

Beyond intersubjectivity in olfactory psychophysics I: Troubles with the Subject

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Abstract

This article provides an experience-oriented relational account that goes beyond a human control of the world. Rather than working with the notion of *intersubjectivity* (commonly evoked in sensory STS, and still conserving the *subject/object opposition*), the article reports on how the sense of smell affords a rethinking of our relationship with the world. It does so by challenging the assumption of olfactory ineffability as it turns to a place whose inhabitants speak about smell as a part of their everyday affairs: a laboratory of olfactory psychophysics. There, we attend to a multimodal, embodied language that participates in preparing, running and analyzing scientific experiments. While Western languages are short on specialized vocabulary for expressing olfactory qualities and it feels difficult to talk about smell, laboratory events manifest smell language in its enmeshing with the sensory realm and the world. Noticing these ties destabilizes the idea of agential subject, highlighting instead our *pre-intentional* sensibility, in its connection with the world. A sister article on ‘troubles with the Object’ (Alač, 2020) continues to argue that the notion of intersubjectivity is overly narrow, highlighting our immersion in the world (rather than assuming our dominance of it).

Keywords

ethnomethodology, olfaction, sensory ethnography, subjectivity

To reflect on our relationship with the world, this text turns to the sense of smell - often described as private and exclusively inward-looking. I pay attention to how we speak *about* and *as a part of* olfactory experiences in order to push sensory STS beyond the human-only realm, providing, at the same time, an experiential account that is relational.

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By indicating how we may get at *embodied experience* that is not bounded by an individual's skin, while not reducing our being *in the world* to the human-only realm (either in respect to other social agents, or to objects we are to be in charge of), the present text (Part I) is a reflection on how this may be tackled by going beyond subjects and subjectivity. The sister paper (Part II, Alač, 2020) continues with the challenge by offering an account on how we may go beyond the world carved into well-bounded, manipulable objects. Together, the two texts constitute an argument for thinking about our relationship with the world that is *more than* intersubjective.

The laboratory as a challenge to olfactory ineffability

When a scientist, who works in the laboratory where I conduct my study, tells me about her research on olfaction, her account is organized around a comparison. Originally, she worked in an olfactory laboratory that experimented on animals (as model organisms for humans), but, eight years ago, she moved to a laboratory that studies olfaction *in* and *on* humans. She explains her preference for her current work by talking about language. She points out that in the human lab, participants report on their experiences, which may otherwise remain unavailable to scientists. As I follow up on our conversation, she further elaborates: in the human lab, 'feedback from the experimental participants is more valuable'. In the work with experimental animals, 'you always assume that the animal is doing what you think it's doing, but that may not be the case because you cannot communicate with the animal'. In the human lab, 'the feedback is valuable because you really understand what the participant is experiencing'.

This convergence of experiential and communicative realms that the olfactory scientist articulates is curious. It is curious because we – at least in the West – have for centuries associated the sense of smell with ineffability. We say that we cannot talk about our olfactory experiences (e.g., Plato, *Timaeus*, 1892: 488), as Diane Ackerman (1990: 6) indicates when she calls olfaction a 'mute sense'. But, if this is so – if olfaction is mute – how is it that the researcher with whom I spoke singles out language as one of the main advantages for working in human olfactory research? To engage the puzzle, I follow the researcher into the laboratory, where, as she points out, this language is spoken.

Engaging the problem by entering the laboratory is neither to relegate the ineffable language to a specialized realm of professionals (see, for example, Alač, 2017) nor to focus on the intentionality of scientists or the products of their work (results of experiments, and what they report and publish). Instead, it is to engage the language in the midst of laboratory events, in which it is unavoidably entrenched. Since these events are populated by the sense conceived as an allusive perceptual domain (e.g., Freud, 1961/2010: 78n–79n), the language – in its nonrepresentational bond to sensory experiences – is a way to reach olfaction in all the concreteness of laboratory situations (Garfinkel, 1984, 2002; Garfinkel et al., 1981). While keeping an eye on historical records in olfactory psychophysics (e.g., Gamble, 1898), this article pays attention to what takes place in encounters with experimental participants, like those evoked by the lab scientist. The focus is on the lab's everyday where bodies and environments are arranged so that scientists can study the least understood of the five senses, whose workings they still have not fully deciphered (e.g., Wise et al., 2000; see also Horowitz, 2016: 80, 95).

Highlighting the semiotic *ability* of our sense of smell is not to deny that Western languages lack specialized vocabulary for expressing olfactory qualities and that to talk about smell is experienced as difficult. The aim, instead, is to question the assumptions that animate the claim of that ineffability: those concerning language and those regarding how we image ourselves and our relationships with the world we live. When we say that we cannot talk about smell, we expect olfactory language to function as a self-contained, cultural system consisting of symbols (e.g., Zelman, 1992), where those symbols are conceived as conventionally established and stable entities that are independent from the world and sensory experiences (see Alač, 2017). This view of language implies and further enacts a conception of ourselves as intentional actors, fully in charge of the world that is clearly distinct from us and composed of manipulable objects. What we find instead in the laboratory is a language that – in its intertwining with the sensory – manifests our *pre-intentional* sensibility and our *rootedness in the world*. The present text engages the former (leaving the later issue to the sister article), as it describes how olfactory scientists listen to the language that encompasses gestures, facial expressions and body movements (e.g., Goodwin, 2000), not disregarding its rhythms, prosody, temporal organization of utterances (e.g., Sacks et al., 1974), or those aspects of voice that do not stand for established units of meaning (e.g., Connor, 2014). It also acknowledges how the scientists, while inhabiting their laboratory spaces, let the language speak of how smell is experienced.

This manifests a language in its association to *a life* (Deleuze, 1995/2001: e.g., 27–29), rather than to intentionality. In this sense, my interlocutor's mention of other animals in telling me about her work on olfaction is not lost in the discussion of how we engage with sensory experience via semiotics. On the contrary, in foregrounding its analogical features, this project describes a language that urges us to recognize our closeness to other species. The sister article further discusses how the multimodal and multisensory language that is part of laboratory life indicates our *immersion* in the world, rather than control of it. The two texts thus employ language as a means to get at sensation that, rather than being an internal, private property of a subject, is vitally bonded to the world.

Psychophysics and the olfactory laboratory

In the *Handbook of Olfaction and Gustation* (a copy of which I found in the lab's library), Doty and Kobal (1995) define psychophysics and its procedures as follows:

Even though the classical psychophysical methods (e.g., detection thresholds) were formally described by Fechner in 1860 and used by him in an effort to specify mathematical relationships between the mental and physical worlds, such methods have subsequently found widespread application in assessing sensory function in many fields, including olfactory science. Today, any procedure that provides a quantitative measure of sensory function and requires a verbal or conscious overt response on the part of the examinee is considered to be a psychophysical procedure. (p. 196)

The US-based human lab whose activities I observe is a leading olfactory laboratory, focused on the association between odorous stimuli and psychological aspects of

perception. The lab's focus is not primarily on the 'mechanisms' (e.g., Bechtel, 2006) – genetic, neuronal and behavioral (as it usually is in laboratories that use nonhuman animals to study physiological-biochemical processes and behavior involved in olfaction) – but on sensory experience. Practitioners of olfactory psychophysics believe that establishing the relationship between the intensity of olfactory sensations and the magnitude, in terms of concentration, of odorous stimuli would allow them to learn quantitatively – not *subjectively* or introspectively – about odor perception in humans. But how exactly is this done? How do researchers get at sensory experience in relationship to physical phenomena so that they can – quantitatively and 'objectively', as they point out – specify it?

The Doty and Kobal quote above suggests that scientists do so by dealing with language, or communication, more generally. Something is a psychophysical procedure when it provides a quantitative measure of sensory function by relying on linguistic or other observable responses. Similarly, Keller and Vosshall (2004) say that:

Human olfactory psychophysics, the study of how humans perceive odors, is possible because humans have acquired language. ... Human subjects can report directly if something smells, characterize the smell, or decide if two smells are distinguishable. (p. R878)

But if psychophysics relies so centrally on language, the question is then not whether this language could be spoken, but how it speaks and how it could direct us to engage olfactory experience.

Doty and Kobal indicate that this language has to do with experimental methods in psychophysics. It is elicited through those methods, so that an experimental participant is expected to speak it, and it is spoken, we can assume, by scientists as they employ those methods. So, to find the language of the mute sense, why not look into experimental methods in psychophysics, asking how exactly, on what occasion, in response to whom and understood as what 'human subjects ... report if something smells, characterize the smell, or decide if two smells are distinguishable'?

Doty and Kobal state that 'detection thresholds' is the classical psychophysical method, and that it dates back to Gustav Theodor Fechner's 1860 specifications. With threshold detection, scientists query the level of odorous concentration at which somebody is able to detect the presence of an odor; in other words, they ask their experimental participants to report whether something smells, so that they can identify the lowest possible concentration of odorant the participants can reliably report detecting (Doty and Kobal, 1995: 196). Other methods in olfactory psychophysics engage language in a broader sense. When Keller and Vosshall (2004) talk about the characterization of how something smells, they refer to 'odor classification', and when they say that subjects are asked to report whether two smells are distinguishable, they talk about 'multidimensional analysis of similarity'. All instances discussed in this paper, however, pertain to threshold detection. This is not only because threshold detection promises a way out of an exclusive emphasis on specialized vocabulary (modeled on the naming of primary colors), but also because this method is the most commonly practiced in olfactory psychophysics. As Engen (1982: 51) points out:

It is a less ambitious approach than odor classification but also more practical, taking one odorant at a time and focusing on its intensity. ... Because of its apparent simplicity, both in the methods used to define it and in the task required of the subject, the concept of stimulus threshold is the most widely used and respected.

Considering methods as scientists practically enact them, however, means treating them quite differently from how their reports depict them. Instead of listing general steps required to execute a method, as is usually done in the methods section of scientific publications, I attend to how an actual, locally produced application of method takes place:

Scientists have to come to terms with the singularity of their situations of inquiry, and in doing so they are thrown again and again into circumstances which require practices that are vaguely, if at all, specified in methodological guidelines and other formations about how science is done *in general*. To mention this is not to make an issue about idiosyncratic origins in science, but to note instead that despite the absence of specific accounts of scientific methods, when scientists are at work they evidently are not at a loss over what to do. They find their ways through singular troubles, vernacularly organized discussions, and embodied routines of inquiry, and they do so as an unremarkable competency with 'the facts of daily life'. (Lynch et al., 1983: 207–8)

But even if, in following ethnomethodology, I write about aspects of practice that researchers commonly do not discuss when reporting on their experimental results, at least some elements of my argument intersect with what they themselves argue for. A case in point are the writings of the contemporary psychophysicist Jirí Wackermann (2008, 2010).

Wackermann discusses how to 'rethink in [a] modern context and reintegrate into the working programme of psychophysics' Fechner's original agenda of achieving a 'unitary science of a psychophysically neutral reality' (2008: 200) – to do this, Wackermann (2010: 193) models his proposal on what Husserl called the 'life-world' [*Lebenswelt*]. As is well known, Fechner's objective for psychophysics was to 'measure sensations', where he conceives of sensations as a part of the 'mental realm' in the mental-physical relation that psychophysics aims to mathematically specify. As Fechner announces in the very opening of his *Elements of Psychophysics*, psychophysics, by providing 'the mathematical connection to ... what is experienced' (1860/1966: xxvii), is to get at the experiential as an objectively measured phenomenon. In my understanding of Wackermann's discussion, he deals with this point when he reminds us that accounts in psychophysics commonly rely on the understanding of perception and sensation exemplified through a causal schema: 'Physical object → stimulus → receptor → neural state → sensation' (Wackermann, 2010: 196). Wackermann points out that the relation between stimulus, receptor and neural state is available only to the third-person perspective. From the first-person perspective, on the other hand, we simply perceive the 'physical object' as something that has, for example, a certain color or smell. If we assume that sensations are part of the mental realm available only through first-person access, the question, is, then, 'how we can obtain access to the 'mental' realm in order to measure sensations' (Wackermann, 2008: 158). Having knowledge of the physical and biological mechanisms that 'caused' the sensation would not solve the problem (Wackermann, 2010: 196).

Of interest is the specific way in which Wackermann answers the question. Wackermann suggests that, rather than looking inside individual minds, psychophysics

should attend to psychophysical experiments. In other words, sensations are to be traced in the world and, more specifically, as instantiated in psychophysics' experiments, which Wackermann characterizes as 'communicable perceptual situations' (2008: 157). Then 'the locus of the measured is in the inter-subjectively shared, commonly accessible and communicable world – not inside the subject's mind'. Rather than battling the duality of the first- and third-person access, Wackermann (2008: 159) asks:

What if neither the first nor the third person perspective is the primary one? Can we start from aligned perspectives of two or more subjects – let's say, '1st person plural' perspective – perceiving the same sector of the world?

This idea of *first person plural* (see also Wackermann, 2010: 191) is closely related to what animates the present account. Events that I encounter in the olfactory laboratory suggest that sensations – and, specifically, olfactory sensations – do not need to be considered, at least not completely, as phenomena entirely belonging to the interiority of an individual, where a private sensation always comes first. While conserving their experiential, *felt* character, sensations are, instead, always already in the world. My text, however, extends the idea of the first person plural to language, and specifically to language as it is practiced across laboratory occasions. This, in turn, brings up facets of olfactory sensing that go beyond subjects and objects, as conventionally conceived.

First person plural, radical

Wackermann writes from a philosophical and theoretical perspective and thus treats scientific procedures in general terms, foregrounding the technological apparatus and instructions that researchers are to provide before an experiment in psychophysics. My account, however, focuses on olfactory sensations as *situated* (Suchman, 1987), or always a part of a concrete here and now of everyday activities in the olfactory laboratory. I attend to specific identifications of olfactory acuity as they unfold through the fullness of the everyday in the laboratory. This means that I follow events before, during and after a threshold detection test, while also describing instances through which researchers train each other to perform the test procedure. Proceeding in this manner not only *spreads out* my first person plural – making it a more robust and pervasive phenomenon than what Wackermann's treatment may suggest – but also *radicalizes* it. This first person plural is radical in that its 'first person' concerns the pre-subjective, and its 'plural' refers to the world that is not limited to (while always colored by) the socio-cultural realm.

As in Wackermann's proposal, my use of the first person plural encompasses the felt quality of one's sensing body. I find the 'first person' element of Wackermann's expression useful as it indexes the texture of bodily experience to which I attend by also considering its intertwining with smell language. I show how this language goes beyond words as representations of sensations, incorporating *embodied semiotic acts* (e.g., Goodwin, 2000), such as gesturing hands, facial expressions, non-linguistic sounds, gaze orientation and torso movements. I consider those acts as both rendering qualities of sensory experience, as well as manifesting the relationship between the sensing body and olfactory world. This, nevertheless, problematizes the idea of subjectivity and the first

person. In addition to attending to how those acts take place and how experimental participants deal with smell sensations that are not fully under their control, lab members whose work I observed explain that olfactory sensations concern bodily knowing that is not directed by the rational thought of an individual. By considering members' accounts, embodied semiotics, and living in the laboratory, my orientation toward the felt experience of sensations extends beyond the person and its associated configurations – Subject, Ego or Actor – to embrace what overflows the boundaries of any stable Identity. Rather than being under the control of the Self, laboratory events manifest the experiencing of sensations as something that often escapes the cognitive; lived, instead, also as an 'outside'.

This brings to mind Deleuze's 'fourth person singular' (1969/1990: 103) – an expression the philosopher borrows from the poet Lawrence Ferlinghetti (1960). Deleuze adopts the fourth person singular to get at what he designates as 'singularities' – *potentials* and *intensities* that are correlates of *events*, always in the making – and with which he aims to bypass any reference to consciousness:

What is neither individual nor personal are ... emissions of singularities insofar as they occur on an unconscious surface and possess a mobile, immanent principle of auto-unification through a nomadic distribution, radically distinct from fixed and sedentary distributions as condition of the syntheses of consciousness. (Deleuze, 1969/1990: 102)¹

These singularities, as Deleuze points out (see also Deleuze, 1953/1991), *generate* Subjects, Self and I as their *effects*, rather than being derived from them:

[S]ingularities preside over the genesis of individual and persons; they are distributed in a 'potential' which admits neither Self nor I, but which produces them by actualizing or realizing itself, although the figures of this actualization do not at all resemble the realized potential (p. 103).

While producing Subjects, pre-individual singularities are about *a life* and world, running across humans, plants and animals: 'The subject is this free, anonymous, and nomadic singularity which traverses men as well as plants and animals independently of the matter of their individuation and the forms of their personality' (Deleuze, 1969/1990: 107). Radicalizing the first person plural means revising, via Deleuze's fourth person singular, the common assumptions behind the 'first person'. As I will indicate, in the olfactory lab, neither do its members exhibit an unequivocal orientation toward an 'I' and its narration of Self, nor do experimental participants manifest an absolute control over their olfactory sensing as a strictly personal affair of an individual. Instead, the laboratory is about an unrelenting search for olfactory sensations as not already coded and ready to be represented, but attempted at being realized, by bringing together sensing bodies – rich in their experiential feelings – with the laboratory world – rich in the language of the mute sense.

As soon as we notice that the private character of olfactory sensations is only an effect, we also acknowledge that these sensations are always in *plural*, as is the language that enmeshes with them. The idea of the mute sense is grounded in a belief that olfactory

experiences are idiosyncratic domains, seated somewhere deep in our individual bodies (e.g., Secundo et al., 2015) and, as such, complete in themselves. I point out instead that linking the sense of smell to memory and emotion, as we often do (e.g., Engen, 1991, Vroon, 1997: 22–44; see also Horowitz, 2016: 95), is not to negate its relational character. As I associate the idea of plural to this relational distribution – as in the *distributed cognition* of Hutchins (1995) – my focus is on *distributed sensations*. Distributed sensations, in their participation in the plural of olfactory language, shift the focus from *thinking* (or other cognitive processes of a human actor) to sensations (beyond the visual modality), as well as from representations (and the movement of information across a cultural-cognitive ecosystem) to pre-intentional features of a life. The present text traces this plural of distributed olfactory sensations across three interrelated aspects of ethnographic material: we find it in its embeddedness in verbal language, in its involvement in multiple bodies, and in material features of the setting.

Linguistic terms, in the concreteness of the laboratory, often exhibit their enclosing of other voices (Bakhtin, 1975/1981). Deleuze is once again useful, when, in discussing language, he writes with Guattari (1980/1987: 84):

Direct discourse is a detached fragment of a mass and is born of the dismemberment of the collective assemblage; but the collective assemblage is always like the murmur from which I take my proper name, the constellation of voices, concordant or not, from which I draw my voice. I always depend on a molecular assemblage of enunciation that is not given in my conscious mind, and more than it depends solely on my apparent social determinations, which combine many heterogeneous regimes of signs. Speaking in tongues.

Since language is localized in events (rather than in Subjects), it is always produced by a collective assemblage of enunciation and, thus, has plural inscribed into it. Turning to speech as it is heard in the laboratory indicates how olfactory sensing is enacted not only with those that preceded us and are projected to follow where we've been (Schutz, 1954, 1967), but also with those with whom we speak.

But I do not limit my discussion of the sensory plural to an *intersubjective* engagement, as implied by the idea of language given in purely socio-cultural terms. I adopt Wackermaun's term 'plural', and prefer it to 'we', because it allows for an account that more seamlessly incorporates nonhumans and the rest of the world in olfactory sensing. In amplifying this kind of 'we' (beyond what Wackermaun's discussion of the first person plural suggests), I take special care to indicate that the collective character of olfactory language concerns *worldliness* (see also Alač, 2017), by which I emphasize its obligatory embeddedness in practical engagements as well as in living, more broadly. To acknowledge this is not only to reject the assumption that when something is of the body it is not of the world, but also to notice why pushing further the approach of laboratory studies is needed for such an endeavor. Current work in sensory STS has pointed out the plural of the chemical senses – olfaction and gustation. Ulloa et al. (2017), for example, highlighted the centrality of communication, empathy and intersubjectivity in a team's 'sensible skills' that they observed, tested and worked to further enhance at a Spanish vanguard restaurant. I have, similarly, described the collective aspects of olfaction in my work on perfumistas (Alač, 2017). However, by giving prominence to intersubjectivity (Shapin, 2012: 170) and

the cultural shaping of olfactory sensing (Classen et al., 1994), our research remains largely bound to the human realm. In other words, sensory STS, in relating subjectivity to the world via intersubjectivity, has limited that world to its human dominance. Since intersubjectivity concerns subjects as it is about action between them, it overlooks the rest of the world (in that the socio-cultural focus reduces this world to manipulable objects that humans control). With chemical senses, however, we have an opportunity to direct our noticing more assertively toward the material world – the world that includes but is not limited to the intersubjective realm. Doing so, nevertheless, requires going beyond the notions of the Subject and Object (in their underpinnings of intersubjectivity).

The present text brings forth details of multimodal embodied interaction in olfactory psychophysics to work on dismantling the primacy of the Subject. Part II takes up this line of argument further to question the reduction of the sense of smell to objects as stable and self-standing entities (perceived as sources of odorants), as it probes alternative lines of inquiry and reporting, specifically discussing a methodological experimenting with reproduction, re-enactment and re-experiencing. Because of the particular spatiality through which odorants manifest themselves, one is confronted with a sense that is not reducible to the known parameters of ‘distant observation’ and ‘reaching toward’, familiar from the visual and tactile modalities. Instead, the embodied spatiality associated with the sense of smell is one of immersion: odors *environ* as they *dynamically* propagate through space. This olfactory peculiarity manifest itself in how bodies are fashioned and in how space is arranged in the laboratory, as it does in the language that lives there.

The radical first person plural thus moves away from the dominance of the person (Part I) and highlights the plural where the world embraces us (Part II). Combining these two facets brings forth the world beyond its *intersubjective* character. When one of the scientists points out to me that olfaction is a ‘passive sense’, I understood him to indicate that in olfactory sensing, it is the world that acts on us; or better, olfaction is a sense that makes us notice that we are – just and gloriously – a part of the world, engrossed in it.

In the laboratory

The text follows five of laboratory members and their engagement with one of their experimental participants (as well as the ethnographer), referring to those who constitute the research team by their roles. The lab’s principal investigator, the ‘PI’, has run the lab for over two decades, dedicating her efforts to the study of the relationship between olfaction and cognition, and is an international leader in the field. The lab’s two permanent employees are the manager, the ‘LM’ (‘lab manager’), and the senior scientist, the ‘SR’ (for ‘senior researcher’). The LM has been with the lab for over fifteen years and lab members treat him as the point of reference for the daily business of the laboratory. The LM was trained in psychology with a specialization in science education and divul-gation, so he is also considered a spokesperson for the lab. The SR, whom we encountered in the very opening of this text, has a PhD in biology and co-authors studies with the PI. The remaining two members joined the lab in the last year. A postdoctoral student, the ‘PD’ (for ‘postdoc’), is interested in the relationship between odorants and human health and is planning on an academic career after she finishes her training in the laboratory. The other recent member is a junior psychologist whose objective is to gain research

experience before she enters a PhD program in the field. The ‘JR’ (for ‘junior researcher’) is actively engaged in running laboratory studies, and the PI and LM praise her skill and trustworthiness.

In the remainder of this section, we join a threshold test and its subsequent discussion. The instruction-test-data discussion sequence – where we listen to the experimental participant’s talk as a part of laboratory practices, complete with scientists, instruments and material arrangements of the lab – renders the mute sense speaking in the radical first person plural. The exposition privileges the event, following the actual flow of the laboratory interaction. This means that the argument structure is not rendered in a linear manner, but that it relies on the reader to stay vigilant for cues, as we assemble the argument through details of laboratory events.

The text relies heavily on video recordings collected during my stay in the laboratory. While a video record is always and necessarily perspectival, its mechanistic nature conserves certain situational features that may otherwise escape analysis. Because human attention shapes it to a lesser degree than, for example, ethnographic notes, video registers utterances as they are delivered, also recording silences, gaps and pauses, while preserving the fleeting aspects of interaction – its multimodality and embeddedness in relentlessly changing spatial arrangements (see, Solberg, 2017). In other words, video is less specifically oriented to action and speech, while recording them in more detail and ‘by virtue of the whole of the common situation’ (Gurwitsch, 1979: 113). Solberg (2017) points out that incorporating video in ethnographic writings safeguards against generalizations and interpretations owned completely by the author. While my video excerpts – as inexorably part of the larger ethnography – are not meant to stand on their own or be verifiable against the world (for me, using video is not about asking readers to confirm or disconfirm, find adequate or true what a piece of video is representing), they provide a possibility of co-participation through sensory engagement, opening my ethnographic material to embodied readings (instead of leading my readers to accept my claims through purely intellectual means).² I found somewhat surprising that viewing the recordings of how others engage their sensations helped me articulate how I lived the laboratory, thus not only witnessing the distributed character of olfaction, but also applying the lens of the radical first person plural toward my own engagements.

Despite these advantages, however, video remains a vision-oriented medium, lacking in its capacity to preserve olfactory qualities of events it records. These inadequacies also remind us that laboratory studies are still in need of alternative lines of inquiry. For example, Latour and Woolgar’s (1979) interest in inscription, inscription devices and disseminating data in graphic form – even when what is recorded is auditory, vibrational, or olfactory – has cemented, in that tradition, the dominant orientation toward the visual modality. Today, in addition to building on what is already well-established (see Amsterdamska, 2008; Doing, 2008), we need to figure out how to account for those features of scientific work that are not unproblematically reducible to the visual and auditory modalities (see Alač, 2020).



Figure 1. The JR and SI during the threshold detection test.

Experimental instructions in the midst of laboratory work

We start by paying attention to the work of the JR (junior researcher) and PD (postdoc), as we focus on one run of the threshold detection test that is part of a study concerning natural gas odors. The image reproduced in Figure 1 comes from the run's video, which I recorded with a hand-held camera positioned in front of my eyes. This recording mode not only brings forth the perspectival nature of video record, but it registers my actions as well, tracing the dynamics of how I moved, looked and talked, as I lived what was going on in the laboratory. The video follows the JR administering the test to an experimental participant to whom we refer – adopting the scientists' jargon – as the 'SI', which stands for the 'first subject'. As the image indicates, the two sit facing each other, while I (perched on a high chair) observe the interaction from a distance of about five or six feet. When, on one occasion, I briefly interrupt the interactional flow with a question, my intervention, as the reader will notice, marks me as a *non-ratified participant* (Goffman, 1981). The PD is not shown in Figure 1, but, in contrast to my positioning, is a full participant, as will be seen when the JR directly orients toward her (which will leave an observable trace on the video).

The event is the JR's first run of the threshold detection test performed for the purpose of data collection. The test was preceded by a training session during which the LM demonstrated how to handle the threshold procedure. While the demonstration was intended for the JR and PD (not yet familiar with this stimulus delivery system), the SR also attended so that she could learn about how her colleagues were trained (since they would, soon after, be involved in experiments for which the SR is responsible). Following that session, the JR ran a threshold detection on me, where I was her subject for training purposes, and, after that, she was herself tested by the PD, so that the PD could practice the procedure. How the JR learned on that occasion parallels my learning from the participant's perspective, which, in turn, informs how this text reports on what I observed.

During the trial we follow, the JR also engages the run as an opportunity for apprenticeship, as seen when she discusses the test with the PD and LM immediately after the run (Part II). Because these early runs are more often explicitly discussed among practitioners, they make more readily apparent how the procedure is embedded in and accounted for as a part of practitioners' work.

The session starts with the JR laying out the scope of the main study. Reporting what she says provides the context in the participant's own voice, but it also renders the language that will resurface in S1's subsequent talk, exhibiting the plural character of his olfactory sensing. The JR explains that laboratory members are interested in identifying an odorant that would signal a gas leak, effectively alerting the widest range of smellers when that substance is present in the smallest possible quantities. The existing alarms designed to capture the incidence of natural gas do not work well, and gas companies commonly add odorants into natural gas for human detection of potential leaks. Even if human smell shows a much higher rate of 'false alarms' on psychophysical experiments than do vision and audition, human odor detection is considered more reliable than what can be obtained when using technological devices (Engen, 1982: 53):

[E]ven when such response bias is taken into account, human detection is likely to be superior to 'objective' techniques of detection with so-called sensors. This holds both in general applicability and sensitivity. Moreover, these physical gadgets are inferior to people in detecting *rapid changes* in odor.

The project for the lab is to identify experimental participants whose noses will inform researchers on how to best tune the environment for detection of gas leakages. Because all noses – old and young, trained and unprepared, sensitive and dull – ought to be able to pick up the substance the lab is searching for, lab members need to find those whose extreme smelling capacities would assure that what is true for them will be true for everyone. To do so, researchers rely on the threshold detection test. The JR specifies that the test has a 'screening' function – it is performed to determine the participants' eligibility for the larger study. In other words, the smell test is not used to directly identify what substance will be used to act as a warning sign for gas, but to diagnose subjects' sensitivities to odor so that they can, eventually, participate in the larger study oriented to the practical matter of specifying the most apt additive for the warning sign. The JR says that the lab

is looking for people who are highly sensitive to odors, as well as people who are below average and not highly sensitive to odors. So that's where eligibility kinda comes into play. If you were within that average range, you would not qualify for the study. Ok? So that's why we will be doing this little odor test here.

When the JR says, 'this little odor test here', she places her hand over the set of pen-like objects positioned next to her (see Figure 1). To deliver odor samples during threshold testing, laboratory members use what they call 'Sniffin' Sticks' (Hummel et al., 1997) – a kit with three rows of sixteen sticks each (see Figure 2), where each stick, in comparison to the one that follows (marked by a higher number), is filled with twice as potent



Figure 2. Sniffin' Sticks kit.

concentration of the odorant. As mentioned, measuring threshold sensitivity has been part of psychophysics from the outset, and the smell test parallels threshold tests used in other branches of psychophysics where experimenters aim to assess a participant's sensitivity for the sense in question (in auditory psychophysics, experimenters may vary intensities of tones, and in visual psychophysics, they may vary luminance, for example). As the widely adopted, standard piece of apparatus in odor psychophysics, Sniffin' Sticks is an olfactometer in that it is 'an instrument designed to control and manipulate the concentration of odorants' (Engen, 1982: 36). While olfactory scientists rely on 'modern olfactometers' (Engen, 1982: 40) when interested in controlling and manipulating odorants more subtly (to obtain higher accuracy and precision results), they commonly use Sniffin' Sticks when needing to rapidly acquire threshold indicators. In Part II, we will notice how the mapping of the sense of smell on the other senses (embodied in the Sniffin' Sticks) constrains the procedure, erasing some of this sense's peculiarity. To get there, the present text follows an instance of this technology's use, rendering the complexity of olfactory experience and its laboratory accounting (that also pertains, even if only to a degree, to state-of-the-art olfactometric technology).

As we focus on the threshold test and Sniffin' Sticks only, we will not engage the main experiment (focused on the problem of signaling a gas leak, and which will use state-of-the-art olfactometers). Even so, the JR's mention of the main study as a part of her instructions is of relevance as it provides S1 with a number of olfactory descriptors. The JR says that 'natural gas doesn't have odors naturally, we add those into it just so that we can detect them to make sure that we are not in danger of inhaling anything'. By indicating that at stake is an odor that we have experienced before, the experimenter offers its characterization: the 'smell of gas'. This occurs again when the JR, in informing S1 about his rights as a participant, provides additional descriptors, while talking about potential risks:

The only risk to you is that you will be smelling a lot, and sometimes the act of smelling can leave you a little bit lightheaded, as well as you will be smelling bad odors, like natural gas doesn't smell very good. So this is the only other downside that you will be smelling some rotten egg gassy type of odors. But I am sure you kind of assumed that by the title of the study.

In this stretch of talk, the JR alludes to the cultural knowledge of *mercaptan*³ – considered to be a harmless molecule, commonly added to natural gas to make its detection possible— characterizing its smell as ‘bad odors’, ‘like natural gas’, and odors that do not ‘smell good’. The presence of those descriptors is not to be taken as a shortcoming of the procedure, but as an inevitable feature of sense-making in laboratory practice (how is the experimenter, otherwise, to provide those instructions?).

The JR then describes the threshold detection test. She points out that, during the test, she will present S1, in random order, with ‘three different pens’ which ‘have like felt tip and instead of having ink in them they have an odor inside’. While explaining, the JR gestures with both hands as if holding these ‘pens’ and moving them with sweeping motions. During the test, those actions have to be enacted delicately and precisely. On one hand, the experimenter needs to make sure that her movements conform to those of her lab colleagues, as well as to those she will perform when testing other experimental participants. On the other hand, she has to pay close attention to the physiognomy of the participants whose olfactory threshold she is testing; the JR has to align her movements to participants’ breathing rhythms so that they can reliably inhale odorants, while inhaling neither more nor less than other participants in their cohort will have a chance to do. The richness of this choreography between the experimenter’s hands and the participants’ noses worries scientists, particularly because it depends on natural sniffing⁴ – an inclination to inhale more vigorously may generate variability across trials and participants, in contrast to the generalizability that scientists are aiming at. I, on the other hand, find this richness interesting, mostly because it indicates linkages between participants’ olfactory sensing and the embodied presentation enacted by the experimenter. The centrality of that coordination indicates the plural of olfactory sensing. Differently from those culturally marked descriptors just mentioned (‘rotten egg gassy type of odors’, for example), this plural exhibits an embodied character.

As the JR gesturally indicates the hand movements she will perform during the test, she employs them as a way to introduce S1 to the odor-dispensing devices she will use (Figure 2). The JR explains that she will use three pens at each trial, one of which is expected to be filled with n-butanol⁵ as the target odorant, and two of which are marked as ‘blanks’. The experimenter also points out that the test follows the so-called ‘forced-choice procedure’, which dictates that, at each trial, experimental participants must report which of the three stimuli has the strongest odor. The JR says to S1:

So I will present you with two blank pens and the one pen has an odor, and you are going to tell me which pen has an odor. Even if you don't actually detect anything, ah, just make a guess, your best guess. Yeah, so what you think it could possibly be.

While saying this, the JR produces beat gestures (Kendon, 2004), as if further emphasizing her instruction. S1 joins by smiling, nodding and indicating his understanding by concurrently saying ‘a guess’, when the JR utters ‘a guess’ for the first time.

When I subsequently talk with the PI, she explains that one reason for her laboratory to use the forced-choice procedure is to deal with judgment variability across participants in their reporting on olfactory sensing:

Because everybody has their own criterion for when they'll say they smell something or they don't. ... some people are very conservative and they won't say they smell something until it is so strong ... because they don't want to be wrong. And other people are very liberal.

In illustrating strategies scientists use to achieve this *going beyond judgment* in participants' reporting, the PI mentions that the variability can be corrected by using monetary incentives to change subjects' motivation toward saying 'yes' or 'no', or relying on signal detection theory.⁶ She explains, nevertheless, that those solutions are often too complex to implement, and frequently generate unwanted consequences; they may lead to undesirable effects on behavior (such as putting participants in a position where they are unwilling to report an odor, even when the odor is presented in a relatively high concentration), or may be impractical for day-to-day laboratory work. The PI concludes by further describing how her lab manages to achieve participants' sensory reporting that is not clouded by rationalization:

so forced choice is an easier way for us to establish a threshold because people, and you've probably experienced that yourself, [...] very often you'll be correct when you really don't have any idea what you are smelling. But, you'll be correct, and you'll be correct over and over again at that concentration, without the awareness that, you know, where you would never say 'Yes I definitely smell something.' ...

I see that when I test people ... for training them for these studies, especially because they think there is a job there that they have to do. So they want to be right, and they'll say 'well, I don't know.' And I'll say, 'I understand that you don't know, you are not consciously aware, but you must give me an answer.' And it's good not to think about it too long; it's good to just smell the three samples and react because if you do, you'll probably be right more often than you know.

Giving an answer on the threshold test is not about 'knowing', or 'having an idea of what you are smelling', or about a 'conscious awareness of knowing'. It is not about something that we can declare as 'definite', but about, as the PI explains, 'giving answers' and 'being right', where we don't 'think for too long' but 'react'. It is a robust phenomenon, where 'you'll be correct over and over again', but a phenomenon that is not about your cognitive effort and control. In other words, the forced choice procedure aims at capturing sensations as they *talk from the body*. It is a mechanism that researchers employ to make the mute sense speak by going beyond subjects and their rationality.

The PI's explanation illuminates the idea of 'guessing' mentioned by the JR when she asks S1 to 'just make a guess'. This guessing is not about selecting 'correct answers by pure chance' (which will come up later on, as the test unfolds), but about receiving an answer that taps into the participant's sensing without relying on reflection and deliberation, as the experiment is to tap into the involuntary and nonnarrative of olfactory sensing. In other words, the quest for objectively measured sensations is to be realized by harvesting the pre-intentional.

To achieve this, the experimenter asks S1 to respond to her test questions by uttering either ‘one’, ‘two’, or ‘three’, as she waves three pens under his nose. The JR explains: ‘So I’ll, like, I’ll have you close your eyes and then I’ll go, “here is pen one”, give you a chance to sniff, “here is pen two”, “here is pen three”. And then you’ll tell me what your answer is, at the end.’ As the JR utters ‘one’, ‘two’, and ‘three’, she indicates the words the participant is expected to articulate during the test. As we will soon notice – aligning our noticing of the test events with that of the experimenter – S1’s olfactory sensations will be legible not only through these three worlds, but also via his semiotic enactments involving the entire body.

Next, S1 asks about the number of test trials, to which the JR replies by introducing ‘the form’: ‘So we are going to be doing this until I fill out this form.’ While saying ‘fill out’, the JR picks up a piece of paper from the counter next to her, lifts it and gestures over it. When uttering ‘this form’, her hand has a flat shape and moves swiftly from left to right, simulating the order in which she is to fill it out. The experimenter then wraps up her answer by saying: ‘And this will give me a good idea of where your threshold lies for this odor.’ The form, as seen in Figure 3, is a chart that lab members use to record participants’ responses during threshold testing. As I learned during the training session, the chart – with its rows, columns and arrows – asks the participant to perform certain actions (‘provide answers’), while it guides the experimenter in presenting subsequent concentration of odorant in respect to the correctness of previously received responses (see Doty and Kobal, 1995: 197).⁷ During the training session, the LM explains that he sees this filling out of the chart as playing a game; when initiating the test, he says, ‘let’s start the game’, and after demonstrating to his colleagues how to fill out the chart, he concludes by saying, ‘that’s the game’, while he gesturally enacts quotations marks around the word ‘game’. So, during this game, the participant is to utter a number (one to three), and, if that number does not correspond to the position of the target odorant in the presentation sequence, the experimenter is to judge the answer as incorrect. In such a case, the experimenter, guided by the chart, is to assume that the participant is not able to perceive the odorant at that level of concentration, and is to follow with a presentation of the stimulus at a higher concentration. On the other hand, if the participant’s answer is perceived as correct, the experimenter is first to provide an additional token of the same concentration (to establish with more certainty that the correct answer was not a guess), and, if the participant responds correctly again, to present a decreased concentration of the stimulus on the following trial. When that happens, the experimenter is to switch columns, recording the results now in the blank, adjacent column, on the right-hand side. The experimenter is to continue to record in the same column until the participant fails to detect the stimulus correctly (at which point the experimenter is again to switch to the next blank column on the right-hand side, proceeding the test by using pens with higher concentrations of the odorant).

To mark the participant’s responses into the chart, lab members use an ‘X’ sign to indicate an incorrect answer, and a ‘0’ sign to indicate a correct one. As soon as they write an X into the chart, they are to substitute the current pen for one with a higher concentration of odorant, and then mark the following result into the next row. However, when they receive what they see as a correct answer, they are expected to write a ‘0’ sign

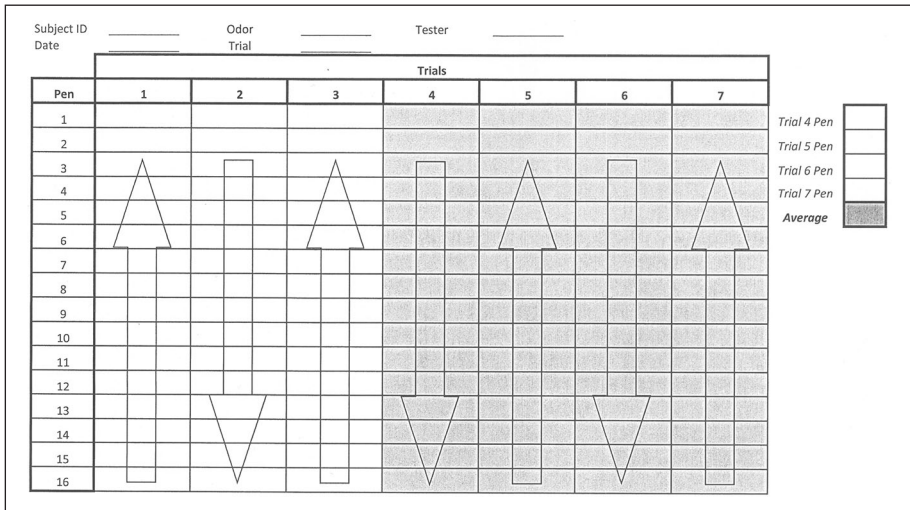


Figure 3. Threshold test chart.

but use the same pen again. If the following answer is correct (in other words, if there are two correct answers in a row), they are then to move on to mark into the next column, and continue to use pens with lower odorant concentrations until the participant responds incorrectly.

When experimenters fill out the chart, the next step is to calculate ‘where the threshold [for the specific participant] lies’. During the training, the LM explains that, ‘The least concentrated that you can’t detect, and the least concentrated that you can detect, the average of those two will be your threshold.’ Considering how this is marked on the chart, experimenters are to select the numbers indicating odorant concentration that correspond to those writings on the chart that are closest to the heads of the arrows on each ‘reversal’, and inscribe them into the table on the right-hand side of the chart. The chart is shaded in two tones of gray to highlight the last four reversals as those to be used in calculating the average score on the test. In the words of the LM, ‘There are seven reversals. The last four reversals are the average that you are going to take to determine which pen is her threshold.’ Researchers are to write this number in the cell marked with the label ‘Average’.

Wackermann (2010: 198) points out that, in a psychophysics laboratory, instructions, coordinated with the universe of instruments, constitute the agreed upon, intersubjective world: ‘The agreement upon ‘what’s there’ in the world (instructions) is a necessary condition for a successful experiment, as necessary as the properly functioning apparatus (constructions).’ In the olfactory laboratory, the chart participates in collectively establishing this ‘what’s there’. Through its design, the chart brings up claims about the nature of the reality we live, as it stabilizes and further enacts the objects in the world to which it refers. Together with the Sniffin’ Sticks apparatus, the chart specifies that, during the test, the olfactory world should concern only three objects – the pens – where two of

them will have no odor and one will have a specific and unchanging odor, which, in turn, shall allow experimenters to calculate the participant's sense of smell. With its gridded system, the chart also predisposes for a notation of 0s and Xs that stands for correctness (or not) of participants' reported detection capacity, derived from the small set of well-defined words (one, two, and three). In focusing on an actual threshold run, however, it appears that, in order to have 'a good idea of where your threshold lies for this odor', much more than merely filling out the chart is involved. Unlike what the smoothness of the JR's gesture over the chart may suggest, the methods lab members bring to the chart go beyond writing 0s and Xs into it and calculating the threshold as a fixed numerical value derived by counting those 0s and Xs. As we will soon witness, experimenters' skills importantly concern monitoring what the participant does during the test, and reading the chart in its wholeness – ingrained in the lived world of the laboratory. This, in turn, goes beyond intersubjective agreements and what is explicitly established before the experiment, as smellers' pre-intentional bodies are sensitive to the olfactory material that does not entirely comply with the ideas of boundedness and stability of objects. We will see how, to read the chart, researchers – while acknowledging limitations of this enterprise – go beyond the objects that the chart, the kit, and experimental instructions specify.

However, before we get to this fullness of the radical first person plural (some of which the chart hints at by its four 'training columns', but will become fully available only once we start to attend to the actual test event), let's continue to follow the JR's instructions, staying first with the plural that, in displaying referentiality (to objects in the world) and cultural elements of smell talk, together with effects of that talk on olfactory sensing, can be characterized as intersubjective. After the researcher points out that the chart will give her a sense of S1's threshold, continuing to explain the working of the test, she briefly turns toward me and then toward the PD (who observes the scene from the corner of the room), and asks: 'Am I supposed to tell him what the odor is?' The question is embedded in an extensive literature in the field that explicitly targets the plural character of olfactory sensing. Engen (1960) points out that those who study olfaction should pay attention not only to effects of practice and training,⁸ but also to how variations in instruction generate significant effects on this sense modality (p. 195). Moreover, studies have shown that naming odorants during a test procedure can generate results analogous to using actual odorants on a comparison task (Doty and Kobal, 1995: 202; see also Carrasco and Ridout, 1993; Ueno, 1992). The lab members are particularly careful in this regard, as they study the issue themselves (the PI tells me that this is why 'it is fun to study smell'). For example, in one of their studies, lab members showed how sufferers of asthma respond differently to an odor relative to its description. While exposing two groups of asthmatics to phenylethyl alcohol – a benign odor described as having a pleasant rose quality – they informed one group that the odor is harmful and that it could elicit asthma symptoms, while saying to the other that it is a healthy, therapeutic odor. The 'pleasant condition' group described the odorant more positively and did not report any health-related problems. The participants in the 'harmful condition' group, on the other hand, reported difficulties in breathing and showed airflow restriction for over twenty-four hours after being exposed to the rose smelling odorant.

The PD thus has a fair bit to consider before she responds positively to the JR's question. The JR follows with, 'Ok, so this is called butanol', to which S1 responds by shrugging. The experimenter, then, further clarifies with, 'This is what typically a sharpie marker smells like',⁹ her clarification exemplifying a strong referentiality and connotative character (Barthes, 1957/1987) of smell talk. The technical term 'butanol' is an example of how it is commonly imagined a smell language should work – the assumption is that, if there were a smell language, it should be a semiotic system composed of symbolic signs, unique to that specific system (e.g., Ackerman, 1990: 7). Anthropologists look for such a language in other cultures (e.g., Majid and Burenhult, 2014), and those discoveries are highly appreciated by the mass media (e.g., Yong, 2015). On the other hand, 'what typically a sharpie marker smells like' is an unremarkable example of language that relies on smell's source (an indexical sign), which those same arguments characterize as lacking (e.g., Ackerman, 1990; Zelman, 1992). We acknowledge that, '[i]n English, most words for smells are words for their sources. ... To name it – to know it – we want to know where the smell comes from' (Horowitz, 2016: 74; see also Henshaw, 2013: 6). Ineffability arguments not only find such a linguistic method uninteresting, but also consider it a sign of muteness. They say that the mute sense cannot speak because it is contingent on the world: rather than being self-sufficient, the language partners with pieces of the world to which it refers – here, sharpie markers.¹⁰ But, when S1 is provided with this vernacular ('what typically a sharpie marker smells like'), he speaks. He readily comments, his talk manifesting cultural embeddedness of smell language: 'Ah, ok, that's a good smell.' He then adds while chuckling, 'If you are into that', sharing with the JR the common notions that sharpie markers can act as drugs¹¹ (as suggested by the manner in which he says it while chuckling, and how the JR laughs in response).

When the JR turns toward the counter, she puts on a pair of nitrile gloves while saying, 'Let me get some gloves on', S1 repeats, as if for himself, 'butanol?', which I take as an opportunity to ask whether he knew the term. Just after S1 negatively answers my question, the JR jumps in to point out, 'I've just said it.' S1 then confirms with, 'Oh, no, yeah, she just said it', while he directs a pointing gesture toward the JR. After I try to excuse my lack of comprehension revealed by the question, S1 further explains by saying, 'No, I am an accountant. I don't know these kinds of things.' That S1 delegates the knowledge of the olfactory vocabulary to the researcher as somebody who is in the position to 'know these kinds of things' (rather than being 'an accountant'), and that the JR exhibits certainty when she points out that she was the source of that information may be seen as reinforcing the commonly assumed view of olfactory language and how it should function: only professions – in charge of specialized vocabulary – should be able to speak this otherwise ineffable language. Nevertheless, turning to the smell talk as it takes place in the midst of laboratory events puts forward an alternative view. Embedding the olfactory language in the laboratory not only downplays the apparent semiotic inequality between those who have the power to speak this language and those who do not, but also suggests that the individual – in charge of stable and fully manipulable objects in the word – may not be the best unit of analysis. The language of the mute sense, rather than being 'externalized' from an individual, is always already in an embodied plural, speaking from its entrenchment in olfactory experience. We will first notice this in the sections

that follow as we focus on the participant's talk (and how the researchers read it), and then, in Part II, in its manifestation in smell language of the specialists themselves. In so doing, we will attend to indexical signs that incorporate in their workings sources of odorants, but also to those that couple with the world in ways that gave up on the quest for a source identification (accepting, instead, the prevalence of the immersive character of our relationship with odors).

This will specifically show up as we move into other aspects of laboratory work, beyond the instructions. The language we hear there pulls the entire body in its articulations. There are words that render the quality of olfactory sensations, similar to the those just heard during the instructions session (the end of the wrap up session, just before S1 leaves the lab, further manifests some of its instances, and the concluding portion of Part II discusses an example), and there are also multimodal configurations that, rather than having a narrative format, indicate the relationship of the sensing body to what it smells (examples show up during the threshold test, discussed in the following two sections). The eloquence of this language troubles the idea of agential subject as the ultimate point of reference for sensory STS.

Overt response on the part of the examinee

To catch how the 'examinee' speaks the language of the mute sense as a 'part of a psychophysical procedure' (Doty and Kobal, 1995: 196), we next turn to a video record of S1's smell test. We just heard (during the instructions session), S1 participating in smell talk by relying on referentiality (e.g., 'what a sharpie marker smells like') and cultural knowledges (e.g., 'that's a good smell. If you are into that', while chuckling). The video of the actual test provides opportunities for specifically getting at a verbal or overt response (exemplified by the three words the examinee is asked to utter – one, two, or three), as well as noticing its accompanying multimodal aspects.

Below is an excerpt from the video of the test, transcribed in the style that borrows from *Conversation Analysis (CA)* (Sacks, 1992) and *Multimodal Interaction Analysis (MIA)* (e.g., Goodwin, 1994, 2000).¹² MIA enriches the rendering of how the talk-in-interaction is delivered (as captured by CA), by indicating the employment of gesture, gaze, prosody, facial expressions, body orientation, touch, and the changing aspects of space in which action and interaction are embedded (e.g., Goodwin, 1994; Hutchins and Palen, 1998; Koschman et al., 2007; Mondada, 2007; Suchman, 2000). In this sense, video ethnography and the adoption of MIA transcription style are critical for broadening the idea of what a language is. This is so not only because the approach allows us to attend to language beyond focusing on worlds, but also because it pushes us to notice how it participates in the sensory sphere. That, in turn, points to the radically plural aspects of the sense of smell – its concurrent embeddedness in the experiencing body and the concrete circumstances of its realization.

The transcribed excerpt is incomplete as it only covers the first five trials of the test, taking S1's turns as its focus. The only reason for this is brevity, and it should not be taken to mean that either the rest of the trials or the JR's comportment across the trials are identical to those transcribed.

Excerpt 1

1 JR: Ok, so: you can close your //eyes,
 2 S1: //((Closes his eyes.))
 3 JR: ((Picks up three pens from the pen holder, and arranges them
 into her left hand.))
 4 ((Opens one pen with the right hand, and starts to move her left
 hand toward S1's face.))
 5 Here is pen one, ((Moves her hand back and forth under S1's nose
 with the open pen toward his nose while S1 inhales.))
 6 ((Closes the first pen, opens the second one, and starts to move
 her hand toward S1's face.))
 7 Here is pen two, ((Moves her hand back and forth under S1's nose
 with the open pen pointing toward his nose while S1 inhales.))
 8 ((Closes the second pen, opens the third one, and starts to
 move her
 hand toward S1's face.))
 9 And here is pen three. ((Moves her hand back and forth under S1's
 nose with the open pen pointing toward his nose while S1 inhales.))
 10 S1: Ok.
 11 ((Opens his eyes.))
 12 Just pick a number?
 13 JR: Yeah, ((Nods.))
 14 S1: ((Performs a shrugging hand gesture while tilting his head.)) Two.
 15 JR: ((Writes into the chart))
 16 ((Turns toward S1.)) Ok, close your eyes again,
 17 S1: ((Closes his eyes.))
 ...
 18 JR: A:nd pen three,
 19 S1: ((Shrugs while the JR retracts the pen.))=
 20 =One
 21 ((Opens his eyes.))
 ...
 22 JR: And pen three?
 23 S1 Mmm, ((Tilts his head.))
 24 Two,
 ...
 25 JR Here is pen three,
 26 S1: Two.
 ...
 27 Here is pen three?
 28 S1: ((Grimaces, shrugs and tilts his head to one side while
 producing a short sucking sound with his cheek.))
 29 (It was tough I'll say two again)

Throughout the transcript, the experimental participant dutifully utters the three words he is asked to report: the cardinal numbers from one to three. The experimenter listens to those words to translate them into marks she writes into the chart. The transcript, however, indicates that the language the participant speaks concerns much more than this verbal reporting. Not only does S1 say more, but his speech also resides in his shoulders, his facial expressions, adjusting movements of his body on the chair, as well as the timing of his responses. While the three cardinal numbers articulate whether he detects a

smell, this multimodal language displays his orientation to his smelling experiences. All this takes place in front of the JR, and in tight coordination with what she does.

A striking feature of S1's turns is their temporal organization. Not until the fourth trial (Line 26) does S1 produce the response he is asked to deliver in a manner that appears unproblematic: indicating a pen number immediately after the experimenter's demonstration. The rest of his responses (Lines 14, 20, 24, and 29) are marked by temporal shifts. Trial two exhibits an overlap between the two interlocutors, while, in the rest of the trials (trial one, three, and five), the JR's presentations are followed by delays. This is accomplished through a variety of means.

On the first trial (Lines 1–15), S1 prefaces his requested report with four distinct acts (Lines 10–13) and, when he finally delivers the verbal response, he enacts it in a conjunction with a complex gesture of uncertainty (Line 14). In Line 10, he first says 'ok', acknowledging that the trial is over. While this does not appear to have an informative import, it is performative – it defers his answer, as it does his next action in Line 12. After opening his eyes (Line 11), S1 inquires whether he should just say a number. This is in contrast with his displayed awareness on how he is expected to act during the test, as exhibited when he overlapped with the JR's 'your best guess', during her introduction to the procedure. S1 then asks 'Just pick a number?', which not only prolongs his answer but also implies chance and uncertainty. When he finally utters 'Two' (Line 14), he does so after the JR's encouragements (in Line 13, she says 'Yeah', and nods), and by co-enacting it with a shrugging gesture while tilting his head. When the JR turns toward the counter to fill out the chart (Line 15), the chart allows her to write only 0s or Xs into it (on this occasion, she writes a 0), in contrast to all the interactional richness she just had a chance to witness.

During the second trial (Lines 16–21), S1 rushes, rather than delaying. His act, nevertheless – and once again – indicates uncertainty. His turn starts while the JR is still in the midst of presenting a sample to him (Line 19), but it opens with a shrug, which, together with the displayed impatience, renders available his non-commitment toward the answer he provides next: 'One' (Line 20). On the third trial (Lines 22–24), S1 precedes his answer (in Line 24) with vocalizing 'Mmm' and tilting his head (Line 23). Even more dramatic is the multimodal performance that he enacts in the fifth trial (Lines 28–29). There, S1 prefaces the delivery of the answer – complex in itself – with a compound multimodal enactment. He first grimaces while bulging his lips, which enacts his uncertainty about the task not only through the gestural and verbal displays, but also through the temporal delivery of his response. S1 continues to perform that delay through Line 28, where he morphs his facial expression into an act of shrugging. He then combines this gesture with cocking his head to one side and producing a short sucking sound with his cheek.¹³ He follows this enactment with a verbal gloss that characterizes his stance, 'It was tough.' He delivers this comment, all in one breath, with the answer, 'I'll say two again' (Line 29). The format of the utterance, once again, displays S1's hesitation toward his answer.

In MIA (e.g., Goodwin, 2000), our efforts have been importantly directed toward describing how the gesturing body (frequently – the hand) extends into the rest of the world, most often marking or manipulating it. Here, instead, we witness gestures

performed by the entire body that appears as being washed over by the world, where the world impacts the body that *responds* to it. We can suppose that how S1 provides test answers by moving his body allows him to experience how he lives his olfactory sensations, as he feels his body in movement. By being importantly accomplished through the perceivable body, these movements are, at the same time, available for reading in the public space. But while S1 enacts them as semiotic fields accessible to the experimenter to read, it would not be accurate to say that he intentionally moves or purposefully employs those movements to communicate. That the character of S1's enactments is public while also felt in the body (while not intentionally directed) is not a contradiction. This is what the language of the mute sense is – a language rooted in sensations whose format is always already in plural.

I am an average smeller

The JR's 'Ok, we are done', uttered just after she marks the last reported number into the chart, opens the 'wrap-up session'. The experimenter attentively looks at the chart, and then provides her assessment of S1's performance on the test. As S1 follows with his account of the experience, the interchange indicates how the complexities of the enactment manifested in Excerpt 1 are not simply under his control, while his olfactory sensing, rooted in his body, has a profoundly plural dimension.

Excerpt 2

- 1 JR: So:, I think, in general, (.) you are fairly average,=
 2 S1: =(Laughs)
 3 JR: But, I think you're ((turns toward S1)) also very good at guessing?
 4 S1: I am good at guessing?
 5 JR: Yeah, ((smiles))
 6 ((Turns toward the chart)) cuz like one of them, so, is:,
 7 You have some correct that are: (.)
 8 Like ((turns toward S1)) really really low,
 9 S1: ((Nods))
 10 JR: And then ((pulls her hand up, and //gestures by spreading her fingers))
 11 S1 //A lot of the ones I
 smelled, (that that were most distinct) smelled like rotten eggs,
 (.)
 12 JR: Yeah?
 13 S1: Yeah.((while wrinkling his nose)) I mean to me they did, ((while
 gesturing toward himself and then outward))
 14 They smelled a little bit like ((two gesture strokes while
 saying 'like'),=
 15 =(Enacts a facial expression of disgust, looks toward me and back
 to the JR, enacts two emphasis gestures as if indicating 'you know'))
 16 You know they didn't smell like a sharpie,
 17 JR: Ok, did it smell like my glove? ((puts her hand under S1's nose))
 18 S1: ((Gets closer to the glove and inhales))No not at all.
 19 JR: Ok. ((starts to reorganize the pens))
 20 S1: I thought you're gonna tell me ((while gesturing outward and then to
 himself)) that there was no smell in any of them((gestures negation))
 21 ((Smiles and briefly looks at me))

- 22 It is all scam ((while turning toward the JR and continuing to smile))
 23 JR: Haha ((laughs)) No,
 24 This is what, this is the most concentrated, ((puts a pen under S1's nose))
 25 S1: ((Sniffs)) Yeah, I didn't really smell that too much.
 26 I mean ((gestures emphasis)) it didn't smell like that ((points toward the pen))
 27 Obviously that is much stronger.
 28 JR: Mhm ((confirms))
 29 S1: I am an average smeller, ((starts to stand up and leave the room))
 Whoop dee do,

While the JR is still looking at the chart, she notes that S1's sense of smell appears to be 'fairly average' (Line 1). S1 only laughs in response (Line 2), possibly acknowledging the illocutionary force of the JR's statement, namely its functioning as a denial of his future participation in the study. The JR continues with the assessment by adding, 'But I think you are also very good at guessing?', as she turns toward S1 (Line 3). By 'guessing' she means here¹⁴ that the match between the participant's answer and the expected correct choice is a result of his randomly providing an answer. Laboratory members call this also 'getting it right by chance', 'probability', or 'just luck', and are particularly vigilant against treating such results as *real*. One can conjure that the JR's judgment of S1's performance is grounded, at least in part, in what she observed during the test (Excerpt 1). As suggested by the MIA rendering of the test, the JR could have relied on her mundane semiotic competencies, and, by reading the multimodal aspects of smell language – S1's fidgeting, smirking, protruding his lips, and shrugging while delivering his answers – concluded that those answers, even if apparently correct, do not accurately render his odor detection.

As soon as the event was over, I spoke with the PD, excited about the JR's not considering only numerical results when assessing S1's test performance. Even if visibly perplexed by the banality of my fascination, the PD patiently explained that her colleague was able to do so by observing how the experimental participant behaved during the test. The potency of this mundane capacity was also on display when I gave talks on this material; on two occasions¹⁵ the audience was small enough for me to ask – just after playing the video clip transcribed in Excerpt 1, but before showing the one rendered in Excerpt 2 – for an assessment of S1's test performance. On both occasions, the first and instantly delivered comment was that the experimental participant 'was guessing'.

Of note is that S1 – the person who actually performed the actions seen by others as indicators of his guessing – does not display a control, or, possibly, not even an awareness, of those semiotic actions. When the JR, in Line 3, describes the S1's performance as guessing, her utterance has an upward intonation, and S1 treats it as a question to which he responds. His answer (Line 4) – 'I am good at guessing?' – is fashioned as an indication of surprise, and an act of not accepting what the JR just said. This disagreement on S1's part makes us think that his enactments of hesitation during the test (as seen in Excerpt 1) have a strong experiential character in their blending with sensations, but were not intentionally governed or directed toward the JR as representational signs of his

inner states. In this respect, his performed relationship with those enactments displays some commonalities with Ferlinghetti's (1960) notion of fourth person singular:

The figures on the terrace had already happened, and one of them was myself, and one of the other figures had my arm and was shaking it, again. ... The hour was late, and I had my coat collar turned up, as if it were cold on the terrace. Or as if I had been traveling. The old coat collar turned up made me believe I had been traveling. Or perhaps it had been raining and I had been walking in the rain. There was a small puddle at the edge of the terrace, at the very edge, in which I saw the scene recapitulated upsidedown. I had only to look down into the puddle to see the whole scene arrested in its essence Even the tongue in the open mouth hung suspended, waiting to speak again. ... That tongue dwelt with a curious, scalding intensity upon what it was saying, as if the words issued from the mouth against its will, as if the tongue tore the words from it and spit them out through the mask of the face, the face itself half-believing what it heard. (pp. 15–16).

When S1 displays his surprise toward the JR's test assessment, it appears as if his multi-modal enactments made during the test – the language that is about 'the mouth, the tongue, and the face' – was not heard by the person who just a couple of minutes ago had spoken it. As if that tongue, which now has a chance to dwell on itself, acted against the will of the rest of the body, allowing S1 to resist the JR's assessment by showing his surprise.¹⁶ But it would be wrong to negate the occurrence of that language, as both the experimenters and my audience noticed it. It would be also limiting to describe it as purely 'subjective', in that, while not controlled by the Subject, it unfolded across the public scene to which it appertains as much as it does to the body.

The JR, indeed, rebuts S1's disapproving stance in Line 5, where she rejoins by confirming her original statement. While the JR's intonation in Line 3, together with her gaze direction, suggested her interest in S1's response, her confirmation of his guessing also indicates that she is not to treat the participant's post-hoc answers as the ultimate explanation for what happened during the test.¹⁷ Instead, the language she orients to goes 'beyond judgments and criteria', beyond being 'consciously aware' and 'thinking for too long' (tapping into what the lab's PI highlighted during my conversation with her). This is what the JR wants to get at, as she considers how *the body* that 'has answers' speaks the sensory experience.

To back up her claim that S1 was guessing, the experimenter partners with the chart (Figure 4). Rather than evoking S1's ephemeral comportment during the test, she turns to what – inscribed on that piece of paper – remained of it. The experimenter, however, does not read the chart mark by mark, but considers S1's individual answers through their linkages across the experiment. As his answers stand for olfactory sensations (or lack thereof) by being associated with other answers, their togetherness also aligns with what the JR experienced in the midst of that test. The JR makes her argument available to S1 by grouping the answers into two clusters. There is a cluster of answers in response to a low concentration of odorant (Line 8) that, despite the hesitation with which they were delivered (these are the answers on the trials that were transcribed in Excerpt 1), the chart records as being largely correct (Line 7). To back up their characterization as 'guesses', the JR contrasts them with the subsequent answers, which are correct only in

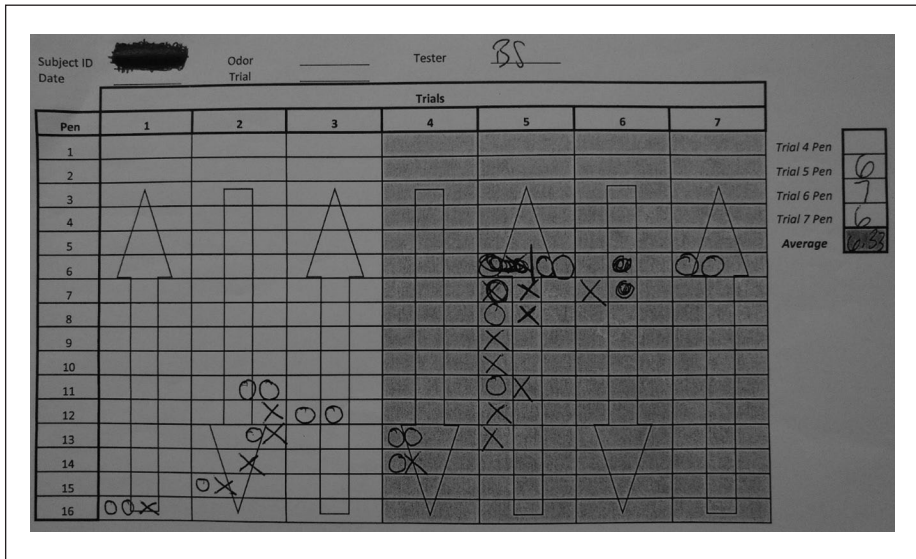


Figure 4. The filled-out chart of S1's threshold detection test.

response to much higher concentrations of the odorant (Line 10).¹⁸ Through this showing of the chart and indicating how to read it, the JR's actions relate the chart to Ferlinghetti's mirror image in the puddle; by looking at the chart and listening to the experimenter's explanation, S1 can now see himself from a distance, unsure of what exactly he was doing when performing the actions that left the trace in that mirror.

The threshold test is designed to elicit whether experimental participants can or cannot detect an olfactory stimulus – the articulation is not about the quality of an odor, but whether there is an odor. By paying attention to broader semiotic territories during actual test administrations, experimenters can also catch the non-verbal, embodied signs that indicate how participants live smell occurrences – what is their orientation toward them (noticing these, as further discussed in Part II, is a way to inform experimenters on how participants link their bodies to the world, and, in turn, provide insight on its make-up). During the wrap-up session, however, S1 is explicitly asked to describe odors – what it is he smelled during the test and what that smelled like. While the concatenating of the chart's marks across the experiment and the public character of S1's stance toward his sensations already indicate a plural of S1's language, the *speaking of other voices* is further strengthened with S1's reply in Lines 11–16 that consists of an account of how he experienced his olfactory sensations during the test.

In Line 11, S1 defines the odor he sensed during the test as 'like rotten eggs', and in Line 16 he says that what he smelled was not 'like a sharpie'.¹⁹ The words he uses are those that the experimenter provided when giving instructions. The reader will, however, recall that the JR described the threshold test by mentioning the odor of 'butanol' and 'what typically a sharpie marker smells like', and she only talked about 'bad odors', the 'natural gas odor' which 'does not smell very good', and 'some rotten eggs like gassy

type of odors' when presenting the main study. It is interesting that now, in accounting for what he sensed during the threshold test, S1 relies on those descriptors provided for the main experiment. During the threshold test, S1 might have been looking for, but not able to find, the odor of 'what typically a sharpie marker smells like', and, instead, experienced what also was semiotically provided, namely 'rotten egg gassy type of odors'. As the experimenter's words articulate his smelling, we may say that S1 smells through the experimenter's words, the instance manifesting how language shapes sensations, so that one smells, at least to a degree, via language. This plural of S1's talk and his olfactory sensations also appear to have to do with how he orients to the setting at large (which possibly includes me as well, as S1's gaze direction in Line 21 may indicate²⁰). That full setting seems to have so much influence on S1's experience that he even says that he thought that the test was a fraud (Line 21), and that there was no odorant in any of the dispensing devices (Line 20).

In replying to the experimenter who asks for further clarifications (Line 12) after she heard that S1 perceived an unexpected odor during the test,²¹ S1 provides further examples of smell talk. This time he – in addition to, for example, using words that stand for odor sources – describes how the test odors made him feel, employing another common strategy of smell language (Ackerman, 1990: 7), but largely enacting it through multi-modal means. First, in Line 13, S1 briefly wrinkles his nose, to then specify that the gesture regards his own experience, 'to me they did'. He possibly further strengthens this through the accompanying beat gesture. In Line 14, he further starts with, 'They smelled a little bit like', in coordination with two beat gestures (in correspondence to the word 'like'), realizing his account fully in Line 15, where he enacts a facial expression of how he lived the odorous quality, namely, as disgusting. He follows this with a brief glance toward me, and two beat gestures that conceivably forecast what he will utter next, namely, 'You know' (Line 16), as if assuming a shared recognizability of those 'own' and embodied experiences (see Alač, 2017), rendered in this 'language without words' (Goode, 1994).

Just as S1 is to leave the lab, this multivoiced language, tinted by emotion and oriented toward the situation in which it takes place, displays one more token of its fourth person singular. In Line 29, S1 confirms his resignation toward his future participation in the main experiment by echoing the JR's opening line with, 'I am an average smeller.' S1 then combines this utterance with a playful use of the excitement expression, 'Whoop dee do.' As this ironic celebration of the news that he is an 'average smeller' performs a distancing from what the test measures, it suggests that S1 is not taking the test of his ability to be a test of the person. Like the narrating voice in the passage from Ferlinghetti (1960), this meta-comment manifests S1's living of his tested sensory abilities as an outside. The subject is swallowed by its pre-intentional features and the plural of its sensations, articulated through the language of the mute sense, as *a life* shows up in the interactional detail of the laboratory scene. Instead of encountering a *subjective* experience (internal, individual, and under a control of the Subject), that is *then* shared in the social world (instantiated, for example, in scientific practices), we witness an embodied field of intensities that is from its very beginning in the world. Noticing it is about patiently staying with singular events in the everyday life of the olfactory psychophysics laboratory.

Concluding remarks, for now

In his 2011 Presidential Plenary talk for the Society for Social Studies of Science (the text of which was subsequently published in this journal, 2012), Steven Shapin spotlights gustation and olfaction in his call for an *STS turn to subjectivity* ‘as a knowledge-making mode open to systematic study’ (Shapin, 2012: 170). Shapin points out a lack of sociological literature on ‘making and communicating taste’ (p. 177), and – after bringing up a cognate urging by Hennion (2007) in his study of wine-tasting – states:

What would be good to have are ethnographies – contemporary and historical – of how taste judgments come to be formed, discussed, and sometimes shared. Such ethnographies would look a lot like those produced by laboratory studies of science, concerned with how fact and theory judgments come to be formed, discussed, and sometimes shared (p. 177).

The present text proposed a reporting on a laboratory study of olfactory science. But, by noticing what takes place in the laboratory, I suggest a more expansive view of the olfactory sense.

In the laboratory, I listened to smell language, and rather than labeling it as ‘mute’, I not only identified its descriptor words – representing sensations of which the subject is in control – but also caught phenomena such as movements of the body that render, while participating in, our experience of odorants. One may or may not be willing to accept this view of language, and I leave the decision to my reader, recognizing its dependence on affinities that go beyond this paper. Undeniable, however, is that, once we notice this semiotic engagement with the sensory, we are led to acknowledge something about us and our relationship with the world that, buried in those same Western categories that dismissed the importance of human olfaction for centuries, we tend to overlook when discussing science, technology or other endeavors of STS interest.

While I align the present text with Shapin’s push toward the sensory in STS, spending time in the olfactory laboratory convinced me that working with notions such as *subjectivity* and *intersubjectivity* may obscure the power that olfaction affords. For one, these notions presuppose a ‘private’ sensation, which is *then* externalized, first formed and then, as a second step (and sometimes), intersubjectively shared (in coordinating one’s private responses with private responses of others). This article, instead, focused on the interlocking between the embodied experience and the world from the very beginning. It described the pre-subjective *openness with the world* of olfactory sensations by rendering its linguistic articulation where the pre-subjective and interactional spheres dynamically co-produce effects of subjects and subjectivity. By unearthing the specific ways in which felt characteristics of sensing bodies are not reducible to a person or its agential control, but are – from the very start – plural, the text casts a doubt on a treatment of the ‘subject’ (‘the knower’) – and with it the subjective and ‘subjectivity’²² – as anchoring points for an STS approach to ‘minor’ senses.

While I here centered my attention on destabilizing the subject as a reflexive unity in sensory STS, Part II will further delve into the make-up of the sensory world. It will highlight the restraining tightness of its conceptualization in terms of stable and manipulable objects (the second notion in the conceptual pair that animates the idea of intersubjectivity) by focusing on the curious spatiality of the sense of smell. I will ground

this discussion in how olfactory researchers go beyond objects, as they attend to the multimodal smell language manifested during the threshold test described here. With this, the questioning of the agential subject as the ultimate point of reference for a sensory analysis is not over. It will continue to occupy Part II as we orient to how our lived world – beyond the sociality of the intersubjective engagement in a shared experience – poses resistances to its submission and control.

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Notes

1. Neither Deleuze's mention of the unconscious nor my embrace of embodiment and sensory experience are related to Freud and psychoanalysis, where unconscious is representative and already there from the start (e.g., Deleuze and Guattari, 1980/1987: 12). In describing the involuntary and non-directed character of olfactory sensations, this article aligns with the critique of that tradition as outlined in *Anti-Oedipus* (Deleuze and Guattari, 1972/2009).
2. For an example of how my video excerpts are read in an alternative manner from what I saw, see Jones, 2017.
3. Why humans are particularly sensitive to mercaptan even in low concentrations is still unknown (Engen, 1982: 35–36).
4. 'Although observers can learn to do this consistently and thus control the flow rate ... and the volume of air inhaled, it is difficult, especially in a threshold experiment, for observers to resist a natural tendency to sniff harder when an odorant is weak' (Engen, 1982: 38).
5. When, during the training session, I asked the LM why the lab uses this particular odor, his response was that 'it is a standard ... Phenylethyl alcohol (PEA) and butanol have been used in the past so frequently that there is a normative curve of what to expect people to be able to detect.'
6. Application of signal detection theory in sensory psychology (which dates back to the 1950s) aims at separating the measure of sensory process from the subject's decision criteria by controlling and measuring that criteria. In addition to mathematical statistics, the approach

relies on research on electronic communications to specify the most sensitive performance attainable as a function of the signal-to-noise ratio (Green and Sweets, 1966/1988: 1–2). This implies a difference in attitude that this theory has toward the subject's report, and those in Fechner's 'classical theory', largely used in the lab when running threshold detection experiments: 'in one case the observer is trusted and in the other case he is not' (Green and Sweets, 1966/1988: 123). As these proponents of signal detection theory explain: 'Forms of Fechner's methods in general use, without a substantial number of blank trials, do not permit an objective check on the observer's report. Their use assumes that, although the observer will sometimes be confounded by psychological factors, he is generally able to say whether or not he is aware of the signal that he knows is present. And their use with blank trials, but without a treatment of the data that permits an index of the response criterion, assumes that the observer will rarely if ever have valid sensory reasons for deciding that a signal is present when none is; that is to say, it is assumed that if noise alone can exceed the threshold, it will do so on a negligible proportion of trials. Of course, the fact that detection-theory methods do not trust the observer to differentiate signal and noise reliably is not a comment on his character; they assume that sensory events caused by noise can exactly duplicate any sensory event caused by the signal and that the observer, therefore, is constitutionally incapable of determining whether any given sensory event was caused by noise or by the signal' (p. 123). For this reason, signal detection theory – as it assumes that our criteria for what counts as an odor will always color our responses on olfactory testing and thus generate a response bias (overestimating both the presence and duration of an odor) – does not promote the idea that training experimental participants in gaining expertise on testing would eliminate human error (Engen, 1982: 52–53).

7. The LM calls this chart the 'answer sheet', articulating, thus, participants' responses as provoked, and framed by experimenters' 'questions', which, in turn, are guided by the chart. During the training, the LM also tells his colleagues that, 'the answer sheet itself pretty much tells you what to do'. Because the chart guides the administering of the threshold test, the JR can use it to indicate the temporality of laboratory events (Lynch, 1985), as she does when gesturing over it to answer S1's question on the duration of the experiment.
8. A related practice is the using of trained experimental participants for psychophysics testing. Engen, when talking about threshold detection, pointed out that, 'To date most of the effort in this area has been devoted to determination and selection of judges for sensory panels and the best methods for measuring threshold' (1982: 52). Unlike signal-detection theory, in classical threshold detection (as proposed by Fechner and practiced in the lab), researchers believe that training experimental participants on testing procedure could eliminate human error (Engen, 1982).
9. During the training, and when describing the odor of 'butanol', the LM said, 'In my mind, I label it as what a sharpie smells like', and added, 'but you can think of it however you want'. It is not irrelevant, however, that the physical shape of the container in which the target odorant is incased evokes permanent markers.
10. Elsewhere, I specifically discuss this 'worldliness' of smell language and its criticisms (Alač, 2017), and characterize it further by going beyond stable objects in the world (Alač, 2020).
11. When, for example, I performed a Google search for 'sharpie marker smell', the search returned, as its first result, a parenting blog ('pplwhomatter'), which explains that sharpie markers are abused by children and teenagers, who, by repeatedly sniffing a marker, can generate a 'short-lived high' (<https://pplwhomatter.wordpress.com/2012/07/10/sharpies-and-smell-how-high-can-you-really-get/>, last accessed on March 22nd, 2017).
12. To indicate the intricate ways in which interlocutors coordinate with each other, the transcription adopts the following conventions (Sacks et al. 1974; Jefferson 2004):

- = Equal signs indicate no interval between the end of a prior and start of a next piece of talk.
- (.) A dot in parentheses indicates a brief interval within or between utterances.
- () Parentheses indicate that transcriber is not sure about the words contained therein.
- (()) Double parentheses contain transcriber's descriptions.
- // The double oblique indicates the point at which a current speaker's talk is overlapped by the talk of another.
- : The colon indicates that the prior syllable is prolonged.
- Underscoring indicates stressing.
- .,? Punctuation markers are used to indicate 'the usual' intonation:
- . Dot is used for falling intonation;
- ? Question mark is used for rising intonation;
- , Comma is used for rising and falling intonation
13. The compound enactment in line 28 is so complex that I have to thank my graduate students (particularly Rebecca Hardesty and Sarah Klein) who, as native English speakers, helped in providing description for this action.
 14. Of course, this is very different from JR's use of 'guessing' when she encouraged S1, during the instructions session, to give his 'best guess' on the test.
 15. During my talk 'Sensing as Method', at the University of California Riverside *STS Methods Speaker Series* (April 28, 2017), and during artist talk and walk-through with Evelyn Walker at The Institute for Art and Olfaction in Los Angeles (March 1, 2018).
 16. By this, I am not indicating that S1 was not 'conscious' of his actions during the test; of course he was; I am, instead, suggesting that those actions are not under his narrative control – he does not intentionally direct them or a posteriori accounts for them, when he rationalizes his behavior.
 17. By aligning my account with the practitioner's as she relies on what was publicly available during the actual test event, rather than relying on what S1 reports post-hoc, my account differs from the *neuroanthropology* of Andreas Roepstroff (e.g., Petitmengin et al., 2018) in respect to its orientation toward narration and introspection. Paying attention to events in real time, rather than conducting after-the-fact interviews, provides an access to the experiential as it actually takes place while available in the shared environment of interaction (e.g., in multimodal semiotic acts that, with their indexical and iconic character, are part of sensations, rather than being symbols that represent those sensations). It also allows us to witness how participants themselves deal with the impossibility of governing those experiences, and further concur with them, rather than implementing methods where we (i.e., social scientists) bring additional, external methodological elements to what is already there. The conceptual import of this move resides in its disturbance of the human subject's dominance, which in Roepstroff's account appears to remain largely intact.
 18. The JR enacts her explanation by heavily relying on gestures that involve her entire body. In line 8, she turns toward S1 – after saying 'like', – and positions her right hand just in front of her stomach – while uttering 'really, really low'. In Line 10, she describes S1's latest answers by saying 'And then', followed by a gesture where her hand is pulled up (in front of her neck), while she moves her spread fingers up and down, one after the other (Line 10). Rather than verbally expressing a negative stance toward his answers (for example, saying that the participant performed *poorly* on *easier* targets), the researcher depends on gestures.
 19. If one were to argue that S1's language enacted during the test was to render his capacity to smell (whether he smelled something or not, and how he experienced his ability to do so), here, we witness, with no doubt, S1's articulation of what he smelled.
 20. That S1 may be looking for a more general consensus, for instance when he looks toward me in Line 15, may be an alternative explanation.

21. How the experimenter, in Lines 17 and 23, responds to the participant report is of utmost importance. However, to generate as linear and compact a text as possible, I will return to those actions and their pointing to the presence of unwanted odors and how experimenters deal (or not) with them (Alač, 2020).
22. Where olfaction is a ‘mode of subjectivity’ that needs to be treated as ‘an explicitly framed topic of inquiry’ (Shapin, 2012: 172).

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