

Rotating maps and readers: praxiological aspects of alignment and orientation

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A longstanding topic in our notions of what geographic knowledge could be is the mental map, or, in its most recent form, mental spatial representations. In this paper we draw upon ethnomethodological critiques of cognition, and mind more generally, to re-specify navigation, orientation and alignment in terms of human practices of navigating, orienting and aligning in particular settings. Our ambition in the paper is less to dismantle notions of cognition still present in geographers' studies of map use; instead we offer the beginnings of a way of analysing ordinary practices of wayfinding that treats matters of reasoning as publicly available in gestures and conversation rather than indirectly accessible inner processes of mental map consultation. To do so we describe what occurs during two video fragments involving consultation of maps in commonplace situations. The first is a group of tourists on foot trying to find an old building in Edinburgh and the second daytrippers travelling out for a day in the countryside locating some recommended places to visit in a road atlas.

key words cognition navigation orientation video-analysis ethnomethodology

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revised manuscript received 23 January 2008

Introduction

While maps are a powerful resource for the orienteer, agronomist and tourist alike, their examination *in use in the midst of everyday practices* has been a surprisingly neglected part of geographical investigations. Indeed, much more attention has been given to mental maps (Tolman 1948; Sanders and Porter 1974), schemata (Tuan 1975; Sholl 1987), cognitive maps (Lloyd 1989; Golledge 2002), cognitive representations of space or route (Cornell *et al.* 2003) and 'map like-models' (Blaut *et al.* 2003). In this paper, following on from our earlier work (Brown and Laurier 2005), we examine maps in places wherein spatial reasoning is exercised intelligently or otherwise. In that earlier paper we showed how maps are seldom put to use for solely navigational purposes, rather they are made sense of by way of the particularities of the activities and persons that constitute journeys. In what follows we will present an alternative to classic cognitive studies of orientation and alignment (and misalignment and disorientation) with maps,

one that distributed cognition has established already within psychology itself (Hutchins 1993 1995), though one that human geography has yet to follow. Our focus will be on problem-solving with maps as a publicly available, socially and locally constituted activity, and how such an approach helps us avoid the traps that we may be led into by the concept of cognitive representations of space (see also Ingold 2000).

In what follows we will tease out problems of how groups of people bring their movements, the maps they are carrying and themselves as a navigational unit into alignment. In doing so, we want to provide an alternative to the replicated and familiar experimental result: maps which are misaligned with respect to their reader's forward/rearward and left/right orientation disrupt their navigation (Levine 1982; Shepard and Hurwitz 1984). As most of us will know from experience, finding your way when a map is upside down in respect to its conventional alignment is quite a challenge. It can be done, but it slows you down considerably and you tend to make many more

mistakes. In cognitive models of spatial knowledge and learning, these delays and errors are referred to as 'alignment effects'. Following the model, if we attempt to use a map which is misaligned with our external environment, a correlate mental rotation of the map 'in our heads' is required to make sense of the map. Alignment effects are thus the extra time and effort required to rotate the mental representation of physical maps (Shepard and Hurvitz 1984; Finke 1990; Lloyd 1989 1997; Golledge 1999; Shepard and Metzler 1971). Consequently these mental rotations add to the already considerable burden of navigating through unfamiliar territories (Lloyd 1989 1997; Golledge 1999; Shepard and Metzler 1971), particularly if we are making sense of the surrounding landscape at the same time. This is not just an issue which concerns the immediately visible surroundings either: experiments involving abstract diagrams show that individuals find it easier to identify spatial relationships when presented with them from consistent orientations (Presson and Hazelrigg 1984). Alignment effects have been demonstrated with regard to navigational structures in environments, such as the street grids of cities or layout of corridors (Levine 1982; Nori and Giusberti 2002; Werner and Schindler 2004; Werner 2004).

In agreement with ethnomethodological (Coulter 1983; Watson 1998; Sharrock and Coulter 1998) and Wittgensteinian (Bennett and Hacker 2003; Hacker 1990) critiques of the relationships between seeing, mental images and imagination we find this depiction of an inner representation of the outer world misleading. While we can use our imagination to picture details of a map this does not mean there is a mental map or cognitive representation that we can rotate inside our brain. It is not a question of seeing an inner map with our mind's eye, where if it is out of focus we could hold it a little closer, or if it is in the dark we could apply a little more light, or that an internal hand could rotate the image for us. While we use eyes to look at the outer world, there are no sense organs that could be used to look at images conjured up by our imagination. There is no misalignment between *mental* maps and the space we are in. There are, on the other hand, extra difficulties in transposing misaligned perspectives with depth into recollectable two-dimensional maps or equally between what we are making sense of with a map in hand and what is in front of us as embodied persons with 'left' and 'right', 'ahead' and 'behind' and so on (Schutz 1973a; Merleau-Ponty 1962).

To give an example of what is involved in orienting ourselves with a map: you are standing in New York, the map is held in your hands so that 'up' on the map is aligned with the forward of your body and you turn around until 'up' on the map is in the centre of the landscape you are looking into (for a nuanced account of depth see Wylie 2006). From this alignment of body, map and landscape a gestalt of spatially embodied properties emerge: backwards, left, right, close, far away, behind, in front of etc. So oriented, you need only continue the movement of your hands and eye from the map to trace up and into the world you can see. If '5th Avenue' is on the right hand side of the map, then so it will be aligned to your body. Never mind that you cannot make out 5th Avenue because buildings are in the way, you can point and look in its direction from where you are now. The search for how to get to 5th Avenue will start by working out how you find your way there from details supplied by the map, identifying a route, usually in parts, on the map and then looking for those parts of it in the landscape around you.

In the city with its topology of streets, we typically build a sequence of what left and right turns will need to be done to bring us to our destination. With a misaligned map when we look up from the map, there is no longer simple correspondence between map and features in the landscape; rather there will be numerous translations and transformations required. What is left on the map is straight ahead of us and what is right on the map is behind us, second on the right on the map means two streets behind us, the sequences of left, right, ahead and backwards are harder to produce without error by mirroring or reversing etc.

Common cultural conventions of map production such as North being up allow for practised skills in navigating with maps, consequently if we have to do things unconventionally, such as consulting a map constantly kept at an 85 degree angle, this can slow us down, at least initially. Soon enough we get used to the new convention and start to speed up again. School teachers learn quickly to read upside down and mechanical typesetters read mirrored letters as fast as conventional layout. The cognitive research introduced earlier recorded the time it took experimental subjects to read letters variously rotated and found a correlation between the degree of rotation and the time taken by the subject to work out what letter they were seeing. Famously, the argument is that the mind has to do a mental

rotation (Shepard and Metzler 1971). By contrast, we would say that as the distortion of the letters increases, the letter is becoming less easily recognisable and it takes 'longer to work out how a certain figure will appear when rotated otherwise' (Bennett and Hacker 2003, 197). If you mess around with the conventions then it will take time to re-acquire the skills at using the new ones. In fieldwork with staff at a tourist information centre (Brown and Perry 2002), they found it difficult to read maps *the right way up*, since they were so used to helping out over a desk, with the map correctly oriented for the tourist. Are we to believe that their mental orientation has been transformed? Or simply that they have learnt a different way of working with maps.

In this paper, we look afresh at navigation with maps, by examining two ordinary situations involving navigation and alignment. Our goal is to re-examine alignment as a joint accomplishment, and to learn from real-world map users. We develop a distinct description of orientation and wayfinding in terms of shared, socially organised practical reasoning. Alignment, situated ecologically in the rich environments we navigate through, is a process by which we think through – with 'hands and eyes' in Latour's (1986) phrase – how we will get to where we want to go. As often as not, in doing so we are coming to agreement on what that 'where' is at the same time. A number of phenomena need to be brought into alignment on any occasion when we navigate with maps – descriptions of the thing we are looking for, other maps, the help of others, what we can see around us. The phenomena shift and change as one builds on another. Alignment, as *accomplishment* rather than *effect* or *bias*, is not only about bringing people and things together around maps and working out what to do, it is about in what sequence does each aligning, orienting and way-finding progress or, equally, regress (since we also get lost in the world).

Reading maps in the wild

By examining map reading in any specific instance, we come upon a host of 'curious properties' (Garfinkel 2002) missed by studies which seek to produce general (or even 'universal'; Blaut *et al.* 2003) mapping as spatio-cognitive process or ability. Rather than individual psychology or social structures supplying what the local situation lacks, each problem's generality, reasonableness, orderliness, classification, exceptionality, gendered nature, affect and more

are the *in vivo* accomplishments of the joint courses of conduct by unexceptional navigators, then and there. What we are suggesting is that there is a promising avenue away from mental explanations of spatial cognition to return to how maps are made sense of in and by an array of practices in places and paths where we dwell (Ingold 2000; Lorimer and Lund 2003). In relation to alignment and orientation this suggests that we look for unexceptional and fairly typical occasions where we turn maps around, or map readers turn themselves around, to examine them as spatial reasoning in *concretia*. Goodwin's (2000 2003a 2003b) work on archaeologists making and consulting diagrams and charts during field digs has been exemplary in this respect, building on Latour and Woolgar's (1979) and Lynch's (1990) work on how scientific diagrams, sketches and images are attended to, and arranged with respect to one another and accompanying text.

What Goodwin adds to the research of Latour and others is a focus on

how participants treat the visual displays of each other's bodies as consequential, and how this is relevant to the moment-by-moment production of talk. (Goodwin 2000, 174)

Alongside foregrounding the complex ecologies of settings, in terms of furniture, tools, images, maps, charts and other instruments, Goodwin highlights four broad ranges of methodological problems that participants must ongoingly solve in pursuing courses of action together. First, participants need to select particular details of visual material from the larger assortment of images, environment and texts available to them at any point in time. Even as this selection is done, what is relevant at one moment in time is confirmed, discounted, built upon, re-inspected etc. at the next. Second and relatedly, these materials must be managed and brought to attention at the right moment for those members participating in the action. This is not at all straightforward since in the unfolding of an event there are multiple courses of action at work, with potentially divergent speeds, projectable endings, rhythms and so on. In group situations different things are being done at the same time – such as one person walking up to read a signpost while another person scrutinises a guidebook. Participants in the action are sometimes choreographing and sometimes mis-timing, having to do certain things first, other things last, able to slot an action

inbetween or in parallel with another. Third, the objects involved inescapably mediate what happens, having been assembled elsewhere, embodying instructions, potential courses of actions and so forth. Goodwin is careful to remind us that objects are not determinate but rather come to life in particular ways according to how they are involved in fields of practice. A final point made by Goodwin is that 'settings' are often assembled in order to support and structure the visual aspects of activities that occur within them. Street signs, advertising and information boards are intendedly located by urban planners and civil engineers in relation to where tourists are looking toward and away from (see also Mondada forthcoming). In other words, the environment is not passively laid out, it is pre-constructed with an eye to the navigation of its likely inhabitants (be they tourists, shoppers, bank customers, students in libraries; Crabtree 2000; Carlin 2003), although as we know that pre-construction is, as often, unsuccessful.

Empirical materials

Goodwin's work has led us toward social settings which implicate maps in a less nakedly instrumental manner than that found in experiments (Montello 2005). Field studies of map use are still quite rare – as Malinowski and Gillespie comment

although spatial ability research conducted in small-scale or laboratory settings has flourished, fewer studies have been done in real-world, large scale settings. (Malinowski and Gillespie 2001, 73)

Cornell and Heth go further and argue that there is an important need for studies of 'humans navigating real world routes' since little work has looked at orientation which is not part of experimental tasks (Cornell and Heth 2000, 72). Following the lead of psychologists such as Hutchins (1993 1995), and more specifically Garfinkel's (2002) ethnomethodological programme, we will look at alignment as 'cognition in the wild' using video fragments we have collected of map reading in varied situations. By way of contrast with controlled studies, we will describe how maps are 'naturally' consulted and 'naturally' followed during the course of a journey (Heath 1997; Watson 1999). In particular, we will focus on how the movement of perspective (re)arranges scenic features into analysable spatial relations, how orientation involves multiple shifts back and forth between map and features of the scene and

how the multiple perspectives of a group are brought to bear on the problem of where we are and where we are going. The two video fragments we will examine are of a group of tourists 'found' on a street corner lost, and a group of daytrippers organising their day out as they drive into the Scottish highlands. In the clips we will describe, in some detail, the mundane everyday resources which are used to *achieve* orientation around maps. This orientation brings together not only map and view, but co-map readers, drivers, other publications and paper materials – broadly: alignment work.

The materials we use here may seem unusual for those who are familiar with the existing literature on spatial cognition in human geography. To provide access to the details of map work we will use two video recordings of episodes of map consultation. These episodes happened during ethnographic fieldwork we were conducting on tourism and car travel (Brown 2007; Laurier *et al.* 2008). While we would not argue that having a camcorder trained on a setting does not change elements of what happens in such a setting, we would suggest there is less self-consciousness than one might expect in the map use we recorded. In one clip, we had been filming the subjects in advance to get them used to the presence of the camcorder and, for the other, the presence of the camcorder was as unremarkable as could be, given that the street they were on was teeming with other cameras and camcorders.

There is a further spontaneity to the map use since maps and wayfinding were not understood by the subjects to be the focus of our study, nor was it at the time we were filming. As we noted above, our projects were on tourism and car travel. Indeed, the fact that we have examined map use without it being part of the *a priori* aims of our projects gives the material a certain strength. Conversation analysis tries where possible to listen to conversations, at least at first, in an 'unmotivated manner' (Have 1998; Sacks 1972) in order to hear what is there, rather than to begin by, say, searching for a research project's object and then counting instances of items which correspond to that object (e.g. numbers of times X points at the map). To begin to hear and see what was in our data we met for 'data sessions' where we viewed and reviewed these short strips of video up to 20 times or more. Notes were made throughout the sessions, which were tidied up and elaborated upon for this article.

Transcripts were rendered of the talk and actions occurring during the clips using CA conventions (Jefferson 1984) and they are listed in the Appendix.

Aligning the guidebook and the junction on foot

The first episode that we will examine takes place around a group of four tourists looking for a particular historic house with a map contained in a guidebook and a page of text describing different attractions. They formulate the old house they are looking for in a number of ways: locating it on a map in the guidebook, analysing the surrounding scene for features which will orient their map to just where they are and where they would like to go. 'Where they are' is not a static viewpoint, however; the group's analysis of 'where are we?' is an active 'feeling toward' and 'grasping' of the space. Glances lightly touch upon certain buildings, signs and roads, looks rapidly rove around the restricted horizon, extended stares hold on to and acquire a surer sense of other buildings, signs and roads. As we shall show below, not only does each member of the tourist party turn around to try out different lines of sight, the group itself utilises its different perspectives to see if any of its members can find from their perspective, items that will lead them to their objective. We do not need to search for *inner* mental map readers swivelling on their

cognitive heels with misaligned representations (and presumably mental guidebooks) hidden inside our tourist's brains – the map readers are right in front of us, trying to orientate themselves, their map with the junction where they have not quite found themselves.

Bringing their map into alignment with the surrounding cityscape is not as simple as turning a map – the tourists have the map 'the right way up'. Their problem will turn out to be more subtle: moving from a description, guidebook and map to an identified object, or even, just finding one thing's direction in their visual field. This is still a challenge. The alignment they seek is not a complete correspondence of the map and visible scenic features; there is an economy of navigation in providing sufficient and profitably vague shared sense of where they are going. It is simply impossible to align the inexhaustible details of their surroundings; what is required is just enough of an awareness of where a few places are to allow them to do the next thing.

Fragment 1 – Gladstone's Land

As the episode begins, the group of four tourists are all standing together in a group at a crossroads trying to recall and make sense of a recommendation they have been given. The two women on the right walk away to look down a street close to where Barry is standing with the camcorder.

1 Tourist 1: Maybe it's down there.

It could be down there Fran ----->

(4.0)

2 Barry: ((to the two women standing beside him looking along the street)) Are you looking for a street?

3 Tourist 1: Nooo it's a (.5) a very old house, is it Gladstone or Livingstone. (.5) Very old place. I think it's to the left of Deacon Brodie's ehh



This extract starts with a group of tourists on a street corner, consulting a map and looking for a particular attraction. As locals to Edinburgh, one piece of *post-hoc* analysis we can offer is that the tourists were only a few metres from the historic house that they were searching for. However, we are not interested in evaluating their competence against an external analyst's ideal of navigation. Nor, equally, are we intending to show how

their methods for using maps and guidebooks were deficient. Their unexceptional competence in navigating with a map is typical of tourists (as against professional orienteers) and it is of a level that is good enough for the task in hand. The reality of being in the midst of their inquiry is that it is simply impossible for them to have the solution that we have *post-hoc*. Our purpose in what follows is to describe what it is they are doing as typical tourists,

where it might turn out to display various seen but unnoticed skills. While the proximity of their objective makes it clear how difficult it can be to find a destination in the city, we want to retain a sense of the tourists' inquiry as a real and serious problem that they are inquiring into. This is a common situation we find ourselves in when we are tourists in a foreign city: being unable to find our way to a place recommended by a guidebook and/or someone else. To recover the sense of the unfolding action we will pay attention to the *olving* and not to their 'final' or our 'correct' solution.

The junction where one of the authors crossed the paths of the 'searching' tourists is a popular spot for tourists to stand and consult maps. This is not incidental – by placing themselves at a street corner on a busy intersection (and getting in the way of locals trying to cross the street) tourists can see the names of the streets, scenes along the streets and sections of the skyline. They can inspect the map for 'landmarks' such as 'the castle', 'the cathedral' and the 'Royal Mile', then look along the street for any visible parts of these landmarks (crenellations, spires etc.). Not only is the junction a good spot in terms of its observational arrangements, the ongoing crowd of tourists pausing there to search make observable to other tourists that it is a good spot for working out where you are in an unfamiliar city.

The group of tourists begin, closely packed, all looking at the Edinburgh Old Town map in their 'Insight' guidebook to Scotland. In their close-knit standing arrangement they have arranged themselves behind the guidebook with the map (Mondada forthcoming). As their inspection of the map provides no immediate solution, two of the members of the group split off, walking away to scout. Standing at a distance they can gather additional perspectives up and down the street orthogonal to where the remaining group members are standing (for more discussion of tourist collaboration see Brown 2007). From this we can see what tourists can do when they are a group rather than a lone traveller – they can distribute and coordinate the activities involved in orienting their unit.

The map reader has rotated the guidebook so that the map is held in one of the possible matches with the cross of the junction – one aspect of a junction is that it limits you to four possible alignments with the map. Further adjustment is required of the book, the available horizon and the group. To produce a shared orientation of left and right, up

and down, in front and behind etc. the group has squeezed together in order to stand behind the book facing the same way. In other words, the alignment between the map and what they can see comes *after* their alignment with each other as pedestrians. With this side-by-side arrangement any one in the unit, on pointing, can have the potential building or sign or street they are picking out easily found by the others in the group (see also Mondada forthcoming). The alignment here then is a group alignment – standing together close, but polite, so as to see in common both the map and the city. A hand held on the map can be raised to point toward features found to correspond with it.

Barry did not offer his services as a local accidentally; the tourists were visibly engaged in a search and thus candidates for the category: 'lost'. The two 'scouts' had walked into his proximity and were standing continuing to look around. His first question (line 2) is, in this way, a response to their status as persons who, while not asking help, can be offered help. As such the tourists don't tell him to butt out nor challenge his question; Tourist 1 jumps straight to refining his formulation of their search as 'for a street' to a 'very old house' (line 3). One of the puzzles facing them being that they are uncertain of the proper noun that will identify the 'very old place' they are looking for. So they offer the problem of locating what they are unsuccessfully formulating to Barry as something, as a local, he might reformulate for them correctly (e.g. by saying 'Ah you must be looking for John Knox's House'). Note here that Barry is not struggling to look for the inner cause of mere outward behaviour; he sees persons conventionally categorisable as tourists, visibly searching for something. His question is not as to what could be passing through their minds at this point; it is directly as to what it is they could be searching for. As analysts, we can doubt that they are lost, but for bystanders they do not begin with doubt nor become doubtful without some anomaly.

The search unfolds in turns of talk wherein Barry displays his understanding of what they might be doing in his first question. In response the two members of the group begin to formulate their problem. What they have established is that they are looking for an old house but they are not clear by what particular name it is known, either 'Gladstone' or 'Livingstone'. In fact, as we soon discover, this is what they left the other two members of the group

investigating with the guidebook. That they were looking for an ancient house gave them a sufficient formulation of place to begin looking at the houses up the street to see if any stood out as being

noticeably older. One major orientational problem on the High Street in the Old Town in Edinburgh is that many of the houses look very old (and *are* very old).

4 Fran: ((still in the distance. Looking intently at one page after flicking through the book))

Gladstone's Land? Gladstone's Land? ----->

((Fran looks back down at the book as she closes in on the group))

5 Tourist 1: What?

6 Tourist 2: Say we're on the Northern

7 Fran: Uh huh



Back together again, the group re-initiates their search with 'Gladstone's Land' now in hand. In the background we can now see, if only partially in the still from video, how the man is peering around and up the street and becomes a sort of scenic watchman while Tourist 1 (in light grey outfit) is drawn back into the inquiry with guidebook. The guidebook, we should note, has a list of historic sites on one page with a map on the opposite.

Fran shows that the guidebook has provided the refinement in the way that she looks at it each time she announces the particular place they are looking for. For Barry, the relevancing of the guidebook is important if he is to help them make sense of specifically the guidebook's recommendations. Bringing the book back over takes them forward in their search as they now have a name for the place that they wish to see.

8 Tourist 1: Uhh I think Gladstone's land is number six

((moves index finger to touch map on list one left page of guidebook))----->

9 Tourist 1: Where's six?

10 Fran: Six is (.5) ----->

((tourist 1 takes away index finger and shifts to holding the book))

fifteen. Five. Six. Castle hill. (1.5) High Street

11 Barry: Castle hill is [just there] ((points at street))

12 Fran: [iddsh] well it, it, it has a description. ((turns toward Barry holding book))



The two guidebook readers have stopped looking around the streets and returned to the guidebook. They use the list of significant tourist sites on one page to collect the number for their object. With the number in hand they then have to transpose that to the map. It is Grey that picks out the number by pointing, though once she has the number, she offers up the book for their joint inspection by pulling her finger back. The gesture supporting her

question in offering the turn back to Fran. Fran, finding the number on the map on her side of the book, she can then read off the streets that it lies on: 'Castle Hill' and 'High Street'. At this point it is Barry who picks out the street for them from the streets visible to them from where they are standing. Rather than taking Barry's orientational pointing up, Fran as the guidebook consulter presses on. The book remains held firmly in play (see below).

13 Fran: [iddsh] well it, it, it has a description. ((turns toward Barry holding book))

Let's see what it says ((looks at guidebook))-----

14 Fran: It's a six storey home and look at the year: 1620

15 Barry: It's on the Lawnmarket

16 Tourist 1: Yeah

17 Fran: Where does it say, oh Lawnmarket Oh. He said it was on the High Street

18 Tourist 1: Maybe they've got it .. ok

While the group now gather further resources, in terms of a description of the potentially identifiable appearances of the building, Barry continues to pursue the name of the street from the map and offers 'the Lawnmarket'. Fran returns to the map, making available what she is up to by saying 'where does it say' and then, on seeing what Barry has already found for them, offers a recognition token, 'oh', being a token (by contrast with Tourist 1's 'yeah') that this is indeed news. Something of the source of the group's disorientation becomes apparent, as it becomes clear they are not only trying to align the map with the surrounding street names, someone has told them previously it was on the 'High Street' (line 17). Who that someone is, is left out at this stage, since what is being made available in their remarks is that 'High Street' came from another source. The pronomial 'he' distinct from the 'it' of the book (lines 13 and 17), being

19 Barry: Lawnmarket's just here ((Barry points forwards from where he is standing down the street))

20 Fran: Oh oh:.....

((tourist 1 turns around to face away from the guidebook and look at the street))

what's this street called? Is this Lawnmarket too?

((Barry turns around to face up the street))

21 Barry: This is Lawnmarket ----->

But then it becomes High Street ermm

((Barry returns to facing downhill))

What Barry is leading the group to, here, is the step-by-step establishment of their orientation. In line 19 following the arc of his gesture, as he swings around and points, the group look together along the street labelled 'Lawnmarket' running



analysable thereby as a person of some kind. *Retro-spectively*, Barry and ourselves as listeners can use this remark to analyse the search backwards as for the 'High Street' from another source, in combination with an old building. The tourists were looking for 'Old Building/High Street' – but this lacks the details they need here – the road sign does not have 'High Street' (even though it is part of it) it has 'Lawnmarket' written on it. Where reading texts on maps and then texts on signs normally quickly matches scenic features to the map, here it does not.

So again we have a distinct form of alignment: bringing together the description given to them with what roads are here. The street, its signs, the guidebook. The city streets act as an alphabetic maze of signs that must be brought together and combined with the short description they have – 'high street/old house' – to find their tourist destination.



downhill from them on the other side of the traffic lights. Anticipating and building up the sense of her next inquiry, Fran turns from the street Barry has brought to their collective attention to look uphill. Barry follows her, turning his bodily orientation

and confirming her question. The turning around and aligning of bodies is key in all this in keeping their inspection of the streets aligned in terms of up and down, left and right, particularly at a cross-roads. Barry's solution to the 'High Street' is then to turn Fran's attention back downhill once more. The street changes its name downhill.

It was at this point where Barry as a local really began to help (since he did not know directly where Gladstone's Land was or would have offered them directions immediately). His local knowledge of the city brought out a likely source of the confusion arising from the map and guidebook. As a local he knows that the Royal Mile goes by several different street names along its course and so he looked to see what the name was of the section they were currently standing on and how this related to the street name found on the map and in the guidebook. At this point, a further source of their disorientation became apparent: they are not on the wrong street, the same street has several correct names for it. This unconventional naming of what is visibly a continuous street is the navigational problem. As they grasped this and its implications (e.g. 'X' becomes 'Y' at a certain junction (lines 19–23), then they were ready to begin walking again.

Even though the actual buildings that the tourists want cannot be seen, they turned so as to see the segment of the city, *there*, where they were going from *here*. This is our *embodied* sense of position and location (Jonsson 2002), how we see and understand where things are in, and beyond, our visual field. A rough and ready solution to find a place, although obviously fallible in a 'maze' like Edinburgh, to finding it is to walk in *its* direction and try out another, usually closer, perspective (Ingold 2000).

In following these tourists, as they gradually found their attraction, we have been attempting to excavate some of their skills of hand, eye and talk. Orientation here isn't simply turning the map – although we see lots of that (and turning of bodies). Accomplishing orientation in this instance involves coming upon *the essential insufficiency of directions, looking and walking around, dis-assembling the group and re-assembling it, shifting back and forth between texts and directions in hand, the utilisation of the formulation of a building as much as the names of streets and more*. These behaviours may seem a curiously un-academic way of describing the work of orientation: yet this is witness-ably what occurs as a course of intelligible action. Alignment, in this case, of tourists, locals, guidebooks, maps, pre-existing

directions, buildings, streets is brought together as a navigational, conversational, rotational, intentional, translational and procedural matter. This is not a for-ever, all-time, complete alignment, it is a for-another-first-time orienting to these streets, looming buildings and related features with respect to a destination only actually emerging in the midst of searching: 'Gladstone's Land'. Although seemingly so unexceptional it nevertheless locally produces its reason, order, puzzles, solutions and criteria. Alignment here is visible not as a cognitive rotation but in an inter-subjective architecting of questions, replies, formulations, gestures and shared sense and sense-making of joint action. The fragments above offer a description of what the tourists are doing on the way to their destination and the bricolage-ing of resources in ordinary navigation (Lynch 1993).

Locating places in a road atlas while driving

Some map orientations make maps harder or easier to understand than others. When using maps to navigate a large majority of people find them easiest to use if the top direction of the map is the facing direction (heading) of the viewer. Thus, the 'navigator' in the front passenger seat of the car frequently turns the road map as the car turns. This is 'forwards-up' or 'track up' alignment. If the map is not so orientated, the person navigates less accurately and/or more slowly. (Montello 2005, 271–2)

We now shift from pedestrian tourists to car daytrippers and describing this video fragment we will end up following a slightly different course of action. Rather than orient themselves to what they can see and point at (and what they cannot see though they can point towards), our second group of tourists are orienting themselves to the *road ahead*. A map is being used to discuss, plan and arrange activities drawing upon the road's emergent features as they drive along its course, where it can go, and where (taking the correct turnings) it could get them to.

As we have seen in the first episode, alignment's criteria are not about completion but found in relation to what we can do next; it has an 'in order to' (Schutz 1973b) orientation. We achieve sufficient matching of our map to features of the surrounding world to get somewhere else. With our tourists they were going to an essentially and inescapably vaguely formulated but definitely recommended place, so the alignment, there, was done with respect to the next activity – going to a place we do

not yet recognise as the place. In this clip we find a group of daytrippers orienting to where their car can go next, which is a remarkably limited set of directions. The correspondence between map and world is not between what is forward for an imagined walker in an open landscape, rather it is what is forward and next for the car on the road and the daytrippers in the car.

Fragment 2 – Finding the road we are on

On a daytrip into the countryside four friends have a short list of recommended places to visit. As we join them the two backseat passengers have been going over the names of the places they've been given, what they can do there and finding them on the map. Jane is on the left, Fay on the right and the driver out of shot in the front seat.

1 Driver: Well there's a loch with a nice pub too

(1.0)

2 Jane: Is that separate though from Killin

3 Driver: Yeah Killin is:: further on

4 Jane: [Then it must be the loch there]

((Jane points halfway up page))

+

5 Fay: [((Fay points))-----]------

6 Jane: Possibly that one.

((turns page of atlas to next page))

7 which is (.) there ((touches map with thumb)) -----

(2.0)

((Fay reaches over and points again))

8 Fay: Yeah or this road -----

((runs finger along road on map))

9 is the one we're coming up

((Fay drops thumb under map)) -----

((Jane turns page))

10 Jane: Yeah

11 Fay: is that one there -----

((Fay circles a feature and then withdraws hand from atlas))

12 Jane: That's (1.0)

13 Jane: Well it's not much farther on (3.0)



While, as a unit, these daytrippers are mobile in the sense that they are in a moving car, their orientation to each other is relatively immobile. The car locks the daytrippers into a side-by-side and front-to-back orientation – one reminiscent of the initial orientation of the pedestrian tourists in our first clip. Side-by-side the backseat map-readers do not spend much time watching one another's faces, yet this is, of course, not a great source of trouble given that their focus is the map. Being side-by-side fits well with the task at hand, 'up' will be 'up', 'down' will be 'down', 'left' will be 'left' for both of them. Equally they share an embodied orientation toward the road ahead, behind, to the left and right. What makes aligning the map's features, with what they see ahead, behind and out of the side windows, potentially complex, is that they are moving steadily forward, at times turning, with things close up flashing by while those in the distance move slowly.

There are two things the backseat navigators are trying to establish in the ongoing work around the map – clarification of where *we are on the map* and *where our recommended destinations are*. Hopefully the similarities with the pedestrian tourists are apparent and we can begin to tease out the particularities of what happens in this episode in the car. The car travellers have a number of recommended places to locate rather than one, the two being dealt with here are Killin and the loch. Killin has been found on the map already, so that when the driver tells her navigators 'Killin is further on', by examining the atlas they can identify candidate

6 Jane: Possibly that one.

((turns page of atlas to next page))

7 which is (.) there ((touches map with thumb)) -----

(2.0)

Jane and Fay gaze for a while at the surrounding region, 'taking in' that loch and its nearby features over the page. Shifting pages with this second possible loch now in hand allows a scan of the eastward area. To switch register for a moment to the notion of the map as a mental representation, could it ever come in atlas form with pages that need turning? We would want to say that turning the pages of the mental atlas is absurd. Yet why is the notion that we might be rotating mental images to see other sides of them not so absurd?

loch. Killin can be found, like 'Gladstone's Land' because it is a placename, whereas the loch's location is formulated in relation to Killin.

One of the things we would like to draw out is Fay's engagement with the map: pointing at one feature (line 5), then leaning in, later on, in order to trace another feature (lines 8–12). In the first instance we have lochs being pointed at and in the second roads being traced. Much like the abundance of old buildings in Edinburgh, there are several lochs in the region of Scotland they are travelling toward. When the driver had provided that the place-name 'Killin' is further on in their journey (line 3), then Jane reaches for a loch below Killin on the map as the one that it 'must be' (line 4). Due to the camera angle her gesture is obscured by the head rest of the driver's seat, so we have circled and arrowed the relevant gestures. From what we can see Jane makes a finely tuned gesture that wags her fingers down from Killin to a loch a centimetre or so below on the map. Even as Jane is confidently identifying one loch as the loch which has Killin 'further on' from it in relation to their journey, Fay is reaching toward the map and picking out an alternative loch by touching on its icon on the map. Jane responds to Fay's identification of an alternative, even though she had expressed certainty earlier 'it must be that one', by accepting it as a possible alternative. Moreover, she then picks the alternative loch out with her other hand's thumb over the page (see below, line 7). It is worth speculating whether the switch of hands is a way of inviting Fay to continue helping her out with finding their destinations.



After their pause where they are taking in what is on the next (eastward) page, Fay leans in and switches her pointing hand. What is of interest here is how her leaning in, rather than reaching across with her nearest arm, establishes a different involvement with the task of map reading than from her first point. What she is about to do is fairly complicated and requires access to the map over an extended period of time (compared to the short sharp point from before). The gesturing and the speaking work together here: what 'this road' could be is established by her pointing to a

road on the map. Her finger does not rest on the map feature as it did with the loch, rather it runs along the map, along the line of the road. While her gesture is temporally extended, there is the space for her to bring in its relevance for their problem, that it is the road they are currently driving along. And part of its artfulness is that the gesture therefore is also

((Fay reaches over and points with other hand))

8 Fay: Yeah this road -----

((runs finger along road on map))

9 is the one we're coming up

((Fay drops thumb under map)) -----

((Jane turns page))

10 Jane: Yeah

11 Fay: is that one there -----

((Fay circles a feature and then withdraws hand from atlas))

The turning of the page is used as a resource by Fay in that the first page becomes the one that is used to secure that 'we are here' (e.g. like 'you are here' arrows on maps) and the understanding of this point is marked by Jane's 'yeah' (line 10). On turning to the second page, which is where the two possible lochs are, we have the proximity of their road to Fay's alternative loch being established. Once again the gesture and speaking working together in the elegant way Fay does not trace on the second page. Her gesture is a quick point that pulls away quickly, 'revealing' as it were the loch and the road will converge.

12 Jane: That's (1.0)

13 Jane: Well it's not much farther on (3.0)

14 Fay: Ah well, let's just drive and see what happens

As we noted of our earlier fragment, we are not so much interested in the solution as the solving, or rather, not final alignment so much as aligning. In the final sections of the fragment, Jane comes to no conclusion, she looks a little longer at the small patch of relevance that Fay has revealed. Her remark echoes the tactics of the pedestrian tourists, they are driving in that direction and so will by closing in on the territory be able to use the perspective they have later to try and establish which loch is which.

Finding the road we are travelling along, from the many possible roads shown on the map, involves

establishing the direction which they travel into the landscape and as it traces along the paper it passes by various features. While her index finger is doing this, Fay, as the road reaches its visible end at the edge of the page, requests a turning of the page – in line 9 she drops her thumb under the page, which Jane recognises as a request to turn the page and does so.



tracing any, or each, potential road as marked on the map to see if it links up those recollected features of the road we have been passing by. Their tracing places features and placenames (e.g. two possible lochs one reached first, the other second and Killin third) in sequences, and, on the left or right side of the route. Because driving along a road puts places in order of this first, this after, this nearer, this closer etc., members of the car can, and do, use their journey as a shared sequencing device. In contrast to standing on a hilltop, travelling along a road by car produces a perspective of things passed one after/before another. As a visual order the journey forms a gestalt field of changing points-of-view and perspectival arrangements of surrounding features from its sequence (Ingold 2000). The shared sense of the movement of the car in one direction along the road establishes steady bodily coordinates of ahead, behind, left and right. Moreover, features such as lochs, forests, towns and so on will come one after the other as they travel along the road. Where we might assume that the constant movement along road complicates navigation; instead it is a device that can help in making sense of the map in terms not only of where are we now but bringing new perspectives and revealing more about places as we enter into them (e.g. does this loch have a pub on it, then it may well be the one we were recommended).

Where for the tourists in our first example, their orientation was one of streets and what they can see, the daytrippers orient the map with where they were last, before that, will be next, and after that and after that. Unable to rotate their perspective, 'to the left' or 'to the right' remain fixed. Unlike orienteering through woods or across open land, the navigators of the tarmac road do not choose where to go from the cardinal directions or distant features; they are restricted to a small set of junctional options where there are t-junctions, crossroads, slip roads, exits, roundabouts and so on. The ordering of towns, lakes, rivers, road signs, and the like along a road as they travel along it are the way in which they can find themselves somewhere along its course. Sequential ordering is important in further ways: a turning after the loch is different from a turning before the loch and analysis of the map is done through movement across it as they establish what to look out for in the route ahead. The uncompleted orientation task which we have for the daytrippers is to align not only the rest of the journey in the car with the road on the map but also to establish relations of proximity, distance and sequence for the recommended places they began with. By bringing these together as their joint accomplishment with road atlases, tracings, pointings, gazings and speech, they can organise their trip and be prepared to take correct turns in time.

Orientation in this case has not simply been one of map and direction, it has been one of map, road and journey. In describing Fay and Jane's joint map reading we can see a number of the features of consultation of maps and diagrams that Goodwin (2003a) has emphasised. As part of an evolving inquiry, different parts of the map – the loch, road and road names – are selected, pointed at and mentioned by backseat map-readers. Features are brought into consideration at times appropriate to the course of action and different concerns addressed (often simultaneously). Roads have relevance, for example, of not only 'where we are going' but 'where we are now'. While the map itself is a constructed and mass-produced artefact, it is in their lived work of reading it on an easygoing day out in the Scottish countryside that the daytrippers find in the map its relevance to the problem at hand here and now.

Conclusions

By looking at navigation in action in the two video fragments, we have shown elements of why it might

be that tourists are to be found standing blocking busy street corners, turning around slowly to look at the surrounding city and why maps are rotated by all manner of people in all manner of settings. As Ingold (2000) has argued forcefully, more or less disengaged cognitive models of navigation, alignment or orientation gloss numerous features of what ordinary navigators are doing with maps. Finding our way to destinations in unfamiliar terrain involves a host of different resources when we navigate with maps: descriptions of the thing we are looking for, other maps, place names or place terms offered by others as directions and/or recommendations, what we passed by one mile back, what another member of our group as a scout is able to see by walking 100 metres further on and so on. Our analyses of the gestures, postures and conversation involved in everyday navigating owes much, as we noted at the outset, to Goodwin's exemplary studies of seeing, pointing and joint action in workplaces populated with diagrams and maps (Goodwin 2000 2002 2003b). The small supplement this paper has provided is perhaps in terms of how recommendations, in the form of place names, are dealt with through the evolving and sequential perspectives provided by distinctive forms of human locomotion. How pedestrians walking city centre streets and automobiles driving on country roads provide distinctive contextures of navigation and alignment with particular forms of maps (the guidebook and the atlas) in unfamiliar places.

In this paper we have approached navigation in a different way from spatial cognition, staying with the details of the activity, trying to understand the publicly available nature of map use in the wild (Hutchins 1993). To draw our analyses of the two video fragments together, let us return to the original orientation, alignment and mental rotation models of spatial cognition that we considered in the introduction. Our goal in addressing those cognitive theories was to re-specify orientation and alignment as publicly available and practically accomplished reasoning without recourse to mental representation of space. In studies of alignment effects rooted in cognitive science there is assumed to be an equivalence between mental manipulation and physical manipulation. If a map is misaligned with respect to the environment, it must be mentally rotated to be in alignment with what can be seen. Our point, here, one made also by Bennett and Hacker (2003, 197), is that there is no equivalent mental rotating of a

map to get a different view of it. What we hope has become apparent from the episodes we have described above is that we can see why it takes a long time to *work out* how to align the map with the perspective, and even longer to ponder if the two have any points of alignment, without requiring us to detect the 'ghost in the machine', as Ryle (1949) famously put it.

The real world skills of navigation are not, then, those of mental reasoning and spatial models; what we do find are map readers looking and reading signs, misunderstanding street names, grappling with more or less cumbersome paper documents and the like. Reading maps, we are arguing, is so much more than mental cognition, if it is that at all. When we pick up maps we are consulting, reading, pondering, planning, checking and more, it is practical reasoning that is done in the midst of particular projects (e.g. on a city-break with family or an outing in the car with friends) with the help, hindrance and suffering of others, rather than inaccessibly in an individual's head. Of course, sometimes we read maps alone, but as often we work collaboratively around maps as groups to find our way. Our undertakings or overtakings with maps are produced in order to be sensible, follow-able and morally evaluated by others (as anyone who has misread a map while out driving with their loved one will know).

As Coulter (1989) and Watson (1994 1998) argue, all too often cognition becomes the province of those sciences that provide explanations in terms of indirectly accessible yet causative psychological processes (there are a number of important critiques and respecifications of cognition from within psychology, such as Edwards (1997), Te Molder and Potter (2005) and famously on navigation, Hutchins (1993 1995)). In re-appropriating perception, beliefs, mental representation, decisionmaking, these psychological processes become socially situated and localised (or globalised) practices of seeing, looking, imagining, categorising, inferring and so on (Lynch 1993; Latour 2003).

As one of the reviewers of this article asked: 'What (would) the profit of such difficult changes be?' Changes that take us from trying to provide psychological or social explanations and causes for certain effects, to describing social practices as they happen (a praxiological turn). From individual cognition to tourists gesturing and talking around a guidebook, as was the case in our study. There is hardly the space here to do more here than

make gestures as vague as those of our navigators around the central section of the article and its connection to the re-evaluation of ordinary practice and ordinary language in the social sciences (Sacks 1992; Thrift 2007) and in philosophy (Ryle 1949; Cavell 2005). What our university schooling in critiquing and theorising has done, for very good reasons, has fostered and fed our sceptical attitude towards not only other minds (which gave birth to classical cognitive theory) but also to other methodologies (which gave birth to classical explanatory social science). What ethnomethodology and ordinary language philosophy have in common is a reconsideration of our response to scepticism and the arrogation of human practices (Cavell 2005). For ethnomethodology, all methodologies and their methodologists are equal. Sometimes we find 'participant observation' being done better elsewhere than in ethnography. Rather than treat the surface appearances of the world with suspicion and get at hidden and universal forces behind wayfinding, ethnomethodology has a concern with what is right in front of us, what we normally overlook. Human practice itself is immensely powerful, a stupendous store of reason acquired over millennia and it moves fast, yet it is also what we all know, what is *so* obvious, and what surely does allow us to accomplish some of the sometimes mundane and sometimes spectacular feats that we do daily. The profit then, to answer the question, is, to reveal both the logic of our practices at source and the skill of the persons achieving those practices. Otherwise, while we assume we know what any particular human action is and what it looks like and then quickly jump to what cognitive ability could have lain behind it, such an arrogant assumption has allowed us to pass by quite what the thing is that we began with. In other words, we think we know what map use, wayfinding and navigation in the world are, but really we are only beginning our inquiries.

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Appendix: Transcription symbols

[hi] + [hello]	overlapping speech
()	pauses in seconds
it was today	speaker emphasis
((hand goes up))	non-verbal actions
=	latched speech
(sauce/source)	uncertain transcription of words