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Kinds of seeing and spatial reasoning: examining user participation at an architectural design event

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Abstract

The ways that we see and acknowledge design in the interactions between architects and resident users is examined, to recover the interactional practices through which mundane reasoning concerning the spatial properties of a housing scheme were articulated and organised at a design event. Informed by ethnomethodological studies of mundane reasoning in sequential, practical actions, the residents' formulation of a design problem and engagement in problem-solving demonstrate accomplished spatial reasoning skills. Their spatial reasoning was seen to be far from mundane. The ways that these actions were acknowledged as contributing to the design of the scheme were also remarkable. This study develops practical understanding of the ways we appreciate and in acknowledgements can facilitate active user-participation in design interactions.

The users of designed things provide input into design processes in various ways. In this article our attention is drawn to the actions of a group of residents as they examine and discuss the proposed design for a housing scheme, uncovering problems within it. It is the residents' skills at spatial reasoning, as exhibited in their identification and formulation of design problems that are recovered and examined closely at an architectural event, and the ways that these observations are received. This study begins to probe ways that we recognise and acknowledge users' actions in social interaction. In particular, in the ways that mundane reasoning features in the formulation of design problems and subsequent problem solving.

1 Recovering design work

The study of design as it happens in practice is complicated by contested views of what design *is*, and what it is that constitutes a series of actions as *designing* and practices connected with 'doing design'. Recovering the workings of design, as it happens in practical actions and social interaction, is the task at hand. In doing this two ways that design has previously been understood are brought under the spotlight: i. design as something that designers uniquely do, and relatedly ii. design as a distinctive kind of thinking that is associated with creative thought and problem solving. It is debated in situations when users participate at events whether they design or 'merely' talk about the design of something, and whether they do so by 'thinking' in designerly ways. There are multiple ways that users provide input into design processes and varying degrees of acknowledgement of users' engagement in design. The ways that design is studied in practice, and then what then can be revealed about human capabilities for creative thought and problem solving are central to this study of the residents' participation at an architectural event.

In a setting where a group of residents discuss the design of a housing scheme with two architects, it is the actions of the users in particular, as they see and uncover problems within it that are examined. This study is in part a restorative to the research fixation on the work activities of professionals. As Suchman notes, images of work have been “systematically biased to highlight judgmental, interpretative work amongst the professions, while obscuring the work’s mundane practical aspects. Commensurately, mundane practical activity is fore-grounded in so-called routine forms of work, while reasoning is neglected” (Suchman 2000 p.30). The ways that mundane reasoning features in the practical actions of design problem solving are studied in this setting, to recover the spatial reasoning practices of the ‘users’ and how their actions are seen and are acknowledged as contributing to the design of the project. It is the interactional space in which mundane reasoning and problem solving take place that is studied, informed by ethnomethodology and workplace studies’ methodological orientation to practical action and ‘order at all points’ to account for the ‘just thisness’ of the work that is happening in local reasoning practices (Garfinkel and Weider 1992; Sacks 1992 p.484; Psathas 1995; Rawls 2008).

The human ability to see something, to perceive what it is and to be able to recognise it *as* something, draws on our experience of the world we live in, our multi-sensory perception and cognitive faculties at understanding and interpreting what is going on around us. We engage in midenic reasoning, “reasoning in the middle of doing things, reasoning in the midst of reasoning about what we are doing” (Livingston 2008 p.39). For the mundane reasoner, it is not the world's intersubjectivity that is at stake, “but the competence of the perceiver and the adequacy of his means of perception” (Pollner 1974). Indeed, people will interpret situations differently and an ability to perceive how the world might be different from how things currently are is integral to design. To change the world, as design does, the re-interpretation of a situation through kinds of seeing and reasoning with material artefacts is part of the task at hand (Schön and Wiggins 1992). This insight raises many questions, including the ways that we recognise design in the course of interaction, and how design problems are manifested in reasoning processes. To probe how these questions that preoccupy design studies might be engaged, first some of the ways that problem solving and pattern recognition are understood are described. Mundane reasoning as a practical activity of ethnomethodological concern is then introduced to position this study of interaction at an architectural event.

2 Community participation events

Participatory design as an ideology advocates the engagement of people, often characterised as ‘users’ who are not institutionally or professionally recognised as designers, in events to discuss the design of a service or product (a building or a neighbourhood, as well other cultural and material artefacts at a smaller scale). In planning and community participation in architecture, there is longstanding commitment to consultation (Sanoff 1975; 1991; 2000; 2010) and learning in collaborative situations where people pursue objectives that they themselves have defined (Sanoff 2000 p.x). Yet there is also criticism of the potential for constructive and active design participation at these events (Forester 1985; Till 2005). The extent that ‘users’ could be said to be ‘doing design’ and actively engage in designing is debated, generally (Lindsay 2005). Furthermore practical actions are situated, in response to what is happening at specific moments in time, contingent on the circumstances and organisation of an event, and events tend to be initiated and

facilitated by professionals (Sanoff 2000 p.65). These events are structured, often have particular topics and goals and public and user engagement is managed, even at a micro level. For example, public engagement at a community democracy planning event was seen to be organised at a micro level, spatially and sequentially, through the intricate embodied actions of a facilitator, to indicate who has the conversational platform, and simultaneously, who is cued as a next speaker (Mondada 2011). It is through interactional and praxeological competencies such as these that the expertise of a facilitator at engaging participants in the discussion of a scheme is demonstrated (Luck 2007a). An architectural practice's expertise in participatory design will be demonstrated in their ability to successfully and effectively negotiate the participation of 'users' and then realising their input in the developing design. Not all architectural practices are equally adept or disposed to participatory design. While participatory events provide a setting for 'designers' and 'users' to come together, in this setting different expertise, experience and interests in the development of a scheme become apparent (Cuff 1989; Forester 1989; Sanoff 2000). The architects will be seeking to manage both the events and the input from residents in a number of ways. This does not mean events are ruthlessly controlled or that divergent input (from any 'plans' or agenda) is not welcomed at times, but it should be noted that the architects run the events. They introduce the topics and more-or-less manage the discussion, that is, they can choose whether to try and keep it on topic, on time, or to let it meander, in a way not so available to residents. Participatory events provide a setting for architects to present the design of a scheme in progress, and importantly, for the discussion of this to inform what they plan to do next. Participation at an event can be more than a determinate show-and-tell, stating what will happen, and is an opportunity for feedback on the design-in-progress and for creative synergy between the users' observations expressed in this setting, and then, what will be designed. At events architects are held accountable for what has been designed (Cuff 1989; Blundell-Jones, Petrescu et al. 2005; Luck 2007b). In doing this, spatial reasoning and expertise in design problem solving come into play in navigating around the design, contextualizing it and envisioning alternative solutions. How these skills are understood in ethnomethodological and design studies is considered next.

3 Seeing similarity: problem solving, spatial morphology and pattern recognition

There is a trajectory of thought that associates design with problem solving. On this track there has been a progression in understanding that not all design problems follow a logico-deductive pattern, and also an acknowledgement that not all problems are wicked (Cross 2001; Coyne 2004), as in some situations parameters and constraints can be defined for problem solving to be automated (see for example, Chung, Hwang et al. 2000). 'Problems', as way of describing the design task at hand are more than a rhetorical trope in some situations. Indeed, understanding a design situation to locate a problem, is a problem (Lloyd and Scott 1994). In the presentation of a housing scheme to the 'users' who will occupy the building, they may not see a problem in the scheme's design. This is a design setting where, in theory, a design problem may not even exist. This is different, at first glance, from the problem solving, diagnostic work of engineers engaged in the re-design of photocopier support systems, as they re-solve reported problems (Button and Sharrock 2000; Whalen and Vinkhuyzen 2000). However, on closer examination it is not only the reported problems that pose problems for engineers in practice, problems were emergent and contingently arising in interaction (Button and Sharrock 2000). Defining and framing a design problem is key to creativity (Dorst and Cross 2001) and it is reasoning in

problem formulation (Cross 2001) that is studied closely in the interaction between architects and the residents in this article. This is especially noteworthy as the residents' experience of design problem solving and designing a social housing scheme will be different from the architects present.

The expertise of a designer is often examined comparatively with novice designers, where designers engage in the "concrete interrogation of knowledge of theory and practice for new productive purposes" (Buchanan 1996). An ability to problem solve is associated with the application of previously acquired knowledge of objects, attributes and relations to a novel situation, often studied as analogical reasoning (Ball and Christensen 2009) where analogy takes several forms. Similarity with another situation may be analogous in the properties of things in another domain, for example, biomimetics examines design inspired by patterns in nature, both as an analogy and analytically (Stevens 1974). Another form of analogy is in the recognition of similarity with a previously encountered problem (see for example Ball, Omerod et al. 2004 ; Ball and Christensen 2009; Stacey, Eckert et al. 2009). Indeed, memory and analogy are routinely associated with the human faculty for creativity and an ability to see similarity in situations to solve problems (Ingold 1986; Mithen 1998; Sawyer 2010). While a natural intelligence in design is acknowledged, and an ability to design is widespread amongst all people (Cross 1999) the ability to see a pattern in a problem improves when a designer becomes more expert at designing.

In this pattern recognition takes several forms, in the identification of problem as well as associating a pattern with how a problem might be solved. Studies of spatial morphology are a design resource that architects may be familiar with, where studies of geometric form define patterns and typologies for the configuration of the built environment (Bon 1972; March 1976). These explorations of spatial layouts can serve as problem framing aids, or as generic architectural design solutions when the design constraint conditions can be defined. An example of this that engages a topic raised in the data, is Alexander's (1967) patterns for the entrance to a house, which uses the ability to see people as they approach as a design constraint. An ability to see and talk about shape and form is intrinsic to spatial morphology (Stiny 2006) and it is the ways that the residents see spatial relationships to then formulate these as design problems that are examined. The residents' spatial reasoning will be mundane in nature, and crucially not so linked to the knowledge that comes from learning architectural design and having previous experience of seeing the designed form take shape in a building, as an architect would¹. However, these residents do orientate to the recognition of patterns and do link these to architectural concerns in the design of housing in a number of ways.

While pattern recognition, with a cognitivist disposition, works with an assumption of representations and schema in the mind-brain, the 'location' of cognition is contested from an ethnomethodological and praxeological perspective (see for example Coulter 1990; Coulter 1991). In this vein, this research seeks to retrieve the social

¹ This is a professional vision point (Goodwin 1994) in an ability to see things in a particular way and that implications of that seeing are tied to certain epistemological structures. For the architects it will come more readily to see things as certain sorts of design problems, with certain sorts of solutions. For the residents it is not that they cannot see things, it is just that they will more readily see things in relation to their concerns. The architects' and residents' practices are at base all mundane and shared. The difference comes in what they are employed for, and what the implications are.

interactional foundation for the residents' formulation of design problems, as displayed in their spatial reasoning actions and practices. The idea is to explicate cognition as a witnessable social practice. This brings into question the methodological ways that we study reasoning and how this is approached analytically in social interaction, and warrants further consideration.

4 Studying mundane reasoning in (design) interaction

This study of reasoning at an architectural event, in common with Pollner, aims to develop an appreciation of the genius of mundane reason and mundane reasoners (Pollner 1987 p.x). In paying attention to mundane reasoning practices, as these are evident in negotiations of the production of space, the distinctiveness between mundane and technical practices is downplayed, in tune with ethnomethodological studies of science (Atkinson 1988; Lynch 1993; Livingston 2007). Mundane work for a professional designer is their everyday work. For a resident they are not doing mundane work in this setting, they are doing something different to normal. However, and crucially, they can help by employing their mundane, or vulgar competencies in looking, reasoning, and pattern recognition. The difference between residents and designers is the specific application of the competencies and the purposes they are put to. The way in which the architects will see something quickly, as being of this or that kind of design problem, or having this or that type of design implication. Subsequently most of the residents' seeing is with implications 'closer to home', noticing mundane experiential implications that also have architectural implications. However, the residents are also on a trajectory of learning (and some show greater aptitude) so they do also do some quite surprising designerly reasoning. "That's the thing with mundane - it is unextraordinary work for the designers - but that has nothing to do with a negative evaluation about skill or expertise. They just do things in routine ways, with known about practices" (Martin 2011).

Several ways of seeing are interwoven in the study of this. With reference to Wittgenstein's understanding of language as action, Schön and Wiggins' (1992) characterisation of *designing* was with an appreciation that seeing is a social practice. Architects do not use a special type of architectural looking, moving their eyes in special ways, being able to navigate an imagined space or envisage a future state in ways unavailable to the populous at large. It is just that they do this very specifically for architectural purposes and often they do it quickly and effectively in ways that are not so effective or economic for residents, as they do not have experience of years of learning and do not know the full extent of the language game of architectural design; but we do see that they can pick up aspects of it rapidly. The socio-cultural and interactional practices that are part of 'seeing' are clearly explicated by Goodwin (1994; 1995), where the scientists on a ship see marks on a screen, become aware and orientate towards the actions of others in a setting to accomplish their work (Goodwin 1995). Seeing is more than a visual competence. The scientists' professional vision is constituted in the practical actions and practices of their work (Goodwin 1994), in contrast with this competence being defined by a job title, or by a researcher labelling a sequence of actions as a kind of activity, retrospectively. From this emic perspective, it is the endogenous actions and practices of the participants' that constitute what an action is and does at that moment in time, and it is these that are recovered and accounted for.

Ethnomethodological studies draw our attention to methods of mundane reasoning and the practical actions of members in their everyday conduct (Garfinkel 1967; Zimmermann and Pollner 1971). It is the members' ethnomethods in their everyday practices and practical accomplishments that are studied. Recovering these practices is written into ethnomethodological analysis and "mundane reasoning is essentially and unavoidably part of the investigative attitude of ethnomethodology" (Pollner 1987 p.149). In this "ethnomethodology rejects the standard social scientific conception of reasoning as some kind of abstract apparatus, and emphasizes instead the fundamentally situated and contingent character of reasoning as a practical matter" (Hester and Francis 2007). It is the ability "to render features of their individual reasoning and actions 'publicly' visible by talking through the reformations whilst they are being accomplished" (Heath and Luff 2000 p.103) that are noteworthy. From this understanding of social phenomena, it is the real-time, practical actions and situated reasoning, as witnessable features in the data that are available for detailed inspection in this study.

Circumstances of practical reasoning have accounted for mundane reasoning skills in everyday activities such as solving crossword puzzles, playing checkers and constructing geometrical designs in origami (Livingston 2008). In these studies, 'finding the object' (Livingston 2008 p. 131) the problem and anticipating the consequences of a next action were part of the task at hand. In the midst of this unanticipated relationships were discovered (Livingston 2008 p.173) and in mathematical problem solving, exploration of the unanticipated possibilities for finding a proof (Livingston 2008 p.163). Spatial reasoning practices feature as resources in these practical problem seeking and solving matters in various ways: using representations, sketches, graphic and symbolic notation in mathematics (Greiffenhagen 2008; Livingston 2008 p.183) and in taking the perspective of a domain state object in physics to think through a research problem (Ochs, Gonzales et al. 1996). The navigation through space in an urban regeneration area was approached as a mundane reasoning problem (Housley and Smith 2011) and in the space-making practices at a collaborative planning meeting (Mondada 2011) and also in the visual reasoning of architectural students, when they decide where to draw a section through a housing scheme (Ivarsson 2010). This last study is especially fitting with the materials presented in this article, as the students eventually decide to draw the view, as the residents would come into contact with the building. These studies demonstrate that mundane reasoning is endogenous to practical action and social interaction, even in the domain-specific, praxeological work of experts.

5 Studying the design of a social housing project

The study of the design of a social housing project in London forms the data for this research. The architects appointed to the project, organised a series of meetings and design workshops with a group of residents on the estate; these are the people who will live in the dwellings once these are built. Events such as these are a perspicuous setting for the residents' lived-experience of everyday life on a social housing estate and for their insight into the kinds of 'problems' they routinely encounter to be brought into conversation with the architects.

Designing the scheme for the safety of the residents is a prime concern on housing estates, and at the time this data was collected there had been a widely reported fatal knife assault in a housing estate stairwell. Shared circulation spaces on estates provide

access to private dwellings and the design of these attempts to regulate who has access to them, for the safety of the residents. Security and personal safety are complex and emotive issues that are considered in the design: in the selection of materials, levels of enclosure and in the spatial configuration of communal areas. It is the intertwined subjects of security and safety that the residents topicalize in the conversation we examine, drawing on concepts that the architects have taken time to introduce at previous meetings. Concepts that are well known in social housing design, ‘overlooking’ and ‘positive overlooking’ come into play. This concept concerns the design of communal spaces on an estate so the activities that take place there can be overseen by other people, in a designed attempt to discourage covert and illicit activities. These are the ‘unfortunate’ use-behaviours in public spaces that the residents have experience of, and that the architects and residents attempt to ‘design out’ of the scheme, for the estate to be safer for the people who live there.

The data corpus includes ethnographic field notes, audio and video recordings of meetings, workshops and a field trip to view contemporary social housing in the Netherlands that the architectural practice arranged, data gathered over a five-month period. Through these events relationships have been formed between the architects and the residents and there is evidence of learning: the residents’ learning some of the technical terminology and practices associated with housing design, and in a participatory process, learning through increased awareness of a design problem and how their understanding of this develops. Indeed, this is not surprising since participatory design should be thought of to include a trajectory of learning on both sides, but particularly to be a process in which residents become knowledgeable in elements of design thinking and acting as a project progresses. Ideally, then, while maintaining their separate identity as residents they are better able to articulate their concerns and even potential solutions in terms more readily usable to the architects as the relationship progresses.

The materials on which these analyses are based were taken from a four-hour design meeting. This includes a group discussion of the scheme’s progress, an introduction to the design themes to be considered, followed by a design workshop in smaller groups. The architects plan the event, materials are prepared for the workshop exercises, and the sequence of activities is set by an agenda, with scheduled refreshment breaks. The episode we join is the introductory discussion of the access to the dwelling from the street, which then leads into a workshop. The workshop that followed is more indicative of recent participatory design techniques (Sanoff 2000; 2010). However, it is the pre-workshop interaction that is reported, as in this sequence the residents’ spatial reasoning and their skills at solving a design problem that they themselves identify were remarkable.

This event is the third meeting when the architects meet this user group. This took place in the setting shown in Figure 1, where the residents sit around a table and the project architect stands in front of the plan and elevation drawings for the scheme that are pinned to the wall behind him. The scheme is large and the drawings are shown at a scale 1:200. At this scale the drawings can be ‘read’ when standing close to them, but the precise location of elements of the building cannot be seen clearly from a further distance. Data collection in this setting was using a video camera mounted on a tripod, pointed in the direction of the project architect leading this event, at a distance recording the actions of many of the participants sitting around the table.

This view is not unreflective of the participants' visibility of the drawings during this episode, especially for those sitting furthest away from the architect. The recording of this naturally occurring interactional event preserves the temporal and praxeological features of the activity, which are indispensable for its analysis (Mondada, 2006). The participants present were: Adam the project architect, Anna another architect from the practice working on this scheme, the residents: Liz, Valerie, Mark, Tanya, Chloe, Tom and the participant observer.

Figure 1: Design workshop setting

The project architect introduces access to the dwellings and its relationship with the street frontage as the subject for discussion at this phase of the event. *“Are you all refreshed, ok if we do, as I said we want to look at the issues opportunities and differences on access to your dwelling and how the street frontage might be, and what I’ve put on this sheet (Figure 2) is just some examples on the left hand side as it were on enclosure. This discussion is about how far the common areas of the flat how far that needs to be enclosed. There are different levels of doing it and you can have it fully enclosed and that can use a lot of material and that can be expensive and can sometimes make you feel very kind of caved in. There are other ways of doing it where it’s completely open to the elements and my understanding is that that was not was kind of agreed in the master plan, that you don’t want rain falling on your head and you don’t want external access and you don’t want lots of people marching past your window and that kind of over looking problem that we talked about last time round, but there are ways of doing sort of half enclosed, which means that you can filter and screen views in and out and the example here is using wooden slats (Figure 2, top left) to do that and there are some open areas as well on this particular building”.*

We join the event after the group have discussed the minutes from the previous meeting, for one hour and twenty minutes, and then had a refreshment break. In this interval the residents had an opportunity to look at the plan and elevation drawings pinned on the wall. Some, but not all, of the residents did this. The housing scheme is drawn to a scale that is routine for reading the details on a plan when in close proximity. In this setting, it is because the residents cannot see the plan clearly when sitting that the architects and residents collaboratively work at articulating features on the plan to progress the participants’ understanding of the scheme as the conversation unfolds. The residents’ ‘seeing’ in this situation is different from viewing drawings close up, when specific features on a plan can be visually seen and touched (see for

example Murphy 2005). In this situation seeing and showing over distance is the task at hand, for the residents to ‘see’, to understand what is proposed, and then imagine and propose how the scheme might be changed. The ‘seeing’ that this research aims to recover, is how actions in this setting exhibit their spatial reasoning and problem solving competence. This is contingent on the interplay between the use of material resources in this setting, the actions of the architect in his display of locations on the plan, trust in what is being shown and also the participants’ knowledge of the scheme, as this has evolved through their engagement in this project over several months (also for some residents, looking at the drawings before this conversation). There is a blending of what is known, from the residents’ background knowledge, their experience of living on this estate and recall of this, in conjunction with the ways that they exhibit their understanding of what is happening now.

During the interval a handout has been given to each of the participants showing several images of entrances and shared circulation spaces from completed social housing projects (Figure 2). A copy of the handout is also attached to the flipchart, to the right of the project architect (Figure 1).

Figure 2: ‘Access to street frontage’ handout

We join the conversation as the resident Mark refers to the building entrance in the photograph on the top left hand side of the handout (Figure 2). The residents’ critical engagement in the assessment of the scheme is immediately evident.

#1 [49:10-49:36] “This one is having a laugh”

- 10 Mark: just a quick one I think from a security point of view this one is having a laugh
- 11 because they’ve got um
- 12 Adam: [yes]
- 13 Mark: the door entry system there and how easy is it to climb up there
- 14 Adam: right yes
- 15 Mark: so let’s [point that
- 16 Liz: [tick that one off] ((laughter))
- 17 ((laughter amongst the group))
- 18 Mark: it’s like a tease isn’t it that one
- 19 Adam: well it’s one of the reasons why we haven’t shown balconies with column
- 20 supports
- 21 Mark: yes
- 22 Adam: if you put column
- 23 supports beside quite high front walls you know you are making (.) virtually a

24 staircase on the outside of the building to clamber up
 25 UM: exactly
 26 Adam: but that said UM I would hope that some (.) erm of this overlooking thing [will=
 27 Mark: [will guard against it]
 28 Adam: =be helping cause your neighbours will see or you yourself will see
 29 Mark: [yeah sure that's the best protection]
 30 Adam: people (.) see what you're up to and so
 31 Mark: yeah
 32 Adam: it's combinations of things that hopefully will control=
 33 Mark: [yeah]
 34 Adam: =that will control those kinds of=
 35 Mark: [yeah you're right]
 36 Adam: =of unfortunate behaviours

Firstly, the resident, Mark, looks at an image of a building shown on the handout in front of him, to negatively assess the design of the entrance, 'this one is having a laugh' (line 10) and then elaborates, that although there is a door entry system, 'how easy is it to climb up there' (line 13). The project architect agrees with this negative assessment of the entrance 'right yes' (line 14) and Mark continues to dismiss the design of this in security terms, 'it's like a tease' (line 18). We see that the architect is being held to account for a photograph, an example to encourage the discussion of access to dwellings, as if this was an exercise in the selection of entrance options from a handout, 'so let's point that' (line 15) and 'tick that one off' (line 16). The architect then orientates the conversation to how they have approached design of the scheme, 'well it's one of the reasons why we haven't shown balconies with column supports' (line 19) and then rationalises why the example shown on the handout would fail in security terms 'you are making virtually a staircase on the outside of the building' (lines 23 and 24). Mark and the project architect agree on this and the architect connects this observation to the design concept of 'overlooking' (line 26) and how the use of the building will help with security and 'hopefully will control ... those kinds of unfortunate behaviours' (line 34 and 36).

The security of the scheme was topicalized by the resident Mark, and is the assessment criterion used to critique both an example on the handout and the architect's reasoning for what they have not done, 'we haven't shown balconies with column supports' (line 19). The residents bring to the discussion an assumed knowledge of how people behave in this neighbourhood, in an attempt to influence how the architects conceive the design of this housing scheme, specifically for this locale. This extends the scheme's design remit beyond some generic, functional housing pattern, to a design solution that fits with use behaviours in with this part of London, and this is contingent on local knowledge that is brought into conversation. Artfully the architect agrees with the negative assessment of the example shown, and then reformulates this assessment to bring the scheme being proposed into conversation. In this there is interplay between different resources, the examples on the handout, which the architects are not proposing as part of this scheme, and the design they do propose, making it known how their design, and their reasoning in this, is attentive to security concerns (the security concern of climbing the front of a building).

Figure 3: ‘The lift is tucked around the corner here’ Figure 4: ‘Yes so the lift is here’

The conversation continues, as the resident Chloe links the ideas on the handout with the scheme as it is proposed. She questions, ‘where would you put the lifts’ (line 37), making it known that at this point in time, she does not know where the lift will be. The architect orientates his response to the design of the proposed scheme.

#2 [49:37-49:57] “Where would you put the lifts ... this will be doing quite a lot of stuff”

- 37 Chloe: if you use that type of idea (0.2) where would you put the lifts↑
 38 Adam: obviously the lift has got to go in there someplace (.) >sometimes you can switch it to the side<
 39 you can see that the lift is tucked around the corner here (0.4) (FIGURE 3)
 40 Chloe: alright
 41 Adam: and that’s because this has to do quite a lot of work (.) I mean firstly it=
 42 Chloe: [um]
 43 Adam: =gives access to the stairs and the lift (0.2) say you’re up on the err second floor so it’s
 44 it’s your route to your dwelling it’s also the route from the street to the communal garden so:: when
 45 you arrive on your bike (.) you’ll want to take your bike through to the parking in the back
 46 (1.7) it’s also the route through from the street to the communal garden
 47 Chloe: um
 48 Adam: I’m saying that twice cause there’s a whole lot of other things (0.3) there’ll be lawn mowers going
 49 in and out through there there’ll be people who’ve grown their cabbages or whatever [out the back and
 50 [(laughter)]
 51 want to take them through and back so
 52 so this will be doing quite a lot of stuff and also when you fix and change things (.) this
 53 is the only route for bringing things in and out (.) so it means that’s secure but its doing quite a lot of
 54 work (0.3) and the question was (.) where’s the lift (.) yes so the lift is here (0.6) (FIGURE 4)
 55 so that’s why we’ve given quite a lot of space in here cause the lift needs to be tucked away cause
 56 everything’s too tight (.) >you’re coming in with your bike< and somebody’s got a baby buggy (.) and
 57 somebody’s got cardboard boxes phe::ww you need a bit of room in there

The architect answers, ‘the lift has to go in there someplace’ (line 38) as he moves towards the drawings on the wall and then points at a location on the ground floor plan (Figure 3), and is more specific, ‘you can see that the lift is tucked around the corner here’ (line 39). The architect points at and touches a precise location on the plan to make it publicly visible where the lift is shown, and the residents turn to look at the plan. Praxeologically his actions draw the participants’ attention to the drawing and to the location on the plan where the lift is represented, that is, to the visual embodiment of the lift in this setting. The residents’ ability to read the plan and to visually see the precise location of the lift when sitting was limited. However, the residents do not question or challenge the location of the lift and this location is accepted as where the lift is. At this point in time it is through the architect’s actions that anchor the location of the lift to a point on the drawing that the residents then reason spatially about the design of this space. In this the residents continuously

connect the architect's actions presented to their attention, with their stock of knowledge in the progression of this scheme's design.

The architect then elaborates that the lift space 'has to do quite a lot of work' (line 41), illustrating with examples, 'it gives access to the stairs and the lift' (line 43) emphasising the residents' use of the space 'its your route to your dwelling', 'you'll want to take your bike through to the parking at the back' (lines 44-45). His actions are in some ways pedagogical, explicating some of the uses that the design of this space needs to satisfy through scenarios of use, when moving between the street at the front of the building and the communal garden at the back. The entrance space is a transit and access point for various things and the design of this is not just dealing with choice in the location of the lift in isolation. The importance of the design of this space for the security of the scheme becomes evident 'this is the only route for bringing things in and out', which the architect reasons 'means that's secure but it's doing quite a lot of work' (lines 53-54). The architect then re-introduces Chloe's question 'where's the lift' (line 54) as he points to the precise location on the plan again 'so the lift is here' (Figure 4). Although the architect now stands more centrally in the room, the details of the lift are not more clearly visible to the residents. The architect rationalises why the entrance space is configured in this way, as 'the lift needs to be tucked away' (line 55) to allow space for the multiple uses of the communal entrance area.

The architect uses the drawing as a material resource to show the location of the lift over a distance where the details of what he is showing cannot be clearly seen by other participants. The architect works with the contingencies of the setting and the resources available but he is doing something different from showing in detail features on a plan over a distance that can be clearly seen by the participants (for example, when the drawings are larger, or the participants are closer to the drawings). This is noteworthy when we compare these actions in this setting with another community participatory meeting, when at a point in time when the participants could have referred to a plan, to be more specific in describing a location, there was no pointing at the plan (Mondada 2011). In this conversation the architect's actions exhibit the factuality of the lift's location, which these residents accept. The residents are connecting what is presented to their attention, with what they can reasonably assume to exist, from their stock of knowledge. In this the residents make sense of what the architect is doing, contingent on their knowledge, personal experience and memory of the scheme, in conjunction with his embodied actions now, as he points at and touches the plan and accounts for the lift being 'tucked away'.

Figure 5: 'That's the one spot that you can't see through' Figure 6: 'Or it could be like that'

Next, the resident Chloe pursues her questioning concerning the lift, re-topicalizing the issue of safety.

#3 [50:01-50:32] “You didn’t highlight ... that’s the one spot that you can’t see through”

- 1 Chloe: you know (.) >the thing that you didn’t highlight is (0.3) how some people feel is (.) because
 2 the lift is right at the back now=
 3 Adam: [yes]
 4 Chloe: =[which means that the open air >where people can see through<
 5 Adam: yes
 6 Chloe: that’s the one spot that you can’t see through you’re right at the back= (FIGURE 5)
 7 Adam: [yes]
 8 Chloe: =[so its >just because as well<=
 9 Liz: [umm]
 10 Chloe: =it’s also because of the type (.) how you’ve designed the building >so I suppose if you’ve got
 11 just normal< (.) straight forward (.) one flat on top of the other square=
 12 Adam: [yeah]
 13 Chloe:=[then you probably won’t have so much of that situation but it (.) just can you see the question
 14 Adam: but when you’re actually in with the lift here (1.6) it’s in with the stair
 15 (.) it’s it’s=
 16 Anna: [it’s in with the stair]
 17 Adam: =not right at the end of the corridor its in a its in a
 18 Chloe: so therefore for (.) >as example then< (.) the back end of the stair that’s basically (.) glass↑
 19 Anna: or it could be like that >that image could be clearer<
 20 Chloe: it could be like that (FIGURE 6)
 21 Adam: it could be like that
 22 Chloe: so therefore >in actual fact< there will be some opportunity of having it (.) of having some
 23 glass so it doesn’t look as dark↑
 24 Liz: [um]
 25 Adam: [yes]
 26 Chloe: so if I’m going right in the last corner (.) if I was coming in here (.) and going right there to
 27 that corner
 28 Liz: um
 29 Chloe: all here is nicely glass and bright and in fact I’ve got to go over [there=
 30 Adam: [right]
 31 Chloe: =to go get the lift↑
 32 Mark: [yeah]

The resident, Chloe’s line of inquiry is that there are aspects of design of the lift area that the architect ‘didn’t highlight’ (line 1) and continues, ‘the lift is right at the back’ (line 2) and this is problematic for her as ‘that’s the one spot that you can’t see through’ because ‘you’re right at the back’ (line 6). She imagines inhabiting the entrance space. Chloe’s observations are directed to the architect. As she says this, she leans forward and points to the plan on the wall, which the architect then turns towards (Figure 5). She points at the plan in the direction of the location the architect has previously shown (Figures 3 and 4). Through her spoken and gestural actions they establish their mutual orientation to the lift on the plan. She does this with reference to a drawing that she is not close to and there is a difference in the precision with which Chloe points towards the lift compared with the architect who was close enough to touch the plan. Chloe reasons that the location of the lift is a problem ‘because of the type how you’ve designed the building’ and elaborates ‘I suppose if you’ve got ... one flat on top of the other’ (lines 10-11) and reasons that ‘you probably won’t have ... that situation’ (line 13) but as it is designed, she does consider there to be a problem. The project architect responds to this negative

assessment explaining that ‘when you’re actually in with the lift here, it’s in with the stair not right at the end of the corridor’ (lines 14, 15, 17). Responding to this, Chloe then proposes that ‘the back end of the stair that’s basically glass’ (line 18) suggesting that the ‘problem’ could be designed out and solved by using glazing at the rear of the scheme. Chloe is reasoning hypothetically, suggesting how the scheme might be. Another architect from the practice agrees that it could be designed with glazed panels, like one of the examples on the handout. Noticeably, Chloe looks at her own copy while pointing to the handout attached to the flipchart, agreeing that ‘it could be like that’ (Figure 6). Chloe’s actions visibly depict her orientation to the handout in front of her, and by simultaneously pointing to the handout pinned to the flipchart, praxeologically she draws others’ attention to the handout and how the entrance might be glazed, like one of the examples shown. The project architect can be seen to lean forward to look at the handout attached to the flipchart in Figure 6.

The architects are being held to account for the design of the scheme, to address a problem the resident Chloe sees in this. The same resident then suggests a design solution, in the selection of glazing panels to ‘solve’ the problem. Next Chloe articulates her imagined use of the space (Murphy 2005), as if walking from the entrance to the lift, ‘if I was coming in here and going right to that corner all here is nicely glass and bright and in fact I’ve got to go over there to the lift’ (lines 26, 29 and 31). In the midst of doing this she reasons that the lift space design ‘problem’ is not resolved. These were artful manoeuvres through which Chloe re-formulates the location of the lift as problematic.

#4 [50:32-50:51] “I think we’ve had that problem before”

- 32 Mark: [yeah]
 33 Liz: [I think that we’ve had that problem before with the >you [know what<=
 34 Chloe: [ha ha ha::]
 35 Liz: =I think we had to move the (.) I think we had to move the lift [to the front=
 36 Vivian: [oh]
 37 Liz: =but its a bit of a configuration (.) its just trying to make sure that people didn’t feel that somebody
 38 could have been in that little corner
 39 Chloe: in that corner and nobody (.) and there’s no possibility of anyone seeing you↑
 40 Liz: and because nobody wasn’t walking [by=
 41 Chloe: [yes]
 42 Liz: =cause the lift wasn’t at the front=
 43 Adam: [yes]
 44 Liz: =[you felt uncomfortable (.) so we have an issue of security=
 45 Adam: [yes]
 46 Anna: =[cause here you also use the area right next to the lift also is an entrance [to the=
 47 Chloe: [yeah]
 48 Anna: =the flats (.) so that people (0.2) [its not]
 49 Adam: [that would be the entrance (.) and the lift is in here
 50 Liz: umm um
 51 Adam: and I certainly would be (.) encouraging the whole of that to be either semi-enclosed

At this point other residents align with Chloe’s concern, most noticeably Liz reasons ‘I think we had that problem before’ (line 33). The entrance and space in front of the lift is now referenced and registered as a ‘problem’, with some similarity with their previous experiences living on this estate. A pattern in how a lift problem was solved in one situation is noticed as similar to the design problem they now face. The

solution in the other situation was ‘I think ... to move the lift to the front’ (line 35), which Liz acknowledges was ‘a bit of a configuration’ (line 37) and explains why this happened, ‘its just trying to make sure that people didn’t feel that somebody could have been in that little corner’ (line 37-38). Liz now evokes the residents’ sense of feeling safe as important and Chloe agrees and reinforces ‘in that corner ... and there’s no possibility of anyone seeing you’ (line 39). Liz and Chloe direct these observations to the project architect but neither gesture towards the drawing. Seemingly ‘that corner’ where the lift is shown on the drawing, has already been established as an inter-subjectively shared known location (through previous speech and embodied actions). The residents want to be seen in the corner by people walking by. Because the lift is not at the front of the building, Liz’s then upgrades the seriousness of this and warrants ‘we have an issue of security’ (line 44). In response, the use of the communal space as an entrance is brought into conversation and then the project architect reasons that is why he encourages a semi-enclosed design for that space. The architect is interrupted before ‘either’ (line 51) is explicated, that is, before an alternative solution to a semi-enclosed design is offered. In this sequence there is alignment and reinforcement between the architect and residents that personal safety is the residents’ primary design concern and that the lift, in its current location, does pose a safety problem.

#5 [50:52-51:15] “So therefore actually swap the lift with the stairs”

- 52 Chloe: could it be the other way↑ (0.3) >for example< could the stairs be where the lift is and the lifts
 53 be where the stairs is↑=
 54 Liz: [umm]
 55 Chloe: =[just from that standpoint >what you have in actual fact< is (.) you will have some form of
 56 glass partitions
 57 Adam: um::
 58 Chloe: even if the whole (0.2)=
 59 Adam: [umm]
 60 Chloe: =but some for the top of the stairs will be glass I’m assuming=
 1 Liz: [umm]
 2 Chloe: =so therefore actually swap the lift with the stairs
 3 Adam: [yeah]
 4 Liz: [yeah]
 5 Chloe: what you’ve got is (.) the lift is >not right in the corner< (.) you’ve got glass there
 9 yeah but what you’ve got with the stairs is (.) where those living in Marshall blocks are actually
 10 not used to having no glass cos (.) or stairs are internal ain’t they↑ (.) but the thing about that is (0.2)=
 11 Adam: [right]
 12 Chloe: =if you’ve got half of gla::ss
 13 Adam: yep
 14 Chloe: if its bricked and glass topped (.) then you’ve still got an open part into the back garden
 15 Adam: yes

The conversation now focuses on how the design might be, in the re-design of the space, and how the transparency of materials, in the use of glass or semi-enclosed panels, might feature in resolving this ‘problem’. It is noticeable that Chloe proposes how the design might be re-configured. Chloe ventures ‘can the stairs be where the lift is and the lift be where the stairs is’ (lines 52-53) reasoning in her re-design of the space that glass partitions will be part of the solution. Her upshot solution is ‘so therefore actually swap the lift with the stairs’. Chloe notices that ‘the lift is not right in the corner you’ve got glass there’ (line 5). She reasons that in the use of materials and the layout she proposes for the scheme, the design will be an improvement on what the residents currently have, internal stairs. The architect acknowledges her

reasoning ‘right’ (line 11) and permits Chloe to develop her line of inquiry. Her solution to the problem is that the lift be located on the street frontage with the stairs at the rear of the building, overlooked by the ‘open part’ (line 14) to the communal gardens at the back.

In the course of this conversation the design problem has shifted from its initial focus on the location of the lift, to resolving how the residents can be seen when waiting for the lift and also when using the stairs. This is a more complex problem. Noticeably it is through the articulation of this problem, by the residents, and the design solution offered by Chloe, that many people present are now made aware of the bigger picture and a more nuanced design problem. The lift and staircase are entwined design problems that become evident in the moment of problem solving, to then reveal a different problem. In this more complex problem, an assumption held by the residents and architects is that proximity to the street frontage is more likely to be overlooked by people walking by. Overlooking is assumed to be a positive design attribute in both the lift and staircase spaces. A section of the conversation has been omitted, when the residents express their personal preference in the relative importance of being seen in the staircase or when using the lift. We re-join the conversation, to get a flavour of this debate, as Chloe expresses her preference for taking the lift.

#6 [51:44-52:37] “I think it’s interesting what you’re saying and we do need to we’ll look at that”

- 44 Chloe: then only and then you only rarely use the stairs more like with me I genuinely
 45 only ever use the stairs for emergencies
 46 Valerie: [for emergencies yeah]
 47 Chloe: if the lift’s not working I’m a (.) lift woman you know what I’m saying
 48 ((general laughter))
 49 Chloe: and I think that most people would use the lifts and I’m just thinking that what
 50 you would do is you’d bring anyone who’s in the stairs I mean genuinely I don’t
 1 think you’ll find so many most using the stairs on its own but then if you’ve got
 2 glass (.)
 3 Adam: I I think it’s interesting=
 4 Chloe: [what you’re beginning to look at
 5 Adam: =I think it’s interesting what you’re saying and we do need to we’ll look at that=
 6 Liz: [but we’re looking to encourage um=
 7 Adam: =in terms of lift stair combinations
 8 Liz: =a bit of walking and health
 9 ((general laughter))
 10 Adam: you you can have two t-shirts yours says lift-taker mine says take the stairs
 11 ((general laughter))
 12 Chloe: I’ve always been told to take the stairs
 13 Liz: that’s cost effective as well as low maintenance (.) you know what I mean cut the
 14 costs straight away
 15 Adam: ok um (.) just a couple of quick questions
 16 Chloe: yeah but the problem comes when people have got their shopping
 17 Adam: I’d quite like to move onto the resident options (.) and want to make sure we
 18 don’t run out of time at the end of it
 19 Tina: in terms of human safety and what not (.) the two that were used for the actual
 20 lifts could they be transparent
 21 Chloe: that’s going to be too expensive they’ll probably tell us
 22 Adam: there are a couple of things there (.) our structural engineers are quite keen on
 23 using bits of this structurally so they’re quite solid
 24 Chloe: ahem
 25 Adam: but (.) and (.) I did a workshop with them this morning (.) I’m workshopping all
 26 day

- 27 ((*general laughter*))
 28 Adam: um and they're you know grappling these areas as being quite solid but I take
 29 your point and your point=
 30 Valerie: [um]
 31 Adam: =that you need enough transparency for the positive overlooking
 32 Liz: yes
 33 Tina: it's not just overlooking even if you're on the stairs (.) then everybody feels
 34 more secure
 35 Adam: yeah you're right (.) yeah you are

This excerpt develops our understanding of how the project architect receives the residents' assessments and their interventions in the design of the scheme. In the progression of this event a problem in the scheme was manifest initially as a question concerning the location of the lift, supported by reasons why this posed a security problem for the residents. Chloe's inputs into design solutions, in the selection of materials, glazed panels in specific locations, were acknowledged without negative assessment. Often the architect's acknowledgements were continuers that permitted Chloe to develop her line of reasoning, actions that are indicative of the encouragement of residents' active participation in the design, even on occasions when negative assessments were offered. This is a characteristic of the event where the architects are organisers, they collect information and later they are executors of decisions (sometimes based on a meeting outcome, sometimes as a selection, synthesis or transformation of what they have heard). The architects will be responsible in their future work to show how it has been done in relation to the outcomes of this consultation. This will happen at the next event with these residents and also in the monitoring of the participatory process by the local authority that commissioned this architectural practice.

Chloe's re-configuration of the entrance space, suggesting that the location for the lifts and stairs be reversed, is a more radical design solution. The project architect acknowledges these design problems and suggested solutions 'I think this is interesting what you're saying and we do need to we'll look at that in terms of lift and stair combinations' (lines 5 and 7). The problem is now acknowledged as a 'lift and stair' problem and that this is something that the architects need to look into. The problem is not dismissed as trivial but acknowledged and received as requiring further attention. The architect attempts to draw this subject to a close 'just a couple of quick questions' (line 15) to 'move on to the residents options' (line 17) and 'to make sure we don't run out of time at the end' (line 18). The architect is now attentive to the agenda and the organisation of the event, to allow sufficient time 'at the end' (for the workshop exercises that follow). Next the resident Tina offers that the 'lifts could be transparent' (line 20). This solution builds on Chloe's understanding that the problem is reduced 'if you've got glass' (lines 1 and 2). Chloe's response 'that's going to be too expensive they'll probably tell us' (line 21) prompts Adam to explicate how the structural engineers are keen to use these building components in the scheme 'as big and solid' (line 28). We gain momentary insight into reasoning in the design of the scheme that is often hidden, to residents and others without access to the design decisions made outside this setting. It is evident that the architect is assessing and considering the lift/stair problem in a broader context, and how other problems, including the design of the structural elements for the building might be solved. This demonstrates his design expertise and appreciation of the multi-disciplinary inputs that feature in the design of the scheme, as he balances resident concerns 'I take your point and your point' (lines 28 and 29) looking at Chloe and Tina, with the ways the

building structure will be designed. The design problems associated with the entrance space and access to the lifts and stairs have again increased in complexity. There is no attempt to resolve this here and the architect re-formulates the residents' concern 'that you need enough transparency for the positive overlooking' (line 31) and again he acknowledges their reasoning in this 'yeah you're right, yeah you are' (line 35).

Figure 7: Architect making notes

Figure 8: 'it's actually six of one and half a dozen of the other'

The design of the scheme is work-in-progress. The materials for specific building elements will be selected as the scheme is designed in more detail following this event, with the input of other expertise to design how 'solid' and 'enclosed' the entrance space will be. Although we do not know what the project architect is writing, in Figure 7, we can see that following the discussion of the residents' safety concerns he is making notes, as Tom then joins the conversation.

#7 [51:59-52:26] "Just one last thing ... that dead end is dangerous"

- 59 Tom: ju::st one last thing (Figure 7)
 60 Liz: >we haven't got on to that<
 1 Tom: just one last thing
 2 Adam: yes
 3 Tom: as you walk in
 4 Adam: yeah
 5 Tom: that flat is blocking off what's happening round the corner (.) so therefore that dead end is
 6 dangerous
 7 Adam: what here↑ ((*pointing at drawing*))
 8 Tom: yeah (0.2) you walk in and then you turn to the right where the lift is
 9 Adam: yes
 10 Tom: right so that nobody is looking over the fence (.) and you cant really see what's waiting for you
 11 round the corner (.) so you could be attacked
 12 Adam: round here↑ ((*pointing at drawing*))
 13 Tom: surely the lift should be in the front section so a passer by=
 14 Adam: [yeah]
 15 Tom: =[can see what's happening
 16 Liz: [can see what's happening]
 17 Adam: what in the front here↑ ((*pointing at drawing*))
 18 Chloe: but I think you still have the same other thing of the stairs (.) that people could be loitering in
 19 the stairs (.) [it's actually six of one and half a dozen of the other (Figure 8)]
 20 Tom: [yes but yes but there are] (.) more people are walking passed the front=
 21 Adam: [yes]
 22 Tom: =[therefore you can see as you walk in if someone's waiting for you
 23 Adam: there are quite complex things in that and I hear what you're saying there and I'm not quite sure
 24 what to do about that to be honest
 25 Chloe: yeah
 26 Liz: right

The discussion is not yet drawn to a close. Again the security of the residents is topicalized as Tom now registers ‘that flat is blocking off what’s happening round the corner so therefore that dead end is dangerous’ (lines 5-6). He then upgrades the seriousness of this, ‘so you could be attacked’ (line 11). The architect and Tom now work towards establishing which ‘dead end’ Tom refers to, and whether this is a new problem that Tom has found, or the same entrance space and lift location problem that the group have been discussing. Tom does not point towards the drawing, however the architect moves towards the drawing and points at a location the plan as he says ‘what here’ (line 7). Tom’s response ‘yeah’ (line 8) acknowledges their mutual orientation to the corner, which Tom is now formulating as a problem, with further references to help locate this ‘where the lift is’ (line 8). Tom and the architect’s actions intersubjectively establish their orientation to the same ‘corner’ location. The architect points to the drawing again as he says ‘round here’ (line 12). Tom’s response is ‘surely the lift should be in the front’ (line 13), although not an acknowledgement and with no noticeably visible actions, Tom does not disagree with the architect. The solution to the problem that Tom offers, moving the lift to the front, is the same solution Chloe gave in extract #5. It is the same ‘lift problem’ that Tom now reformulates. The delay in Tom’s appreciation of the problem serves to illustrate that some residents took longer than others to register and then engage in the discussion of the problem. It is Chloe’s next response that is remarkable in the further progression of her spatial reasoning.

Although Tom’s initial noticing of the lift problem was addressed to the architect, it is Chloe who self-selects and responds. Chloe exhibits her understanding that the problem is not resolved by moving the lift to the front as she now looks at Tom and says ‘I think you still have the same other thing of the stairs’ (line 18). Chloe reasons that ‘it’s actually six of one and half a dozen of the other’ (line 19) as she moves her arms as if they are weighing scales (Figure 8). Chloe understands, that irrespective of whether the lift or stair is placed at the front of the building, one of these circulation routes will be less overlooked. Tom reasons that ‘there are more people walking past the front’ seemingly not registering the escalation in the complexity of the problem that has happened in the course of this conversation. The architect admits ‘there are quite complex things in that and I hear what you’re saying there and I’m not quite sure what to do about that to be honest’ (lines 22-23). This is an acknowledgement that he is taking the re-design of this area seriously and also that he has no immediate solution for this. A problem the residents themselves found and defined in the scheme, which they then attempt to solve, is not resolved.

6 Discussion

Design is not always conceived as a problem solving activity, however in this situation this characterisation is apt. Problem finding, collaboratively formulating features of the problem and ongoing attempts to find solutions characterise the residents’ and architects’ activities during this interaction. In a situation to discuss the access to dwellings and the street frontage, there may not have been a problem with the design of the scheme proposed to the residents. The lift location was formulated as a security ‘problem’ as it was reasoned during this episode that in its current location, people waiting for the lift could not be seen by passers by. The problem was a ‘found object’ in Livingston’s sense (2008 p.131), in the residents’ lived-work and their practical actions reasoning spatially, why the lift in that location was problematic. The

problem was constituted, locally, and the architects and other residents present then acknowledged this as problematic. In the participants' ongoing attempts to find a solution for this characteristics of the problem were revealed and specified and the problem was re-formulated. In this setting the architects were being held accountable for the design of the scheme they proposed and also to rationalise the design of images for a building shown on the handout, being held to account for what they had not done. While problem formulation and the propagation of a problem in the course of interaction is not on its own novel, given some preconceptions of user engagement in architectural design, in this setting these actions were remarkable. The residents 'found' the problem. Furthermore, the problem became more complex in the residents' attempts to find a solution, which is also uncharacteristic in preconceived views of what users do. In keeping with a participatory design ethos these residents collaboratively pursued finding a solution to a problem that they themselves defined (Sanoff 2000 p.x). The ways that they accomplished this and what they found in this situation warrant further attention.

6.1 Accomplished spatial reasoning practices

Seeing similarity in the problem was remarkable in the residents' actions in this setting in several distinct instances. First, in the recognition that there was a problem, in noticing a use pattern in the entrance space, where being seen when using the lifts would be problematic (if the building was constructed to the current design). Attempts to solve the problem considered the use of glazed panels, transparent materials to alleviate the problem of being seen. This was the first candidate design solution offered. Noticeably, it was the resident who initially raised the problem, who in the course of formulating the problem offered reasoned attempts to find a solution for this. Seemingly, as is encouraged in participatory design, there was a shared sense of ownership of the problem and the residents, especially Chloe, became engaged in problem solving. The re-design of the entrance space was not viewed solely as something for the architects to resolve, as the residents actively engaged in this. This event was evidently more than an information gathering consultation exercise.

The residents' lived-experience of use-behaviours and the need to feel secure in communal areas featured in raising a problem and also provided experiential resource to draw on when seeing similarity between a problem with this design and in another situation. In a previous situation the overseeing problem was resolved by moving the lift to the front of the dwelling and this was the second candidate solution offered. The problem had similar, analogous characteristics with another situation, although the problem as it was manifested at this event was also unique. However, whilst articulating the problem, there was progression in understanding the complexity of the problem. Reformulating the problem was ongoing at this event and in this new aspects of the problem were revealed, in the "discovery of unanticipated relationships" (Livingston 2008 p.173). The residents' stock of knowledge and lived-experience in this locale did feature in this, in offering a candidate solution from another situation. The similarity with another situation was then reasoned to offer a less relevant solution in this situation.

The third instance of seeing similarity is considered especially evident of accomplished spatial reasoning practices and problem solving insight. The resident, Chloe notices similarity in the correspondence of the problem, that is, even if the lift and stair locations are reversed the overlooking problem is not resolved. This was

exhibited as Chloe responds to another resident, who at a later stage registers the problem. Chloe's insight was that the problem is not resolved if the locations of these elements are switched. This problem solving insight drew on her conceptual transformation of elements in one location, assuming their re-location in another. The logic of the problem was symmetrical. Chloe demonstrates her recognition of a pattern in the problem in understanding that irrespective of whether the lift or staircase is at the front of the building that one of these circulation spaces will be less overlooked by passers by. Noticeably the resident Chloe exhibits abilities to see the problem in a designerly way by being able to reason through the consequences of transforming the lift and staircase locations, to then realise that it is still not resolved. These actions in particular exhibit accomplished spatial reasoning skills. These skills are more routinely associated with expert designers, in closer proximity and with clearer visual access to design drawings, to then imagine one element in another location (Murphy 2005). Witnessably ongoing in this interaction was the co-evolution of the problem. The problem formulation, attempts at solution and re-formulation actions occurred at situated moments and also were connected acts in the course of interaction. This was exhibited, for example, in Chloe's ability to connect moments of insight into the problem at one point in time with another. Chloe was evidently engaged in 'doing design' as through her reasoning the problem was registered and then ultimately acknowledged as not yet resolved. While these analyses do furnish us with further evidence of users' capabilities to engage in design and that these skills are widespread, here the spatial reasoning exhibited are considered especially accomplished. It is proposed that it is difficult not to see Chloe's actions in this setting as accomplishments of *designing*, passing through stages in her thinking as a designer would, bringing her experiential insight in problem formulation-solution through actions that are observably similar to problem solving by a professional designer. There is no comment here on her design competence or how a designer might be more adept at this, just that she is designing, although, it is remarkable that she does draw attention to a problem that the architects have not seen. Her actions exhibited user-resident active engagement in attempting to find a solution to the problem and then, ultimately not finding one. Furthermore, her actions demonstrate that it is not only the architects in this situation that evaluated the solutions offered by other participants, as evidently Chloe was at liberty to offer her designerly insight into the problem.

The problem was constituted and re-formulated at particular moments in time, working with the specific properties of the building and the ways that features of this were communicated through the use of material resources, in conjunction what was said and the embodied actions of the participants. While material representations were used in this setting, the orientation to these was over a distance where the residents' ability to visually see the problem in detail, especially on the drawing pinned to the wall, was variable and limited. To negotiate this, showing over distance was an ongoing concern of the participants, for their intersubjective understanding and mutual orientation to aspects of the design. Working with the contingencies of this setting, artfully the architect and residents, through their speech, direction of gaze and embodied actions of touching, pointing and bodily orientation, were able to negotiate the showing and revealing of particular aspects of the design. There was a difference in precision with which the residents could point at the drawing in comparison with the architect who could touch this, and there was evidently coordinated interactional work around indexical expressions, for example, to establish which corner was being referenced. Noticeably the residents did not challenge the location of the lift on the

plan that the architect was close enough to touch. In his actions he exhibited the manifest, factuality of the location of the lift, as shown on the plan and the residents' experience, knowledge of the scheme and trust in the architect's expertise was evident in the ways that they intersubjectively made sense of what was going on, to establish what was noticed, specified and re-formulated ongoingly at this event.

The residents' problem solving skills, in their identification, formulation and the solutions offered at this event, were remarkable. These actions, it is proposed, exhibit these residents' active engagement in the design of this scheme to inform how this will be progressed after this meeting. Spatial reasoning skills that are routinely associated with experienced designers were evident and accomplished in the residents' practical reasoning and problem solving competencies. This is not to trivialize the domain-specific reasoning that is commensurate with the design of social housing, and the expertise that these architects brought to this situation. It does, however, highlight the non-trivial contributions that these residents made to the design of this scheme. In mathematical terms, the lift-stair problem is symmetrical. While a lift and staircase are not identical, in the translation of one element to another location the problem is symmetrical. The residents' spatial reasoning and problem solving competences exhibited were not a taught expertise, or with reference to published pattern language resources. The recognition of a pattern in the problem in this instance drew our attention to accomplished mundane spatial reasoning skills. Seeing these practices in action reinforces the view that creativity and problem solving are human faculties and then develops an appreciation of this further. Problem solving in design situations is not all of one sort. There are degrees of complexity in problems. In this situation the residents' (Chloe in particular) spatial reasoning and problem solving skills extended beyond received views of user capabilities. This raises our expectations in the spatial reasoning and problem-solving *expertise of 'non-designers'* and in common with Pollner (1987 p.x) points towards not underestimating the reasoning skills of mundane reasoners. However, for this mundane reasoning to flourish, the actions of the organisers at participatory events come into play.

6.2 *Enabling participatory engagement in design*

Participatory events, such as this, provide an opening for community engagement in the design of environments they will inhabit. While user participation at events is sometimes criticised, this was seen to be an event when the residents' active participation in the negotiation of the design of the scheme was characteristic of the interaction. The actions of the architects facilitating this event were significant in enabling this to happen. This was accomplished, not only in their organisation of the event but also more locally, in their receipt, acknowledgement and response to what the residents said and did. The project architect acknowledged moves in the residents' reasoning sequentially, often with continuers, such as *um*, *yes*, *right* that did not attempt to take the conversation platform and let the person speaking develop their chain of thought. In actions such as these the architects remained receptive to what were at times negative assessments of the scheme. Each action was contingent, in the moment of reasoning, in response to what had just been said and to what is happening, now. Praxeologically these actions permitted the residents' reasoning about the design to propagate. The architects' expertise in the domain of building design, and participatory engagement in social housing in particular, were exhibited in their attentiveness to this problem and their artful practices in acknowledging and responding to the residents' assessments of the design and the solutions offered. The

architects did not dismiss the problem as trivial. In the course of the conversation, however, the complexity of the problem escalated. The project architect brought the structural design of the scheme into conversation, making it known that the design of the scheme engages further design problems and considerations to be raised in other settings, drawing in other design expertise. For the residents the structural integrity of the building is something that is assumed, rather than something that can be worked towards in this activity. For the architects on the other hand this is still a living and unsolved problem.

There were particular roles, purposes and goals for the different participants in this setting. In a basic sense the residents were there to voice their opinions and the architects to collect opinions, on all matters scheduled and then to work to satisfy these opinions. The interesting feature in this interaction was the depth and sophistication of these residents' opinions, and their thoughts and reasoning going into them. The residents were more help and active in the design of the scheme than is sometimes assumed. We have gained insight into participation in design when it works well and all points to taking residents more seriously and not being cursory in our use of them. The pedagogical effort made in participatory consultation may well reap greater reward in terms of residents' ideas, help in problem forming and solving, and buy-in to a scheme that they will inhabit. User engagement need not be viewed as a troublesome activity that some architects pay lip service to.

By offering the design lens of problem-solving and an ethnomethodological mirror to recover the workings of design through mundane reasoning's situated practical actions, we have seen that these residents' spatial reasoning were remarkably skilled and accomplished. Complex conceptual problems, in how the entrance to this scheme might be, were brought into a shared discursive and interactional space at this event. Our attention was drawn to their practical actions of reasoning spatially, bringing their lived experience into the re-design of the scheme. As one point built upon another the intricacies of the problem unfolded revealing their "reasoning in the middle of doing things" (Livingston 2008 p.39) which evidently is what designing and design problem solving is about. This was problem seeking and solving in the wild, as this was ongoing in the moment of practical reasoning.

Conclusions

Participation in design is political in its re-negotiation of relationships between designers and users. This research offers practical understanding of what users can bring to design situations and how this can reveal more profound designerly insight than is sometimes portrayed, when studying design problem solving and spatial reasoning in the intricacies of their practical details. Participatory events, such as this, provide a perspicuous setting to study the ways that user practical reasoning can meaningfully input into the design of things. In their mundane reasoning and practical actions an unforeseen problem, not previously noticed by the architects, was brought to everyone's attention. A problem in the design was found that was far from mundane. Furthermore the residents' actively engaged in the re-design of the scheme, in their problem seeking and solving actions, in witnessable actions that are more routinely associated with institutionally recognised designers. The general human capacity for creativity and problem solving is already acknowledged. In this paper we see non-expert designing and problem solving in action, where people collaboratively pursued finding solutions to a problem that they defined, and architects that were

receptive to this. In this our appreciation of mundane reasoning and mundane reasoners is developed further. This all points towards not underestimating the spatial reasoning competencies of resident users in situations such as these, and here they were not. For this to happen the actions of these architects were remarkable: in the organisation of this event, in their acknowledgement of reasoned arguments, and honesty in acknowledging that they have no immediate solution for this problem. Importantly this research shows what this looks like in practice.

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References

- Alexander, C. (1967). The Atoms of Environmental Structure. London, Ministry of public buildings and works.
- Atkinson, P. (1988). "Ethnomethodology: a critical review." Annual review of sociology **14**: 441-465.
- Ball, L. and B. Christensen (2009). Analogical reasoning and mental simulation in design: two strategies linked to uncertainty reduction. About: designing, analysing design meetings. J. McDonald and P. Lloyd. London, Taylor and Francis Group: 137-152.
- Ball, L., T. Omerod, et al. (2004). "Spontaneous analogising in engineering design: a comparison of experts and novices." Design Studies **25**(4): 495-508.
- Blundell-Jones, P., D. Petrescu, et al., Eds. (2005). Architecture and participation. Oxford, Spon Press.
- Bon, R. (1972). Allometry in micro-environment morphology. Cambridge, Mass., Harvard University.
- Buchanan, R. (1996). Wicked problems in design thinking. The idea of design. V. Margolin and R. Buchanan. Cambridge Massachusetts, The MIT Press: 3-20.
- Button, G. and W. Sharrock (2000). Design by problem-solving. Workplace studies: recovering work practice and informing system design. P. Luff, J. Hindmarsh and C. Heath. Cambridge, Cambridge University Press: 46-67.
- Chung, J., T. Hwang, et al. (2000). "Framework for integrated mechanical design automation." Computer-aided design **32**(5-6): 355-365.
- Coulter, J. (1990). "The praxiology of perception: visual orientations and practical action." Inquiry **33**(3): 251-272.
- Coulter, J. (1991). Cognition in an ethnomethodological mode. Ethnomethodology and the human sciences. G. Button. Cambridge, Cambridge University Press: 176-195.
- Coyne, R. (2004). "Wicked problems revisited." Design studies **26**(1): 5-17.
- Cross, N. (1999). "Natural intelligence in design." Design studies **20**(1): 25-39.
- Cross, N. (2001). Design cognition: results from protocol and other empirical studies of design activity. Design knowing and learning: cognition in design education. C. M. Eastman, W. M. McCracken and W. C. Newstetter. Oxford, Elsevier Science Ltd.: 79-104.

- Cuff, D. (1989). Mirrors of power: reflective professionals in the neighborhood. The power of geography: how territory shapes social life. J. Wolch and M. Dear. London, Unwin Hyman: 331-349.
- Dorst, K. and N. Cross (2001). "Creativity in the design process: co-evolution of problem-solution." Design Studies **22**(5): 425-437.
- Forester, J. (1985). "Designing: making sense together in practical conversations." Journal of Architectural Education **38**(3): 14-20.
- Forester, J. (1989). Planning in the face of power. London, University of California Press Ltd.
- Garfinkel, H. (1967). Studies in ethnomethodology. Englewood Cliffs, Prentice-Hall.
- Garfinkel, H. and D. L. Weider (1992). Two incommensurable, asymmetrically alternate technologies of social analysis. Text in context: contribution to ethnomethodology. G. Watson and R. Seiler. Newbury Park CA, Sage Publications: 175-206.
- Goodwin, C. (1994). "Professional vision." American anthropologist **96**(3): 606-633.
- Goodwin, C. (1995). "Seeing in depth." Social studies of science **25**(2): 237-274.
- Greiffenhagen, C. (2008). "Video analysis of mathematical practice? different attempts to 'open up' mathematics for sociological investigation." Forum: qualitative social research **9**(3).
- Heath, C. and P. Luff (2000). Teamwork: collaboration and control in London Underground line control rooms. Technology in action. Cambridge, Cambridge University Press: 88-124.
- Hester, S. and D. Francis, Eds. (2007). Orders of ordinary action: respecifying sociological knowledge. Aldershot, Ashgate Publishing Ltd.
- Housley, W. and R. J. Smith (2011). "Mundane reasoning, membership categorization practices and the everyday ontology of space and place in interview talk." Qualitative research **11**(6): 698-715.
- Ingold, T. (1986). The appropriation of nature: essays on human ecology and social relations. Manchester, Manchester University Press.
- Ivarsson, J. (2010). "Developing the construction sight: architectural education and technological change." Visual communication **9**(2): 1-21.
- Lindsay, C. (2005). From the shadows: users as designers, producers, marketers, distributors and technical support. How users matter: the co-construction of users and technology. N. Oudshoorn and T. Pinch. London, MIT Press: 29-50.
- Livingston, E. (2007). Circumstances of reasoning in the natural sciences. Orders of ordinary action: respecifying sociological knowledge. S. Hester and D. Francis. Aldershot, Ashgate Publishing Ltd.: 121-134.
- Livingston, E. (2008). Ethnographies of reason. Aldershot, Ashgate Publishing Limited.
- Lloyd, P. and P. Scott (1994). "Discovering the design problem." Design studies **15**(2): 125-140.
- Luck, R. (2007). "Learning to talk to users in participatory design situations." Design Studies **28**(3): 217-242.
- Luck, R. (2007). "Using artefacts to mediate understanding in design conversations." Building Research and Information **35**(1): 28-41.

- Lynch, M. (1993). Scientific practice and ordinary action: ethnomethodology and social studies of science. Cambridge, Cambridge University Press.
- March, L., Ed. (1976). The architecture of form. Cambridge, University Press.
- Martin, D. (2011). Design and the mundane: personal correspondence.
- Mithen, S. (1998). Creativity in human evolution and prehistory. London, Routledge.
- Mondada, L. (2011). "The interactional production of multiple spatialities within a participatory democracy meeting." Social semiotics **21**(2): 287-314.
- Murphy, K. (2005). "Collaborative imagining: the interactive use of gestures, talk and graphic representation in architectural practice." Semiotica **156**: 113-145.
- Ochs, E., P. Gonzales, et al. (1996). 'When I come down I'm in the domain state': grammar and graphic representation in the interpretive activity of physicists. Interaction and grammar. E. Ochs, E. Schegloff and S. Thompson. Cambridge, Cambridge University Press.
- Pollner, M. (1974). "Mundane reasoning." Philosophy of the social sciences **4**(1): 35-54.
- Pollner, M. (1987). Mundane reason: reality in everyday life and sociological discourse Cambridge, Cambridge University Press.
- Psathas, G. (1995). "'Talk and social structure' and 'studies of work'." Human studies **18**(2/3): 139-155.
- Rawls, A. (2008). "Harold Garfinkel, ethnomethodology and workplace studies." Organization studies **29**(5): 701-732.
- Sacks, H. (1992). Lectures on conversation vols. 1 and 2. Oxford, Blackwell Publishers.
- Sanoff, H. (1975). Seeing the environment: an advocacy approach. Raleigh, North Carolina, North Carolina State University.
- Sanoff, H. (1991). Visual research methods in design. New York, Van Nostrand Reinhold.
- Sanoff, H. (2000). Community Participation Methods in Design and Planning. New York, John Wiley & Sons Inc.
- Sanoff, H. (2010). Democratic design: participation case studies in urban and small town environments. Saabrücken, VDM Verlag Dr Müller.
- Sawyer, K. (2010). Explaining creativity: the science of human innovation. Oxford, Oxford University Press.
- Schön, D. A. and G. Wiggins (1992). "Kinds of seeing and their functions in design." Design studies **13**(2): 135-156.
- Stacey, M., C. Eckert, et al. (2009). From Ronchamp by sledge: on the pragmatics of object references. About: designing, analysing design meetings. J. McDonald and P. Lloyd. London, Taylor and Francis Group: 361-379.
- Stevens, P. S. (1974). Patterns in nature. Boston, Little, Brown and Company.
- Stiny, G. (2006). Shape: talking about seeing and doing. Cambridge, Massachusetts, MIT Press.
- Suchman, L. (2000). Making a case: 'knowledge' and 'routine' work in document production. Workplace studies: recovering work practice and informing systems design. P. Luff, J. Hindmarsh and C. Heath. Cambridge, Cambridge University Press: 29-45.
- Till, J. (2005). The negotiation of hope. Architecture and Participation. P. Blundell-Jones, D. Petrescu and J. Till. Oxford, Spon Press: 23-42.

- Whalen, J. and E. Vinkhuyzen (2000). Expert systems in (inter)action: diagnosing document machine problems over the telephone. Workplace studies: recovering work practice and informing system design. P. Luff, J. Hindmarsh and C. Heath. Cambridge, Cambridge University Press: 92-140.
- Zimmermann, D. H. and M. Pollner (1971). The everyday world as phenomenon. Understanding everyday life: toward the reconstruction of sociological knowledge. J. D. Douglas. London, Routledge and Kegan Paul: 80-104.