

Publisher's and author's accepted manuscript (the same content as the published version)

## Benefits and challenges of adding participant photography to qualitative residential research

[Gerhardsson, K. M.](#), 2021, *Approaches and Methods in Architectural Research*. [Nordic Academic Press of Architectural Research](#), Vol. 2021. s. 45–76 32 s. (NAAR Proceedings Series; vol. 2021, nr. 1).

### **BENEFITS AND CHALLENGES OF ADDING PARTICIPANT PHOTOGRAPHY TO QUALITATIVE RESIDENTIAL RESEARCH**

Kiran Maini Gerhardsson

#### **ABSTRACT**

This article discusses the benefits and challenges of adding participant-produced photographs to qualitative interviewing. The analysis is based on two qualitative studies aimed at improving the understanding of how residents experience and use their a) luminaires and b) window openings. A convenience sample ( $N = 12$ ) was asked to take photographs of all luminaires in their apartments. Facilitated by the photo albums, semi-structured interviews were then held in the participants' homes and the researcher made observer-based environmental assessments of the apartments. The same procedure was used in the second study investigating window openings, with a new convenience sample ( $N = 20$ ). Here, participants were asked to include between one to three keywords for each image when submitting the images prior to the home visit.

The researcher experienced several benefits when combining verbal methods with imagery: discussion of the photos created more relaxed and focused conversations, enabling time-efficient interviews with improved data quality. Adding keywords to the images prompted further discussion and thereby additional information. It is suggested that the identified benefits outweigh the disadvantages, such as more time needed for data collection. This article supports findings in recent literature on qualitative research that adding participant-produced photographs to interviews has multiple benefits in knowledge production, from the perspectives of both the researcher and the participant.

#### **KEYWORDS**

Residential, user experience, participant photography, photo-elicitation interviews

## **INTRODUCTION**

Knowledge of user needs and preferences concerning electric lighting, daylight, and room darkening in homes is limited. This was the motivation for conducting the two studies in the field of environmental psychology on which this article is based: the investigation of the use of indoor home lighting and window openings, and the role these artefacts play in residents' everyday living. Findings from the studies are reported elsewhere.<sup>1</sup> The focus of this article is on the method used in both studies: the combination of participant photography and qualitative interviews conducted in the field.

Photo-elicitation was assumed to offer an insightful research method. The decision to add participant photography and observer-based environmental assessments to the qualitative interviews is consistent with the author's pragmatic approach to conducting research: the production of useful knowledge allows either quantitative or qualitative research approaches, or both, in ways that offer the best opportunities to answer the research question.<sup>2</sup> Visual material, as a tool for communication, has also been central to the author's professional experience of creating architectural work as well as book illustrations.

The objective of this article is to identify both benefits and challenges of adding participant photography to qualitative interviewing aimed at examining user experiences of cultural inventories of the physical home environment. The article is divided into four parts. The first part begins with a short background to the conducted studies, and then photo-elicitation in research is presented (the terminology, the historical use of visuals in different disciplines and various reasons for including visual data in scientific research). The second part gives a detailed account of the methods used in both studies. The third part presents and discusses both benefits and challenges relating to participant photography and its contribution to the empirical findings. The article concludes with the most important insights.

## **Background**

The rapid advancement in lighting technology has opened a window of opportunity for a universal design of interior home environments: new lamp technologies with variable intensity and colour temperature can be controlled, either manually or automatically, to fit residents' different needs and wants depending on age, culture, and other individual characteristics.<sup>3</sup> When daylight is available, the home environment has to permit maximising, shading, or blocking it. Both luminaires and physical design features of the home environment are central to residents' exposure to light and dark, which, in turn, influence visual performance, experience and comfort (image-forming effects), and circadian regulation and alertness (non-image-forming effects).<sup>4</sup>

Not only do individual biological lighting needs and lighting preferences among healthy people justify the universal design of homes, or 'design for all', but so does the on-going demographic shift. The proportion of older people is increasing<sup>5</sup> and policy goals state that older people should be able to carry on living independently in their homes as long as possible. Living independently and in-home care demand special attention in the design of both physically and visually accessible homes.<sup>6</sup>

In times of accelerated change in technology, more research is needed on user experiences of products and the physical home setting. Qualitative methods, such as

interviews and observations, are considered to be appropriate techniques for increasing understanding, but how do we get the most out of research interviews?

### **Photo-Elicitation in Research**

Participant photography belongs to a wider research method named photo-elicitation which is defined by Harper as being ‘based on the simple idea of inserting a photograph into a research interview’.<sup>7</sup> This wider use of photography is included in the guide *Visual Methodologies* by Rose who explains how photo-elicitation (i.e. using photographs to encourage interview talk), photo documentation (i.e. using photographs as documentary evidence), and further use of photos in research are distinct from other approaches to visual materials:

because they do not work with ‘found’ images that already exist distinct from a research project: Hollywood films or family snaps, for example. Instead, they work with images that are made as part of a research project. The images can be made by the researcher, or they can be made by the people they are researching; and they can take the form of film or still photos, maps or diagrams . . . or drawings . . . . Importantly, these are not images that simply illustrate some aspect of the research project: what Marcus Banks (2001, p. 144) calls a ‘largely redundant visual representation of something already described in the text’. Instead, in these methods, the images are used actively in the research process, alongside other sorts of evidence generated by interviews or ethnographic fieldwork.<sup>8</sup>

Rose divides the use of participant-produced photographs in research into two categories: photos can be supportive or supplemental.<sup>9</sup> When photos are supportive, they are used to encourage interview talk and they are subordinated to the researcher’s interpretations. When photos are used as visual supplement to the written text, they are analysed as images on their own terms.

Photo-elicitation has been widely used in anthropology, sociology, human geography, health care, and action-oriented research addressing problems facing a particular community (photovoice). Although photo-elicitation for research purposes is limited within the psychology discipline,<sup>10</sup> photographs taken by clients have been used in photo therapy guided by a mental health professional to improve their well-being.<sup>11</sup> Environmental psychology researchers have used still photography or videos for environmental simulations in laboratory settings, that is, representations of already existing or planned environments, and for behavioural mapping in observational studies.<sup>12</sup> For an overview of photo-elicitation in previous psychology research and a step-by-step guide for psychology researchers, see Bates et al.<sup>13</sup>

Why use photo-elicitation in research? To evaluate the choice and use of visual methods, Pain reviewed 109 research reports published between 2000 and 2010, finding two categories of given reasons: 1) the enrichment of data collection or presentation, that is, improving the quality and depth, or 2) the relationship between participants and researchers, for example acknowledging participants’ expertise, addressing the imbalance of power between researcher and participant, or effecting change within a community. Non-instrumental use of visual information was excluded in the review, that is, studies using the visual for its own sake.<sup>14</sup>

Departing from ‘The Integrated Framework of Visual Methods’ proposed by Pauwels, there are a number of additional issues to be considered by researchers opting

for the use of photo-elicitation techniques.<sup>15</sup> During *the input phase*, the researcher has to decide on the origin and nature of the photos, which relates to the reasons for choosing photo-elicitation. Photos can be produced by participants,<sup>16</sup> the researcher,<sup>17</sup> or both<sup>18</sup>. The subject matter can be, for example, material culture, behaviour, elicited behaviour of a verbal or visual nature, or concepts. The visual medium in photo-elicitation studies can be photography or film.

Investigating the role played by the physical setting in patients' recovery, Radley and Taylor asked patients to take photos of their hospital ward and then interviewed them both in the hospital and in their homes.<sup>19</sup> In another photo-elicitation study, the subject matter was the patients' preferences and appropriation of social spaces in the hospital environment.<sup>20</sup> Patients were asked to take photographs of places at the hospital that they would associate with pre-written questions and then answer them on one of 20 researcher-selected 'postcards' with images. In a study exploring suburban lived experiences, participants compiled a photo diary with images of at least ten aspects of the suburb, either good or problematic.<sup>21</sup>

In the *processing phase*, the researcher has to take decisions regarding the processing of the photos.<sup>22</sup> The analytical focus may involve a detailed analysis of the photo: the content, how it is depicted, or the visual form based on a theoretical foundation for visual analysis. When photo-elicitation is used in interviews, the focus is on the respondents' feedback on the photos. According to Pauwels, additional issues at this stage are visual competencies (e.g. the researcher's technical knowledge of photography and editing, sampling, and data production strategies), providing the necessary context when presenting the photos in reports, ethical issues regarding how recognisable participants are in the photos, and the question of copyright.<sup>23</sup>

The final issue for researchers to consider is in the *output phase* and involves how photos should be presented as well as their status in the final work.<sup>24</sup> In some cases the purpose of participant-produced photos is to communicate desired improvements in the community to decision-makers.<sup>25</sup>

Like non-visual research methods, such as verbal-only interviewing, the use of photo-elicitation is purpose-driven, that is, the ways in which photos are collected, analysed, and presented will depend on the aim of the study and reasons for including the photo-elicitation technique.

## MATERIAL AND METHODS

Qualitative interviewing in the field, photo-elicitation, and observer-based environmental assessments (OBEA) were used to deepen the understanding of residents' experiences with artefacts (luminaires and window openings) in their home environment. The main motivation for adding participant photography to the research design was an expectation that this would elicit more information from the research interview because it can encourage participants to talk and reflect.<sup>26</sup> Photos can be especially effective when they involve something that is visual, such as objects or people, compared to less concrete day-to-day phenomena.<sup>27</sup> The purpose of the interviews was not to make statistical generalisations, but analytical ones.<sup>28</sup>

**Table 1.** Contextual information for the two studies based on 'The Integrated Framework of Visual Methods': The 'Origin and nature of visuals' equals the input

phase, ‘Research focus and design’ correspond to the processing stage, and ‘Format and purpose’ to the output phase.<sup>29</sup>

| Characteristics                              | My Home Lighting   | My Window Openings  |
|--|--|---|
| Aim of study                                 | To examine residents’ needs and desires concerning interior home lighting in everyday situations, based on residents’ experiences with their home lighting and perceptions of their luminaires.<br>A second aim was to examine the key factors influencing residents’ lighting choices.  | To examine the role of window openings in homes: their contribution to the lighting situation and residents’ dwelling experiences during the day and night.   |
| Origin and nature of visuals (input phase)   | <i>Origin/production context</i><br>Researcher-initiated production of visuals (not pre-existing visuals): participants were instructed by the researcher to take photos of their luminaires.<br><i>Subject matter</i><br>Artefacts (luminaires) and elicited behaviour were in focus.<br><i>Visual medium/Technique</i><br>Photography, using a camera phone or a single-use camera.  | <i>Origin/production context</i><br>Researcher-initiated production of visuals (not pre-existing visuals): participants were instructed by the researcher to take photos of their window openings and room interiors, and to write keywords.<br><i>Subject matter</i><br>Artefacts (window openings) and elicited behaviour were in focus.<br><i>Visual medium/Technique</i><br>Photography, using a camera phone.  |
| Research focus and design (processing phase) | <i>Analytical focus</i><br>Photo-elicitation, i.e. analysis of participants’ feedback on visual stimuli (photos).<br><i>Theoretical foundation for visual analysis</i><br>Photos were not analysed, since the role of the visuals was to support the interviews, which were analysed thematically.<br><i>Methodological issues</i><br>A convenience sample with a variety of household size, housing tenure type, and dwelling size (see Table 2). Participants were offered a | <i>Analytical focus</i><br>Photo-elicitation, i.e. analysis of participants’ feedback on visual stimuli (photos) and verbal stimuli (written keywords).<br><i>Theoretical foundation for visual analysis</i><br>Photos were not analysed, since the role of the visuals was to support the interviews, which were analysed thematically.<br><i>Methodological issues</i><br>A convenience sample with a variety of household size, housing tenure type, and |

single-use camera.  
 Recorded interviews in situ provided the contextual information relating to the photos.  
 Permission to use the photos without naming the photographer was obtained by the researcher at the end of the interview.  
 Image-external context was provided in end reports, i.e. photos were supplemented with other kinds of data findings, such as informants' responses.

dwelling size (see Table 2).  
 Participants without a camera phone were offered a single-use camera. Older participants, unable to take photos, were assisted by friends or family.  
 Recorded interviews in situ provided the contextual information relating to the photos.  
 Permission to use the photos without naming the photographer was obtained by the researcher at the end of the interview.  
 Image-external context was provided in end reports, i.e. photos were supplemented with other kinds of data findings, such as informants' responses.

Format and purpose of visuals (output phase)

*Output/presentational format*  
 Selected photos were used as examples of produced visual data in articles and oral presentations.

*Status of the visual*  
 Photos were intended as facilitators and prompts in qualitative interviewing and not as the end product.

*Intended and secondary uses*  
 See above.

*Output/presentational format*  
 Selected photos were used as examples of produced visual data in articles and oral presentations.

*Status of the visual*  
 Photos were intended as facilitators and prompts in qualitative interviewing and not as the end product.

*Intended and secondary uses*  
 Selected photos of appropriate technical quality were intended to be used as examples of various challenges of the home setting in future communication with practitioners and popular writing.

**Table 2.** Participant characteristics in the two studies.

| Characteristics   | My home lighting   | My window openings   |
|---|--|--|
| Participants  | <i>N</i> = 12.<br><i>Mdn</i> = 43 yr ( <i>M</i> = 46 yr),<br>range = 26–76 yr.<br>50% females.   | <i>N</i> = 20.<br><i>Mdn</i> = 57.5 yr ( <i>M</i> = 66.5 yr),<br>range = 24–93 yr.<br>50% females.                                     |
| Household size  | Single person ( <i>n</i> = 8).<br>Multi-person, two adults ( <i>n</i> = 3).<br>Multi-person, adults + children >12 yr ( <i>n</i> = 1). | Single person ( <i>n</i> = 8).<br>Multi-person, two adults ( <i>n</i> = 8).<br>Multi-person, adults + children >12 yr ( <i>n</i> = 4). |
| Dwelling size   | 26–107 m <sup>2</sup>  | 33–114 m <sup>2</sup>  |
| Housing characteristics (building year, location, housing tenure <sup>a</sup> ) | 1880–2006.<br>Lund and Malmö.<br>Rented ( <i>n</i> = 7), tenant-owned ( <i>n</i> = 5).   | 1912–2011.<br>Lund, Malmö, and Eslöv.<br>Rented ( <i>n</i> = 4), tenant-owned ( <i>n</i> = 16).  |
| Data production (photography and interviewing)                                  | Eight weeks from October to November 2015.   | Ten weeks from March to May 2017.  |

<sup>a</sup> ‘Tenant-owned dwelling’ refers to a common tenure model in Sweden. The tenants own a share of the housing association which in turn owns the building. Tenants can sell their share and the tenancy rights.

### **My Home Lighting: Participants**

The study was carried out in people’s private homes. A convenience sample was recruited, consisting of six female and six male residents aged 26 to 76, with a variety of household size, housing tenure type, and dwelling size (see Appendix, Table A1). Inclusion criteria were Swedish-speaking adult residents living in apartments located in Lund or the adjacent city of Malmö. People in the researcher’s network were approached and asked to invite contacts in their respective networks to participate in the study (close friends of the researcher were excluded). This sampling technique was preferred because people can otherwise be reluctant to agree to interviews in their private homes. As an incentive, the participants received either three lottery tickets or a movie voucher upon completion.

### **My Home Lighting: Material**

The study was guided by the following question: ‘How are luminaires used in homes and what are the residents’ needs and wants regarding home lighting?’ Information and material obtained were digital recordings of interviews, participant-produced images of their home lighting, floor plans, and observer-based environmental assessment (OBEA) forms completed in situ by the researcher (see Figure 1). The purpose of the initial walk-through and the environmental assessment was to ascertain if the participant had taken photographs of each luminaire and not accidentally missed any, to see the luminaires in the actual setting, to record interior features relevant to the lighting

situation, and to form an impression of the home lighting before carrying out the interview.

a)



b)

Participant no 1: female, 31 years.  
 Time of visit: 18:30, 2 November 2015.  
 Studio apartment, ceiling height 2.7 m, construction year 1936, rental.

| Room                     | Height of window sill | Blank wall: Yes/No | Wall finish: Light/Medium/Dark | Visible candle-sticks: Yes/No | Colour tone of the lamp: Warm/Cool | Daytime: Lights on/Blocked daylight | Bathroom luminaire: Wall/Ceiling/Integrated |
|--------------------------|-----------------------|--------------------|--------------------------------|-------------------------------|------------------------------------|-------------------------------------|---|
| Hall                     | –                     | No                 | Light                          | No                            | Warm                               | –                                   |   |
| Kitchen                  | Medium                | Yes                | Light                          | No                            | Warm                               | –                                   |   |
| Bathroom                 | –                     | Yes                | Light                          | Yes                           | Warm                               | –                                   | Wall mounted                                |
| Bedroom area/living room | Medium                | Yes                | Light                          | Yes                           | Warm                               | –                                   |   |

**Figure 1.** ‘My Home Lighting’: (a) albums with participant-produced photographs served as facilitators in the interviews and (b) observer-based environmental assessment (OBEA) forms were completed in situ by the researcher to supplement the images.

### My Home Lighting: Procedure and Analysis

An invitation e-mail was sent to the participants explaining the purpose of the study and providing information about the requirements: a copy of the floor plan, if available, and information that a series of participant-produced photographs of residents’ luminaires were to be taken before the home visit. Participants who accepted the invitation were later given the following instructions by post: ‘Please take photos of all the luminaires in your home with a camera phone, single-use camera or another type of camera, but no more than twenty-five images. Do one room at a time. You may include several luminaires in one image, or one per image, if the total number allows this. You are free



to decide view angle, distance range to the luminaires, time of day, etc. Avoid including faces of people in the photos.’ They were also given a limit of file size (approximately 1 MB). Two weeks were given to complete the assignment. Prior to the interviews, the images were assembled by the researcher in an album (see Figure 1a).

Home visits began with a walk-through with the participant who was asked to turn on any unlit luminaires. During the walk-through, observations of interior features relevant to the lighting situation were continuously recorded on a prepared form and on the floor plan. Features observed were the colour tone of the light sources (warm or cool), surface colours of flooring and walls (light, medium, or dark), window openings, and visible candlesticks (see Figure 1b). No lighting measurements were taken, as the aim of the inquiry was to obtain participants’ experiences with their home lighting and perceptions of their luminaires.

The interview was semi-structured (see Appendix, Interview guide A1) and the photo album was used as a facilitator. Participants were asked to consider one photo at a time and talk about the luminaire: why it had been chosen and how it was used. If not addressed by the participant during the interview, additional follow-up questions were asked regarding lighting controls, lighting preferences of other household members, past changes to their lighting and desired changes, daylight satisfaction, lighting behaviour (turning off the lights when no one is in the room), and the possibilities to darken the bedroom at night. The recorded interviews varied in length (15–35 minutes) depending on the number of luminaires and on how much participants elaborated on their answers to the researcher’s questions. The total duration of the home visit, including the walk-through and the interview, was approximately one hour. Field notes were recorded by the researcher after the visit, including participant characteristics and reflections.

After the collection of all the necessary material, the researcher carried out a thematic analysis following a three-stage process, including moving back and forth between steps.<sup>30</sup> The participant-produced images were not analysed, since the purpose of the photos in this case was to encourage participants to talk and reflect on their choice and use of luminaires.

### **My Window Openings: Participants**

Residents’ experiences with daylight and their window openings were explored in a similar way to the home lighting interview study, but with a new set of participants (see Appendix, Table A3).

### **My Window Openings: Material**

The study was guided by the following question: ‘How do residents experience their window openings, during day and night?’ Information and type of material obtained were similar to the first study: digital recordings of interviews, participant-produced images of their window openings and room interiors, floor plans, and observer-based environmental assessment (OBEA) forms completed in situ by the researcher. Unlike the first study, research material also included keywords or short descriptions added to the images by the participants. The purpose of the initial walk-through and the environmental assessment was to ascertain if the participant had taken photographs of each window opening and not accidentally missed any, to see the windows in the actual

setting, to record interior features relevant to the research question, and to form an impression of the home before carrying out the interview.

1. Please take photographs of every window opening in your home using a camera phone or another type of camera, but no more than **25 images**. The focus is on the window opening and not the design of the window.

- Stand in a room with a window opening (or a glazed balcony door) in the wall. Position yourself in front of the window opening and take a picture. Distance is optional. You may supplement with additional photos of details if there is anything you would like to draw attention to. The window can be open or closed.
- Then turn around and take a picture of the room view with the window right behind you.
- Move to the next window opening in the room or to the next room. Proceed as above until you have taken pictures of all window openings.

...

**Figure 2.** ‘My Window Openings’: Excerpt from instructions sent by post.

### **My Window Openings: Procedure and Analysis**

Similar to the first study, an initial invitation e-mail was sent to the participants explaining the purpose of the study and providing information about the requirements. This study included a series of participant-produced photographs of the window openings and the room interiors that were to be taken before the home visit. Participants who accepted the invitation to participate in the study received detailed instructions by e-mail and had 20 days to complete the assignment (see Figure 2). Unlike the first study, participants were also asked to assign one to three keywords to each image of the window openings in the hope of encouraging them to further reflect on the topic. The instruction was: ‘Include between one and three characteristic keywords that capture something in the picture with the window opening, or something you thought about when taking the picture or looking at it afterwards. . . . If you find it difficult to come up with any keywords, you could imagine the opening has been blocked up so there is no window. What would a wall instead of a window opening mean to your everyday living, day and night?’ Prior to the interviews, the images including the keywords, were assembled by the researcher in an album (see Figures 3 and 4).

Home visits began with a walk-through with the participant who assisted in taking some of the measurements, such as the height of the windowsill above the floor. During the walk-through, observations of interior features relevant to the lighting situation were continuously recorded on a prepared form and on the floor plan. Features observed were:

- the placement of air intakes,
- inward or outward opening windows,
- external shading devices,
- fabric of interior shading,
- surface colours of flooring and walls (light, medium, or dark),
- colour of window frames, mullions, and glazing bars (light, dark),

- electric lighting turned on or/and shaded windows during daytime,
- type of room darkening,
- splay angle of window reveals,
- window recess measurement,
- windowsill height,
- size of window opening (for later calculation of window to external wall ratio),
- glazing size and room floor area (for later calculation of glazing to floor ratio).

The interview was semi-structured (see Appendix, Interview guide A4) and the photo album was used as a facilitator. Participants were asked to consider one photo at a time and respond to the following question: ‘Imagine the window opening has been blocked up and there is no window anymore. How would it affect your use of the room and your dwelling, during the day and night?’ If not addressed by the participant during the interview, additional follow-up questions were asked regarding, for example, satisfaction with and use of daylight, the possibilities to darken the bedroom at night, and preferences of other household members. The recorded interviews varied in length (30–75 minutes), and the total duration of the home visit, including the walk-through and the interview, was between one and two hours. Field notes were recorded by the researcher after the visit, including participant characteristics and reflections. Collected material was analysed following the same process as in the first study.<sup>31</sup>



Kitchen (1). "Light, contact, sunshine"



Kitchen (2)



Kitchen (3). "Nature, people, watch"



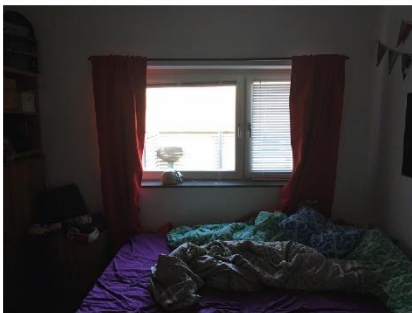
Kitchen (4)



Living room (1). "Heat, exit, visual intrusion"



Living room (2)



Bedroom (1). "Room darkening, morning"



Bedroom (2)

**Figure 3.** 'My Window Openings': photographs including keywords produced by a female participant, living with her son in a rented one-bedroom apartment on the ground floor. Each pair consists of a view from the inside looking at the window opening, and a view of the room taken from the window opening.



Kitchen (1, 2). "Living, city, everyday life – because I see Malmö Live, St Peter's Church and Turning Torso, which represent 'the city'"



Dining room (1, 2). "Calm, relief, simplicity – because of the influence of the window on the spatial experience and the outdoor view"



Living room (1, 2). "Light, relaxation, security – because of the size of the window opening, the water in the canal and the living room as the 'heart' of the apartment"



Bedroom (1, 2). "Rest, neighbourhood, silence – because this is the first thing I see in the morning"

**Figure 4.** 'My Window Openings': photographs including keywords produced by a male participant, living with his girlfriend in a rented two-bedroom apartment, 82 m<sup>2</sup>, on the third floor. Each pair consists of a view from the inside looking at the window opening, and a view of the room taken from the window opening.

## FINDINGS AND DISCUSSION

The findings of this article concern the role of participant photography in two studies. Based on these findings, grouped according to the different phases, I will discuss and reflect on the value of camera-based imagery in research on cultural inventories of home settings, and whether initial expectations of generating more information from the research interviews were met. Unless stated otherwise, the word ‘participants’ refers to interviewees in both studies.

### Observations in the Input Phase

*Aspects of time, effort, and abilities in co-production.* As in verbal-only interview studies in the field, recruitment takes time for various reasons: people may be reluctant to be interviewed in their private home and interviews and participant photography involve more effort compared to a questionnaire survey. Two volunteers in a previous conventional interview study in a laboratory setting were interested in taking part in the second study. However, they declined after receiving the formal invitation letter because they did not have a phone camera (despite the offer to send single-use cameras).

Some of the older participants needed assistance in taking and sending photos. Four older participants in the second study received help from a friend, a spouse, a son, or a daughter. One participant requested a single-use camera. Only two participants needed a reminder to email the photos they had taken. Before submission deadline, a male participant inquired about whether luminaires in the bathroom should be included before the submission of the photos. Other than that, preparation and photo production before the home visit did not present any unexpected complications, suggesting that the instructions were clear to participants in both studies.

Three participants in the first study were explicitly asked about their experience of taking the photos. A female participant living in a studio apartment commented: ‘I didn’t reflect too much about it, it was easy once I got on with it. But then my apartment isn’t so big either . . .’. Another comment by a male participant, living in a large two-bedroom apartment, was: ‘It was nothing special. I’m used to taking photos.’ A similar sentiment was expressed by another male participant: ‘It was just taking photos. Nothing special.’ Even though the question was not posed to all participants, there was no indication that the required photography presented any problems to those who had agreed to participate.

The production of photo albums by the researcher comprised the digital assembly of photos and floor plans, when submitted by the participant beforehand, and print outs. In the second study captions with participants’ keywords were also inserted. Photos were not edited apart from occasional reduction in size.

*Pre-views of artefacts and home settings before home visits.* Seeing the images and floor plans prior to the home visit provided an unexpected opportunity for the researcher. The interview could be better planned in relation to the number of items (luminaires or window openings) and matters to bring up in the discussion, such as any items participants might have forgotten to include in their photo collection.

The subsequent home visit and interview provided an opportunity to check the depicted items in the real setting. Two female participants had forgotten to take photos of the luminaires in their bathroom. The former had also forgotten to include the ceiling pendant in the hallway. Another female participant, living in a two-bedroom apartment,

had forgotten to include twig branch lights in the bedroom window. She explained that ‘they are seldom lit. They were lit yesterday and today, to have some cosy lighting.’ A male participant, living in a large-sized two-bedroom apartment (107 m<sup>2</sup>), had forgotten to include the luminaires in two bathrooms, a walk-in closet and a small kitchen with no dining area. In the second study, a female participant, living in a two-bedroom apartment, had forgotten the window opening in her pantry.

Additional deviations from photos were observed during the walk-through. A male participant had moved a floor-standing luminaire from one bedroom to the master bedroom because it was only temporarily placed in the other room. A female participant, living with her partner in a one-bedroom apartment, explained why the floor-standing luminaire in the living room was placed in the middle of the room, unlike in the photo. It is moved around depending on where light is needed: beside the armchair or the dining table (the room had one pendant ceiling luminaire in the centre of the room but none over the table). One photo in the second study showed a bedroom window with the venetian blinds pulled down, but opened slats. During the interview, the female participant was asked if this was normal, but she explained that the blinds are usually closed throughout the day and night. Her response prompted further questions as to why she has the blinds closed during the daytime.

Privacy can be an issue for some but not for others. An older female participant, living in a two-bedroom apartment, chose not to include the bedroom interior because she regarded it as being too private. Conversely, bedrooms with unmade beds occurred among images taken by younger residents.

## **Observations in the Processing Phase**

***Focused and relaxed interviews.*** The researcher perceived the interviews supported by images to be more effective in obtaining information compared to previous verbal-only interviews. The photographs were taken by the participants, but they did not see the albums until the interview. With the albums guiding the interview, the conversation stayed focused on the subject matter, namely luminaires or window openings. Another possible contributing factor to the relaxed interview atmosphere was the active involvement of the participant in the initial observer-based environmental assessment. In the first study, the participant was asked to turn on the lights in each room while the researcher made notes and took the measurements. In the second study the participant assisted in measuring the windowsill in each room.

***Keywords served as reminders in the interviews.*** In the second study, the captions, containing the keywords written by the participants, served as valuable reminders in the interview. For example, a female participant, living in a two-bedroom apartment on the ground floor facing a busy street, had included three keywords to the window opening in her bedroom: ‘light, sound, visual intrusion’. She was asked by the researcher to elaborate on ‘visual intrusion’. Only then did she remember that she likes a closed curtain by the bed to avoid visual intrusion from the street. During the interview, some participants said it had been difficult to think of keywords for all window openings.

***Images convey different types of information.*** Although the intention was not to perform a visual analysis of the images, a few characteristics were noticed in the photos. In the first study, the only restriction was the limit on the number of images yet all photos were taken from a standing position. Some participants had chosen to submit more than one photograph of each item. A male participant, living in a one-bedroom apartment, depicted some of the luminaires lit and unlit, as did a female participant,

living in a studio apartment. Another male participant, living in a two-bedroom apartment with a balcony visible from the living room, included the exterior LED tree lamp on the balcony.

In the second study, photo shoot instructions were slightly more restricted since the participants were to ‘Stand in a room with a window opening . . . Position yourself in front of the window opening . . .’. The lack of variation among participants’ photos was less surprising because instructions left little room for personalisation. A female participant, sharing a two-bedroom apartment with her friend, provided additional photos including details for four of five window openings. A further female participant, living in a two-bedroom apartment with characteristic sight lines across the apartment, chose to show the room interiors with both opened and closed doors. Only one participant, living in a studio apartment, took photos of the window openings during the evening. When asked for the reason in the interview, he explained that he had postponed the assignment to the final evening before the submission deadline.

The instructions to participants in the second study explained that the focus of their photography was to be on the window opening and not window design. One reason was to encourage participants to reflect on how the opening contributes to residential comfort rather than the design features of the window. Another reason concerned a more practical matter. It was assumed that it would facilitate the photography since a series of adjoining window units would be regarded as one window opening. However, some types of window openings are not that straightforward, such as bay windows, consisting of three windows, and corner windows. Two participants, living in multi-dwelling buildings in the city centre with bay windows looking onto the street, depicted the bay windows in one image. A male participant regarded the bay windows as three openings, each with a different outdoor view and view distance. Considering that the apartment was on the fifth floor in a nine-storey building block facing the sea and the city, this was hardly surprising.

*Images as visual memory aids for reconstructing the visit.* Looking at the photos when transcribing the interviews helped to recollect the interview situation. Images could also be used as photo documentation for confirming or correcting observations after the visit. In one case, a three-armed candle holder with candles in the kitchen was visible in the background but was not recorded on the prepared form.

*Ethical considerations regarding photography.* All procedures were performed in accordance with the general ethical principles of psychologists,<sup>32</sup> followed informed-consent rules, and showed respect for confidentiality and privacy. No approval from the Ethical Review Board was needed, since the studies did not include interventions or potential risk of unintentional physical or psychological harm.<sup>33</sup> Permission to use the photos without naming the photographer was obtained by the researcher at the end of the interview. No identifiable faces of people were visible in the photos. In a few photos of room interiors including mirrors, participants were visible but not recognisable. Participants could freely decide whether or not to include photos; one participant chose not to include a photo of the bedroom interior because she regarded it as being too private.

## **Discussion of Participant Photography in the Input Phase**

The input phase comprises the origin of the photos and the context of the site. Taking the photos did not seem to be too demanding for most participants, which is not surprising considering the current widespread use of smartphones and images among



Swedish people in general. Another reason could be that both studies involved inventories that are more easily depicted than abstract concepts. Also, when the subject matter is material artefacts, such as luminaires, window openings, or other inventories of the physical setting, some of the ethical issues related to photography of people and the social environment can be avoided: there are no issues of obtaining their permission, as no people are depicted. Although requiring less effort than more abstract and general topics, participants can be reluctant to engage with visual methods, as pointed out by Pain.<sup>34</sup> The exclusion of certain groups will certainly have an impact on the findings. In these studies, the assistance given to older participants was encouraged and taking pictures can make participation more enjoyable.

Another reason for including visual methods can be to mediate the relationship between researcher and participant, such as to address the imbalance of power between them.<sup>35</sup> However, in the two studies presented in this article, this was not the reason for using participant photography. Instructions as to what to depict were determined by the researcher who also assembled the photos in albums. However, the order of the photos, as the participant took them, steered the interview. Other studies have adopted a more respondent-controlled approach, for example Warner et al.<sup>36</sup>

The inclusion of participant-produced keywords in the second study was expected to encourage participants to further reflect on the topic before the interview. Some participants found it difficult to provide keywords to all photos depicting window openings, suggesting that they actively thought about them. It is likely that the addition of keywords furthered the participants' reflection on the topic since only taking photos can be a hasty and unconsidered exercise when depicting pre-determined artefacts.

### **Discussion of Participant Photography in the Processing and Output Phase**

When photo-elicitation is used in interviews, the analytical focus in the processing phase is on the respondents' feedback on the photos. The researcher experienced several benefits: the discussion of the photos produced a more relaxed and focused conversation which enabled a time-efficient interview and keywords to the images prompted further discussion.

The interview, guided by the pictures displayed in front of the participants, was found to be time efficient. Another option would be to conduct an interview while walking through each room, stopping and looking at the actual luminaires or window openings and not their two-dimensional representations. Both techniques have merits, but the latter would require more time and participants may be unwilling to accept more extended home visits than one or two hours.

In her review, Pain concluded that there is strong support for the use of visual methods to enhance data richness although more research is needed.<sup>37</sup> In both studies, the use of participant-produced photos was appreciated by the researcher for eliciting more information because visual stimuli prompted further discussion. Richer data is also central to increased trustworthiness. The combination of seeing the depicted items in photos before the home visit and later in their real setting allowed for more questions than would have been the case without the photos. Deviations from photos were brought up in the interview, such as closed blinds during the visit which were opened in the photo, for instance in the bedroom (see Figure 3). Photos alone would thereby not have been effective. The subsequent interview was essential for seeing whether the setting had been modified. The statement by Kvale and Brinkmann concerning validity in qualitative interviewing applies also to photo-elicited interviews:

Validity here pertains to the trustworthiness of the subject's reports and the quality of the interviewing, which should include a careful questioning to the meaning of what is said and a continual checking of the information obtained as a validation in situ.<sup>38</sup>

The analytical focus in both studies was the participants' feedback on visual stimuli (photos) and verbal stimuli (written keywords). Digitally recorded interviews provided the contextual information relating to the photos. Photos were not analysed as images in themselves, since the role of the visuals was solely to support the interviews.

However, photography can capture unintended perceptions of the subject of inquiry. Some participants in the first study forgot to include the luminaires in the bathroom, which indicates that bathroom lighting does not seem to play a prominent role in these particular residents' everyday lives. This is something to reflect on considering how central early morning light exposure is to circadian regulation.

Even though the photos have not been analysed, they carry information worth noting. Surprisingly, all photos of the luminaires in the first study were taken from a standing position although instructions allowed any position ('take photos of all the luminaires in your home . . . You are free to decide view angle, distance range to the luminaires, time of day etc.'). One reason could be that taking photos from a standing position is quicker, and thereby requires less effort. Another possible reason could be a non-conscious choice to depict an object in a way that is the most representative of reality, not uncommon for non-professional photography. Some participants chose to include several photos of the items. This extra effort reveals an appreciation of aesthetic values, interest in interior design, or the spatial qualities of the home setting, which became apparent in the interview.

Since data collection, selected photos from both studies have been used as examples of produced visual data in articles and oral presentations. Photos were not intended to be end products but as stimuli for talking about residents' experiences with their luminaires and window openings. Images in published and presented material always include either captions describing the context or participants' interview responses.

A forthcoming book for a wider audience will include selected photos of residents' window openings and room interiors. Photos will be used as examples of various design challenges for existing home settings of interest for practitioners involved in housing development and planning. The choice of photos will depend on the technical level of image quality. With that in mind, it may be tempting to prepare for improved image quality in future photo-elicited research by giving more restrictions. However, the original purpose of applying the technique in a particular study should be carefully considered and the possible consequences of demanding requirements such as increased participant effort. 'As with any type of research, visual research is purpose driven and yields its particular design for a large part from this purpose.'<sup>39</sup>

Table 3 summarises the findings and discussion of the article, that is, the benefits and challenges of the combination of qualitative interviewing and participant photography, and additional findings of previous studies using similar techniques.

**Table 3.** Summary of discussion divided into reported themes, whether findings are valued as a benefit (+), a challenge (–), or non-problematic (×), and who is affected.

| Findings sorted according to themes  | Benefit (+)/<br>challenge (-) | Researcher/<br>participant |
|--|-------------------------------|----------------------------|
| <b>Input phase (origin and nature of visuals)</b>  |                               |                            |
| <i>Aspects of time, effort and abilities in co-production</i>  |                               |                            |
| • taking pictures involves more effort and time,   | -                             | Participant                |
| • assistance in taking pictures may be required,   | -                             | Participant                |
| • taking pictures can make participation more enjoyable,   | +                             | Participant                |
| • sending reminders to email photos,   | -                             | Researcher                 |
| • production of print albums.  | -                             | Researcher                 |
| <i>Pre-views of artefacts and home settings before home visits</i>   |                               |                            |
| • better planning of the interview in relation to the number of items (luminaires or window openings) and what should be addressed in the subsequent home visit.   | +                             | Researcher                 |
| <i>Ethical considerations regarding photography</i>  |                               |                            |
| • concerns of privacy, e.g. private spaces or personal items,  | (-)                           | Participant                |
| • giving instructions to participants that identifiable faces in photos should be avoided unless consent is obtained from the person who is pictured in the photo. | ×                             | Researcher                 |
| <i>Examples of insights in previous studies</i>  |                               |                            |
| • excluding certain groups (participants reluctant to engage with visual methods), <sup>40</sup>   | -                             | Researcher                 |
| • the need to obtain consent from people or not including them in the images can limit the participants choices when taking photos, <sup>41</sup>                  | -                             | Participant                |
| • adopting a more respondent-controlled approach to address the imbalance of power between researcher and participant, <sup>42</sup>                               | +                             | Participant                |
| • the value of visual data through engagement at all stages of the research process. <sup>43</sup>   | +                             | Researcher, participant    |
| <b>Processing phase (research focus and design) and output phase (format and purpose of visuals)</b>   |                               |                            |
| <i>Focused and relaxed interviews</i>  |                               |                            |
| • the discussion stays focused on the subject matter with the albums guiding the interview,  | +                             | Researcher, participant    |
| • interviews, supported by images, can enable a time-efficient interview,  | +                             | Researcher, participant    |
| • interviews, supported by images, can be effective in obtaining information.  | +                             | Researcher,                |
| <i>Keywords as reminders in the interviews</i>   |                               |                            |
| • producing keywords,  | -                             | Participant                |
| • keywords to the images can prompt further discussion.  | +                             | Researcher                 |

|  |                           |  |
|--|---------------------------|--|
| <i>Images convey different types of information</i>  |                           |  |
| • photography can capture unintended perceptions of the subject of inquiry.  | + Researcher              |  |
| <i>Images as visual memory aids for reconstructing the visit</i>   |                           |  |
| • looking at the photos when transcribing the interviews may help the researcher to recollect the interview situation,   | + Researcher              |  |
| • using photos as photo documentation for confirming or correcting observations after the visit.   | + Researcher              |  |
| <i>Ethical considerations regarding photography</i>  |                           |  |
| • obtaining permission from participants to use the photos without naming the photographer (anonymity prevents publishing information about the copyright holder). | × Researcher              |  |
| Examples of insights in previous studies   |                           |  |
| • strong support for use of visual methods to enhance data richness, <sup>44</sup>   | + Researcher              |  |
| • facilitating the asking of questions and rapport between the researcher and participant. <sup>45</sup>   | + Researcher, participant |  |

### Strengths and Limitations of the Studies

The discussion of the benefits and challenges of adding participant photography is based on two studies investigating inventories of home settings. Samples were similar in both studies, that is, residents living in multi-dwelling buildings, tenant-owned or rented, with a variety of ages. The inclusion of keywords written by the participants in the second study thereby enabled a comparison of the technique with and without the written input. However, participants were not systematically asked about the personal perception of the technique, unlike Meo in her within-subject comparison between verbal-only and photo-elicited interviews,<sup>46</sup> and Warner et al. who explored suburban lived experiences using photographic diaries.<sup>47</sup>

### CONCLUSION

This article supports findings in recent literature on photo-elicitation studies that adding participant-produced photographs to the interview has multiple benefits in knowledge production, from both researcher and participant perspectives. In agreement with Roger, participant and researcher engagement characterises the use of visual data in research.<sup>48</sup> In the two studies investigating home lighting and window openings, I perceived it to be particularly characteristic of the input phase.

However, there are challenges to be considered from a researcher's perspective, such as participants' experience with digital photography despite the widespread use of camera phones. In addition, special attention must be paid to:

- Participants reluctant to engage with camera-based images. (Be prepared to make adjustments to procedure to prevent excluding them from participation.)

- The time needed for collecting the photos and the subsequent layout of albums, because this stage provides the first ‘visual encounter’ with the participants that contributes to better preparation before the interview.
- The time needed for post-production, such as the inclusion of additional explanatory captions in the albums.

The most important insight is the benefit of adding verbal stimuli (keywords) to the visual stimuli (photos) in terms of improved data quality. Working collaboratively may also contribute to a more enjoyable interview atmosphere for both researcher and participant.

In conclusion, it is suggested that the identified merits of visual data outweigh the drawbacks, such as the longer time needed for data collection. Participant photography can be a valuable addition to the researcher’s toolbox to enrich the data in applied architectural research, when user needs and universal design are the focus of the study.

## NOTES

<sup>1</sup> Kiran M. Gerhardsson, Thorbjörn Laike, and Maria Johansson, ‘Leaving Lights On: A Conscious Choice or Wasted Light? Use of Indoor Lighting in Swedish Homes’, *Indoor and Built Environment* (March 2020); Kiran M. Gerhardsson and Thorbjörn Laike, ‘Windows: a study of residents’ perceptions and uses in Sweden’, *Buildings and Cities* 2, no. 1 (2021), pp. 467–486.

<sup>2</sup> Robert Burke Johnson and Antony J. Onwuegbuzie, ‘Mixed Methods Research: A Research Paradigm Whose Time Has Come’, *Educational Researcher* 33, no. 7 (2003), pp. 14–26; David L. Morgan, *Integrating Qualitative and Quantitative Methods: A Pragmatic Approach* (London: Sage Publications, 2014).

<sup>3</sup> Erhan E. Dikel, Gregory J. Burns, Jennifer A. Veitch, Sandra Mancini, and Guy R. Newsham, ‘Preferred Chromaticity of Color-Tunable LED Lighting’, *LEUKOS* 10, no. 2 (2014), pp. 101–15.

<sup>4</sup> Yvonne A. W. de Kort and Jennifer A. Veitch, ‘From Blind Spot into the Spotlight’, *Journal of Environmental Psychology* 39 (2004), pp. 1–4.

<sup>5</sup> World Health Organization, *Global Strategy and Action Plan on Ageing and Health* (2017), <https://www.who.int/ageing/WHO-GSAP-2017.pdf?ua=1> (all URLs accessed in May 2021).

<sup>6</sup> Sara J. Czaja, Walter R. Boot, Neil Charness, and Wendy A. Rogers, *Designing for Older Adults: Principles and Creative Human Factors Approaches* (Boca Raton, FL: CRC Press, 2019); Nanet Mathiasen and Anne Kathrine Frandsen, ‘Lighting Design as a Universal Design Strategy to Support Functional Visual Environments’, in *Transforming our World Through Design, Diversity and Education: Proceedings of Universal Design and Higher Education in Transformation Congress*, edited by Gerald Craddock, Cormac Doran, Larry McNutt, and Donal Rice (Amsterdam: IOS Press, 2018), pp. 752–59; Cecilia Petterson, Inga Malmqvist, Sten Gromark, and Helle Wijk, ‘Debate: Study Protocol; The Physical Environment and Home Healthcare Services: The Development and Content of a Study Protocol to Explore Enablers and Barriers for the Delivery of Home Healthcare Services’, *Nordic Journal of Architectural Research* 31, no. 2 (2019), pp. 105–22.

<sup>7</sup> Douglas Harper, 'Talking about Pictures: A Case for Photo Elicitation', *Visual Studies* 17, no. 1 (2002), p. 13.

<sup>8</sup> Gillian Rose, *Visual Methodologies: An Introduction to the Interpretation of Visual Materials* (London: Sage Publications, 2007), p. 237.

<sup>9</sup> *Ibid.*, p. 239.

<sup>10</sup> Elizabeth A. Bates, Joseph J. McCann, Linda K. Kaye, and Julie C. Taylor, "'Beyond Words': A Researcher's Guide to Using Photo Elicitation in Psychology", *Qualitative Research in Psychology* 14, no. 4 (2017), pp. 459–81; Paula Reavey, ed., *Visual Methods in Psychology: Using and Interpreting Images in Qualitative Research* (Hove: Psychology Press, 2011).

<sup>11</sup> Robert U. Akeret, *Photoanalysis: How to Interpret the Hidden Psychological Meaning of Personal and Public Photographs* (New York: P. H. Wyden, 1973); Judy Weiser, *Phototherapy Techniques: Exploring the Secrets of Personal Snapshots and Family Albums* (San Francisco: Jossey-Bass, 1999).

<sup>12</sup> Robert Gifford, *Research Methods for Environmental Psychology* (Oxford: Wiley-Blackwell, 2015); Robert W. Marans and Daniel Stokols, *Environmental Simulation: Research and Policy Issues* (New York: Plenum Press, 1993).

<sup>13</sup> Bates et al., "'Beyond Words': A Researcher's Guide to Using Photo Elicitation in Psychology'.

<sup>14</sup> Helen Pain, 'A Literature Review to Evaluate the Choice and Use of Visual Methods', *International Journal of Qualitative Methods* 11, no. 4 (2012), pp. 303–19.

<sup>15</sup> Luc Pauwels, 'Visual Sociology Reframed: An Analytical Synthesis and Discussion of Visual Methods in Social and Cultural Research', *Sociological Methods & Research* 38, no. 4 (2010), pp. 545–81.

<sup>16</sup> Charles F. Harrington and Ingrid E. Lindy, 'The Use of Reflexive Photography in the Study of the Freshman Year Experience', *Journal of College Student Retention: Research, Theory and Practice* 1, no. 1 (1999), pp. 13–22; Lone Stidsen, H. S. Bjerrum, Poul H. Kirkegaard, Niels Thuesen, and Anna Marie Fisker, 'Patients' Light Preferences in Hospital Wards: Related to Atmosphere in Danish Homes', *WIT Transactions on the Built Environment* 121 (2011), pp. 211–22.

<sup>17</sup> Rosalind Hurworth, Ellen Clark, Jenepher Martin, and Steve Thomsen, 'The Use of Photo-Interviewing: Three Examples from Health Evaluation and Research', *Evaluation Journal of Australasia* 4, no. 1 (2005), pp. 52–62.

<sup>18</sup> Erling Björgvinsson and Gunnar Sandin, 'Patients Making Place: A Photography-Based Intervention about Appropriation of Space', in *ARCH 14: Proceedings of the International Conference Research on Health Care Architecture*, edited by Ira Verma and Laura Nenonen (Helsinki: Alto University, 2015), pp. 25–42.

<sup>19</sup> Alan Radley and Diane Taylor, 'Images of Recovery: A Photo-Elicitation Study on the Hospital Ward', *Qualitative Health Research* 13, no. 1 (2003), pp. 77–99.

<sup>20</sup> Björgvinsson and Sandin, 'Patients Making Place: A Photography-Based Intervention about Appropriation of Space'.

<sup>21</sup> Elyse Warner, Louise Johnson, and Fiona Andrews, 'Exploring the Suburban Ideal: Residents' Experiences of Photo Elicitation Interviewing', *International Journal of Qualitative Methods* 15, no. 1 (2016), pp. 1–9.

- <sup>22</sup> Pauwels, ‘Visual Sociology Reframed: An Analytical Synthesis and Discussion of Visual Methods in Social and Cultural Research’.
- <sup>23</sup> Ibid.
- <sup>24</sup> Ibid.
- <sup>25</sup> Caroline Wang and Mary Burris, ‘Photovoice: Concept, Methodology, and Use for Participatory Needs Assessment’, *Health Education & Behavior* 24, no. 3 (1997), pp. 369–87.
- <sup>26</sup> Douglas Harper, ‘Talking about Pictures: A Case for Photo Elicitation’, *Visual Studies* 17, no. 1 (2002), pp. 13–26.
- <sup>27</sup> Gillian Rose, *Visual Methodologies: An Introduction to the Interpretation of Visual Materials* (London: Sage Publications, 2007).
- <sup>28</sup> Steiner Kvale and Svend Brinkmann, *InterViews: Learning the Craft of Qualitative Research Interviewing* (London: SAGE Publications, 2009).
- <sup>29</sup> Pauwels, ‘Visual Sociology Reframed: An Analytical Synthesis and Discussion of Visual Methods in Social and Cultural Research’.
- <sup>30</sup> Virginia Braun and Victoria Clarke, ‘Using Thematic Analysis in Psychology’, *Qualitative Research in Psychology* 3 (2006), pp. 77–101.
- <sup>31</sup> Braun and Clarke, ‘Using Thematic Analysis in Psychology’.
- <sup>32</sup> American Psychological Association, *Ethical Principles of Psychologists and Code of Conduct* (2017), <https://www.apa.org/ethics/code/>.
- <sup>33</sup> Swedish Research Council, *Good Research Practice* (Stockholm: Swedish Research Council, 2017).
- <sup>34</sup> Pain, ‘A Literature Review to Evaluate the Choice and Use of Visual Methods’.
- <sup>35</sup> Ibid.
- <sup>36</sup> Warner et al., ‘Exploring the Suburban Ideal: Residents’ Experiences of Photo Elicitation Interviewing’.
- <sup>37</sup> Pain, ‘A Literature Review to Evaluate the Choice and Use of Visual Methods’.
- <sup>38</sup> Kvale and Brinkmann, *InterViews: Learning the Craft of Qualitative Research Interviewing*, p. 249.
- <sup>39</sup> Pauwels, ‘Visual Sociology Reframed: An Analytical Synthesis and Discussion of Visual Methods in Social and Cultural Research’, p. 19.
- <sup>40</sup> Pain, ‘A Literature Review to Evaluate the Choice and Use of Visual Methods’.
- <sup>41</sup> Warner et al., ‘Exploring the Suburban Ideal: Residents’ Experiences of Photo Elicitation Interviewing’.
- <sup>42</sup> Ibid.
- <sup>43</sup> Kerstin Roger, ‘The Fringe Value of Visual Data in Research: How Behind Is Academia?’, *International Journal of Qualitative Methods* 16 (2017), pp. 1–7.
- <sup>44</sup> Pain, ‘A Literature Review to Evaluate the Choice and Use of Visual Methods’; Warner et al., ‘Exploring the Suburban Ideal: Residents’ Experiences of Photo Elicitation Interviewing’.

<sup>45</sup> Warner et al., 'Exploring the Suburban Ideal: Residents' Experiences of Photo Elicitation Interviewing'; Analía Inés Meo, 'Picturing Students' Habitus: The Advantages and Limitations of Photo-Elicitation Interviewing in a Qualitative Study in the City of Buenos Aires', *International Journal of Qualitative Methods* 9, no. 2 (2010), pp. 149–71.

<sup>46</sup> Meo, 'Picturing Students' Habitus: The Advantages and Limitations of Photo-Elicitation Interviewing in a Qualitative Study in the City of Buenos Aires'.

<sup>47</sup> Warner et al., 'Exploring the Suburban Ideal: Residents' Experiences of Photo Elicitation Interviewing'.

<sup>48</sup> Kerstin Roger, 'The Fringe Value of Visual Data in Research: How Behind Is Academia?'.



## APPENDIX

**Table A1.** “My Home Lighting”: participant characteristics.

| I<br>D | Gender | Age | Household size<br>(adults +<br>children <12 yr) | Number of<br>bedrooms in the<br>apartment, floor<br>area, level | Housing<br>tenure <sup>a</sup> | Building year and<br>most recent<br>renovation (if<br>known)                | Total<br>number of<br>luminaires |
|--------|--------|-----|---|---|--------------------------------|---|----------------------------------|
| 1      | Female | 31  | Single-person                                   | Studio, 49 m <sup>2</sup> ,<br>second floor                     | Rented                         | 1936  | 10<br>(10 photos)                |
| 2      | Male   | 73  | Multi-person<br>(2)                             | Two-bedroom<br>apartment, 107 m <sup>2</sup> ,<br>second floor  | Rented                         | 1907, conversion of<br>care home to<br>dwellings in 2009 by<br>the landlord | 25<br>(16 photos)                |
| 3      | Female | 53  | Single-person                                   | Two-bedroom<br>apartment, 58 m <sup>2</sup> ,<br>second floor   | Tenant-<br>owned               | 1939, renovated by<br>the tenant in 2015                                    | 16<br>(11 photos)                |
| 4      | Female | 69  | Single-person                                   | One-bedroom<br>apartment, first<br>floor                        | Rented                         | 1880, renovated by<br>the landlord in 2000<br>(approx.)                     | 18<br>(13 photos)                |
| 5      | Male   | 55  | Single-person                                   | Three-bedroom<br>apartment, 99 m <sup>2</sup> ,<br>ground floor | Tenant-<br>owned               | 2002  | 23<br>(22 photos)                |
| 6      | Male   | 30  | Multi-person<br>(2 + 2)                         | Two-bedroom<br>apartment, 71 m <sup>2</sup> ,<br>first floor    | Tenant-<br>owned               | 1925  | 20<br>(16 photos)                |
| 7      | Male   | 26  | Single-person                                   | One-bedroom<br>apartment, 62 m <sup>2</sup> ,<br>first floor    | Tenant-<br>owned               | 1932, renovated by<br>the tenant  | 14<br>(15 photos)                |
| 8      | Male   | 53  | Multi-person<br>(2)                             | Two-bedroom<br>apartment, 81 m <sup>2</sup> ,<br>first floor    | Rented                         | 1900, renovated by<br>the landlord in 2015                                  | 17<br>(17 photos)                |
| 9      | Female | 26  | Single-person                                   | Studio, 26 m <sup>2</sup> ,<br>second floor                     | Rented                         | 1957  | 9<br>(14 photos)                 |
| 10     | Female | 28  | Single-person                                   | Two-bedroom<br>apartment, 85 m <sup>2</sup> ,<br>fifth floor    | Tenant-<br>owned               | 2006  | 21<br>(14 photos)                |
| 11     | Male   | 76  | Single-person                                   | Two-bedroom<br>apartment, second<br>floor                       | Rented                         | 1907, renovated by<br>the landlord in 1985                                  | 21<br>(8 photos)                 |
| 12     | Female | 33  | Multi-person<br>(2)                             | One-bedroom<br>apartment, second<br>floor                       | Rented                         | 1936  | 15<br>(10 photos)                |

*N* = 12, 50 per cent females, median 43 years (mean 46).

<sup>a</sup> ‘Tenant-owned dwelling’ refers to a common tenure model in Sweden. The tenants own a share of the housing association which in turn owns the building. Tenants can sell their share and the tenancy rights.

## **Interview Guide A2: ‘My Home Lighting’**

Introductory questions:

- A. Can you tell us how old you are and how many people live in your household?
- B. Do you work with or have you worked with anything to do with lighting?
- C. Do you know approximately when the house was built?

Main question:

Now we’ll turn to the pictures in the album that you have taken. Can you tell us a little bit about why you’ve chosen the luminaires and how they are used? I suggest that we do it room by room, in the same order you took the pictures.

Follow-up and additional questions:

1. Do you have any sort of automatic sensor, for example a presence sensor or daylight sensor?
2. Do you have a dimmer in the flat?
3. When is the lamp switched on? When you are eating, watching TV, when you are spending time with each other (conversation and with guests), during sedentary activities (reading, working at the computer, sewing, doing crafts), when you are sleeping/resting?
4. [Multi-person household] Do you agree on how the lighting should look or how bright it should be? If you have different needs, how do you resolve the differences?
5. Have you changed anything in terms of lighting since you moved in? Age can, for example, affect how much light you want.
6. What changes would you make if you could change your lighting? Which rooms? What stops you from making the changes?
7. Are you satisfied with your daylight?
8. Do you make use of daylight during the day? For example, by not switching on electric lights or keeping blinds up and not drawing dark curtains.
9. Do you turn off the lights when no one is in the room? If you do not do this, why not?
10. Can you black out the bedroom?
11. Do you black out the room every night?
12. Have you thought of anything else about lighting that I haven’t covered?

**Table A3.** ‘My Window Openings’: participant characteristics.

| ID | Gender | Age | Household size (adults + children <12 yr) | Number of bedrooms in the apartment, floor area, level     | Housing tenure <sup>a</sup> | Building year and most recent renovation (if known)  | Total number of window openings <sup>b</sup> |
|----|--------|-----|---|--|-----------------------------|--|--|
| 1  | Female | 77  | Multi-person (2)                          | Three-bedroom apartment, 89 m <sup>2</sup> , third floor   | Tenant-owned                | 1959, window replacement in 2011 by the housing association                                  | 5 (10 photos)                                |
| 2  | Male   | 77  | Multi-person (2)                          | Three-bedroom apartment, 89 m <sup>2</sup> , third floor   | Tenant-owned                | 1959, window replacement in 2011 by the housing association                                  | 5 (10 photos)                                |
| 3  | Female | 35  | Multi-person (1+1)                        | Two-bedroom apartment, 76 m <sup>2</sup> , ground floor    | Tenant-owned                | 1944   | 4 (8 photos)                                 |
| 4  | Male   | 70  | Multi-person (2)                          | Four-bedroom apartment, 110 m <sup>2</sup> , ground floor  | Tenant-owned                | 1912, renovated in 1976 by the housing association   | 10 (14 photos)                               |
| 5  | Male   | 93  | Multi-person (2)                          | Three-bedroom apartment, 114 m <sup>2</sup> , third floor  | Tenant-owned                | 2005   | 10 (18 photos)                               |
| 6  | Female | 62  | Single-person                             | Two-bedroom apartment, 84 m <sup>2</sup> , second floor    | Tenant-owned                | 1929, window replacement in the 1990s by the housing association                             | 7 (7 photos)                                 |
| 7  | Female | 70  | Single-person                             | One-bedroom apartment, 69 m <sup>2</sup> , ground floor    | Tenant-owned                | 1936   | 3 (6 photos)                                 |
| 8  | Male   | 70  | Single-person                             | Three-bedroom apartment, 114 m <sup>2</sup> , ground floor | Tenant-owned                | 2002   | 6 (12 photos)                                |
| 9  | Female | 83  | Single-person                             | Two-bedroom apartment, 90 m <sup>2</sup> , second floor    | Tenant-owned                | 1967, window replacement in approx. 2005–11 by the housing association, balcony with glazing | 4 (13 photos)                                |
| 10 | Female | 59  | Single-person                             | Two-bedroom apartment, 74 m <sup>2</sup> , ground floor    | Tenant-owned                | 1942, window replacement in 1982 by the housing association, new balcony with glazing        | 4 (8 photos)                                 |
| 11 | Female | 56  | Single-person                             | Three-bedroom apartment, 89 m <sup>2</sup> , second floor  | Tenant-owned                | 1949   | 10 (8 photos)                                |
| 12 | Female | 23  | Multi-person (2)                          | Two-bedroom apartment, 82 m <sup>2</sup> , first floor     | Tenant-owned                | 1945   | 5 (16 photos)                                |

|    |        |    |                    |  |              |      |                  |
|----|--------|----|--------------------|--|--------------|------|------------------|
| 13 | Male   | 26 | Single-person      | One-bedroom apartment, 33 m <sup>2</sup> ground floor      | Rented       | 2000 | 3<br>(4 photos)  |
| 14 | Male   | 24 | Single-person      | One-bedroom apartment, 41 m <sup>2</sup> , sixth floor,    | Tenant-owned | 2007 | 6<br>(12 photos) |
| 15 | Female | 36 | Multi-person (1+1) | One-bedroom apartment, 63 m <sup>2</sup> , ground floor    | Rented       | 2011 | 4<br>(8 photos)  |
| 16 | Male   | 34 | Multi-person (2+1) | Three-bedroom apartment, 114 m <sup>2</sup> , third floor  | Rented       | 1941 | 7<br>(10 photos) |
| 17 | Male   | 59 | Multi-person (2)   | Three-bedroom apartment, 112 m <sup>2</sup> , fifth floor  | Tenant-owned | 1959 | 9<br>(18 photos) |
| 18 | Male   | 24 | Multi-person (2+1) | Three-bedroom apartment, 109 m <sup>2</sup> , second floor | Tenant-owned | 1967 | 6<br>(12 photos) |
| 19 | Male   | 27 | Multi-person (2)   | Two-bedroom apartment, 82 m <sup>2</sup> , third floor     | Rented       | 1946 | 4<br>(8 photos)  |
| 20 | Female | 54 | Multi-person (2)   | Two-bedroom apartment, 84 m <sup>2</sup> , first floor     | Tenant-owned | 2001 | 5<br>(11 photos) |

$N = 20$ , 50 per cent females, median 57.5 years (mean 66.5).

<sup>a</sup> ‘Tenant-owned dwelling’ refers to a common tenure model in Sweden. The tenants own a share of the housing association which in turn owns the building. Tenants can sell their share and the tenancy rights.

<sup>b</sup> A corner window, including at least one window on each side of the corner, is regarded as two window openings. A fully- or semi-glazed balcony door is regarded as a window opening. Entrance doors with only a small glazed unit are not regarded as a window opening.

## **Interview Guide A4: ‘My Window Openings’**

Introductory questions:

- A. Can you tell us how old you are and how many people live in your household?
- B. Do you know approximately when the house was built?
- C. Do you work with or have you worked with anything to do with architecture or design?

Main question:

Now we’ll turn to the pictures in the album that you have taken. I suggest that we do it room by room, in the same order you took the pictures. Imagine the window opening has been blocked up and there is no window anymore. How would it affect your use of the room and your dwelling—during the day and night?

Follow-up and additional questions:

1. [Multi-person household] Do you agree on how to use the windows? If you have different needs, how do you resolve the differences?
2. Have you changed anything in terms of how you use the windows or their design since you moved in, such as natural ventilation habits, curtains and window treatment, room darkening . . .
3. Do you need to open the windows? In which rooms? For what reasons?
4. What changes would you make if you could change the window opening? Which rooms?
5. Are you satisfied with your daylight?
6. Do you make use of daylight during the day? For example, by not switching on electric lights or keeping blinds up and not drawing dark curtains.
7. Would you be satisfied with a screen emitting the same kind of light as daylight?
8. Do you have any room without a window? What is your experience of such a room?
9. Have you ever stayed in a windowless hotel room? How did you experience that?
10. Do you occasionally need to darken the rooms, such as the bedroom at night?
11. Do you black out the room every night? [Multi-person household] Do you have the same needs?
12. Is there anything preventing you from getting the desired room darkening? Do you use a sleep mask?
13. How is your sleep in general (do you feel rested when you wake up, do you get enough sleep)?
14. Would you describe yourself as a morning or an evening person?
15. How frequently do you clean your windows? Why do you clean them?
16. Through which window do you look to check the weather?
17. How is the indoor temperature affected by the windows in summer?

18. Can you hear any characteristic sounds from outdoors?

19. Have you thought of anything else about your window openings that I haven't covered? (Orientation, view, view content, visual intrusion, privacy, enclosure, natural ventilation, noise, etc.)