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GETTING UNDER THE(IR) SKIN: APPLYING PERSONAS AND SCENARIOS WITH BODY-ENVIRONMENT RESEARCH FOR IMPROVED UNDERSTANDING OF USERS' PERSPECTIVE IN ARCHITECTURAL DESIGN

TENNA DOKTOR OLSEN TVEDEBRINK AND ANDREA JELIĆ

ABSTRACT

The aim of this paper is to challenge established positions in architectural design by discussing a more refined user perspective. The motivation is threefold. Firstly, fields like environmental psychology and cognitive science for architecture have in recent years brought forth novel insights on the embodied nature of human spatial experience, and the extensive effects of the built environment on people's psychosomatic health and behaviour that are not well-captured by existing building standardization systems. Secondly, while the fast growing trends of user-centred and research-based design in architecture have showed that users' experience is a valuable source of design knowledge, the methods for incorporating this wealth of new insights in the architectural design process are still underdeveloped. Finally, the example of the newly built psychiatric department in Aabenraa, Denmark, indicates there are existing discrepancies in current approaches to translating research information in user-centred design to architects, given that the buildings' interior, despite an international architectural award in 2016, had to be re-designed one year after construction due to poor understanding of the needs of users.

To address these issues, we discuss the experiences from a new Masters' course in 'Architecture, Health, and Well-being' and propose that user-centred methods like 'personas' and 'scenarios' used in IT, marketing, and product development also have a potential to develop more in-depth research-informed user perspectives. Additionally, these methods can help students envision and strengthen the architectural quality of the programming and building design throughout the architectural design process, by supporting a 'design empathic' understanding and immersion in user perspectives.

KEY WORDS

User Perspective; Architecture and Health; Research-Informed Design Process; Personas; Scenarios

INTRODUCTION: ON THE RELATIONSHIP OF ARCHITECTURE AND PEOPLE IN PRACTICE AND EDUCATION

Over the last two decades, the architecture-users relationship has been moving to the forefront of architectural design concerns. The reason lies in the strengthening of user- and human-centred design approaches and in the growing recognition of social sustainability as one of the key factors in designing architectural and urban environments for the future. In current professional practice and related research fields, the themes and approaches for considering the relationship between architecture and its users are manifold: these include the impact of built spaces on people's health and well-being, users' spatial and perceptual experiences, and user behaviour issues like wayfinding and social interactions in the built environment. However, despite the rich body of knowledge available within both design (methods) thinking and user-environment research, the task of conceptualizing and incorporating users' perspectives in the design process and idea development phases remains an error-prone and oftentimes misunderstood aspect in contemporary architectural practice.

The importance of carefully considering the user perspective in the design process can be illustrated in a recently completed psychiatric hospital on a hillside just outside the city of Aabenraa, in the south-eastern part of Jutland in Denmark. Here, the architectural layout and design process behind the building has unintentionally become an illustrative example of the common pitfalls in understanding the architecture-users relationship. The psychiatric hospital is an impressive new building, completed in November 2015, and comprising 20,000 square meters, 7 departments, and 115 beds for both adolescents and adults with mental health issues. The overall design strategy and architectural vision for this psychiatric hospital was to create a dynamic building design addressing human scale, personal comfort, and well-being. Strong focus was placed on natural daylight and green facilities, resulting in design solutions like a therapeutic garden with sense stimuli, green indoor wall decorations, and views to the surrounding landscape (Holte 2015; WhiteArkitekter 2018). Still, despite both local and international architectural awards in 2016 and 2017, as well as positive feedback from architectural critics, parts of the interior in the youth department of the psychiatric hospital had to be re-designed a few years after construction. According to chief psychiatrist, Birgitte Vange (2018), this was due to poor spatial understandings of the users and their behaviours.

As an example, Vange (2018) mentions the rather large number of full-sized glass windows facing public areas in department corridors, common rooms, and shared facilities. Her criticism of the windows relate to a strong concern for the young patients' sense of privacy and comfort. With the large windows connecting many public spaces visually, the individual behaviour and appearance is easily 'displayed' and 'revealed' across the department to everybody present – staff, visitors, and co-patients (Vange 2018). It signifies a strong sense of surveillance, which in the worst case creates an environment in which the young patients feel uncomfortable moving around the facility and choose instead to stay in their private room, behind closed curtains (Vange 2018). The dilemma with the open public space against closed private ones is that—from a treatment and security point of view—some kind of surveillance is necessary to prevent risks of suicide, self-harm, and violence. On the other hand, according to the architectural firm, the large window areas were originally designed to create a stronger sense of comfort and closeness, as patients and visitors at all times would be able to be in visual contact with the staff (WhiteArkitekter 2018). In the end, the department interior was re-designed by adding more activity spaces, friendly and welcoming environments to connect, engage, and to divert from the sad thoughts and emotions that might occur. The revised design also accommodated a small common kitchen area providing the possibility to cook or prepare a

light meal for patients on a specific diet (Vange 2018). In this way, architects' focus was on how the interior settings can facilitate smaller, more intimate spaces, without making (expensive and extensive) changes to the design of the large window areas.

The above example of the psychiatric hospital and youth department in Aabenraa highlights some of the existing discrepancies in translating research information in user-centred design to idea development and detailed buildings specifications in the design process. Here the difficulties stem both from how the research results are conveyed to the architects, as well as in the currently practiced approaches by designers for interpreting this information creatively in the design process. . Scholars such as Strickfaden, Delieger, and Heylighen (Strickfaden, Devlieger & Heylighen 2009) and Heylighen and Vermeersh (2015) argue that often users are not central stakeholders in the design process. Given the complexity of the building process and the myriad of design parameters and stakeholders involved, further analysis would be required to understand what happened in the designing of the hospital in Aabenraa, which is beyond the scope of this paper. Still, this case serves as an example closely related to a more general problem of how best to address the the needs and preferences of diverse users—children, elderly, people with cognitive and physical impairments—in the design process in the context of architectural education (Heylighen & Vermeersch 2015; Strickfaden, Devlieger & Heylighen 2009).

In our teaching experience at Aalborg University in the educational program Architecture & Design, understanding and incorporating user experiences and behaviour in architectural spaces is commonly an elusive task for the students as they struggle to comprehend the complexity of the task. The students generally find that various user needs and especially the perceived atmosphere and human emotions are difficult to quantify and describe. On the one hand, they struggle how to start analysing, evaluating, and documenting user needs, atmosphere and emotion, and on the other, how to use and transform that information together with imagination and creativity when developing their own design concepts and detailed solutions. Moreover, the clearly defined legal standards and primarily quantifiable design parameters referring to the environmental sustainability building standards (which are part of the standard educational programs at Aalborg University) are privileged in students' design thinking, and lead them to forget that people and their personal emotions are a very central part of every architectural experience.

Therefore, the aim of this paper is to explore how these two related problems—(1) the issue of translating user-research information in design practice, and (2) educating students how to understand and tackle the complexity of users' perspectives in their design thinking—can be addressed by including a more refined user perspective as part of the initial design process. We discuss our teaching experiences from a new Masters' course in *'Architecture, Health, and Well-being'* (AHW onwards) taught at Aalborg University in the education of Architecture & Design. Based on these experiences, we propose that user-centred methods like 'personas' and 'scenarios' used in IT, marketing, communication, and product development (Bødker 2000; Grudin & Pruitt 2002; Nielsen 2002; Nielsen et al. 2015) have an immense potential to help develop more *research-informed user perspectives* in architectural design process. This, we argue, will strengthen (future) architects' empathy, as well as their capacity to consider the architecture-users relationship.

The motivation for such rethinking of the established positions on user perspectives in architectural education (and practice) are threefold. Firstly, fields like environmental psychology and cognitive science for architecture have in recent years brought forth novel insights on the embodied nature of human spatial experience, and the extensive effects of the

built environment on people's psychosomatic health and behaviour that are not well-captured by the existing standardization systems (Jelić et al. 2016; Mallgrave 2013; Robinson & Pallasmaa 2015). Secondly, while the fast growing trends of user-centred and research-based design in architecture have showed that users' experience is a valuable source of design knowledge (Annemans et al. 2016; Van der Linden, Dong & Heylighen 2016a), the methods for incorporating this wealth of new insight into architectural practice are still underdeveloped. Finally, similar lack of adequate methods for capturing users' perspectives and applying them in design is also notable in the design process' teachings in architectural educational programs. Further, the increasing importance of evidence- and research-based design in professional practice and the benefits of having a better understanding of how people (especially impaired or sick) experience the built environment for creating healthier spaces, calls for nurturing students' skills to gain a deeper understanding of research insights and user perspectives. More importantly, students need to be taught and trained in *how to apply* these skills in developing new conceptual ideas and design solutions.

Accordingly, this paper proposes that a more research-informed user perspective can be implemented in the design process on the basis of the design personas methods and linked with the growing understanding of people's spatial and emotional experiences and behaviours in the built environment from the body-environment research fields like embodied cognitive science, environmental psychology, and neuroscience for architecture. In this way, such enhanced user perspectives are intended to help architectural students to envision and strengthen the architectural quality of the programming and building throughout the design process, by supporting a 'design empathic' understanding and immersion in user perspectives.

FROM RATIONALIZED UNDERSTANDING OF MAN TO EMBODIED EXPERIENCE

The essential idea of user- and human-centred approaches to architectural design is that architects' main task is to create spaces for future inhabitants that will provide everyday functionality, physical comfort, as well as spaces that can have beneficial effects on users' psychosomatic health and well-being. Therefore, in this section we consider how the human body and related idea of well-being has been conceptualized and utilized in architectural design by highlighting two views. First, we discuss the issue of standardization of the human body and well-being as a dominant perspective in contemporary architectural practice (and education), and secondly, how this position has been challenged in recent years with new knowledge on embodied, emotional, and multi-sensory nature of architectural experience.

The standardization of the human body and well-being

Throughout architectural history, the human body has been recognized as the fundamental intersection between architecture and people's physical and mental existence in the world. However, the complexity of the human subject being at the same time both the experiencing and biological body has been interpreted in architectural design in various ways: from fully acknowledging this richness to neglecting the experiential dimension and considering the body in a rationalized, scientific perspective. Importantly, how the body was understood and conceptualized in architecture at any moment in time was always directly influenced by broader social, cultural, political, and economic factors (Pérez-Gómez 1983; Vesely 2004). For the purposes of the present paper, it is worth highlighting two historical developments. The first of these is the emphasis on the scale and proportions of man as guidance for design as evidenced in the writings of Vitruvius and Le Corbusier's modulor man principles[i]. In the second, the body is transformed into a physical and abstracted object in geometrised space as a consequence of

the scientific revolution and Cartesian understanding of human subject as a mind-body dichotomy (Imrie 2003; Mallgrave 2011; Pérez-Gómez 1983; Vesely 2004).

In parallel to these historical developments, the role of the end-user in the design process has been similarly shaped according to dominant socio-cultural conditions. Up until the 18th century, the relationship between architect, client, and users was mainly seen as that of a rich patron hiring the architect to design buildings to fit the clients' individual taste, without putting the needs of the wider public into perspective (Collins 1998). During the late 19th and early 20th centuries, and the emergence of welfare society, this relationship radically changed with the design of public schools, hospitals, and housing complexes bringing users' wellbeing into focus (Whyte 2004). To attain these new goals—and strongly influenced by the industrial revolution and mass production—architects and engineers began redefining building design principles by rationalizing user perspectives into quantitative data and average guidelines on physical comfort like temperature and daylight, as well as assumptions about people and their use of space. As a result, a variety of design manuals and building standards, like Neufert's *Architects' Data*, that prescribe sets of measurements based on the 'standard' human body were developed, and remain in widespread use today (Baiche & Walliman 2012).

This rationalized line of thinking is still influencing Danish and international architectural practice: not only in terms of building legislation and building codes (BR15 (2015) and BR18 (2018) in Denmark), but also in the emerging series of different building certification standards. For instance, the twelve DGNB-criterions[ii] on 'Sociocultural and Functional Quality' were established in 2010 by Green Building Council Denmark to evaluate the quality of sustainable architecture, and has since been expanded to include quantitative and qualitative assessment schemes for a variety of building types, including offices, healthcare, and educational facilities (Green Building Council Denmark 2016). Another example is the international WELL Building Standard focusing on the evaluation of the health and wellness properties of buildings based on categories such as air, light, fitness, comfort, and mind, each defined in terms of appropriate design features (International-Well-Building-Institute 2017). The main goal of these certification standards is to put architectural values like 'sustainability' and 'well-being' into a scoring formula, which helps to assess a series of sub-categories and assign a label based on the percentage or points achieved in each category (for example, Gold, Silver, or Platinum certification).

However, despite the well-intentioned aims and extensive research supporting these building certification standards, the aspects referring to social sustainability—i.e., creation of meaningful places and healthy environments promoting a holistic state of physical, mental, and social well-being (Steemers 2015)—are oftentimes left less detailed and abstract, or difficult to capture, document, and apply in the design process. The limitation of these currently dominant standardizations essentially stems from their engineering-oriented focus on the performance of the body and the building. On the one hand, because of wider cultural and historical changes, conditions have been created to objectivise the body in design in terms of the geometrical and technical definitions, as well as considering the standardized body as a 'normal, able body' devoid of gender, age, and individual needs in a living space (Colomina 2015; Imrie 2003; Van der Linden, Dong & Heylighen 2016b). In addition, the human body as a biological entity and phenomenal experiencing subject is largely subjected to 'medicalized' and reductionist views in relevant user-environment research fields, which tend to narrowly define psychosomatic health and design parameters like comfort. In short, such conception of the 'body as object' neglects people's need for a meaningful connection to places, which has been long-recognised within architectural circles (Pallasmaa 2011; Pérez-Gómez 2016). On the other hand, some of the standardizations and building regulations were primarily driven by the building's performance

and not the users' needs. For example, in recent years there has been a shift in thinking about thermal comfort as it is increasingly acknowledged that the users' experience of comfort has physiological, psychological, and social dimensions, whereas the previous regulations of standardized well-being have essentially originated in the needs of heating, ventilation and air conditioning (HVAC) technology (Nicol & Roaf 2017). Similar change is slowly occurring in the context of environmental sustainability and prevailing focus on buildings as energy-efficient toward including users' experiences and thus, toward practicing a 'mental and existential ecology' in architectural design (Pallasmaa & Bhatt 2013).

Experiential turn and new knowledge from embodied cognitive science and beyond

The reason for rethinking the existing premises in current architectural standardizations of the human body and well-being originates in the 'experiential turn' occurring within both design and scientific disciplines over the last two decades. In architectural circles, this turn has been manifested in renewed interest in multi-sensoriality and corporeality of architectural experiences, thus placing the human body as a central subject in design process (Holl, Pallasmaa & Pérez-Gómez 2006; Pallasmaa 2005). In parallel, the rise of embodied approaches to cognition (Gallagher & Zahavi 2008; Varela, Thompson & Rosch 1991), and scientific disciplines like neuroscience with unprecedented technological and methodological tools, have been contributing to increased understanding of the relationship between architecture and its users, with a particular emphasis on how the built environment can impact and potentially improve people's health (Mallgrave 2013; Robinson & Pallasmaa 2015).

Put succinctly, the new insights from fields like embodied cognitive science, neuroscience for architecture, and environmental psychology, have been illuminating how people experience and engage with architecture in a fundamentally embodied, emotional, and situated manner (Jelić et al. 2016; Mallgrave 2013). In this way, it is our claim that the dominant conception of the body as an abstract user and geometrised object in space has been challenged and is gradually being replaced with the concept of embodiment and user-centred design perspectives. The unmasking of the false dichotomy between the human mind and the body, as well as the fundamental role of environment-body interactions for making us the cognitive and experiential beings we are (Rietveld 2016), have resulted in the increasingly acknowledged importance of the built environment in shaping our minds and bodies, and has a profound impact on our mental and physical health (Robinson & Pallasmaa 2015; Steemers 2015). In other words, the design of architectural settings—by virtue of our embodied, spatial experience—affects how people feel in a certain space: what atmosphere, experiences, emotions, and mood are created in the mind of each user. This (re)discovered holistic perspective on the human body as a biological organism and a lived subject calls for a careful consideration of architectural quality as achieved through emotional, multi-sensory, and meaningful experience of space.

This shift in thinking about well-being and health as stemming from embodied users' experience of architecture is exemplified with the changes in healthcare design throughout the 20th century (Crocker & Leatherbarrow 2018), which reflected the accepted definitions of health and disease within medical sciences (Borasi & Zardini 2012). In the 1920s and 30s because the domains of medicine were still relatively limited, architectural spaces partook in the treatment of disease. One example is tuberculosis as a medical obsession of the time and various sanatoriums, like the famous Alvar Aalto's Paimio Sanatorium in Finland, harnessed the power of nature, human scale, and multi-sensoriality to create a healing and comforting environment (Colomina 2015; Crocker & Leatherbarrow 2018; Pallasmaa 2016). Then, for the better part of

the century, medical technologies have dominated the healing process with architecture's role passing unacknowledged, only to reappear at the start of the 21st century as a critical factor in people's health (Crocker & Leatherbarrow 2018).

However, while this embodied perspective is not new in architecture—in fact, history shows that architectural practitioners and scholars like Heinrich Wölfflin and Gottfried Semper have been occupied with these topics since the 1860s (Mallgrave 2011)—they have yet to take precedence over more abstracted, objectivised conceptions of the body used in architectural practice and education. Therefore, the question remains: what are the obstacles in using the holistic idea of the body in design process, and how can these unprecedented body-environment research findings be leveraged to transform the prevailing conceptualisation of the human body in architectural schools and practices?

User Perspectives in Design and Designers' Empathy

According to a number of design researchers, addressing the above question requires that any user-oriented design method needs to account for and fit with the designerly way of knowing and working (Cross 2006; Van der Linden, Dong & Heylighen 2016c). Namely, one of the main challenges in translating research insights and transferring knowledge about users' perspectives into architectural design is the lack of effective ways to communicate such information to architects (Van der Linden, Dong & Heylighen 2016a). Interesting for our purpose is the prevailing situation in everyday architectural practice—and more importantly in architectural education—in which the only interaction is with a client, while the future end-user is absent and hypothetically defined (Verhulst, Elsen & Heylighen 2016). In that situation, architects and students working with user-centred and human-centred design approaches, need to rely on available (standardized) conceptualisations of the human body, building standards and legislation, as well available information on users' experiences and needs from various user-environment research sources. However, even though architects are in need of and often actively search for in-depth information, "which provides insights into people's actual interactions, experiences and values" (Van der Linden, Dong & Heylighen 2016b, p. 39), user perspective and research findings do not always find their way into the design process. According to Van der Linden, Dong, and Heylighen (2016b), these failings are mostly due to the inaccessible or inadequate user information or research results that do not relate to the designers needs in practice: they have difficulties in assessing the usefulness of the information, information is difficult to interpret and translate into design concepts, or certain design policies and standards like accessibility legislation are perceived as too prescriptive and hindering development of more innovative solutions. At the same time, in the case of a hypothetical user, there is a danger that architects and architectural students rely too heavily on their own body or the bodies of their peers when interpreting user perspectives (Heylighen & Vermeersch 2015; Imrie 2003).

For this reason, researchers have been exploring how different, more narrative, information formats such as design documentaries (film, text, and/or photographic reportages about 'a day in the life' of future users), can offer user narratives that designers can relate to and use as design-relevant insights (Annemans et al. 2014; Van der Linden, Dong & Heylighen 2016c). Initial studies found that these kinds of experiential user information formats also increase designers' sensibility to designing for the other and uncovering their latent needs, as such information enhances their 'design empathic' understanding of how different users experience spaces, their behaviours, emotions, and preferences (Annemans et al. 2014; Heylighen & Vermeersch 2015). Following this line of thinking, in the below section we discuss the potential advantages of using personas as a supplementary method in architectural design

education to help overcome the difficult challenges of introducing user perspectives and building students' empathic understandings in the design process.

Personas as user perspective method in architectural design (education)

According to Nielsen et al. (2015), the persona method was originally developed in the 1990s within the IT sector, with the aim to help system and product developers better understand, as well as keep focus on, the end-users throughout the design process. This had an overall goal to help improve the quality of the final design solutions, but also aimed to enable developers to discuss different design ideas during the design process based on a more informed and well-argued background. Later, the method has been applied to domains like marketing, communication, product development, and service design (Grudin & Pruitt 2002; Nielsen 2002, 2013; Nielsen et al. 2015; Stickdorn & Schneider 2012). Perhaps due to of the breadth of domains using this approach, it can be difficult to find one common definition of what the persona method is, and how it should develop. Nevertheless, as emphasized by Nielsen et al. (2015, p. 45) most literature refers to the persona method as "a persona is a fictitious user". A series of different recommendations and templates on how to develop a persona exist in academic literature and publications by design and marketing agencies (see Nielsen et al. 2015 for an overview on this). To summarise the existing recommendations, researchers are encouraged to first do: (1) ethnographic field studies to collect empirical data with diverse tactics like questionnaires, surveys, interviews, observations, focus groups, and probes; (2) to cluster data together and divide into sensible groupings, and finally (3) develop detailed persona profiles by giving a name, photo, and personal details to the profile, with information at both the level of a more general factual description, and as short textual descriptions (1-2 pages long) (Cooper 1999; De Voil 2010).

In the third step of developing the detailed persona, the researcher/practitioner/ student moves away from the statistical and empirical data collected into constructing the persona profile characteristics. From a methodological point of view, this also means moving from the research phase into the analytical phase, 'breaking down', 'clustering', and 'evaluating' information. It is a phase of personal interpretation, ordering the information, and finding patterns in the collected material by means of specific tactics like scenario writing (Bødker 2000; Nielsen 2002) and storyboarding (Davids 1999) to help visualize and structure the information in the persona profile. This means that the persona profile is developed in practice, first of all on the background of a mix of quantitative and qualitative empirical data, but also by analysis, interpretation and comparison, and it often ends up with both visual and textual description (see Figures 1 and 2 as an example).

According to Nielsen et al. (2015, p. 45), the community of practice, particularly in a Danish context, has strongly influenced the style and usefulness of the persona method. However, the method has also received criticism relating to the methodological and scientific value of the approach. De Voil (2010) among others argues that the persona method as a technique designed to "appeal to the designer's imaginative faculties" (2010, p. 4) can be problematic because "it encourages the taking of decisions in the false belief that they are based on a scientific approach" (2010, p. 1). Moreover, because in constructing the persona profile "it is more important to be precise than to be accurate" in order to make the persona memorable, there is a strong risk of creating "false precision" (De Voil 2010, p. 1-2). While these critiques certainly call for careful consideration and attentiveness when using the persona method, there is also additional evidence supporting the initial ideas in developing the personas in order to trigger designers' empathy, which should in turn have a positive effect on creativity and generate better human-centred solutions during the design process (Miaskiewicz & Kozar 2011;

So & Joo 2017). Some of these positive effects could be due to the *priming effect* of personas on designers' short-term memory, and thus facilitating idea generation in a brainstorming session (So & Joo 2017). In addition, several studies indicated that by providing experiential user information to architects in the formats that are more engaging and vivid in explaining users' needs—such as mini-documentaries and use scenarios constructed with real-life data derived from user studies—designers' are able to obtain more in-depth insight and increase their motivation to include these aspects and perspectives in the design process (Annemans et al. 2017; Van der Linden, Dong & Heylighen 2016a).

Based on the above arguments and from a pedagogical and didactic point of view, we queried whether personas as a user perspective method had the potential in combining quantitative and qualitative data, but also—perhaps more importantly— had the potential to *bridge and make visible the complex analytical steps between research and idea development in the architectural design process*. Therefore, while keeping in mind the methodological critique raised above, the persona method was chosen for the newly established AHW-course as an analytical tool and creative approach to help spark students' creativity and empathic understanding in the initial design phases, including development of the design project brief and building programming.

FINDINGS AND EXPERIENCES FROM '*ARCHITECTURE, HEALTH, AND WELL-BEING*' COURSE

The AHW course was offered as part of the 'Health Centre' design project in the first-year Masters' program spring semester at Architecture & Design, Aalborg University. This program has two main characteristics: overall problem-oriented learning pedagogy (PBL) (Schwartz, Mennin & Webb 2001) and an integrated design approach (IDP) (Knudstrup 2004). The specificity of the integrated design approach is in merging the technical and structural aspects of engineering with architectural design. This means a deliberate effort throughout the educational program to teach students to engage in real-world problems with a holistic and user-oriented mind-set. In bachelor-level courses, students are introduced to methods of observation, interview, questionnaire, and contextual mapping as part of the research and idea development phases. Contextual mapping in particular is trained at each semester and as part of this task, students are continuously encouraged to seek contact with clients and various user groups within that context. Consequently, the students have some experience with qualitative and ethnographic methods, as well as a basic theoretical and methodological grounding for understanding user-centred research. However, no other courses specifically ask them to read or implement the findings of any scientific literature or previous research. Furthermore, no previous courses directly address the issue of how to move from user-oriented research and analysis into idea development in the actual design phase. In undergraduate courses, this is considered a 'black box'—a process difficult to explain and document. Instead, the students are often encouraged to focus on the bodily senses and address the perception of the surrounding environments by paying attention to experiences of vision, sound, texture, materiality, and movement.

The task of designing a healthcare facility, such as a health centre, owes its complexity in large part to the very diverse span of user groups it needs to accommodate, ranging from various specialised staff members (doctors, nurses, psychologists, physiologists, music therapists) to a large group of citizens/patients (small children, adolescents, elderly, people with impairments). These different user groups often have distinct, specific spatial and functional demands or needs relating to their working or health issues. This means that

architects and architectural students must find a balance between public-collective and private-intimate needs, while fulfilling both technical and aesthetic demands.

Therefore, in the AHW course—as a first-time experiment compared to previous semesters— we focused on teaching concepts of atmosphere, emotions, and designers' empathy from a human-centred and user-oriented perspective (Tvedebrink 2018). This holistic perspective, reaching beyond traditional understandings of pragmatic user experience and architectural phenomenology, encourages more user-specific solutions with deep complexities of atmosphere and emotions, as well as use of methodologies engaging imagination and creativity to begin to understand how future design solutions are created.

The aim of the AHW course was to introduce students to a new design approach drawing on a narrative perspective inspired by personas, scenarios, and storytelling methods, in order to help them research, document, analyse, understand, and implement existing contextual and societal problems *before* they begin developing their own design solutions. Importantly, these were also intended as key tools to help them spark creativity and develop innovative conceptual solutions in the initial designing phases. The first part of the course presented a series of lectures outlining state-of-the-art knowledge in healing architecture, neuroscience, and health science, with an emphasis on integrating research-based knowledge from a series of lectures across disciplines of architecture, philosophy, psychology, neuroscience, epidemiology, and public health. Afterwards, students in groups of five prepared a literature review, discussing literature on evidence-based design and concepts of 'healing architecture', with the overall aim to get a basic understanding of existing research and empirical data collected on topics of built environment and well-being. The second part of the course gave a short introduction to user-centred research in general and a more detailed introduction to the persona method. Specifically, this included introduction to academic literature on persona, scenario writing, and storytelling (Grudin & Pruitt 2002; Stickdorn & Schneider 2012), and examples on how to use the different methods and tools together. After this instruction the students were encouraged to begin collecting empirical user data themselves – through observations, interviews and walk-alongs with a few specific user groups, focusing for instance on a staff perspective (doctor, nurse, secretary or physiotherapist) or a patient perspective (children, young, or elderly, with different chronic or life-style related diseases). In the third phase, the students were peer-trained and supervised to use the persona method including scenario writing and storyboarding to help structure, sort, and order the data/information found in the first two phases.

The overall educational aim and learning perspective was to encourage an *integrated design process* (Knudstrup 2004) with the goal to enhance the understanding of human responses to the built environment, and importantly also to discuss how empirical research and scientific research results can be *translated* into architectural design strategies. Thus, the focus was primarily on how the students methodologically moved from empirical research (lab and field study) to idea development and detailed planning in the architectural design process.

In this context, the use of personas as part of an educational toolbox focused on providing the student with a tool to help them implement an in-depth understanding of other people—future users and their everyday lives—in their design solutions. Hence, the purpose of using this tactic in the teachings is also to train the students to use empathy to pay close attention to the differences between people when making design decisions during the design process. For instance, 'scenario writing' (Grudin & Pruitt 2002; Stickdorn & Schneider 2012) was used to encourage the student to transform the user-based knowledge into specific written narratives and fictive stories, unfolding not only a critical lens on the design problem at hand,

but also revealing possible ideas for future design solutions. Finally, in continuation of this process, 'storyboarding' helps the students to illustrate the knowledge and ideas established with the personas and scenario writing in a cartoon-like format. This is exemplified with the two posters below (Figure 1 and 2), illustrating how two students have used the persona method with storytelling and storyboarding as a visual tool to help unfold the steps of the research phase and analytical phase, before developing the final programming and design brief of the architectural design.

All 35 students at the AHW course managed to visually show a much more sensitive and refined understanding of users in their initial programming and design strategies. This stands in clear contrast to their approach and understanding of users in previous courses, when the students were working with the design of sustainable community dwellings. Each project group individually had to decide how to implement different user needs in the design process. The end-result for a majority of the groups was the use of legal standards to define measures on doors, entrances, and bathrooms. This was typically visualized in the final project reports by a single spreadsheet with tables or graphs outlining how elderly demand more space than other users do because of the potential need for a wheelchair.

Writing up the persona description

There is no common description, recommendation, template, or rigorous way to perform the analysis and detailed selection of characteristics and attributes that should be included into a persona. Therefore, there is a risk that "every suggestion from a member of the team is in fact a statement about themselves" (De Voil 2010, p. 5). To some extent, this did occur during the AHW course. Most students found the approach very intriguing during the formal lecture and presentation of the persona method, because it was a point of departure in the user perspective and seemed to bridge the research phase and empirical data with the design phase and programming in a very clear and visual, design oriented way. However, only a few days into the actual work of collecting empirical data on their individual user groups, the students slowly became more and more frustrated and began asking a series of questions: (1) How much data do they need to collect? (2) How many real users/potential users do you have to interview and observe to be able to develop a scientifically precise and accurate persona? (3) How should they select the potential users? (4) What is the difference between a persona and segment/statistical dataset? (5) How should they decide when the persona profile is 'good enough'? (6) How should they judge between the qualities of quantitative data against qualitative data? (7) How can they avoid making the persona too broad or too narrow? (8) How can they accommodate all that detailed information in the architectural design, which in the end will have to fit everybody? (9) Why develop a persona and not just work with statistical averages throughout the whole process? (10) Why not just ask one or two real people, and develop the material precisely based on their answers? (11) To what extent would it be possible to avoid any individual interpretation and imagination (guessing) by securing authentic and real answers in an on-going dialogue, for instance through methods of co-creation and user-involvement in building processes, and thereby developing a mutual understanding? (12) How can they frame the challenges and personal issues in the best and most realistic way, while still taking the existing evidence-based literature into consideration? All of those questions were, in our opinion, very relevant and point directly to the current debate among researchers working with user involvement, user empathy, and personas. Many of these questions also address the existing critique on the persona method. However, does it mean that our experiment with using personas in our teaching failed? Yes and no.

Figure 1: AHW poster by Julia-Vanina Hahn, MSc02 2018

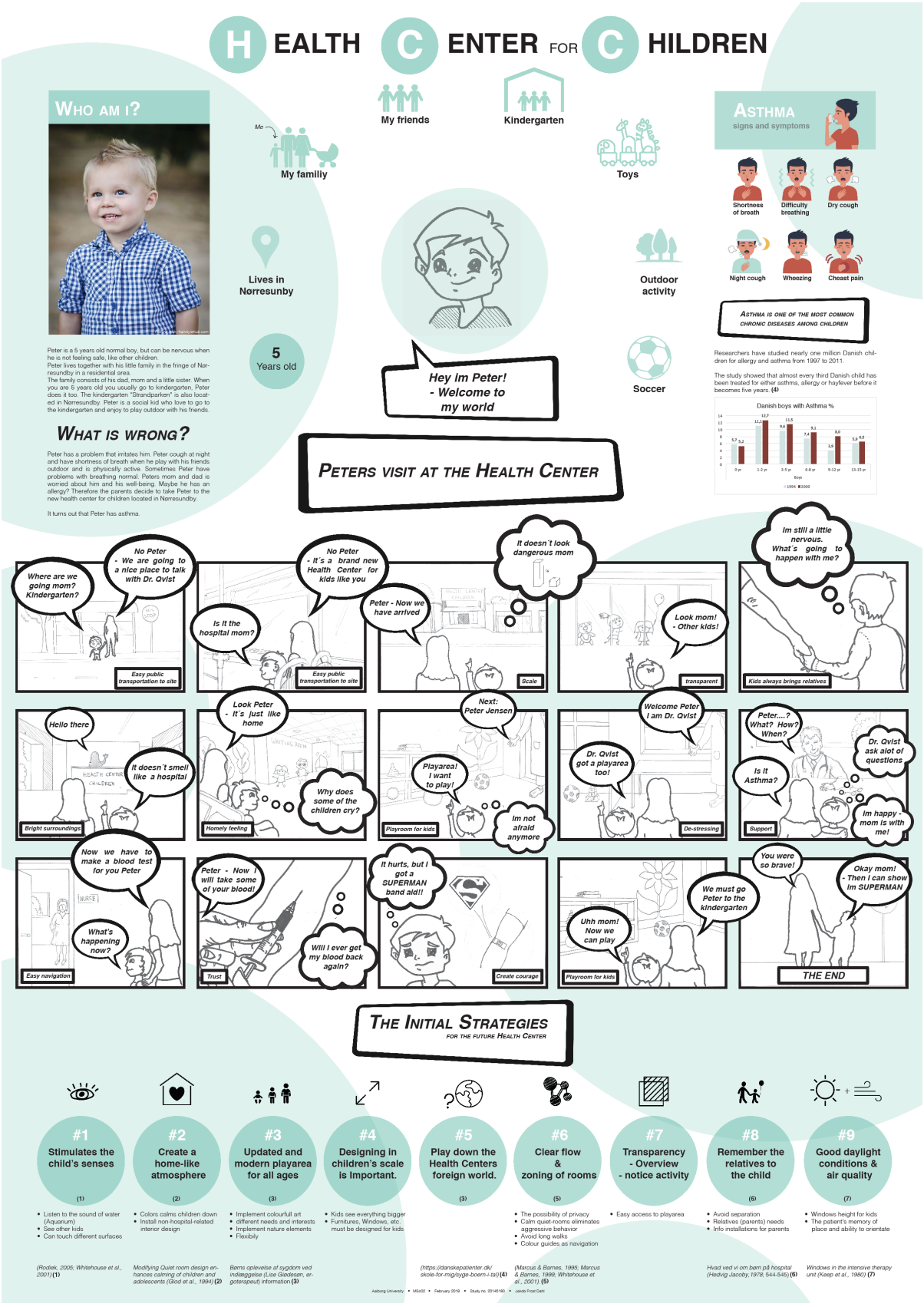

Figure 2: AHW poster by Jacob Frost Dahl, MSc02 2018

No, because the reason why the students became frustrated and began asking questions can be many. For instance, in our specific case we have to keep in mind that a disadvantage (from a research and didactic point of view) was a strict timeframe limited to 3 weeks including lectures, instructions, supervision, and examination. This prevented most of the students from being able to perform in-depth and prolonged observations or collect data from a larger group of users. Secondly, it also prevented a majority of the students from doing thorough transcriptions and proper coding and analysis of their interviews. The effect of this was that in the end, a few students struggled to complete their work effectively, or came up with "quick-and-dirty" solutions to the development of the persona profiles. However, despite the strict timeframe most of the students began critically reflecting on how to incorporate the literature, research findings, and observed user needs in their design strategies. This was a kind of critical reflection that is very rarely seen (if ever) in any of the other courses and semesters in the education.

However, despite the many unanswered questions, frustrations, and methodological criticism of the persona method, we find it surprising and thought provoking in an educational context how quickly the students gained much more interest in user needs. Hence, we have to acknowledge the seemingly great learning effect it had in teaching the students a more refined and *design empathic* consideration of various user groups. Furthermore, questions raised by students incited a very interesting and reflective debate between students and teachers. One of the conclusions from this debate was that in reality, no two people are identical and share the same background or personal experiences; they are all unique characters. Thus, the students, by using the persona method, became much more aware of the architects' role in designing inclusive spaces and began addressing in a more critical perspective how important it is in the design process to reflect upon where to draw the line between the personalized-individual and the standardized-collective.

From a teaching and pedagogical point of view, that awareness of the architects' role in designing inclusive spaces was a very valuable effect of working with the persona method. Still, we must not forget about the 'yes' side of the question of whether the experiment with using personas in our teaching failed. The 'yes' emerges because, from a research point of view, the most critical aspect was teaching the students how to avoid describing the personas as images of themselves. That aspect is not described in existing literature and it was not solved in the AWH course, partly due to the strict timeframe and because methodological reflection was never within the scope and learning goals of the course. However, one way to overcome this challenge in future AHW courses could be to focus more on empathy training, teaching them how to move beyond their own mind-set for instance by practicing more dialogue with real people (Heylighen & Vermeersch 2015; Strickfaden, Devlieger & Heylighen 2009). In addition, in collaboration with ethnographers, complementary exercises in informal observations within public domains could be developed to encourage students to study how small acts and gestures that people perform in everyday situations can reveal how the built environment frames and shapes their behaviours. In the AHW course, the students were informed how small, seemingly unconscious reactions, such as where people position themselves during waiting time in public places like bus stations, train stations, hospitals, and canteen areas, can be a sign of how the built environment works against the well-being and comfort of the user. Accordingly, we encouraged the students during the analytical phases to begin asking all the What-Why-How questions to help them unfold the problem and go deeper into the mind-sets of the specific users. Again, this was an important teaching strategy, because it trains the students' awareness on how the specific design of physical spaces strongly influence or impact on user interactions, user behaviour, and user emotions. Hence, how every design choice the students make on the drawing board have a consequence when built and put to use.

At the same time, they were also encouraged to acknowledge how their personal history, background, and experience can be valuable input to an architects' in-depth understanding of the specific user group of interest. For instance, one of our students had been a heart patient herself for several years, so she had not only a strong personal knowledge of her specific disease, but also had experience from talking with other heart patients during treatment sessions and waiting times in the hospital setting. Of course, not all of the students had that kind of almost 'auto-ethnographic' experience from which to draw their insights. Therefore, during the course we encouraged the students to 'put a face' on the persona they developed by adding a photo and/or a name to the character profile. This was not only to make the description as vivid as possible, but more importantly, to encourage the students to 'see' the individual person, empathize with personal desires and needs, and help move beyond the empirical facts and statistical data. This was further achieved by using analogies and by trying to engage with the more extreme user profiles in order to get an understanding of the edges and limits of the user group. Students were continuously encouraged to share information, discuss in small groups, and do small pin-up presentations in plenum to inspire and learn from each other.

Although we do not aim to answer or solve all of the questions raised by the students, we have opened up important and intriguing research directions to be addressed with further research and teaching experiments. As mentioned above, one possible path is to focus more on training techniques and skills in developing empathy. This could be done, for instance, through collaborations with psychologists and anthropologists to give instructions and participate in the training workshops. Moreover, emerging empathy training techniques could be explored—like digital/video ethnographies (Pink et al. 2017) or somatic 'Focusing' technique that offers a new perspective on people's tacit experiences and personal stories, adapted specifically for design use (Núñez-Pacheco & Loke 2018). Additionally, providing more time for doing in-depth data collection and data analysis during the course would certainly be beneficial.

It is important to underline that it was never the intention with the AHW course, nor the present article, to show or scientifically test whether the persona method works better than other user-oriented methods. We have not performed any before-and-after measurements to evaluate the 'results' of the persona method applied to the AHW course. Hence, it is not our intention to argue that the use of the persona method could have improved the example of the Aabenraa psychiatric hospital. Our goal and motivation was to examine if the persona method had potential to help bridge the transformation of research into design solutions, and importantly—if the persona method could help secure greater implementation of user needs and design empathy throughout the detailed design phases. Based on our initiative and exploratory analysis of the course, we propose that there is a potentially strong educational value in the elements of how individual imagination and intuition unfolded with the persona method in relation to teaching architectural design. In previous courses and semesters, we see that students have intuitively—and without specific tools provided—selected research findings and turned them into design strategies governing their final design solutions, with little or no concern for specific user needs and preferences. In the AHW course, the persona method helped remind the students about the many different perspectives, needs, and preferences different user groups have. In addition, from an architectural educational perspective it was the never the point or purpose to teach the students to develop scientifically sound user profiles. Those already exist with the demographic statistics and Neufert guidelines based on heavy quantitative datasets and statistical analysis. Instead, the architectural educational point with engaging in the detailed user perspectives was to help students understand that not everybody has the same physical abilities, social flexibility, and mental surplus. In other words, to understand that users can have very different and even contradictory needs and desires for the surrounding built environment depending on their age, gender, cultural background, and

current *state-of-being*. What is more, that kind of knowledge and user awareness demands not only a careful programming and detailing of the building design, but also a much more elaborate and user-oriented initial research phase as part of the overall design process.

SUMMARY: POSSIBILITIES OF RESEARCH-INFORMED USER PERSPECTIVES IN ARCHITECTURAL EDUCATION

In our analysis, we have emphasized that the persona method, despite some weaknesses in methodological rigor, nevertheless encompasses a series of strong tools and socio-cultural perspectives through the use of character profiles, scenarios, and storyboarding to teach architecture students how to engage more in the emotions, imagination, and behaviour of different user groups when developing their design solutions. By using words, emotions, and user-centred scenarios together with measurements and drawings of existing environments and daily life, the architecture students learn to focus more on staging different spatial atmospheres, as well as to understand how the story and emotional impact of a room, a building, or a public space can shape user behaviours even before their pen is first put to paper. All three tools together (persona, storytelling, and storyboarding) helped students remember and rediscover the relationship between atmosphere and emotions, to move beyond time, gender, age, and demographics into important creative levels of sympathetic insight and empathy.

Such thinking in design stands in contrast to the currently dominant standardised conceptions of the human body and thus, encourages students to move beyond the statistically based and averaged user definitions by understanding that the architectural experience is an embodied, multi-sensory, and emotional event influenced by the individual user's motivations and needs. Such understanding demands a fair amount of interpretation to move beyond what the users say they want, into finding out what they mean and need, as well as what lies behind what they do. Most importantly, this user understanding is primarily a goal-oriented approach whose aim and purpose is not figuring out who the users are and what they want, but how it influences the architectural design.

In this sense, emphasising the user perspectives in the design process is a reconceptualization of who and what we design for within the domain of sustainable architecture. This is particularly relevant in the context of the growing political, design profession, and academic interest in how architecture—especially of public settings like healthcare facilities—should not only be more sustainable, but can possibly also help to promote healthier lifestyles, prevent future diseases, improve social relations, enhance public health, and help improve overall well-being and quality of life. This issue is closely linked to the increasing demand for evidence-based research and detailed knowledge on how the built environment influences health and well-being. From an architectural design point of view, this demands that architects' have not only a strong ability to integrate knowledge and collaborate across disciplines such as civil engineering and indoor environmental quality, but also hold research-informed expertise and an in-depth understanding of different user groups.

For this reason, this paper proposed that these two aspects: user perspective on the one hand, and a rich body of knowledge from various body-environment research disciplines can be interlinked through the design persona method in order to help encourage in-depth immersion in user perspective and 'design empathic' understanding of diverse user groups in complex building projects like healthcare environments. By exploring the possibilities of using such research-informed user perspectives, architectural education might be better equipped to develop and train not only students' creativity, but also their imagination and emotional sensitivity in design thinking.

End Notes

[i] 'Modulor Man' was a drawing of a stylized human figure positioned in different bodily postures, developed in 1943 and used by architect Le Corbusier in several paintings and architectural sketches as an example of a universal system of proportions. The idea was to provide a series of standard, modular measures used when designing furniture, interiors and spaces.

[ii] DGNB stands for 'Deutsche Gesellschaft für Nachhaltiges Bauen' (The German Sustainable Building Council), a building organization who developed a new method to help evaluate and certify the sustainability and quality of buildings. Today this method is becoming more and more popular not only in Germany, but also within the Danish building industry.

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