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Title **Seismographic imaging via the *ethnogram*: The potential of tailored ethnographic techniques in architectural education to capture below-the-surface user experiences**

Authors **Ruth Stevens**
Hasselt University
Belgium

Micheline Phlix
Hasselt University
Belgium

Jan Vanrie
Hasselt University
Belgium

Abstract Set in an architectural design educational context, this paper contributes to tackling the current weak spot of grasping and including future users' socio-spatial experiences in the early design stages by tailoring ethnography to this particular field of architectural design. To capture below-the-surface experiences, we bring together ethnographic research methods and architectural design, steered by the Design-Based Research (DBR) theoretical framework (Euler, 2014), fostering an educational learning aim and providing a handhold for the fuzzy front end of the architectural design process, enabling young designers to collect rich, below-the-surface user data.

We first conducted a literature review in ethnography to explore how current techniques should be tailored to the specifics of the architectural design context. Next, we empirically tested these tailored techniques for three consecutive rounds in the educa-

tional design context of a master seminar. The seminar's participating master students in (interior) architecture developed and executed three ethnographic studies to capture below-the-surface user experiences in three different spatial and social contexts, exploring three different design challenges. These iterations led to (i) the design principle of 'seismographic imaging', an approach characterized by applying a well-balanced mix of tailored ethnographic techniques to capture and interpret rich, below-the-surface user experiences. Reflecting on the benefits and challenges thereof resulted in (ii) the development of a design tool, the "ethnogram", which can be introduced in the architectural design studio, to aid design students in developing a well-balanced mix of tailored ethnographic techniques considering a specific spatial context, target group and design challenge, and necessary to render designerly rich user data.

That way, this paper fulfills an identified need for methodological educational strategies regarding the collection and integration of user experiences in the early design stages of an architectural design process in an educational context and contributes to the theoretical understanding of the possibilities of the DBR model.

Keywords Architectural design education, Design ethnography, Seismographic imaging, spatial design research, user experience, DBR process

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Seismographic Imaging via the *ethnogram*: The Potential of tailored ethnographic techniques in architectural education to capture below-the-surface user experiences

Ruth Stevens, Micheline Phlix, Jan Vanrie

1.0 Introduction

While rooted in a very human(e) tradition (Salama, 2017), Imrie (2003) criticized the architectural design process for being 'depopulated'; according to Van der Linden et al. (2018), this hints at the fragile understanding of architects regarding the perspectives of their users resulting in the implicitness of user experiences as a dimension in the design process. This can be partially explained by the increasingly complex design process in which architects have to take into account various requirements and regulations, causing user experiences to risk getting overlooked, and in which users are often not the clients that 'commission' the design and realization of a future building, e.g. in school environments or residential care (see Stevens et al., 2019). On the other hand, research still points to the difficulty designers have in empathizing with a possibly distant or heterogeneous target group, e.g. older people from diverse backgrounds. Paradigms such as Universal Design, Design for All (Heylighen, 2014) or Design for Human Flourishing (Stevens et al., 2019) place users' experiential and psychological needs at the forefront of the design process; however, in many cases these particular needs still need to be captured via extensively studying the user groups. Such a research phase could be tackled by ethnographic research methods. These methods hold the power to deeply immerse designers into the lived experiences of their target group in their natural environment (Pink et al., 2022), which we argue to be crucial to understanding not only how end-users behave in their environments but also to capture what we call "below-the-surface user experiences", i.e. thoughts and feelings about (using) the environment that are mostly covert. The latter are crucial to enable designers to shape and design environments and their spatial characteristics aligned with users' particular experiences and needs.

However, such methodology should align with the ways of working of architectural designers. Looking at this from a design process angle, the research-based approach will need to complement the intuitive

approach that architectural designers adopt (e.g. Till, 2009; Van der Linden et al., 2019). While embracing its potential, such an intuitive approach can be imbued with stereotypes (Buse et al., 2017; McGinley et al., 2022; Park & Porteus, 2019). Moreover, given the diversity in target groups of users, designers' personal views and experiences are inherently limited (Cranz, 2016). The potential pitfall is ever more present among young designers or design students, whose intuition is still being shaped, but who can learn from practice (Sloane & Krakau, 2021). In that particular case, in the educational setting, we see the need for a more structured, research-based approach to enrich the early stages of the design process, while also seeing the potential of an adapted ethnographic approach to nourish the intuitive potential of students and steer it towards more profound and genuine understandings.

Thus, we assume that a more research-based approach to design pedagogy should start by integrating ethnography into design education to tackle the hiatus of students' underdeveloped understanding of user perspectives. To steer our thoughts towards a design principle and a tool, we apply a Design-Based Research (DBR) process of Euler (2014) in developing our ideas and formulate the following research question: How can the use of ethnographic methods foster the collection of rich and balanced socio-spatial user data in architectural education?

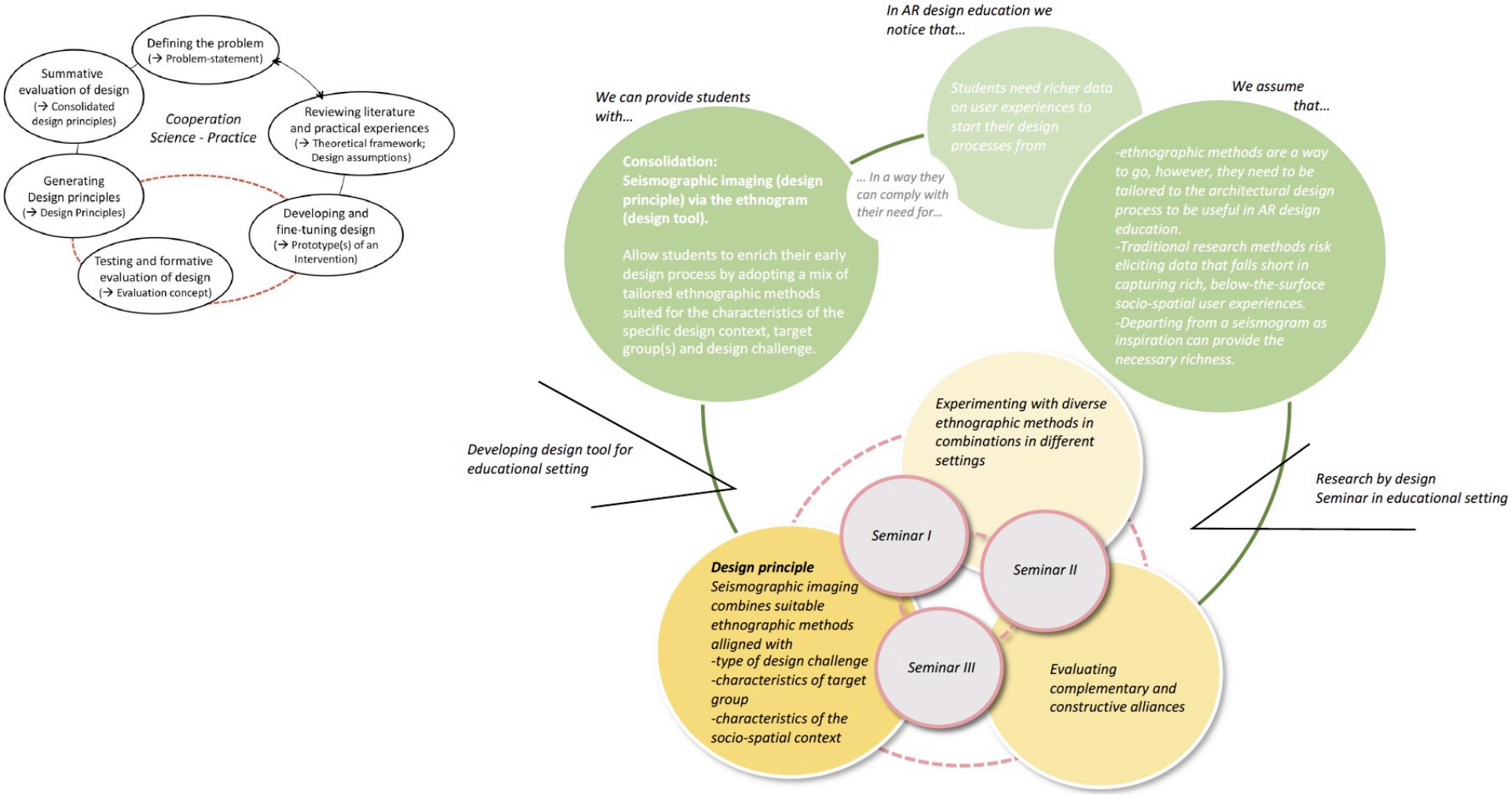

Figure 1. *Original DBR Process of Euler on the left and its application in this study on the righ*

In this paper, parallel to the stages of the DBR process, we aim to:

(1) sharply define our assumptions on what 'design ethnography' should entail in the field of architectural design education

(2) by developing a design principle and a tool that combines a mix of tailored ethnographic research methods with the architectural design process.

In order to do as such, we applied the DBR process and incorporated an additional loop in the process in addition to the iterations inherent in the DBR process of developing, testing, and generating (see Figure 1, left). By conducting this sequence three times across three distinct design challenges we were able to involve different participant populations in each instance.

In the next stages of this paper, we will conduct a targeted literature review on ethnography in design education and engage in a design exercise we repeated three times (see Figure 1). We conclude this paper by reflecting on these goals to create avenues for ways to include ethnography in the design studio of an (interior) architectural educational program.

2.0 *Seismography* as an inspiration to approach design ethnography in education

To start answering our first research aim, we first need to conceptualize ethnography in design by stating how it should be approached in this particular context. We state that capturing and interpreting daily goings and spatial user experiences of the target group(s) could be conceptualized as a seismogram, which is (in its most literal definition) a record of seismic waves. A regular seismogram is made by a seismograph, which measures ground motion along three axes, visualizes these via three complementary lines, and allows to detect frictions at and below the surface of the earth. Interesting here is the fact that the seismograph registers all waves that occur simultaneously, whether small or significant, generating a complete image of movements over a period of time. While minor ground shakings might seem trivial or unimportant, the recurrence or combination with other movements might help the interpreter to conclude potential dangers ahead. The similarity to a humane approach in design and a focus on user experiences therein is striking. While, talking to people, isolated anecdotes or seemingly insignificant experiences might seem too personal to be of use in a design process, combined with other experiences or other types of information (e.g. a photo taken by a respondent or a drawing) a broader and more detailed image can be rendered of experiences of a heterogeneous target group in a particular environment. Concretely, to generate insights into the nuanced phenomenon of a spatial aspect that influences the experience of users, we envisioned composing a seismographic image, via *seismographic imaging*. In this case, a seismographic image registers not only the human frictions and synergies

above the surface but also the small frictions and synergies just below the surface that seem to pass unnoticed to 'the naked eye' or to one's intuition; they seem insignificant when isolated, or are dismissed by the great majority, but can influence the personal experience. In alignment with the first research aim, we propose that ethnography can be made accessible to design students by framing it as a process of capturing and synthesizing both overt and covert frictions in human behavior within a given environment as well as by examining interactions between individuals and their experiences within that environment – much like the workings of a classic seismograph, which records subtle and surface-level movements.

To do so, the regular techniques that have seemed to be inserted in the educational design context over the years, such as the interview and observation (e.g. Van der Linden et al., 2018), risk being too limited in the way these are approached today. We hypothesize that a combination of techniques could render more in-depth, below-the-surface insights and thus a holistic image. Moreover, studies (e.g. Cranz, 2016; Stevens et al., 2021b; Stevens, 2022) have shown that some social research methods are in need of tailoring or altering to fit the specific characteristics of the architectural design discipline. Especially the large scale of architectural design challenges, the greater costs and longevity of the realizations point to the necessity to explore the individual but also a broader, more societal potential of ethnographic methods.

To continue and work towards answering aim 1, we drew inspiration from ethnographic research methods and tailored these to fit and simultaneously broaden the field of architectural design.

2.1 *Tailored* ethnographic techniques to capture user experiences

An ethnographic method is "*a particular activity in research, such as an interview, observation, video-recorded walk or other creative mode of generating knowledge with people*" (Pink, 2021). In order to 'practice' seismographic imaging and thus design ethnography in an architectural context, we argue that some ethnographic research methods require 'tailoring' so that the data they provide become useful in the architectural design process. Below, we discuss six ethnographic clusters of methods that were tailored to the architectural design discipline.

Eliciting interview techniques

To tailor interview techniques to an architectural context, one should stimulate the conversation during an interview and draw attention to the spatial and tectonic aspects (regarding materials and their structure) surrounding respondents. We advise the use of eliciting aspects such as photos to nudge towards a more dynamic interview style, incorporating moving around and immersing in the surroundings.

Such a tailored technique is a *photo-elicited interview*, using photographs or other visuals as stimuli during the in-depth interview. It

evokes emotions and memories (Copes et al., 2018) and allows researchers to access participants' experiences, feelings and perceptions in a particular environment (Coleman et al., 2016). In particular, participant-driven photo-elicitation brings participants more in charge of what will be discussed during the interview, thereby activating and empowering them (Copes et al., 2018). Another approach in the architectural context is to give participants a well-described photography task, and thereby explicitly let them photograph spatial aspects linked to a certain topic, for instance 'memories of one's childhood'. Nudging participants to make a direct spatial connection in this technique also offers a handhold during in-depth questioning (Banks, 2001), which can be especially useful for young, inexperienced design students or designers. Overall, this elicitation in the interview allows for a deeper understanding of the experiential counterpart of the physical environments more than traditional methods that do not use visual stimuli (Copes et al., 2018).

Another tailored, more dynamic interview technique is the *walking* interview, in which a researcher accompanies a participant on a walk around a specific location (Kinney, 2017). The researcher or participant can choose the walking route and define whether the route is structured, unstructured, or even undetermined (Evans & Jones, 2011; Lőrinc et al., 2021). This is particularly useful as the environment serves as a prompt during the interview, generating spontaneous data concerning spatial practices (Lőrinc et al., 2021). Moreover, it allows insight into participants' experiences and feelings within a particular area (Evans & Jones, 2011), spatial practices (Kusenbach, 2003) and spatial routines (Lőrinc et al., 2021). In addition to its value for place-related research, the walking interview is also valuable in uncovering the 'social architecture' (i.e. social relations and hierarchies in a particular place) (Kusenbach, 2003).

A third option is a *playful* interview. Here a playful atmosphere is created to serve as a medium in which the interview is conducted. For instance, with kids in a school context, they are asked to answer questions by switching seats in the classroom or throwing a ball. The technique is often applied to a young audience (e.g. Koch, 2019). Applied to other target groups in design research one should keep in mind to conduct the interview within the researched setting and to also make use of that setting during the interview.

Real-life role play

The tailored technique of real-life role play is based on the classic method of role play. It is often applied in medical sciences to practice caregiver-client discussions and helps participants to become aware of others' experiences. To tailor it to design, we suggest to organize a role play in the researched setting and include real persons present in that environment. In that way, the environment serves as a stage that enables and shapes the role play and allows to capture authentic experiences. For researchers, it offers insights into the authentic experiences in the daily realm of participants. For participants, it offers the opportunity to reflect on the experience while it is unfolding itself and afterwards. Thus, this tailored technique increases the understanding and experience of participants about the design context. Moreover, we believe that it can generate an embodied and common understanding of

the developed ideas (Rodríguez et al., 2006), once applied in actual designing.

Anecdotes: the daily experiential tour

Anecdotes can be defined as "*a naturally occurring story*" (Kurtz & Snowden, 2003) or "*a short account of an incident, especially a personal or biographical one, as well as a particular or detached incident or fact of an interesting nature, a single passage of private life*" (Johannes & Neis, 2007). In scientific research, anecdotes are often referred to as "*the weakest element*", but the anecdote can be of great merit to architectural design research. Tailored to the architectural context, we stimulate eliciting anecdotes that are supported via objects, which makes them more evidential (see Gigerenzer, 2015). Additionally, researchers should steer the participant to explicitly share the fully formed and developed narrative of the spatial context in which the anecdote took place, to embed it with emotions and meaning and link it to spatial characteristics (Yip, 2016). Via sense-making exercises, implicit and explicit information on for instance spatial experiences can be extracted from anecdotes (Yip, 2016).

Interactive boundary objects: *Intuitive drawings, mock-up making*

Boundary objects are objects that carry "*different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable as a means of translation*" (Star & Griesemer, 1989, p. 393). These objects are often used in research as a stimulus in interviews. Here, we tailored the technique to design research by using sketches made by or with the participant. Drawing and sketching are excellent arts-based research methods for idea generation through their inclusivity, their ability to 'see' an object in its context and to capture how we see and remember the world and meanwhile leave certain aspects blurry. Henderson (1991), Perry and Sanderson (1998), and Barley et al. (2012) studied how sketches, CAD models, and physical prototypes work effectively as boundary objects to negotiate objective geometry; however, there is potential to also use it to discuss subjective opinions.

As we go beyond using the sketch as an objective interpretative item, we experimented with *intuitive* drawings that aim to capture subjective experiences. *Intuitive* drawings are to be used to elicit discussion on the interpretation of certain spatial characteristics such as size, texture, etc., and function as boundary objects to link anecdotes to them. Moreover, they can be used as a research outcome in itself.

Mock-up making is a similar, but even more sensory method in which participants are challenged to find the physical counterpart of their intuitive, imaginary world while making actual connections between their fictional ideas and the real, sensory world (Marco et al., 2021). For instance, how can participants materialize a 'soft playground', what shapes, what textures and colors connote the mental image of 'softness'? Here, participants attach spatial characteristics to their proper experiences and emotions, contributing to a sensory ethnography.

Observations

Observation is an immersive method in which the researcher aims to understand the real-world context and executes a detailed analysis to discover and describe complexities and shared cultural nuances of the social world (Jones & Smith, 2017; Manning & Kunkel, 2014). One can take an overt approach, in which the participants know they are being observed, or a covert approach, in which the participants are unaware they are being observed. Moreover, the researcher can take a participant approach or an observer approach, pointing at the levels of integration of the researcher (Jones & Smith, 2017). Tailored to design research, a particular focus should be placed on the interaction between a person and the physical surroundings, and researchers should approach the environment as an 'observant' as well.

At this moment, we have explained *how* ethnography in design can be conceptualized, i.e. via seismographic imaging, and we have explained how, in our view, existing ethnographic (clusters of) methods ought to be tailored to the discipline of architectural design research. Thereby, the first research aim is answered. However, we have not yet established ideal combinations of tailored techniques. To further develop seismographic imaging into a design principle, we need to reflect on how ethnography ought to be applied in a particular design challenge. This corresponds to the second research aim we posed, which will be further addressed in discussing our empirical explorations of seismographic imaging.

3.0 Empirical studies: Explorations of seismographic imaging in the master seminar context

Following our theoretical exploration of seismographic imaging and thus in validation of our initial assumption, the Design-Based Research (DBR) model (Euler, 2014) advocates empirically exploring this design principle through an iterative process. In our architectural design context, this iterative process was conducted through a spatial design and research seminar involving master students in (interior) architecture. To ensure methodological rigor, we organized a sequence of three research-by-design seminars. During these courses, the iterative steps of the DBR model of "prototyping and experimenting with ethnographic methods," "evaluating the combinations", and "articulating and generating the design principle of seismographic imaging" were systematically followed and cross-analyzed. This culminated in the final consolidation phase, during which the ethnogram tool was developed and formally presented.

In the next part of our paper, we will report on our findings by first sketching the context of three master seminar courses in which we experimented with seismographic imaging, followed by explaining how combinations of tailored ethnographic techniques were created in each of the three seminars.

3.1 The research context

As our testing ground, we opted for the spatial design and research seminar ***** for master students in Architecture and Interior Architecture at the ***** of ***** University. The master seminar is a one-semester course with 8 to 9 ECTS that runs from September until January.

In this seminar's set-up, students typically study a particular case from a human-centred design perspective. Students conduct a spatial design research study in which design is embedded within the research process and used to gain new insights (Van de Weijer et al., 2014). In the end, the students deliver their research output and a conceptual design intervention that can vary in scale and size but needs to include volumetric and materialization studies. A master jury is organized with tutors and the stakeholders of the case concerned. To conclude the seminar, a closing moment is organized which involves the target group of the particular case in a more active way so that limitations and avenues for further investigation can be identified.

Three seminar editions between 2020 and 2023 were organized with specific attention to experimenting with ethnographic techniques for architects/interior architects to capture user data and integrate this into a (conceptual) design outcome. Didactically, the applied ethnography was designed to ensure a more profound understanding of the experiences, preferences and needs of the users involved and a deepened spatial understanding of the host site. Tutors relied on their research experience in social science and practical experience in design science to guide the students towards selecting tailored ethnographic techniques to connect with the design challenge. In Table 1, more information on the participants, the host site and the design challenge is given.

Table 1. *An overview of the characteristics of each seminar*

Name seminar	Number of participating students	Design context	Target group	Design challenges	Scale of intervention
I.	7 AR & 12 IAR	Primary school_pavillion typology_ rural village	School children 6-12 years old	Spatial interventions to uplift wellbeing	Interior Building ensemble Outdoor environment
II.	8 AR & 10 IAR	Primary school_U-shaped historical building_suburbs provincial main town	School children 6-12 years old	Outdoor interventions to uplift wellbeing	Playground, roof terraces
III.	7 AR & 11 IAR	Residential superdiverse, social neighborhood_outskirts provincial former mining industrial town	Inhabitants from 0 to 99 years old, superdiverse population	Rich programmatic interventions in public and private environment to bring inhabitant together	Private interior Private outdoor environment Public outdoor domain neighborhood

3.2 Three studies of ethnographic mixes to engage in seismographic imaging

In this section, we will detail the composition of tailored ethnographic techniques used in each seminar study, critically reviewing the insights gained from each approach and providing recommendations for subsequent seminars. These insights also contributed to the refinement of the design principle and the development of a tool. The tutors leading these seminars have backgrounds in psychology, social sciences, or architectural design research, with substantial experience in applying

ethnographic methods to environmental and architectural design research (see Stevens et al., 2019, 2021a, 2021b). The ethnographic techniques were collaboratively designed by the master's students and the seminar tutors.

SEMINAR I_primary school rural setting

In Seminar I, we built insights into the psychological needs of various pupils that co-exist in school contexts and in what way the spatial environment acted in this (i.e. as a mediator, instigator or in another way). A literature review was executed to explore the psychological needs of the target group in general, and the ethnographic research mix was developed to understand (1) how the needs of pupils manifest themselves in this case and (2) in what way these needs strengthen one another or come into conflict. A mix of three tailored techniques was proposed: photo-elicitation, playful interview and observations. During the data collection, the students executed the following techniques:

Photo elicitation:

The design students in the seminar asked the pupils at the school site to photograph their favorite place, the place to go for comfort, the place for quiet conversations etc., accompanied by written keywords explaining their choice, see Figure 2.

Playful interview combined with drawings:

In the playful interview the pupils were presented with a given situation "Where would you prefer to go to when… (e.g. having to read a book/have lunch)?" and were challenged to select a favorite spatial realization out of two possibilities and give arguments for their choice. Finally, they were asked to draw their ideal classroom based on the chosen possibilities.

Observations:

The design students executed observations during the playful interview to screen the level of environmental mastery of the pupils and their behavior in a group.

The rich pallet of collected experiential user data allowed the design students and tutors to define clear conflicts and synergies (see Figure 3) that occurred in the daily experiences of the pupils at school and the effects on their needs and values. Further along in the seminar, these delicate conflicts and synergies were drawn up in an 'experiential passport' of the particular environment, concluding the analysis phase of the design process. Then, via the experiential passport, the students in the seminar were challenged to extract a design challenge based on empowering a synergetic situation and obviating an existing conflict situation (see Stevens et al., 2021b).

Critical review of the mix of tailored ethnographic techniques:

In retrospect, when reflecting on the mix of techniques, it is noticeable that the techniques used were mostly transformed into research actions that focused on person-centred data. A spatial focus was present in linking needs to certain *types* of spaces. In other words, experiences were gauged in particular environmental situations, but the level of spatial characteristics (e.g. sensory qualities, material and volumetric

aspects, etc.) were not particularly touched upon in the research phase but were needed to be brought to the table in the design intervention phase.

The mix of collected ethnographic data rendered insights into the social aspects and personal experiences, but there was still untapped potential in the spatial data that could be collected (e.g., sensory experiences of materials). In other words, more certainty could be gained in the authenticity of the spatial experience of the protagonists if, within the mix of techniques, a sharper focus on more spatially centred data had been included. The latter would help design students to truly connect the psychological needs of the target group to the (re)design of spatial characteristics. These insights were taken into account when composing the mix in Seminar II.

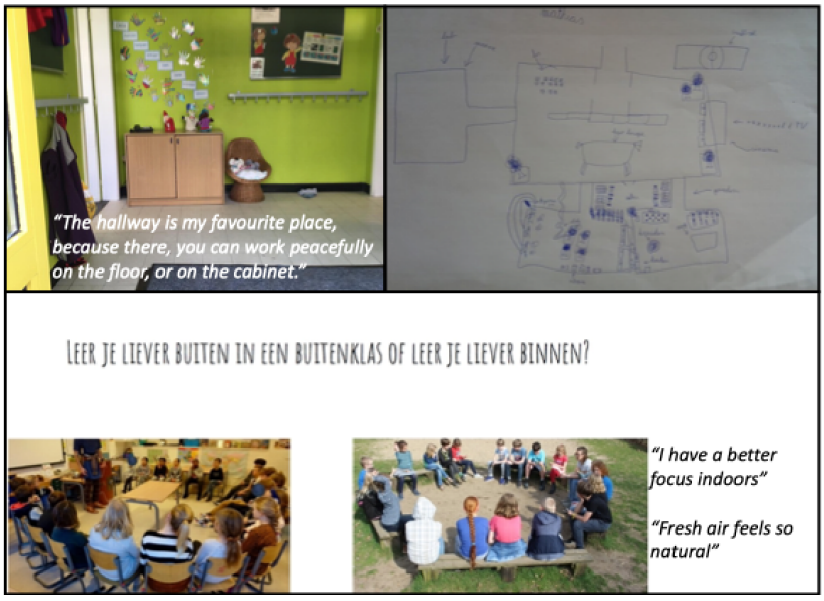

Figure 2. *Results of photo elicitation*

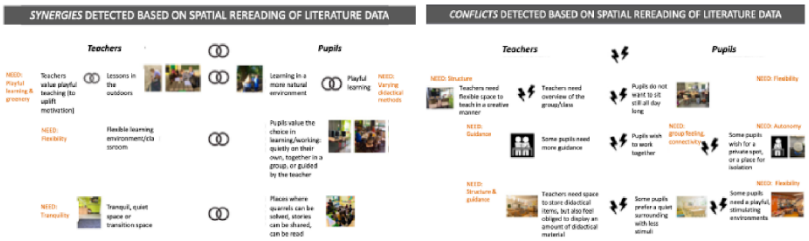

Figure 3. *Example of the synergy and conflict detection identified during observations*

SEMINAR II_primary school urban setting

This seminar focused on understanding what role the spatial characteristics of the environment play in the emotions, behavior and experiences of pupils. In comparison, here the spatial characteristics of the environment were given more attention in this research phase, an insight that we became aware of after Seminar I. Thus, instead of screening the environment for frictions and synergies between the protagonists, in this seminar, the design students explored frictions between

the experiences of the pupils and the spatial reality of their school environment (see Stevens, 2022) in order to find out in what spatial sphere pupils love to study, read, regulate sad emotions, etc. In total, our design students developed seven research actions built from three tailored techniques:

Observations:

With the floor plan of the school as a capture card, the design students observed the daily goings to capture hourly walking lines of individuals and to visualize movement patterns of pupils in a detailed manner throughout the school site (see Figure 4, left). The purpose was to find out at what spots pupils meet and come together or seclude themselves. Additionally, the students executed participant-as-observer, overt observations on the site to capture how certain typical or atypical actions take place in in-between spaces to capture this on the school floor plan as well and added information on the emotions pupils felt therein. For instance, a pupil secludes himself/herself in the restroom when feeling sad. This allowed the students to link emotions and behavior to spatial characteristics, for instance, when some children tend to use a large tree as a cuddling, comfortable space, while others see it as a climbing affordance (see Figure 4, right).

Anecdotes combined with intuitive drawings & photo elicitations:

To find out what spaces were depicted as 'memorable' and what particular tectonic and spatial elements contributed to the memorable experience, the design students collected anecdotes together with a photograph of the space.

Role play:

Several immersive real-life role play experiments were executed to generate authentic information on characteristics of spaces which have the qualities to align with the emotion regulation of pupils, e.g. a place to isolate in case of sadness or in need for concentration or when simply seeking a calmer space to have a private conversation with a friend. Each role play was concluded by a discussion in which pupils generated drawings, sensory descriptions, and photos of the particular spatial environment. As a result, by placing the pupils in a real-life situation, the design students were able to monitor their intuitive actions rather than asking them to envision themselves in a situation.

Figure 4. *Results of observing walking lines and emotions in the outdoor environment*

Figure 5. *Four sets of capture cards from four of the seven research actions built by combining tailored ethnographic techniques such as interviewing, observing, drawing, photographing*

Critical review of the mix of tailored ethnographic techniques:

This mix was based on three different techniques, but in total, these techniques were incorporated into seven research actions. Constructive alliances between techniques were established: for instance, observation combined with intuitive drawings made by the design students, or anecdote collection while respondents had to photograph the spatial environment(s) linked to the anecdote (see examples of the captured data in Figure 5). The seven developed research actions rendered insights into the complementarity of the applied tailored techniques. Assembling techniques in a research action also helped our design students to pay more attention to linking person-centred information to a spatial counterpart. As tutors, we do acknowledge that due to the limited population and a rather homogeneous target group (i.e. school children from 6 to 12), it was feasible to execute a greater number of research actions involving all members of the target group. In line with the efforts, the *seismographic imaging* mix applied throughout this seminar generated more in-depth data and rendered concrete links between spatial aspects and psychological aspects.

As the first two seminars were organized in the spatial design context of school environments, we opted to enlarge the scale and break open the target group for a third and final seminar round. Upscaling could help us check in what way the mix of tailored techniques had to be expanded or altered as well. Moreover, this enabled us to test the feasibility of a variety of techniques when operating in a rather large area with a more diverse audience.

SEMINAR III_residential superdiverse social neighborhood

This seminar focused on creating community connection in a 'superdiverse neighborhood' (see Phlix et al., 2023 for a definition) in a semi-urban context. This design challenge is very broad; it stretches out over a larger spatial area and involves a more diverse user group than in the previous seminars. Creating community connection requires interventions that afford diverse activities in which it is crucial to start from the

socio-spatial user-experiences of the inhabitants, here with the premise that it would bring various groups closer together (Stevens et al., in review). To upscale the *seismographic imaging* in accordance with the physical upscaling of the design challenge, our design students were presented with the 'lessons learned' from Seminar I and Seminar II to base their ethnographic study designs on. Below, the ethnographic mix of this seminar is discussed.

Walking interview combined with photos:

Considering the scale of the study and its focus on the socio-spatial experiences in superdiverse public places, one of the methods introduced was the walking interview. The method is especially relevant considering this seminar's superdiverse context (see Lőrinc et al., 2021). The unstructured participant-led walking interviews through ***** rendered insights into participants' daily experiences in the neighborhood, but also their frustrations and wishes for something to change. For example, in deciding where to go, a respondent pointed towards the cemetery, which elicited a conversation on the – personal – reason for visiting the cemetery (i.e. the loss of her son) and the impact of – spatial – alterations that are currently initiated on her experience (i.e. she regrets the new complexes that are being built there).

Observations combined with drawings:

Our design students observed various places in the neighborhood via a participant-as-observer approach (Jones & Smith, 2017) which rendered descriptive data such as counts of vehicles or people passing by as well as subjective interpretations such as the manner in which people were encountered (e.g. rushed, hanging out, purposeful). Here, the combination of observations and drawings proved valuable as it enabled students to visualize their findings. The observations were useful in capturing small synergetic or frictional socio-spatial (inter)actions (e.g. cab drivers getting lost, quarrels in the street) and helped depict a meta-view of the neighborhood's functioning, which allowed students to position the in-depth, personal experiences from the interviews in 'the bigger picture', see Figure 6.

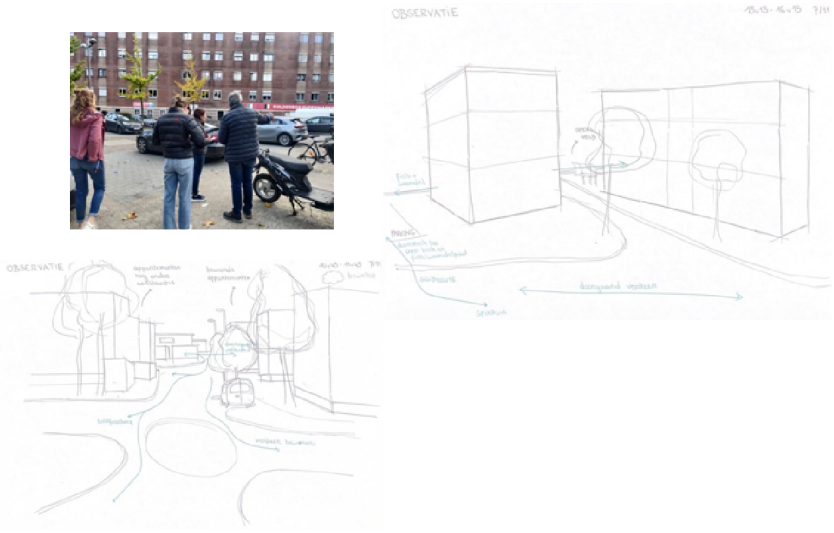

Figure 6. *Picture of a walking interview and drawings the students made to capture daily goings and the way the spatial and social environment interacts*

Critical review of the mix of tailored ethnographic techniques:

In Seminar II, we selected three tailored techniques with which the design students together with the tutors created seven research actions. In Seminar III, the design students and tutors opted for a 'less is more' approach, while dealing with a more diverse and enlarged target group and a larger design context. Thus, the number of techniques was reduced while aiming for the best assemblage when building research actions. For instance, the walking interview was participant-led and even though it was the very beginning of the interview, having the power to decide where to go during the interview as well as having the surroundings as a stimulus resulted in the participant sharing rich, in-depth data early on in the interview. Moreover, the constant confrontation with the physical reality of ***** while sharing personal details during the walking interview allowed participants to reflect on their residential path throughout their lives:

"*They are cutting down trees everywhere and… So, I lived there at the end of the street, on the right. I lived there briefly. First I lived in *****, then this was built*."

Within the walking interview, the respondents were also asked to take pictures of specific aspects of their environment that could later be used as a boundary object. A similar take in the observations rendered various complementary types of output.

Reflecting in retrospect, while toning down the number of techniques, more variations were sought in the execution of the techniques, and techniques were adapted to the age and capabilities of the respondents. The *seismographic imaging* mix of techniques here generated rich in-depth data, and the various techniques seemed to activate the target group to truly get in touch with their personal experiences.

4.0 Towards a design tool: Introducing the *ethnogram* to practice seismographic imaging

4.1 The ethnogram

Building on the empirical exploration of seismographic imaging as a design principle (Part 3), we now address the second research aim. To effectively implement seismographic imaging – capturing below-the-surface socio-spatial user experiences in early design stages –ethnographic methods must be adapted to architectural practice, strategically integrated, and responsive to key variables such as target group diversity and the scale-specific challenges of the design context (Stevens et al., 2021a, 2021b; Stevens, 2022; Phlix et al., 2023; Cranz, 2016).

However, to advance towards practical implementation within the educational design context, further development is necessary. Currently, a systematic framework for determining the types and combinations of techniques that can best support design students in navigating the

fuzzy front-end of their design process is lacking, particularly in gathering comprehensive user experiences. To address this gap, we introduce the 'ethnogram' – a design tool derived from the three aforementioned studies that categorizes valuable, design-tailored ethnographic techniques for the architectural context. This tool is designed to guide design students and their tutors in selecting a suitable mix of ethnographic techniques to capture both overt and more subtle user information within an architectural design framework. Its application aims to illuminate the process of creating well-rounded, context-sensitive user insights, as illustrated in Figure 7 below.

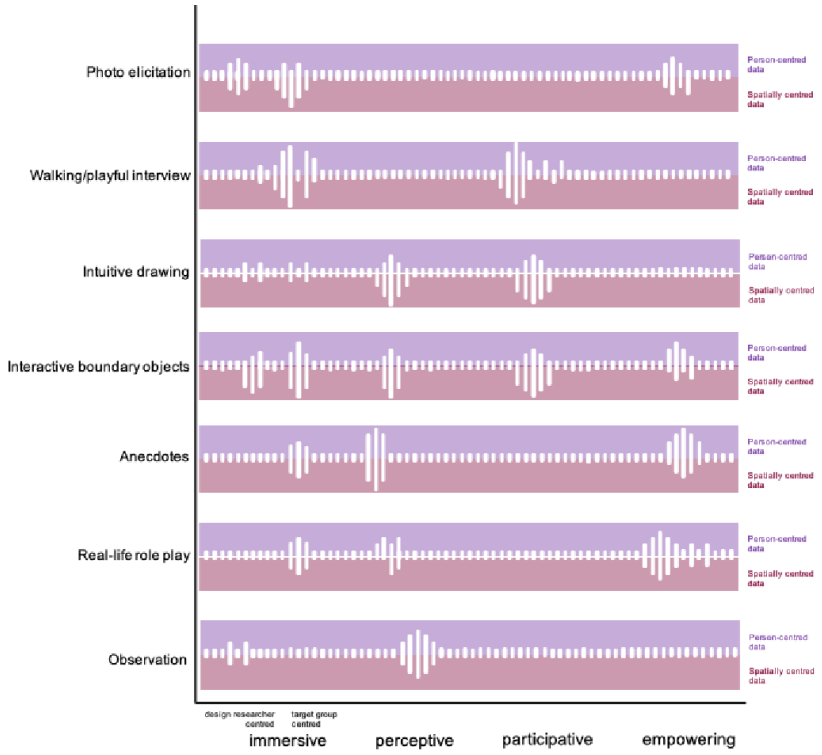

Figure 7. *The ethnogram including all tailored ethnographic techniques*

In designing the tool, we opted for an adapted visual language of an authentic seismograph.

Firstly, on the vertical axis of an authentic seismogram three lines reflect the measurements of north-south, east-west and up-down motions of the ground. All three lines together generate a full perspective of motion that occurs. Here, for the ethnogram, we opted to have each of the tailored ethnographic techniques that ought to be included departing from the vertical axis as well. When assembled together, the tailored techniques in the ethnogram can make up for a much fuller perspective of user experiences.

Secondly, the horizontal axis of an authentic seismogram represents time, so it gives information on the time and frequency of motions that are detected, which can be read as bulges in the line drawing (i.e. a line that remains flat when no motions are detected by the seismograph). The horizontal axis of the ethnogram, on the other hand, provides information on the level of involvement of either design students and/or the participants in executing the research action corresponding

to that particular technique. The level of involvement can be characterized over four dimensions, as identified throughout the seminar experiments: immersion, perception, participation, empowering. When a technique should foremost foster a certain dimension (e.g. immersion of a participant), the flat line drawing bulges when it reaches that term (i.e. 'immersion').

These dimensions can be explained as follows: The first dimension is 'empowering', which concerns the level up to which the traditional top-down power relation between researchers and participants is challenged, for example by allowing participants to bring forward topics that will be discussed during an interview. The second dimension is 'immersive' explaining up to which level the researcher is truly immersed in a research context (i.e. design researcher-centred), and /or the participant is immersed (i.e. target group-centred). Indeed, certain techniques ensure the immersion of participants in a research activity, for instance by asking them to generate combined data such as visual material (e.g. photos taken) combined with oral explanations and drawn additions to the photos or when executing role plays. The third dimension is 'perceptive', which implies a more central role of the design researcher, with an accompanying, momentary reduction in the focus on the target group. This way, there is room for researchers to make their own interpretations and to appeal to their artistic creativity, in line with our aim of delivering a complementary education approach. The fourth dimension is 'participative' pointing at up to which level the target group is enabled to participate in research activities, facilitating contextual understanding by the researchers, e.g. designing, scenario thinking, drawing, photo taking, etc.

Thirdly, in a regular seismogram, the magnitude of the respectively detected motions in the earth is visualized by the amplitude of the change in the line drawing. In the ethnogram, the amplitude stands for the level up to which the execution of a technique suits a more person-centred or spatially centred focus. Indeed, the tailored ethnographic techniques are not only characterized by the four dimensions of the level of involvement of design students or participants but also by two additional dimensions that state that a technique delivers either more spatially centred data or person-centred data. To enter this in the ethnogram's visual language, the line is divided in two branches. The upward amplitude stands for 'person-centredness' and the downward amplitude for 'spatially centredness'.

Thus, to conclude, on the vertical axis, a design student can enter the techniques they aim to use, and on the horizontal axis, they can further concretize via the amplitudes in the line-drawing the level up to which the researching design student and/or participants will be involved and if the design student aims to foster a more person-centred or spatially centred outlook and thus set of data.

Thus, on a meta-level, looking at an ethnogram as a whole, the assemblage of amplitudes will render an image of how balanced the tailored ethnographic mix is.

Note that out of each tailored technique, various research actions can be concretized, resulting in visual variation within the amplitudes in the ethnogram.

4.2 Working with the *'ethnogram'*: a three-step process of assembling techniques followed by characterizing them and evaluating the mix

The three seminars showed the value of combining multiple ethnographic techniques in the fuzzy front end of the design process, in which socio-spatial user data should be gathered. Yet, helping design students find the right balance in such an ethnographic mix of techniques requires further attention. Below, in retrospect, we have drawn the ethnogram for each of the three seminars:

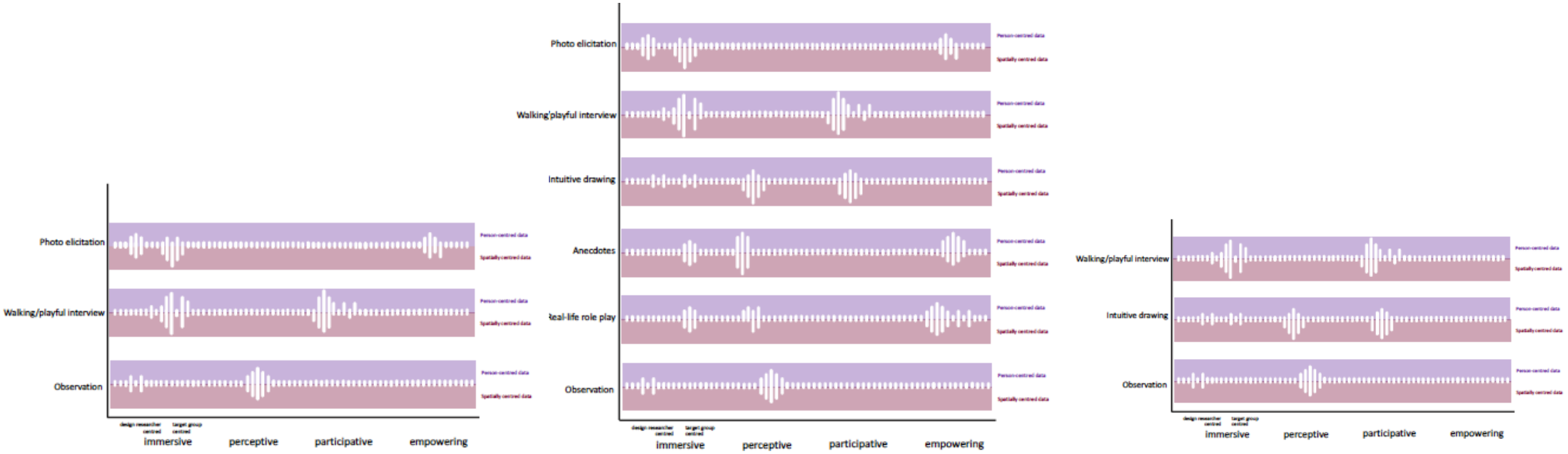

Figure 8. *Seismographic imaging per seminar visualized via their ethnograms: ethnographic method mix for a) Seminar I, b) Seminar II and c) Seminar III (from left to right)*

From the seminars, we gleaned the following insights related to the use of the ethnogram, specifically regarding the preconditions for selecting techniques and crafting a well-balanced mix:

4.2.1 Preconditions for assembling and characterizing the tailored techniques: target group, design context and design challenge fit

Firstly, the methods should fit and contribute to the posed *design challenge* or *goal*. Seminar II was focused on researching the influence of spatial aspects on the emotional and behavioral experiences of pupils, and the ethnographic mix showed a focus on empowering methods (see Figure 7b), which seemed to fit with the more emotionally oriented design challenge. The ethnographic mix of Seminar III (see Figure 7c) contained more participative methods, which resonated with the design challenge of creating community connection in a superdiverse neighborhood while acknowledging the diverse socio-spatial experiences and perspectives.

Next to a fit with the design challenge, the chosen techniques should also work well within the *design context* and *its target group*. Throughout the three seminars, the design students were active in two different contextual design settings (i.e. school and residential environment), which is reflected in the variation of techniques in the ethnographic mixes. For example, the playful interview worked well in a school environment with children as the target group, but the technique was deemed to be less suitable in a residential context with adults from diverse ethnic and cultural backgrounds. The walking interview on the other hand worked well with adults, and empowered the interviewees by giving them control of the way in which they share their socio-spatial experiences. However, in Seminar III, another technique was tested which did not prove to fit well with the research context and target group. Specific boundary objects such as public signs with statements and questions about how to preserve greenery or how to create more social spaces were put up throughout the neighborhood with a marker attached to them to collect data. Unfortunately, instead of marking an answer, the signs were 'trashed'. Hence, finding the right combination of ethnographic techniques has also proven to be a process of trial and error. However, in searching for combinations via the ethnogram, design students can make a more thoughtful and funded choice based on the dimensions that characterize the methods.

4.2.2 Evaluating the mix: creating overlap to generate rich, layered data while maintaining awareness for the workload

In Seminar I, little overlap between the methods (and thus between the four levels of involvement and regarding the person-centred and spatially centred perspective) was realized (see Figure 2a), which resulted in a data set that felt monotonous, and less layered or rich. In

Seminar II and III, more overlap was generated based on the methods' characteristics (see Figure 2b and 2c), which rendered more layered and thus rich data. Concretely, by combining (walking) interviews (gathering personal, in-depth experiences) and observations (gathering a broader view of day-to-day life and interactions with people and places within the neighborhood), the design students were able to position and contextualize user experiences of their target group within the broader socio-spatial context. Here, we broaden existing work that points to the value of combining various qualitative methods in architectural research (Fross et al., 2015).

In addition to selecting the appropriate methods, design students should be attentive to both the quantity and quality of these methods. For instance, in Seminar I, the mix appeared somewhat unbalanced, with an overemphasis on person-centered data. In contrast, the mixes in Seminars II and III demonstrated a more considered and varied approach to collecting experiential data within the same research context. Furthermore, the mix in Seminar II was more expansive and comprehensive, whereas Seminar III adopted a 'less-is-more' strategy. To illustrate this concretely, the ethnographic mix for Seminar III consisted of (walking) interviews and observations. However, the (walking) interviews were considered the main ingredient of the ethnographic mix, in line with the design challenge, which aimed to depart from the lived socio-spatial experiences of participants. Considering the research context of Seminar III (i.e. superdiverse neighborhood) and the target group (i.e. language barriers, age differences, independence), it was crucial to complement the (walking) interviews with other ethnographic techniques such as drawing and taking photos. Also, the mix was supplemented by more low-threshold methods such as observations. In doing so, the perspectives of diverse participants were included in the data collection. Moreover, it again points to the importance of a good fit between the mix and the research context, goal and target group. Supported by literature, we know that combining the strengths of ethnographic observations and interviewing, walking interviews (Kusenbach, 2003) provide privileged access to exploring place and memory (Evans & Jones, 2011; O'Neill & Roberts, 2019), neighborhoods and communities (Emmel & Clark, 2009), mobility, and health and well-being (Carpiano, 2009; Foley et al., 2021).

5.0 Discussion and concluding thoughts: Seismographic imaging unlocked via the 'ethnogram' and its value for design education

In this paper, we have meticulously constructed an argument, steered by the DBR framework, that emphasizes the importance of an ethnographic approach in capturing below-the-surface user experiences within an architectural context. We began by highlighting challenges: 1) the fuzzy front end of the design process, especially for inexperienced designers, and 2) the risk that traditional research methods lack specificity to the architectural discipline. To address this, we tailored

ethnographic methods for capturing and integrating subtle interactions and frictions – both between individuals and between the individual and their environment. By focusing on both the observable elements "above the surface" and the less apparent "below the surface" nuances that might otherwise be overlooked, we have coined this approach within the design principle "*seismographic imaging*".

Subsequently, we have developed the *'ethnogram'*, a design tool that unlocks seismographic imaging for design education, see Addendum 1 for a blank working version of the ethnogram tool. Concretely, the ethnogram provides insights through characterizing techniques and creating a balanced mix of tailored ethnographic techniques. Especially in an educational context this can help students in making well-thought-out choices via a deeper focus and enables them to capture essential below-the-surface experiences of users in an architectural setting.

Next, we argue in what way the tool can be integrated into design education and where its value lies. The following advantages can be anticipated for architectural design students and education:

To start, in the design studio, using the ethnogram *raises students' awareness* of the wide range of applicable tailored ethnographic techniques to collect and draw experiential information out of the target group. Due to their inexperience in ethnography, architectural design students risk getting lost and risk choosing inadequate methods (e.g. counting how many persons walk by while actually being interested in the reasons why people visit a particular place) or applying the methods in a superficial manner (e.g. interviewing three participants instead of a more representational number). The tailored ethnographic techniques that can be drawn out and combined via the ethnogram are characterized through their stance with regard to four dimensions and a person-centred or spatially centred focus, which urges students to reflect on and find matches within the characteristics of their respondents, the physical context, and the actual design goal that needs to be obtained. Via this systematic approach, the design students learn to position themselves as researchers and select techniques that align best with the three aforementioned aspects. Then, by drawing their selected techniques into the framework, they visualize their ethnographic research set-up, or in other words, create their ethnogram, and generate insights on how well-balanced and complementary their mix of techniques is. The double reflective process is inherent to the ethnogram and should ensure a richer and layered data set.

Thus, with regard to the value for design education, using the ethnogram can enrich design students' theoretical knowledge regarding ethnographic research and help them cope with design challenges that become more complex due to diverse user groups and undefined design questions in a reflective manner. Hence, it can aid design students to designerly cope with aspects in the fuzzy front-end of the design process.

Secondly, we believe that the tool can also be valuable to tutors and educational management teams. It provides a theoretical and empirically supported tool that can be introduced in more theoretical courses such as Design Theory, Design Methodology, etc. The tool can also be introduced as an overview and building block which students can use throughout their design and research process in education and, later on, in their professional work practice. By integrating the ethnogram in design curricula as a boundary object, it can be used to connect theoretical courses to the actual design studio. We thereby hope to entangle ethnography with design work in the curriculum of the (interior) architectural educational program.

The limitations, challenges, and the avenues for future research of the ethnogram are mentioned below:

(I) We acknowledge that in the seminars itself, the main focus was on collecting and interpreting user data, pushing other phases of the design process to a minimum (i.e. designing, materializing). However, using the ethnogram also stretches the analysis phase in the design process, as a rather large number of qualitative data are generated. For instance, in Seminar II the abundance of data urged the tutors and students involved in the seminar to develop a novel method of visualizing, organizing and eventually analyzing the data. The large amount of interviews and observational data became more manageable and concrete through the use of personas. Also, experimenting with filtering out data on a soft atlas map (see Stevens, 2022) led to the development of other design methods in Seminar III that can assist designers in building and visualizing rich programmatic interventions (see Stevens et al., in review).

This approach *increases students' cultural competency* and provides them with the tools to seek answers to the design questions they encounter (Hadjiyanni, 2006); the participating design students indicated that such an approach allowed them as designer-researchers to reach deeper insights (i.e. through a seismographic image) which nurtured a more human-centred design. However, we need to place equal effort in understanding in what way the phases of the design process that follow the fuzzy front-end are impacted by the rich data set collected at the start.

(II) The dynamic conceptualization of *'seismographic imaging'* implies that the proposed tool is not exhaustive, as it was creative-based on a tailoring of a cluster of ethnographic methods. When a crossover with other design branches is established, other valuable techniques might surface. Also, other techniques are currently not included in the ethnogram, even though they have merit, but were deemed to be more applicable in the analysis phase, such as the usage of personas. This technique is particularly useful for teaching (interior) architecture students to empathize with the target group. Note that the personas are introduced at the transition between data collection and analysis. For instance, in Seminar III, the design students connected their data and

analysis to an assigned persona, which helped to concretize students' many interview and observation experiences.

In addition to the iterations inherent in the Design-Based Research (DBR) model of developing, testing, and generating (see Figure 1, left), we incorporated an additional loop in the process by conducting this sequence three times across three distinct design challenges, involving different student groups in each instance. Notwithstanding the rigorous approach, the study remains of exploratory nature, and more research needs to be invested in broader testing of the ethnogram both in more diverse spatial contexts as well as with more diverse populations of students, bachelor and master level, and in validating its contribution to a more enriched final architectural design.

A more elaborate testing could also include a multi-actor perspective in which students, teachers and stakeholders who were involved in the design process (e.g. teachers in school environments, community workers in a neighborhood) are asked to share their experiences with the use of the 'ethnogram'. Questions such as 'What works well and what does not work?' and 'How do students internalize and master the use of the ethnogram?' can be posed.

By engaging in these avenues for future research, we are convinced to be contributing to the application potential of the DBR framework.

To conclude, (III) we have shed light on the educational context in which future architects are trained, and question in what way the educational environment in which this process unfolds itself is loaded with course content regarding grasping, understanding and processing user perspectives. This delicate question steers us to the already multidisciplinary character inherent to the architectural domain. Indeed, during their education, students are trained to become omniscient, balancing knowledge in structure and building techniques, design skills, and theoretical understandings of design history and culture, while the curricula today are bursting at their seams. We need to stay attentive hereto and focus on developing tools that easily integrate into the design studio and perhaps other theoretical courses.

6.0 Conflict of Interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

7.0 References

Banks, M. (2001). *Visual Methods in Social Research*. SAGE Publications, Ltd. https://doi.org/10.4135/9780857020284

Barley, W., Leonardi, P. M. & Bailey, D. E. (2012). Engineering Objects for Collaboration: Strategies of Ambiguity and Clarity at Knowledge Boundaries. *Human Communication Research, 38*(3), 280–308. https://doi.org/10.1111/j.1468-2958.2012.01430.x

Buse, C., Nettleton, S., Martin, D., & Twigg, J. (2017). Imagined bodies: Architects and their constructions of later life. *Ageing and Society, 37*(7), 1435–1457. https://doi.org/10.1017/S0144686X16000362

Carpiano, R. M. (2009). Come take a walk with me: The "Go-Along" interview as a novel method for studying the implications of place for health and well-being. *Health & Place*, *15*(1), 263–272. https://doi.org/10.1016/j.healthplace.2008.05.003

Coleman, T., Kearns, R. A., & Wiles, J. (2016). Older adults' experiences of home maintenance issues and opportunities to maintain ageing in place. *Housing Studies, 31*(8), 964–983. https://doi.org/10.1080/02673037.2016.1164834

Copes, H., Tchoula, W., Brookman, F., & Ragland, J. (2018). Photo-Elicitation Interviews with Vulnerable Populations: Practical and Ethical Considerations. *Deviant Behavior, 39*(4), 475–494. https://doi.org/10.1080/01639625.2017.1407109

Cranz, G. (2016). *Ethnography for Designers*. Routledge.

Emmel, N., & Clark, A. (2009). The Methods Used in Connected Lives: Investigating networks, neighbourhoods and communities. Real Life Methods, the Manchester / Leeds Node of the National Centre for Research Methods.

Euler, D. (2014). Design-Research – a paradigm under development. In D. Euler & P. F. E. Sloane (Eds.), *Design-Based Research* (15–44). Stuttgart: Franz Steiner Verlag.

Evans, J., & Jones, P. (2011). The walking interview: Methodology, mobility and place. *Applied Geography, 31*(2), 849–858. https://doi.org/10.1016/j.apgeog.2010.09.005

Foley, G., Timonen, V., Conlon, C., & O'Dare, C. E. (2021). Interviewing as a Vehicle for Theoretical Sampling in Grounded Theory. *International Journal of Qualitative Methods*, *20*. https://doi.org/10.1177/1609406920980957

Fross, K., Winnicka-Jasłowska, D., Gumińska, A., Masły, D., & Sitek, M. (2015). Use of Qualitative Research in Architectural Design and Evaluation of the Built Environment. *Procedia Manufacturing*, *3*, 1625–1632. https://doi.org/10.1016/j.promfg.2015.07.453

Gigerenzer, G. (2015). *Simply Rational: Decision Making in the Real World*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199390076.001.0001

Hadjiyanni, T. (2006). Integrating social science research into studio teaching. *Open House International, 31*(3), 60–66.

Heylighen, A. (2014). About the nature of design in universal design. *Disability and Rehabilitation, 36*(16), 1360–1368. https://doi.org/10.3109/09638288.2014.932850

Henderson, K. (1991). Flexible Sketches and Inflexible Data Bases: Visual Communication, Conscription Devices, and Boundary Objects in Design Engineering. *Science, Technology, & Human Values, 16*(4), 448–473. https://doi.org/10.1177/016224399101600402

Imrie, R. (2003). Architects' conceptions of the human body. *Environment and Planning D: Society and Space, 21*(1), 47–65. https://doi.org/10.1068/d271t

Johannes, R. E., & Neis, B. (2007). The Value of Anecdote. In N. Haggan, B. Neis, & I. G. Baird, *Fishers Knowledge in Fisheries Science and Management* (pp. 41–58). UNESCO.

Jones, J., & Smith, J. (2017). Ethnography: Challenges and opportunities. *Evidence Based Nursing, 20*(4), 98–100. https://doi.org/10.1136/eb-2017-102786

Kinney, P. (2017). Walking interviews. *Social Research Update, 67*, 1–4.

Koch, A. B. (2019, March). *Children as participants in research. Playful interactions and negotiation of researcher-child relationship*. NERA 2019: Education in a globalized world. https://www.ucviden.dk/en/publications/children-as-participants-in-research-playful-interactions-and-neg-2

Kurtz, C. F., & Snowden, D. J. (2003). The new dynamics of strategy: Sense-making in a complex and complicated world. *IBM Systems Journal, 42*(3), 462–483. https://doi.org/10.1147/sj.423.0462

Kusenbach, M. (2003). Street Phenomenology: The Go-Along as Ethnographic Research Tool. *Ethnography, 4*(3), 455–485. https://doi.org/10.1177/146613810343007

Lőrinc, M., Kilkey, M., Ryan, L., & Tawodzera, O. (2021). "You still want to go lots of places": Exploring walking interviews in research with older migrants. *The Gerontologist, 62*(6). https://doi.org/10.1093/geront/gnab152

Manning, J., & Kunkel, A. (2014). Making meaning of meaning-making research: Using qualitative research for studies of social and personal relationships. *Journal of Social and Personal Relationships, 31*(4), 433–441. https://doi.org/10.1177/0265407514525890

Marco, E., Williams, K., Oliveira, S., & Sinnett, D. (2021). The Architectural Model as Augmenting a Sensory Ethnography. *The Design Journal,* *24*(6), 843–864. https://doi.org/10.1080/14606925.2021.1949237

McGinley, C., Myerson, J., Briscoe, G., & Carroll, S. (2022). Towards An Age-Friendly Design Lens. *Journal of Population Ageing, 15*(2), 541–556. https://doi.org/10.1007/s12062-022-09367-5

O'Neill, M., & Roberts, B. (2019). *Walking Methods: Research on the Move* (1st ed.). Routledge. https://doi.org/10.4324/9781315646442

Park, J., & Porteus, J. (2019). *Age-Friendly Housing: Future design for older people* (1st ed.). RIBA Publishing. https://doi.org/10.4324/9780429345920

Perry, M., & Sanderson, D. (1998). Coordinating joint design work: The role of communication and artefacts. *Design Studies, 19*(3), 273–288. https://doi.org/10.1016/S0142-694X(98)00008-8

Phlix., M., Petermans, A., Vanrie, J., Smetcoren, A.-S., & Stevens, R. (2023). A Diversity-Sensitive Home; Age-friendly design interventions in a super-diverse neighbourhood in Belgium. *British Society of Gerontology* (BSG), Norwich, 04/07/2023 – 07/07/2023.

Pink, S. (2021). *Doing visual ethnography* (4th ed.). SAGE Publications.

Pink, S., Fors, V., Lanzeni, D., Duque, M., Sumartojo, S., & Strengers, Y. (2022). *Design Ethnography: Research, Responsabilities, and Futures.* Routledge Taylor & Francis Group.

Rodríguez, J., Diehl, J. C., & Christiaans, H. (2006). Gaining insight into unfamiliar contexts: A design toolbox as input for using role-play techniques. *Interacting with Computers, 18*(5), 956–976. https://doi.org/10.1016/j.intcom.2006.05.007

Salama, A. M. (2017). Teaching architectural programming: cultivating a culture of an inquiry-based and a process-centred design pedagogy. *Architecture and Construction of Russia*, *2017*(2), 30–45.

Sloane, P. F. E., & Krakau, U. (2021). How does didactic knowledge develop? Experiences from a design project. *EDeR – Educational Design Research, 5*(1), 1–32. https://doi.org/10.15460/eder.5.1.1511

Star, S. L., & Griesemer, J. R. (1989). Institutional Ecology, `Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science,* *19*(3), 387–420. https://doi.org/10.1177/030631289019003001

Stevens, R. (2022). Fragments of frictions: A route to spatial manoeuvres for uplifting wellbeing in school environments. In D. Lockton, S. Lenzi, P. Hekkert, A. Oak, J. Sádaba & P. Lloyd (Eds.), *DRS2022*: 25 June – 3 July, Bilbao, Spain. https://doi.org/10.21606/drs.2022.412

Stevens, R., Petermans, A., & Vanrie, J. (2019). Design for Human Flourishing: a novel design approach for a more 'humane' architecture. *The Design Journal, 22*(4), 391–412. https://doi.org/10.1080/14606925.2019.1612574

Stevens, R., Petermans, A., & Vanrie, J. (2021a). A human-centred strategy explicating and designing hidden programs in architectural design. *Nordic Journal of Architectural Research, 33*(2), 13–40.

Stevens, R., Petermans, A., & Vanrie, J. (2021b). Unlocking wellbeing-affordances in elementary schools. A natural experiment initiated and caused by Covid-19. In E. Bohemia, L. M. Nielsen, L. Pan, N. A. Börekçi & Y. Zhang (Eds.), *Learn X Design 2021: Engaging with Challenges in Design Education*, 24-26 September, Shandong University of Art & Design, Jinan, China, Design Research Society. https://doi.org/10.21606/drs_lxd2021.01.117

Stevens, R., Petermans, A., & Vanrie, J. (in review). A design student's final cut: Experimenting with montage technique to generate a rich problem statement and enriched programs in architectural education.

Till, J. (2009). *Architecture depends*. Cambridge, MA: MIT Press.

Van de Weijer, M., Van Cleempoel, K., & Heynen, H. (2014). Positioning Research and Design in Academia and Practice: A Contribution to a Continuing Debate. *Design Issues, 30*(2), 17–29. https://doi.org/10.1162/DESI_a_00259

Van der Linden, V., Dong, H., & Heylighen, A. (2018). Architects' Attitudes Towards Users: A Spectrum of Advocating and Envisioning Future Use(rs) in Design. *Ardeth*, 2, 196–216. https://doi.org/10.17454/ARDETH02.12

Van der Linden, V., Dong, H., & Heylighen, A. (2019). Populating Architectural Design: Introducing scenario-based design in residential care projects. *International Journal of Design, 13*(1), 21–36.

Yip, Y. T. (2016). *Design research on anecdote-based knowledge elicitation for organization development*. https://theses.lib.polyu.edu.hk/handle/200/8750

ADDENDUM 1

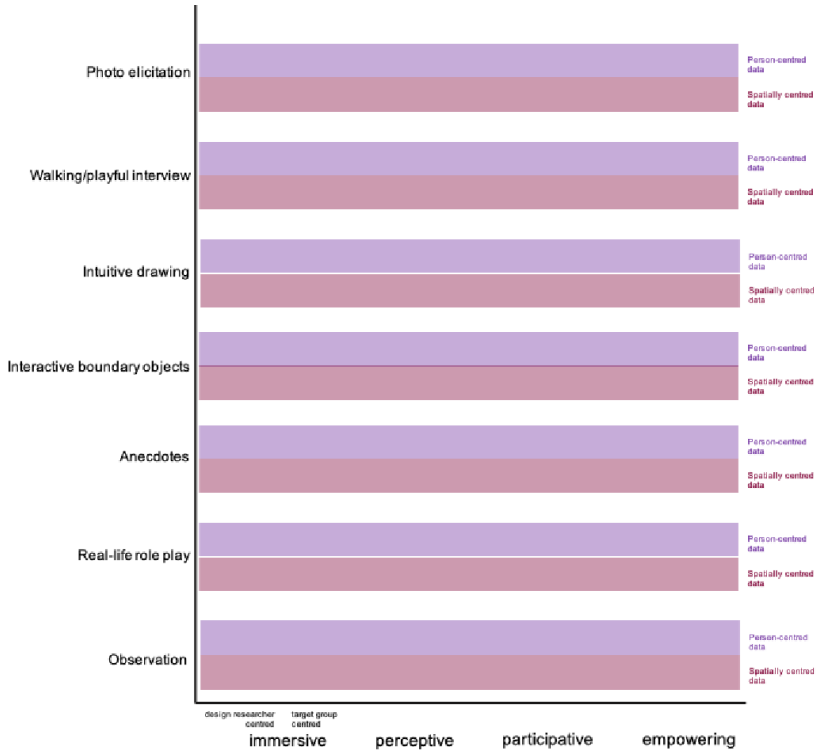
Photo elicitation
Walking/playful interview
Intuitive drawing
Interactive boundary objects
Anecdotes
Real-life role play
Observation
Person-centred data
Spatially centred data
design researcher centred
target group centred
immersive
perceptive
participative
empowering

Author Profiles

Ruth Stevens (PhD, Architecture) is a postdoctoral researcher in design methodology and design didactics at Hasselt University, Faculty of Architecture and Arts, and the School for Educational Studies. Her research interests pertain in the design and functioning of learning environments. She takes an architectural and pedagogical perspective to critically examine the physical characteristics of the learning environment and their compatibility with pedagogical work forms and teacher preferences. Her overarching aim lies in developing a shared language between architects and educators to develop and use learning environments. In her research she integrates the analysis of architectural design processes, pedagogical principles, and policy frameworks, and she uses qualitative and designerly research methods. Via this approach, she studies how spatial design can serve as a catalyst for pedagogical enrichment.

Micheline Phlix (PhD, Architecture & Adult Educational Sciences) is a postdoctoral researcher and lecturer. Her research focuses on the wellbeing and sense of home of older adults (with and without a migration background) and the integration of such topics in age-friendly and diversity-sensitive housing design.

Jan Vanrie (PhD, Psychology) is Associate Professor of Human Sciences and Research Methodology at the Faculty of Architecture and Arts (Hasselt University). He focuses on (interior) architecture, design research and education, and the intersection of environmental psychology and perception.

Author Details

Dr. Ruth Stevens
Hasselt University
Martelarenlaan 42
3500 Hasselt
Belgium
+3211292154
ruth.stevens@uhasselt.be

Dr. Micheline Phlix
Hasselt University
Martelarenlaan 42
3500 Hasselt
Belgium
+3211292128
micheline.phlix@uhasselt.be

Prof. Dr. Jan Vanrie
Hasselt University
Martelarenlaan 42
3500 Hasselt
Belgium
+3211292159
jan.vanrie@uhasselt.be

Editor Details

Prof. Dr. Tobias Jenert
Chair of Higher education and Educational Development
University of Paderborn
Warburgerstraße 100
Germany
+49 5251 60-2372
Tobias.Jenert@upb.de

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