), Intensity low (6 per cent); Isle (17 per cent – all Intensity high).

- ⁷ Carmen Mörsch, 'Am Kreuzungspunkt von vier Diskursen: Die documenta 12 Vermittlung zwischen Affirmation, Reproduktion, Dekonstruktion und Transformation', *What's Next?* 2009. <https://whatsnext.net/249>, accessed 27 February 2023.
- ⁸ Former curator of the Humboldt Labor, interview by the authors, digital recording, May 2022, Berlin.
- ⁹ This has been reflected upon by the former co-curator and the new curatorial team; the latter have been developing and implementing new object texts, e.g., with a group of young people regarding their critical perspectives.
- ¹⁰ Former curator of the Humboldt Labor, interview, May 2022.
- ¹¹ Cf. Mörsch, 'Am Kreuzungspunkt von vier Diskursen'.

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