Unsettling the Chemical Gaze: Artistic research on pesticides and toxic labour in European foodways

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Abstract

This article advances a reformulation of Hannah Landecker's concept of the 'chemical gaze' through artistic research. Instead of framing matter as a site of extraction and profit, the chemical gaze is reimagined as affective, uncertain, and embodied, attentive to uneven toxic relations in contemporary food production. The discussion centres on Exposición, an art-science exhibition created during a residency in Bern, which examined pesticide exposures and the precarious, gendered labour underlying strawberry cultivation in Huelva, southern Spain. Through multisensory installations combining sound, scent, visual media, and ethnographic testimony, the exhibition invited audiences to engage with the entanglements of agrochemicals, migration, and reproductive justice. The article situates this practice within interdisciplinary debates in feminist science studies and environmental humanities, demonstrating how arts-based methods can unsettle dominant imaginaries of agrochemicals and vulnerability. It reflects on the ethical and political stakes of representing toxic labour, the curatorial challenges of working with testimony, and the limitations of aestheticization. Ultimately, it argues that art-science collaborations can generate plural, critical, and sensorially attuned ways of witnessing and contesting toxicity across intimate and planetary scales.

Keywords: chemical gaze; art-science; arts-based research; toxic labour; environmental justice; agrochemicals; Huelva

Introduction

This article centres on an art-science exhibition in which multimedia, research-based installations highlighted the intensive conditions under which strawberries are cultivated in southern Spain. *Exposición* attempted to open a multisensory space for grappling with pesticide exposures within an agricultural system that relies heavily on exploitative and gendered labour. Through the frame of *Exposición*, this paper reflects on artistic research as an experimental means of making chemical pollution perceptible, while foregrounding the need for multiple perspectives and sensitivity to systemic injustices. Looking back on the exhibition and prompted by notes in my project journal, I contemplate and contextualise *Exposición* as an interdisciplinary inquiry into systemic and uneven toxic residues. I explore how and where concepts from science studies, especially Hannah Landecker's 'chemical gaze' (**Landecker, 2019**), resonate with aesthetic theories and practices, generating insights for future interdisciplinary experiments. In particular, I tentatively propose a reformulated version of the chemical gaze in contexts of artistic research, one which replaces scientific and extractive tendencies with uncertainty and affective experience.

Exposición was developed during a residency at the University of Bern, which had been established to support artists and researchers from a mixture of disciplines to explore a shared research topic. As an artistic researcher with a background in cultural geography, I joined forces with social geographer Nora Komposch and soil scientist Adrien Mestrot (**Sabin, Komposch & Mestrot, 2024**). Together we coordinated an events program at Bern on the topic of pesticides in Europe to coincide with the residency. This program formed a basis for continuing our interdisciplinary exchanges, which had previously taken place online, with a wider community of staff and faculty, students, and local publics. The program featured fieldtrips to local farms in Switzerland and guest lectures from environmental scientists, leading to opportunities for interdisciplinary knowledge exchange. We also focussed on a regional case study for the end-of-residency exhibition, which featured ethnographic data and multimedia responses (**Sabin, 2022**). Our case study centred on the conditions of strawberry production in Huelva, Andalusia, where Komposch was already conducting fieldwork on labour conditions and reproductive justice (**Komposch, 2025**).

It is my intention with this essay (or 'assay') to carefully consider some of the affective and political implications of aestheticizing uneven toxic exposures (**Peeples, 2011**), drawing on anticolonial feminist science studies and spatiotemporal imaginaries of chemical relations from across the social sciences and humanities. In recent years, scholars have

underscored the environmental injustices of chemical pollution, as well as practices of care and more-than-human kinship among affected communities (e.g., **Murphy, 2017; Liboiron et al., 2018; Balayannis & Garnett, 2018; Nading, 2020**). These bodies of literature resonate with creative practices and coalitions that have highlighted how industrial chemicals are not isolated entities but mix with other substances and bodies in social and political contexts. Several performance-based artworks have attempted to ritualise or reimagine practices of measuring, sensing or responding to pollution in immersive, speculative and collective ways (e.g., **Born & Barry, 2011; Calvillo & Garnett, 2019; Woolmore, 2024**). In this paper, I attempt to articulate these aesthetic moves by thinking with a concept from science historian Landecker's work on food as exposure, namely, the 'chemical gaze' (**Landecker, 2019**).

As I explain later, Landecker has described the chemical gaze as an act of prospecting for molecular solutions in industrial agriculture. In contrast, I seek to explore how the chemical gaze might be rethought, perhaps as a sensibility for creative practices that engage critically with pollution and power relations. In the first part of the article, I outline the origins of the chemical gaze and provide some considerations for reimagining said gaze in feminist and postcolonial ways. Second, I explore how the configuration of matter and media in *Exposición* mobilised novel ways of tracing relations between bodies, systems, and agrochemicals (**Agard-Jones, 2013**). I emphasise the importance of incorporating local perspectives and sensory accounts, while acknowledging some specific representational limits we faced when curating stories that had previously been gathered from a community who continue to experience precarity. Lastly, I sketch visitor responses to the exhibition along with some lessons on tracing chemical relations via multiple disciplines and sites. Fluid, faltering, and intimate, the ways in which I experiment with the chemical gaze shift throughout this piece as I seek to open further questions around chemical exposures in disciplinarily liminal spaces of intervention.

The chemical gaze according to Landecker

Where the annoyed passerby might see a riot of smelly detritus—beet pulp, fishheads, corncobs—the chemical gaze perceives carbohydrate and nitrogen. Where the naturalist might see species and kingdoms—plants, microbes, animals—the chemical gaze traces a *metabolic map* of enzymatic and energetic conversions between different kinds of matter connecting one body to another across taxonomic boundaries (**Landecker, 2019, 531**).

The chemical gaze, according to Landecker, is a conceptual and practical frame that typified the history of agricultural intensification in North America during the early 1900s. During this time, waste from food production and processing was increasingly repurposed as animal feed or reused for the industrial production of chemicals. The gaze Landecker describes was therefore not about seeing objects, but rather *perceiving* matter in terms of its chemical properties and commercial potential. The capacity to regard waste in this way, and thus wield a chemical gaze, was not just an intellectual exercise but a prerequisite for increasing profit margins. Growth, Landecker observes, was the main object of the chemical gaze, not the toxicants that began circulating *en masse* through the food chain, ecosystems, and bodies. These phenomena were conveniently external to its field of perception.

Through speculative vignettes, Landecker illustrates the operations of the chemical gaze, as exemplified by the previous quotation. Through hypothetical encounters with beet pulp and corncobs, Landecker brings the chemical gaze to life in our imaginations. Each scene involves a comparison between modes of perception. In both examples, the subject (passerby, naturalist) is usurped by a deindividuated force known as the chemical gaze. Thus, the chemical gaze becomes that which mobilises and embodies a specific mode of relating to the more-than-human objects of its attention: food waste, plants, microbes, and non-human animals. Now, a working definition of 'the gaze' in the Oxford English Dictionary refers to a '*way of regarding* people or things which is considered to *embody* certain aspects of the relationship between the observer and the observed' (**OED, 2002**, my italics). This is a deliberately concise definition; the gaze (*le regard*) has, of course, been churned over by cultural theorists and practitioners for the past half century. Many have sought to debunk, contest, and counteract the notion of a hegemonic gaze by directing attention to feminist, postcolonial, and queer alternatives, among others.[i]

Staying with an interpretation of the gaze in the context of history of science, Landecker explains in a footnote how the initial inspiration for a chemical gaze harks back to Foucault's concept of a '*clinical* gaze' to describe the mindset of the nineteenth-century physician towards their patients (**Landecker, 2019, 544**, my italics). This connects Landecker's work with broader discourses on situating scientific practices in social, political, embodied contexts (see, also **Haraway, 1988**). In a similar vein, Evelyn Fox Keller has revealed how what she calls the 'biological gaze', once equivalated to stargazing or observing from a distance, is—in the act of setting up and focussing a microscope—'inevitably enmeshed in actual touching, in taking the object in hand, in trespassing on and transforming the very thing we look at' (**Keller, 1996, 108**). In Keller's study, the gaze of the scientist is no longer distant but relational. Turning to chemical

pollution today, critical scholars and activists are reimagining the industrial chemical not as an isolated entity floating in whitespace but as part of systemic 'chemical relations' between corporations, states, and more-than-human communities who are disproportionately exposed (**Murphy, 2017**).

Figure 1. Polytunnels in Huelva (photograph author's own, March 2022)

Situating the research: Huelva, politics, visibility

This brings me to the case study for *Exposición*. While physically located in Huelva, the selected case transcended national borders. By focussing on the Andalusian berry industry, we designated a specific geographic area, while also unspooling the mobilities of labour migration, European foodways, and pesticides that travel through and transform ecological networks.[ii] In preparation for my art residency, I visited Komposch in Huelva to shadow aspects of her fieldwork. I learned how a long history of mineral mining in the region has in recent decades coincided with intensive agriculture, agro-industrial activities, and toxic waste dumps. Locals are disproportionately exposed to industrial pollution and seasonal workers in the berry industry are vulnerable to sprayed pesticides, especially within the concentrated atmospheres of the polytunnels (Figure 1), which, in some parts of Andalusia, extend as far as the eye can see.

Although exact figures are hard to come by, out of 100,000 workers in the Andalusian strawberry industry, around half are migrants from different regions, including ten- to twenty-thousand women who travel from Morocco on a seasonal basis (**author communication, Komposch, 9 July 2025**). Their labour takes place under precarious and exploitative conditions with little protection from toxic and endocrine-disrupting

agrochemicals that can harm general and reproductive health (**Saxton, 2014; Mrema et al., 2017, Rahimi et al., 2020**).[iii] These circumstances are shaped by systemic gender, racial, and anti-immigrant inequities (**Théroux-Séguin, 2017**). In many cases, the legal status of the workers is temporary and contingent on a bilateral agreement between Spain and Morocco which leverages the necessity for the women to return home to their children when the season is over (**Hellio, 2013, 12; Komposch, Schurr & Escriva, 2024**). The immense struggles faced by this community is the subject of Komposch's doctoral research on 'the planetary-intimate in agricultural labour migration' (**Komposch, 2025**). It is from this research that some of the stories shared in *Exposición* are drawn.

When I visited Huelva, Komposch was already immersed in a period of long-term ethnographic fieldwork and qualitative research on reproductive justice and labour migration. Alongside ethnographic observation, Komposch conducted interviews with seasonal workers in Spanish or Arabic (with a translator), a process which required gaining each interviewee's trust due to the risks of whistleblowing in a situation of precarious employment.[iv] Several women that Komposch encountered expressed a fear of being 'blacklisted' if they were seen to speak out against working conditions. To respect the integrity and context of Komposch's research in the field, workers' identities remained protected in the exhibition and no identifying photographs were used. Instead, we incorporated quotations from the interviews, on the basis that these anonymous narrative elements were not co-produced during the artistic residency itself but shared with care and ethical consideration; I explain our approach to curating these elements later.

The process of gathering worker testimonies was, moreover, shaped by a broader political atmosphere that frequently curtails access to information and efforts to raise awareness about these issues taking place in Andalusia. Activist groups like *Ecologistas en Acción* continue to demonstrate against environmental injustices in the region[v] while local researchers, journalists, and artists have been known to face pressure from industry when it comes to gathering and sharing information on these topics.[vi] On one occasion, we stopped to take photos of a chemical plant from a public road, all of which was adjacent to the strawberry fields, and the temporary accommodation where workers live during the strawberry season between February and June (Figure 2). I remember feeling overwhelmed by the white noise of machinery and an acrid smell that stung my nostrils. But we could only stay for a moment. We were swiftly approached by private security guards, possibly after tracking our movements via surveillance cameras, who questioned us and requested to inspect my camera. After explaining our research and affiliation with foreign universities, we declined their requests, returned to our car, and drove

away without further repercussions. This incident, while seemingly minor, pointed to routine issues of access and control (even in 'public' spaces) that condition how chemical relations are rendered perceptible.

Figure 2. Temporary homes for seasonal workers. Fieldwork photography, C-type prints (photographs author's own)

Sensing chemical relations in the art exhibition

Circling back to the chemical gaze, Landecker's conceptualisation shifts attention from surfaces to processes, from appearances to metabolic transformations. In this section, I explore how the notion of a chemical gaze might be reimagined from a plurality of situated perspectives and through artistic practices or encounters, developing on the broader political and ethical considerations surrounding the case study as outlined above. To deepen this framing, I add Mel Chen's concept of a 'toxic sensorium', which attends to the totality of ways that bodies sense toxicity but also experience sensorial changes due to toxicity (**Chen, 2011**). Serena Stein and Jessie Luna apply this concept in their discussion of worker perceptions of agricultural pesticides in African contexts. Stein and Luna reaffirm that 'pesticides […] may be invisible in some regards, but for farmers applying them, pesticides are highly visible and tangible' (**Stein & Luna, 2021, 89**). Over time—through texture, rhythm, and the accumulation of experience—bodies develop their own practices for sensing and responding to toxicants (**Shapiro, 2015**) or indeed 'attuning' to atmospheres (**Stewart, 2011**) which might contain them. What would it

mean, then, to rethink the chemical gaze as a distributed, partial, and embodied means of attuning to chemical relations, taking power relations and politics of representation into account? How to resist abstract and individualised notions of harm from industrial pollution (**Murphy, 2017**)?

In this section, I describe how the exhibition in Bern took form, how it comprised multisensory encounters and gradually allowed for connections and relations to emerge, extending from the bodies of visitors as they were initiated and immersed into the fabric of the exhibition, pulling them towards the polytunnels of Andalusia, while also evoking the movements of bodies, chemicals, and commodities over time and space. *Exposición* took place in the Institute of Geography, so the context already primed audiences for a more geographic understanding of chemical relations (**Barry, 2017**). Yet the construction of an art exhibition within this building was unprecedented; I am told that our small-scale exhibition was the first of its kind. In this regard, *Exposición* opened a new speculative dimension where, through poetics, sensory experience, and collective witnessing, alternate gazes and relations might emerge.

Words and vignettes will need to suffice here in communicating the materiality, design, and multisensory dimensions of *Exposición*, which comprised several interlinked installations. These installations formed a constellation that invited visitors to move, pause, and feel their way through spaces that echoed the conditions of life and labour in Huelva.

Figure 3. Inside the greenhouse installation (photograph author's own).

A single polytunnel stood conspicuously in the centre of the room. Visitors were invited by exhibition signage to enter the tunnel after donning plastic overshoes, a small ritual which evoked concerns about contamination, hygiene, and permeability. The immersive space was dimly lit by a camping lantern suspended from the central arc—its glow filtered through and accentuated the fog (Figure 3). Although vaporized glycerine is generally regarded as safe, careful attention was paid to ventilation and fog levels, a balancing act which contrasted with the lack of choice that workers face in the strawberry fields of Huelva. The remote location of Huelva was further evoked by the soundscape inside the greenhouse. A speaker nestled amid the soil emitted a layered composition of field recordings made in Huelva: a cacophony of industrial hums, passing trucks, voices in Spanish and Arabic, and trickling water. Adding to the atmospherics, the soil released a distinctive scent, which might be described as earthy and slightly metallic, infusing the artwork with its non-human, molecular contribution.

An eight-metre windowsill displayed a range of accounts from seasonal workers in Huelva, which contributed additional—sensory and affective—information which visitors might conceivably connect or compare with their own experiences of the greenhouse installation. The stories derived from interview materials gathered by Komposch earlier in that year's strawberry season, which, by the end of May when the exhibition was showing, was coming to an end. The anonymous quotes were printed on paper and affixed to the ledge at intervals, so that visitors would pause beneath the windows to read them. These literally vignettes contained vivid imagery highlighting how workers are acutely exposed and expressed the tacit knowledge that they have developed through sensing these exposures (their toxic sensorium). Examples included, 'When they fumigate next to you, you have no protection whatsoever' and 'They are applying it now, when it is cold, because it warms the strawberries. The powder, if you are allergic to it, can make you cough, like me'.

At the same time, we were conscious to not only portray members of this community as victims but to instead foreground the capacity of members of this community to self-determine, in other words, for their lived experiences to not be reduced or fully grasped, but framed with complexity and agency (**Tuck, 2009**). It was important to add narrative threads which might challenge assumptions around vulnerability, such as, 'You have to be very strong for this work, physically and mentally. People in countries like yours should know that and respect our hard work'. They also portrayed the desires of the community: 'The work here is very important for me because […] I can pay the studies of my children […] my son is studying geography'. The minimalist installation beneath the windows was a humble and imperfect attempt to piece together lived

experiences from Komposch's fieldwork. In this way, visitors might begin to fathom (but not presume to fully understand) how the wellbeing of workers is compromised in the pursuit of marketable strawberries, while illustrating a plurality of values, hopes, and strategies.

Outside the tunnel, a triptych of print photographs showed strawberry fields bordered by plastic tunnels, towering chemical silos, and temporary housing with vibrant laundry lines—further traces of the worker community whose anonymity in the exhibition was (as mentioned earlier) essential given the sensitive nature of Komposch's research. Along a long white table, an assemblage of policy documents, artefacts, scientific reports, and maps were scattered, evidencing the broader social and environmental injustices in and beyond Huelva (Figure 4). The documents that we curated for display reflected my artistic research and the interdisciplinary exchanges from the residency. They included a text by Komposch on reproductive justice along with a passage from Rachel Carson's *Silent Spring* describes how pesticides 'lie long in soil, entering into living organisms, passing from one to another' (**Carson, 1962, 6**). The documents were fixed in place by small stones seemingly picked from the soil, ensuring a material continuity between the microclimate of the greenhouse and the pieces of paper beneath each visitor's gaze.

Figure 4: Assemblage, Exposición, Bern (photograph author's own).

Encounters and responses: the visitor's gaze

The exhibition was the culmination of an events program that Komposch, Mestrot, and I coordinated to coincide with the residency in Bern, featuring excursions to local farms and guest lectures. Lasting only three days and initially conceived as a prototype, the exhibition was well-

attended, publicised primarily via university networks, and incorporated into postgraduate teaching. While no formal method was established to gather visitor feedback during the exhibition itself,[vii] I recorded anecdotal evidence in my project journal, highlighting the affective responses of the visitors I observed and encountered. While vigilantly monitoring fog levels, for example, I noted that several visitors found the greenhouse installation to be 'claustrophobic' or 'oppressive'. Some chose not to enter for these reasons, which prompted me to lower the setting on the fog machine at the end of day one. This alteration allowed people to linger in the space, reposing on the burlap sacks to converse or just listen to the soundscape, which a documentary filmmaker described as 'meditative', perhaps implying how the immersive experience allowed them to enter a receptive or altered state. Indeed, colleagues at Bern have since drawn attention to the 'multisensory' aspects of the exhibition space as fundamental to the process of co-creating meaning (**Winkel et al., 2024**) (Figure 5).

One visitor, a soil scientist from Morocco, moved slowly through the exhibition. He asked me about the project, whether we would publish on it, and if we could stay in touch. He noticed that I looked tired. I was. 'It's very sad, isn't it?' he said. In these small moments, I was brought back to questions of witnessing and partial perspective. I saw the exhibition not as a comprehensive documentation or even a primarily informative format, but as a space for disrupting and disturbing the familiar, for performing alternate relations with matter, food, and chemical imaginaries (**Roe and Buser, 2016**). *Exposición* assembled vignettes, material relations, and multisensory encounters with the intention of gradually opening up modes of perceiving and tracing chemical relations in systems. In retrospect, projects like *Exposición* might be seen as opportunities for invoking an alternate chemical gaze.

Exposición engaged both literally and metaphorically with the 'metabolic pathways' where nutrition and chemicals intertwine—not to the benefit of industrial growth, as per Landecker's chemical gaze (**Landecker, 2019**), but as a means of tracing where and how agrochemicals perpetuate social and environmental injustices. I am reminded of the words of art historian Claire Bishop, who affirmed that 'research-based art' must 'go through a body' to be 'metabolized by an idiosyncratic thinker who feels their way through the world' (**Bishop, 2023**). The reformulated chemical gaze I am describing, mediated by bodies and artistic encounters, subverts the gaze of scientific objectivity and extractive logics. Its modus operandi is not to prospect for material gain, but to dwell in uncertainty and curiosity. Distance is replaced with intimacy and emotions, from sadness and concern to sensory wonder and enchantment. The value of this chemical gaze resides not only in understanding, educating, or analysing, but in

expressing and surfacing tensions around chemical exposures that may only be accessible through affective and aesthetic practices.

Figure 5: Diagram of Exposición *(adapted from* ***Winkel et al., 2023****).*

Exposición invited visitors to be present with their curiosity while imagining what was absent and inexpressible. It exposed them in creative and performative ways in one spacetime to more sinister and extensive forms of exposure. The power to witness and make visible was both acknowledged and questioned during the exhibition programming and class visits when I presented my processes to local audiences, also in my project journal. Notably, the exhibition was mounted in Bern in a context of academic privilege, using this privileged and partial perspective (**Haraway, 1988, 579**) to trace metabolic and geopolitical connections to

the distant fields of Huelva and beyond. Importantly, there have been plans to revisit the project through a future intervention, ideally in a more locally accessible space. Such a step would allow the work to resonate closer to the lives it references, opening further questions about reciprocity and voice. Future projects would also benefit from systematic visitor feedback, which would allow for deeper reflection on the role of the visitor's gaze in the exhibition.

Conclusion: Opening sensory worlds

In this paper, I have started to tentatively experiment with how Landecker's chemical gaze might be reimagined and pluralised in contexts of creative and embodied inquiry. In this sense, the chemical gaze would attend not only who speaks or what is shown, but where, how, and with whom such gestures unfold. After defining the chemical gaze in Landecker's work, I explained how and why such a gaze might be reimagined, engaging with wider critical theories on chemical pollution, especially calls for relational and creative approaches. I then outlined the case study in Huelva, the political circumstances surrounding the case study, and the exhibition itself as a performative space for encountering and reflecting on chemical entanglement in food production across multiple scales. *Exposición* sought to foreground alternate epistemologies and underrepresented perspectives. Future developments of this project may include more direct engagement with workers, local co-curation, and systematic evaluation of audience reception.

Zooming out from *Exposición*, while the case study of strawberry production certainly draws parallels with Landecker's research on food waste, metabolism, and toxicity across histories of intensive agriculture, the notion of a chemical gaze could conceivably be mobilised in other interdisciplinary efforts to narrate and witness toxicity from situated perspectives. Such a chemical gaze might illuminate how the chemical properties of food, air, soil, and water are not 'out there' but permeate environments and bodies in uneven concentrations, eliciting and indeed necessitating novel practices of sensing and modes of representation. Industrial chemicals accumulate in specific places and bodies, but they also travel and persist, drift and transform with intimate and planetary ripple effects. These concerns deserve deeper attention in interdisciplinary projects that engage critically and creatively with the possibilities, limitations, and political tensions of their own becoming.

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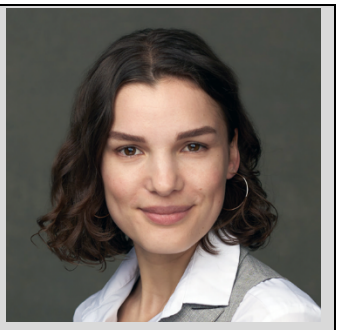

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Endnotes

[i] While this paper lacks the scope for a more comprehensive history of reinvented gazes, I signpost said history here as a premise for reimagining the chemical gaze. My introduction to gaze theory was through media studies, especially Laura Mulvey's concept of the 'male gaze' in cinema (see Mulvey, 'Visual Pleasure in Narrative Cinema' in *Screen*, Volume 16, Issue 3, Autumn 1975, Pages 6–18, https://doi.org/10.1093/screen/16.3.6).

[ii] I refer mostly to 'pesticides' (plant protection products) in discussing the case study but use the term 'agrochemicals' (which can include fertilisers and pesticides) frequently to situate the case study in a broader context that connects with Landecker's work. I also mention 'industrial chemicals' to potentiate broader resonances.

[iii] Acute symptoms of exposure are well-documented (skin irritation, eye irritation, difficulty breathing), also in Komposch's research, but the long-term health impacts have not been studied in the region. I cite comparative studies from other locations to show associations between pesticide exposure and health outcomes.

[iv] Komposch gained workers' trust by offering services to the community, such as driving them from the remote fields where they lived and worked to hospital appointments.

[v] Among these injustices: an enormous deposit of radioactive waste (phosphogypsum) from fertiliser manufacturing lies just several hundred metres from the nearest residences and adjacent to the river that bisects the town.

[vi] In 2006, local artist Isías Griñolo was prevented from exhibiting artworks that documented 'the environmental degradation that Huelva is suffering due to the pollution caused by big companies along the riverfront' (see Molina 2006, my translation).

[vii] This was a learning curve for my first exhibition outside of a cultural institute or arts school. While in-exhibition feedback mechanisms can sometimes feel transactional, I would incorporate a visitor's book or similar in future projects.