The Extended Encounter: Kicking Against Methodology

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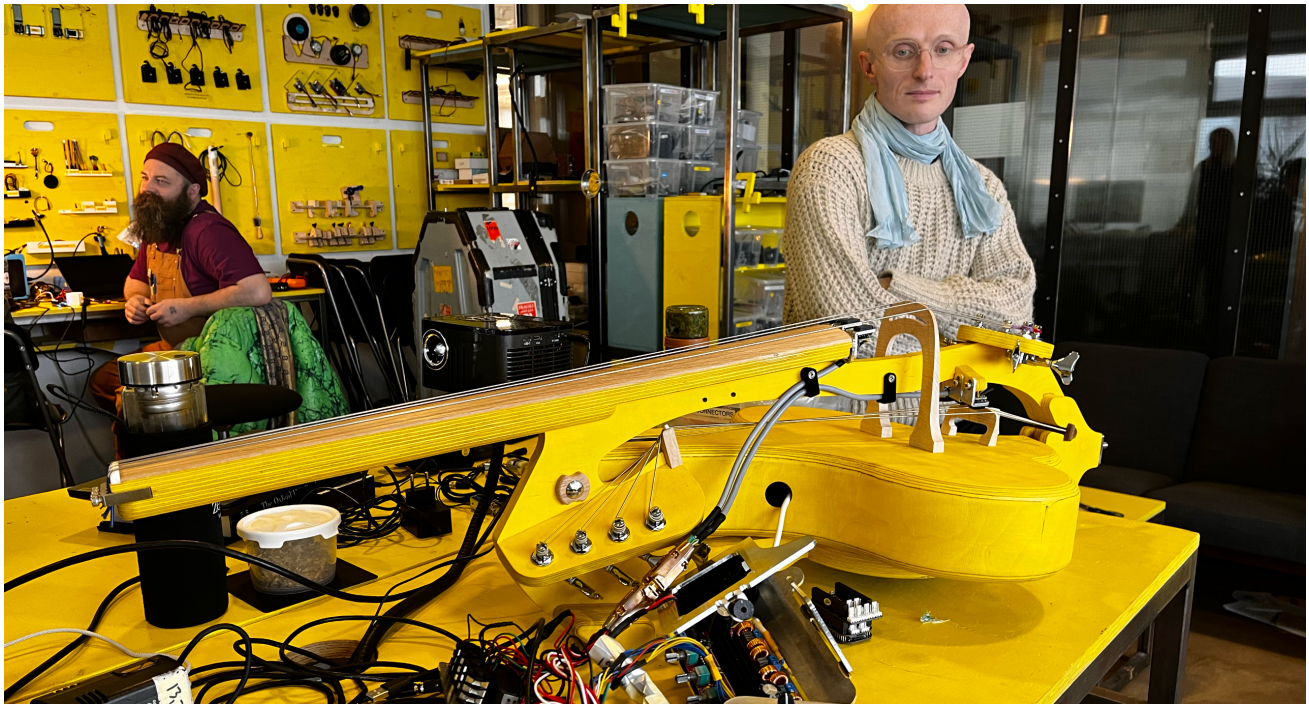

Figure 1: The scene of an extended encounter at the Intelligent Instruments Lab

Abstract

Methodologies from the field of Human-Computer Interaction have been used in musical instrument design for many decades. However, evaluating a computer system is considerably different from the evaluation of a new musical instrument. This paper argues that while HCI methodologies and evaluative taxonomies can be useful conceptual instruments for designers, they eventually must be transcended. The paper introduces the metamethod of the *extended encounter* as a critical analytical framework that can incorporate other methods. Grounded in linguistic skepticism, this approach shifts attention from verbal accounts toward alternative forms of understanding through mindful listening and observation.

Keywords

NIME, methodology, extended encounter, user studies, research methods, encounter, phenomenology, philosophy.

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1 Introduction

The NIME conference embodies a relatively diverse academic community, whose work can be cross-disciplinary, most often interdisciplinary and sometimes transdisciplinary [4]. The research and practice represented by NIME is not an academic discipline on its own; it is rarely taught in undergraduate courses, but we are increasingly seeing more master's degrees that address the issues of musical instrument design (e.g. University of Arts, Linz). At NIME, disciplinary backgrounds vary, and range from computer science, HCI, robotics and AI, through sociology, psychology, ethnography and philosophy, to musicology, composition and performance. As the conference itself started as a workshop at the 2001 ACM Conference on Human Factors in Computing Systems, the research, development and methodological approaches have tended to derive from computer science, and in particular human-computer interaction. This has been raised as a problem, articulated by Hayes and Marquez-Borbon [21] who argue that HCI methodologies are applied in NIME at the cost of alternative methodologies found in the arts and humanities. The authors relate quantitative methods to the situation of the neoliberal university and call for a more critical approach. They do, however, concur with Gurevich [19] that conferences such as CHI

have drastically broadened their methodological array to include diverse approaches – such as practice-based research, ethnography and phenomenology – together with key HCI scientists suggesting the broadening up of the field with non-anthropocentric posthuman methods [17][45]. The move beyond traditional HCI methods is apposite as musical instruments pose a unique and interesting problem. This paper seeks to articulate wherein this problem lies for HCI research.

2 HCI and Musical Instruments

Let's compare: a team is designing a train ticket vending kiosk. This is a physical stand with a touch screen located in a busy area. Here the problem specification is quite clear: the user should be able to select the destination, ticket type and payment method as quickly and in as few steps as possible. There should be no ambiguity, no nested layers, no complexity and the ticket should spit out of the machine fast. Now, when user-testing this system, the user intention, evaluation criteria, and the methods of evaluating are all clear: the goal is to purchase the ticket quickly and reliably. The design team might invite hundreds of people for the user test, measure the time it takes to perform the operation (in different versions of the design perhaps), analyse the steps people take, present them with a quantitative survey and conduct qualitative interviews that yield understanding of the user perception of the system. The quality of the system is primarily measured in user comprehension, low error rate and the time the task takes. The same study could be done on an alternative system and the results compared. Likewise, another team should theoretically be able to reproduce the findings running their own experiment.

Musical instruments are different. They are not technologies designed to solve well-specified problems. They are rather problems of their own, whose solutions are rather a broad range of musical expressions. The music becomes the answer to the problem proposed by the instrument. Music is no one thing and the diversity of musical technologies that engender music is such that it can be thorny to group them into a coherent whole [36]. Further, it is impossible to define the essence of music or musical tasks, as we always find exceptions, especially where music fuses into other art forms such as installations, dance, theatre, film or computer games. Musical practices are highly diverse, with different goals, including dancing, thinking or meditating. Thus, the idea of running reproducible experiments on new musical instruments with a relatively small sample size of "users" is poses difficult problems.

A musical instrument is a gift to the world: an offering. Its *ergodynamics* [37] shape musical expression by inviting the musician into a special relationship of investigation, exploration and discovery. Designers might have some ideas in mind as of the expressive scope and purpose of the instrument: one might be interested in a system for melody playing, another in the material physics of vibration, the third in interaction modes, the fourth in the look and ergodynamics, and the fifth in algorithms and machine intelligence. However, in the hands of an instrumentalist this design intention is quickly forgotten, ignored, reinterpreted or rejected. This is what the actor-network theorists (ANT) describe as rejecting the script of the technology [3] and researchers of social construction of technology (SCOT) point to in the adoption and adaptation processes in technological reception [7]. With each creative instrumentalist, all with their own musical worldview and experience, a unique process of sense-making dialogue ensues.

Beyond this, a musical instrument is a very special type of an instrument: it needs some mystery and magic to be worth exploring. Most instruments (say in science or fine control in craft) quantify perception or amplify bodily control. From a phenomenological perspective, these instruments "disappear" when they have been "mastered," but with musical instruments the situation is more complex. Musical instruments, although disappearing in the flow of an embodiment relation [24], keep re-appearing and requesting focus, equally in instrumental practise, live performance and through audience attention and focus: they are objects that, over time, become focus of love, care and desire [59]. If a musical instrument was as simple as a ticket machine, there would be no challenge in exploring, practising or playing it. We might recall cellist Casals, who, at the age of 90, remarked that he practised on the instrument every day as he kept discovering new things and was still making progress [11]. Clearly, the exploration involves studying the tacit features of the instrument and if there is a lack of these, the instrument ceases to be interesting for the performer. More importantly though, this exploration unfolds as a prolonged relationship between player and instrument, a bond irreducible to the qualities of either. This unique relationship then constitutes the artistic voice of the performer, a voice that is not the voice of an individuated self, but of an ecosystem of processes. Indeed, as Roger et al. so masterfully argue, "instruments are better understood in terms of processes rather than as devices, while musicians are not users, but rather agents in musical ecologies" [56], pointing to the relational nature of musical play.

Considering the above, it is very difficult to design or evaluate musical instruments from predefined standards or metrics, no matter how well developed the methodology is. Performers are simply too different in their musical worldviews, goals and intentions. To impose top-down design heuristics or measurement grids onto the unique phenomenological experience of encountering a new musical instrument is bound to be limited to the conditions of time, context and language used. What kind of question can be evaluated in this context and when should it be asked? The experienced luthier recognises this problem and instead attends carefully to the player: *hearing* and *seeing* the person who picks up the instrument. They trace the processes of familiarisation, of habituation, of a new world of ideas that the instrument brings forth, not through its objective qualities, but through the relationship it affords, beyond the subjective-objective divide, through ergodynamics. We therefore should refrain from applying the term "user-tester," as, indeed, we don't *use* musical instruments, nor are we used by them. It really is not a question of mastery. We unite with the musical instrument and begin to think in terms of a relationship that gets established over time, a process that I call the *extended encounter*. For this reason, I use the term "instrumentalist" in this paper instead of "user," "performer," or "player," connoting the sense of a strong human-object bond.

Here below, I will point to some problems with objective analyses of musical instruments. The goal is not to dismiss any particular quantitative or qualitative approach, for we all know that we can gain important new insights by applying well-chosen research methods. The idea is rather to problematise the idea that we can count on this as solid knowledge or as proven findings that can be reproducible in other contexts, because every musical situation is unique.

3 Against Method and Why

"Science is an essentially anarchic enterprise" begins Feyerabend's controversial book *Against Method* [15:9]. There he states that his intention is "not to replace one set of general rules by another such set" [15:23] but rather to point to the fact that all methodologies have their limits. There is no singular scientific method, and we should not impose methodological rules onto scientific practices. Critics initially argued that this was an unhelpful attack on science, but since then science studies have become increasingly aware of the blind spots of scientific practice [16] and the limitations of the scientific method. In this context, we might consider Latour and Woolgar's assail on the "myth of pure objectivity" and their argument that scientific facts are constructed rather than discovered. [32].

For Pickering, the sociology of scientific knowledge is increasingly making us aware of the "importance of the human and the social in the production and use of scientific knowledge" [53]. Pickering describes two prominent idioms of thinking about science: the *representational* and the *performative*. The former sees the world as an objective fact that science arranges into structures through representation that maps, mirrors and corresponds to the state of the world. The latter emphasises the social aspect of science, the agency of nature and scientific instruments, and the innumerable ways in which we perform science. This focus on lab settings and equipment is something Barad takes further when introducing the *agential cuts* of scientific apparatus, or how we filter and categorise the world through our scientific instruments [5].

Agre calls for a critical technical practice, requiring a "split identity" as one foot is planted in the craft work of design and the other in the "reflexive work of critique" [2]. However, he is not very clear in what that criticality consists of; mentioning Heidegger, Foucault and hermeneutics is not a solution to the problem of critical design. Furthermore, to view design processes from the critical perspectives of authors such as Heidegger or Foucault is just another perspective in which we become enframed. More productive is his suggestion of hermeneutics, the study of interpretation, as any act of focus, listening and care is based on empathy and understanding the interpretative frame of another person, or indeed of a non-human.

3.1 Methods in Design

The problem of methodology in the design of any system, in particular a DMI, ranges from the early stages of design to the evaluation of the end result. Many useful methodologies are relevant and the 2nd and 3rd waves of HCI have brought focus on collaborative practices, how technology transforms, user experience, meaning and emotion [9], including workshop focus groups, user centred design, participatory design, speculative design, design fiction, ethnographic studies, ethnomethodology, autoethnography, interviews, surveys and questionnaires. However, as Whitley argues [25], methodology alone is an empty shell, and we need to pay more attention to how we understand the broader context around the designed object. What is the cultural context into which the design intervenes? What is the historical background? Who is creating this instrument and why? At whom is the technology aimed? This requires some design introspection [62], but there is no single methodology that can encapsulate the unique design, social and technical context of improvisatory explorative design thinking [27].

But even here, musical instrument lutherie differs fundamentally from conventional HCI design. Instrument design is, by its nature, a process of discovery, exploration and research. Physical materials possess qualities that remain endlessly compelling. Strings, membranes, metal and wood are vibrational materials whose behaviours are so rich that exploration will never be exhausted. Then there are electronic components, audio programming languages and new algorithms that offer infinite potential for new discoveries. Finally, the large array of available sensors, controllers, screens and actuators is now so diverse and sophisticated that there is no limit to the potential of new interaction design experiments. How do the technical elements lying around in the workshop shape the thinking that supports the instrument design and how do they condition the scope of potential ideas of the people working therein [39]? What is the *story* behind the design [52]? The assemblage of new technical elements form technical expressions creating new problems: what is the potential of this new thing?

Most new instruments originate in a workshop where the inventor is following their intuition, interests and curiosity. The materiality of technical elements, whether physical or code, afford highly divergent thinking at the initial stage, then converging into a prototype eventually [22][33]. At every point there are multiple forking paths, yet one is chosen. The potential for a different design is embedded in the process. Recruiting an "end-user" for user centred design, participatory design, or other such methods, is a good idea, but it will always be highly contextual. Who is the designer, what is the social context of the lab, who is the "user" and what are the power structures at play? What kind of generalisations are possible when working in such a limited socio-technical context?

3.2 Methods in Evaluation

Evaluating design in music technology is clearly important. This is how we can improve our work and the findings become knowledge that we can build upon. When those are then published, other people can build upon them too. Yet evaluation has its limits. We must ask ourselves how a standard evaluation scheme could be possible, as people's ideas of music, expressivity, sound quality, audience engagement, purpose, and interest diverge as drastically as we find in the extremely broad field of music.

In a 2014 NIME paper, Jordà and Mealla state that there is an urgency for solid and grounded design and evaluation frameworks, some general and formal methods that go beyond specific use cases. They ask if such frameworks will "be the El Dorado or the Holy Grail of NIME research?" [30]. As they point out, a design framework is important when teaching instrument design and an evaluation framework is clearly going to yield better insights into the design process. They reference Waisvisz's lament from 1999 that there is no "consistent development of systematic thought" in the field. The NIME conference series has surely amended this problem, but we need to be aware of how these design and evaluation frameworks must be seen as conceptual nets that will limit a wider scope and understanding of what is going on if used too rigidly. Having applied a chosen methodology, researchers need to be critical of their methods and observe when and how their limitations emerge and what alien new perceptible and imperceptible currents and flows present themselves, yielding new insights that don't fit the chosen conceptual scheme.

I am sceptical of any Holy Grail in evaluation methodology. Kiefer et al. [31] present an early study in 2008, suggesting the focus should be on *experience* rather than tasks, emphasising the potential of the 3rd wave of HCI [9]. They conclude that this might be difficult though, as "techniques for new HCI research are not necessarily immediately applicable to music technology" for the reasons I have rolled out above. A few years later, Barbosa et al. state that evaluation is an emerging trend in NIME research, but through extensive studies of the proceedings, they conclude that there is little consistency of what evaluation actually means [6]. This is precisely the problem: there are no two designers or lab cultures that could easily come to an agreement what such an evaluation means. The problems of user studies within NIME include:

- **Lack of stable baselines and control conditions.** There is no meaningful control condition in musical instruments. Comparative studies are problematic, if not impossible.
- **Problem of modularity.** A DMI is typically more configurable than acoustic instruments; in terms of interaction and mapping, as well as sound output. The results are bound to be conditioned by users responding to a particular setting.
- **Semantic instability of evaluation criteria.** Core evaluative terms, such as "expression, "musical quality," "novel," "creativity," "goal," "error," "complexity," "depth of interaction," "user-friendly," lack stable, shared definitions.
- **Divergent conceptions of instrumentality.** Some people might seek stability and reliability, but others embrace non-linearity and dynamical behaviour. Whilst one might focus on mastery and control, another seeks exploration and discovery.
- **Musicking participants and background.** Musical experience, background and engagement is irreproducible in studies, including musical tradition, formal education, styles in language of describing music and sound, ideas of instruments and aesthetic taste. What are the projections at play?
- **Technological readiness and aesthetics.** How developed is the instrument at the time of the user study? Is it a prototype with wires sticking out or a "finished" design object?
- **Contextual embeddedness.** Musical interaction is deeply sensitive to context. Room acoustics, physical comfort, time of day, fatigue, hunger, social atmosphere, and countless other environmental factors influence both performance, perception and evaluation.
- **Social bias and power relations.** User studies are rarely socially neutral. Participants may know the designer, belong to the same research community or for some reason feel subtle pressures to provide positive feedback. These relationships can significantly shape both behaviour and reported experience.
- **The problem of the "user".** Who signs up for a user study of new musical instruments? Experience shows that these are typically people that are curious and interested in new technologies. There is a considerable bias there already.
- **Habituation and time.** The bond with a musical instrument emerges over time. It requires a long-term engagement to discover the affordances and constraints of an instrument. Short-term user study can only reveal first impressions.
- **Epistemological tension.** Evaluation in HCI typically assumes stable artefacts, repeatable tasks and shared criteria of success. Musical instruments, on the other hand, are open-ended, have vague goals, are culturally situated and are defined through long-term practice and meaning making.
- **The ineffability of inner experience.** The deepest aspects of the inner experience of an instrumental encounter resists the classification of language. What we get are approximations.

In this context, O'Modhrain appositely expresses that "there is no one-size-fits-all solution to evaluating DMIs" and more precisely that "the choice of evaluation methodology - if any - must arise from and be appropriate for the actual problem or research question under consideration" [51]. However, she addresses the *generative power* of design frameworks and taxonomies for the digital luthier. This is an important note for designers, as the taxonomies, conceptual frameworks, methodologies and established praxis all constitute important design references and evaluative registers.

3.3 Replication crisis

Considering the bullet points above and the near infinite number of fuzzy parameters affecting a "user study" of a musical instrument, it is clear that even if we can gather important key findings and insights from the study, we need to acknowledge the situated and cultural context of that particular experiment. Rarely do we have a control group for comparison as this is practically impossible. More concerning is that the findings would likely differ demonstrably if the experiment were conducted in another lab, shaped by different people, climate, history, politics and culture.

The replication crisis refers to a growing realisation in the past two decades that many peer reviewed and published scientific findings cannot be reliably reproduced. The idea that statistically significant results in a scientific experiment produces objective truth is broken. When researchers have tried to either replicate experiments using the described methods or reproduce the results by recomputing from the same data and code, the results are often drastically different from the ones described in the scientific publication. The crisis has been dawning upon the STEM sciences for some time, but it was perhaps with John Ioannidis strongly titled paper "Why Most Published Research Findings Are False" [26] from 2005, where researchers began to pay more attention.

In 2015, the Open Science Collaboration published a study called "Estimating the Reproducibility of Psychological Science," where 100 psychology studies were replicated and the result was that only 36% of 100 replication attempts yielded statistically significant results [50]. This was a shock to the scientific community and has resulted in calls for a more open science, including ideas of funding the experiments themselves rather than research projects or labs, and to conduct them in collaboration across institutions. Another solution is the preregistration movement. Preregistering a scientific experiment is done in order to prevent bias or post-rationalisation of hypothesis through the documentation of study designs, hypotheses and analysis plans in a public, time-stamped registry before the study is conducted [49].

The point is not to suggest that we cannot run experiments to gain some insight into our creations. The point is rather that experiments are contextual frames, highly situated and subjective, which can yield interesting insights and comments, but should be seen as systems of conceptual scaffolds that shape what we might call pure experience.

4 The Extended Encounter

How can we capture and understand our experience of an instrument then? Can we extract the ineffable pre-linguistic experience caused by picking up a new unfamiliar instrument? Or rather: how can we evaluate and understand the qualities of the thing we have made and communicate that knowledge? The perception of an instrument is multimodal and temporal, giving rise to a complex multimodal and culturally contextual experience that is hard to put into words. Some argue that the heart of the matter is what James defines as "pure experience," or that "original flux of life before reflexion has categorized it" [28], yet, in today's context with theories of enactivism [58] and predictive processing [12] we question if there is such thing as pure experience. This was clear to Nietzsche, whose work suggests that any experience is already an interpretation [48]. The idea of translating experience into scientific frameworks has been a method of science since the Enlightenment, but recent work shows how scientific instruments redefine phenomena such that they become increasingly removed from direct experience [16].

In *Sonic Writing*, I describe how the "[t]he notion of ergodynamics unveils how the first encounter of a digital musical instrument typically involves exploring its affordances and then a further study in the instrument's constraints." After a discussion of the continual dialogue with the instrument and its place in the world (history, evolution and future potential), we read: "This depth and mystery is what makes a good instrument. But the instrument is not the same for all players: it emerges or comes to life differently in the hands of different performers, so ergodynamics operate beyond any subjective-objective dichotomy" [38:169]. The encounter participates in the worlding [20] of the instrument: the instrument does not pre-exist its socio-technical relations but emerges through them. If there is no object or subject independent of these relations, the question is not how to access it directly and discover its qualities, but rather how to account for the situated relational practices through which its ergodynamics emerge.

4.1 The Phenomenological Encounter

Phenomenologists have theorised the encounter extensively. The phenomenological encounter is not a fixed doctrine but a cluster of related ideas explaining how meaning arises in lived, embodied experience when a subject encounters something. The emphasis is on how the encounter is experienced prior to mental abstraction, theory or representation. The encounter is initially pre-reflective and relational, where the meaning emerges through experience that transcends the traditional subject-object divide. No concepts, frameworks or taxonomies can capture this holistic experience, and we must be careful of reductionism or the tendency to fit lived experience into linguistic or conceptual descriptors.

For Merleau-Ponty, the encounter (fr. *la rencontre*) is the moment when sense arises through bodily engagement. It is pre-objective, meaning the phenomenal body meets the world through action in an already meaningful context [42]. This resonates somewhat with recent theories of predictive processing [12] where the idea is that the brain is continually building models of the world to anticipate sensory input. But the encounter is bidirectional: by touching the world, the world touches me; by seeing I am also visible; by playing an instrument I am also being played by it. Merleau-Ponty calls this reversibility "chiasm" (intertwining).

Relatedly, Gadamer describes understanding itself as an encounter, (*g. Begegnung*). It is a transformative dialogical event that unfolds beyond our control. The encounter precedes method or rules, and emerges through perception and openness to the other. Understanding is therefore productive, not descriptive, resisting full articulation or closure [18].

Husserl, the founder of phenomenology, was deeply suspicious of the conceptual nets of scientific abstraction. He criticised the methodology of science as a "surreptitious substitution," where the lived world is substituted for constructed, abstract models of science. This way of thinking is for Husserl to "take for *true being* what is actually a *method*" [23].

4.2 Articulating the Introspective Body

The encounter is irreducible and asymmetrical, prior to cognition, ontology or interpretation. It resists thematisation or phenomenological description. It is a moment that cannot be mastered. Yet we need to and that's what we do when we engage with the world and try to put our experience into words. Admittedly, in music, we don't put our experience and thoughts into words, but express them through the music itself, but the goal is different when describing, analysing and explaining.

The theoretical formalisation of the encounter derives from phenomenology, and we can use it to understand the embodied context in which we operate. Postphenomenological notions of human-technology relations are fruitful here too [24]. The recent development of the microphenomenological method also presents itself as relevant for digging into the fine-grained structure of lived experience [55]. But here, too, we must be aware of method, of applying conceptual frameworks or methodological processes onto what is always beyond comprehensive description. For example, following a line of thought can overemphasise an insight that might be contrasted by another view the interviewee could equally provide.

Stimulated recall is another method of user introspection, where the instrumentalist is asked to revisit a past activity while being prompted by a recording of that activity, for example in the form of sound or video [10][34]. The same goes for a method called "think aloud," where participants are asked to verbalise their thoughts in real-time while performing a task [29].

Manning provides a comprehensive art research reading of speculative pragmatism, arguing that making is thinking and vice versa. She points out Whitehead's scepticism of organising experience, but the point is not that we should refrain from it, but rather become aware that we are "creating new orthodoxies" by so doing. Method cannot be imposed on a process from without, but should rather emerge from the experience itself. Manning then suggests a method of close-reading, inspired by Russel's "hypothetical sympathy," seeking to feel the perspective of the other. "Another kind of stand must be taken, one that erupts from the midst, one that engages sympathetically with the unknowable at the heart of difference, one that heeds the uneasiness of an experience that cannot yet be categorized" [41].

4.3 Wherein Lies Meaning?

Who is the "experiencer" behind experience? What is the nature of the self that undergoes this so-called "pure experience"? If thought systems from Buddhism to contemporary cognitive science see the

self merely as a useful illusion, *what* is it then that perceives and constitutes that meaning? As noted above, Nietzsche saw experience as something that is always already subject to interpretation. He saw the self as a construct of thought, not its cause: a by-effect of Indo-European languages that always need a doer for every deed, an agent for every activity [48].

The Nietzschean philosopher Gilles Deleuze thinks through the phenomenological encounter from this perspective. He claims that difference is the fundamental state of the world, yet we tend to focus on identity and essence. There is no solid self that perceives the world through pure experience, but rather subjectivity as an effect of encountering the world. This is centred around our notion of the encounter, described by Deleuze as "[s]omething in the world that forces us to think. This something is an object not of recognition but of a fundamental encounter. … [The object of encounter] is not a sensible being but the being of the sensible. It is not the given but that by which the given is given" [14].

Phenomenology cautions against framings that treat experience as something pure, residing internally in the subject, waiting to be excavated and expressed in language. The experience of an instrument is shaped by the relationship and the movements and reflections that emerge through that connection. Moreover, the encounter is shaped by human relationships of those present in the space, but also by wider societal reputation, media representation, etc. Even the space itself is not neutral: it is the condition in which a form of participatory sense-making happens [13]: the meaning of the experience is not solely within the instrumentalist, nor between the instrument and instrumentalist, but it extends out to a much more complex and spatial ecology of sense-making.

4.4 The Extended Encounter

Considering the above – the conceptual framings of experimental metrics, the impossibility of measuring experience through language, the difficulty and complexity of gaining descriptions of experience through introspective techniques – are we then doomed to have no access to, nor potential to express, this experience? Is the message one of solipsism and nihilism of human communication? Quite on the contrary: the aim here is to point out that many of these methodologies applied to the study of new musical instruments are generative and useful instruments for understanding – including quantitative studies, qualitative studies, stimulated recall [34], microphenomenology [55], grounded theory [1], think aloud methods [29], situated action [44], participatory design [43] – but that we need to be aware of the classification regimes that form when we apply them. For, indeed, classifications order human interaction, shape their language and behaviour, form political agendas and divisions, and are necessary as such, but the byproduct is that they are often kept invisible and will always valorise certain points while others are silenced [8].

In the extended encounter it is therefore important not to implant words into the person encountering the instrument. Ban words would include "expressivity," "musicality," "user-friendly," "agency," "embodied," "communicative," "goals," "mapping," "controllability," etc. More important is to hand over the instrument, sit back and listen. Talk around the instrument in general language, introduce it without any jargon, don't describe it or explain its "purpose," and focus on what emerges through play. Here one can observe the musical ideas and musical gestures form in the person playing the instrument, but keep quiet, listen to their feedback, and possibly suggest the "talk aloud" method.

What the extended encounter proposes is to pay mindful attention to the entire experimental context, including the background and social relations of the people involved, and how every signal, message and sign will influence the perception of the study. How is communication with participants established, of what type is the environment, are people relaxed and is there plenty of time, how welcoming and prepared is the team running the study, what is the weather like? Attention to all of this is essential in the first encounter, as it will arguably shape the experience as much as the instrument itself. Picking up an instrument is then like meeting a new person, or an animal, for the first time: a connection is established and then there is a process of search, improvisation, dance of agencies and collaborative sense-making that shapes the promise of an expressive relationship. Alien (new) signals are being perceived and classified into symbols. All this must be studied and noted by the designer through a stance of empathy with the instrumentalist who is given the time and space to discover and *dwell* in the instrument.

During the encounter some form of a "user study" can be conducted, ideally after a good period of time, but the researcher has to be aware of the limitations of language and the particular framing of their questions that is bound to be *their take* on the instrument, role of music and musical goals – something that might be very alien to the imagination and experience of the instrumentalist. Think aloud, microphenomenology or stimulated recall are all good methods, but depending on the research focus, it might also include other quantitative studies and quantitative schemes.

The encounter with an instrument requires more than a single session; it unfolds over an extended period of time. There is much to digest. What happens when the instrumentalist leaves, what reflections take place, how is the web of experience digested until the next encounter? One way of understanding the potential of an instrument then is to lend it out to the instrumentalist, who familiarises themselves with the instrument and builds up a relationship with it. The instrumentalist might get some studies or exercises to practise, but ideally, they would design these exercises themselves, as musical goals and perceptions vary so much that an exercise that fits one person might feel alien to another. To keep a practice journal is a good idea, but, again, that is putting experience into words, so sound recordings, video, drawing or other non-linguistic means are also expressions at par with language. The expression of instrumental experience through music itself should be considered a key method of understanding.

Workshops with the new instrument are a part of the extended encounter. By inviting different instrumentalists to engage in a dialogue, play the instrument, share experiences and demonstrate their technique, we gain valuable insight into how the human-instrument relationships are shaped through processes of individuation. More broadly, such encounters reveal how individuals and the environment co-constitute each other through the processes of transindividuation [57]. We observe how a new language and discourse emerges naturally around the instrument during these collaborative sessions.

Finally, the instrumental relationship reaches its fullest expression in live performance on the musical stage. Here, the exploratory

encounter becomes solidified and presented as a piece with a defined form unfolding in time and space. There is a statement in the performative act and it becomes an important nonverbal site of enquiry. Furthermore, the audience's perception of the instrument becomes an object of study, explored for example through observation, discussion, post-performance seminars, online survey or other means. A revealing question in such a survey would be "what question should we ask about this instrument? How would you answer it?" i.e., seeking not to plant ideas in people's minds.

An instrument is an opening up to new ways of thought and expression. Designing one ideally involves a collaboration with an instrumentalist in a participatory design manner [63], to be observant and to continually question the process over an extended period. This design dialogue is a synergetic feedback loop where ideas emerge through a participatory process. The instrumentalist might even be a designer themselves. Knowing and understanding cultural background and context is crucial. Through this process, we become increasingly introspective and attentive to our own thought patterns, technological affordances and constraints, and the particular *hauntographic* spectral layer [54] that remains unarticulated and hidden at various times during the process.

5 Discussion

From a phenomenological perspective, musical instruments are not neutral mediators between intention and sound. When encountering new musical instruments, we do not typically have predefined musical intentions in our mind that need expression through the instrument. Skill, expressivity and sense-making emerge through extended bodily coupling where the instrumentalist's body schema incorporates potential relationships. The sense-making is a process of negotiation with the instrument, as it does not exist independently as a musical standard. Technique, repertoire, notation, pedagogy, listening conventions and social use are co-constitutive.

HCI methods typically presuppose clearly defined tasks and goals, measurable performance criteria, comparability across users and condition, short-term exposure sufficient for evaluation, a separation between user, interface and system output, but none of these assumptions hold robustly for new musical instruments. Any attempt to operationalise terms such as "expression," "musicality," "quality," "user-friendliness," etc. flatten the dimensions that make musical engagement with a new instrument meaningful. The challenge, therefore, is not to refine evaluation metrics, but to question whether evaluation, in the conventional HCI sense, is an appropriate epistemic tool for understanding emerging musical instruments at all.

Perhaps most critically, evaluation frameworks in HCI tend to assume that the purpose is clear and that the artifacts are stable at the moment of testing. New musical instruments rarely are: they are deliberately unstable, open-ended, resisting standardisation. To use a Deleuzian term again, we engage not only with their actuality but with their *virtuality*; our understanding of the instrument is never complete or settled, but remains in formation. We are engaging with the potential of a new relationship, the projections of future actions, the structured possibilities of new not-yet-actual worlds. Instead of projecting the instrumentalist as a rational agent with clear logical tasks in mind, we need to understand the implications that posthuman HCI suggests, emphasising the relational and the ecosystemic [60]. This also involves understanding recent developments in material anthropology, psychology, sociology and cognitive science alike, in which the thinking is seen as "thinging," [40] and we begin to appreciate and understand now our technological tools, natural language and external systems affect the way we think musically [35].

The extended encounter challenges the belief that any evaluation metrics can give an answer to questions posed of an instrument. For the first, the metrics are too crude for describing inner experience, secondly, they are concepts of interpretation and difference, and thirdly, they are bound to paint too narrow a picture of the multiplicity of potential meanings that the relationship affords.

6 Conclusion

At the very end of his *Tractatus*, Wittgenstein [61] uses the metaphor of the ladder to explain that the reader, who might by now have understood his propositions, needs to throw away the ladder having climbed up on it. Surmounting the propositions, the reader can become free and see "the world rightly." The idea here is that a theoretical framework is just that: a framework, a perspective. Nietzsche knew this and offered the view of perspectivism, i.e. that all theories frame the way we arrive at truth, and truth is therefore always an interpretation [46]. Data never "speaks for itself" and methodologies are therefore always interpretive strategies.

In that early work, of the Tractatus, Wittgenstein famously also stated that we should "remain silent" of the things we cannot speak of. This philosophy is the epitome of the idea that the world consists of clear-cut states, objects, properties and events that can be expressed in language. He later rejected this view. What the extended encounter of musical instruments might state instead would be the phrase "whereof one cannot speak, thereof one must play music," i.e., emphasising that the musical output is a very important non-linguistic object of study when studying musical instruments.

The purpose of this paper is not to reject HCI methodologies. By kicking against methodology, we point out that methods are enframing processes that shape the way we think of the subject we are dealing with. Methodologies and their diverse techniques are excellent instruments in our toolbox, but they are nothing more than that. The critical designer needs to do more than adhere to a method: they need to listen intensively, to pay attention, to care and empathise, to step out of their musico-technical frames of mind. They need to observe the encounter and understand how an instrument begins to dwell in its user, to slowly reformat the mind towards the qualities of the instrument itself.

The *extended encounter* is therefore a metamethod: it does not reject methodologies such as participatory or speculative design, but it posits that a strong awareness of its ideological framework will colour our perception and classify our experience. Since it unfolds in time, and over a long period, there is no end to the extended encounter. The encounter is an event of disclosure, where the instrument presents itself through embodied engagement characterised by affect and minute perceptions and projections.

Phenomenology and micro-phenomenology are strong methods here, but these too enframe. What is needed is attention, focus, relinquishing of the self's priors, care and an understanding of a human-world situation that transcends subject-object classifications. Methodology is ultimately like music theory: it is not needed, but it can be helpful and it can clarify, speed things up, and establish shared

language, goals and directions. However, we acknowledge the limits: theory is just a blurry map of the territory and actual practices always go deeper and beyond what a theory can represent.

Ethical Standards

This paper reports of ongoing research conducted at the Intelligent Instruments Lab at the University of Iceland. All our experiments are approved by the Ethics Committee of the University of Iceland. No animals, plants or underage individuals have been part of our experimental work. No AI was used in the writing of this paper.

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