"... object-focused discussions 'knit together' disparate tasks and work in the organization, providing a momentary hub through which divisions of labor and courses of action are managed and coordinated."

SHARING THE TOOLS OF THE TRADE

The Interactional Constitution of Workplace Objects

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Despite a growing body of work across the social and cognitive sciences concerned with the relations between inanimate objects and sociality, we still have relatively little understanding of the ways in which participants themselves characterize and discriminate objects in the course of practical activities. This article examines how personnel in a telecommunications control center display their understanding of objects, such as computer screens and documents, and achieve, if only momentarily, some shared sense of (features of) those objects with colleagues. In this way, the article is concerned with interweaving an interest in the interactional constitution of the "interindividual" object with a concern with the organization of collaborative work. The article draws on field observations augmented by audiovisual recordings of "naturally occurring" activities and events.

> Though it is the case that all the possible ways in which an object may be treated are constituent to the object as a unit of meaning, nevertheless it is a peculiarity of the action frame that for a given moment or sequence of moments of activity that it does not engage the notion of "wider knowledge," but involves the treatment of the object according to terms that are relevant to the actor's interpretative scheme at hand. Hence, the exhaustive listing of possible specifications is the task of the person who seeks an ontological cataloguing of a world of objects, in principle both an unnecessary and impossible task.
>
> —Garfinkel (1952, 301)

National and international telecommunications rely on personnel in numerous control centers within various countries dealing with problems and emergencies as and when they arise. For example, when fishing trawlers inadvertently damage underwater cables or when disasters arise, such as earthquakes or floods, new communications routes must be temporarily set in place so that traffic may avoid the damaged cables. The personnel in the control centers do not have direct access

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to the infrastructure but rather rely on various information and communication technologies to provide textual, numerical, and graphical representations of traffic, its routes and channels, current problems and their management, alternative possibilities, demand, potential demand, and the like. These details or "objects" presented on screens, in documents, on large-scale diagrams, and so forth, provide personnel with the ability to identify and discuss problems. Indeed, they often form the focus of collaboration and provide resources through which problems are managed.

In this way, therefore, seemingly large-scale problems and concerns, problems that profoundly affect the ways in which populations are able to communicate with each other, turn on the ability of small numbers of personnel in control centers to notice, discuss, and investigate particular features or properties of their immediate environment. These objects to which we refer permeate the very fabric of social life. They include all sorts of tools that feature in the modern workplace, such as (features of) computer screens, paper documents, telephones, displays, charts, clocks, and so forth. These objects become foci for coordination and collaboration. How this is accomplished in one telecommunications control center (see Figure 1), in and through the interaction of personnel, is the concern of this article.

Despite the pervasiveness of objects in everyday life—be they physical artifacts, digital representations, or images—until relatively recently, they have not received a great deal of attention within the social sciences. Indeed, social science has developed a curiously "disembedded" characterization of human conduct and sociality (see Heath and Hindmarsh 2000). There are of course important exceptions, for example, the writings of Marx (1964), in particular the early manuscripts in which he discusses praxis and action and the ways in which objects consist of congealed human activity. Or in a very different manner, consider Mead's (1934) discussion of the interdependence of the "organism and the environment" and the relationship between artifacts and practical action. However, empirical studies of the inanimate object in sociology have remained rare, that is, until the recent emergence of what we might call the "sociology of the object."

It is perhaps in the work of Latour (e.g., 1992) that we find some of the most vehement contemporary arguments for the (re)instatement of the object in sociology. And it is perhaps subsequent empirical studies

FIGURE 1: The Restoration Control Office
Note the media wall running the length of the room and the multiple monitors and documents on the console.

in Actor-Network Theory (ANT) and within the sociology of scientific knowledge that have had the most profound impact on our understanding of objects and artifacts. Some of this work has been driven by ANT's radical programmatic commitment to accord humans and nonhumans equivalent analytic status, but the growing body of research concerned with the object is by no means limited to ANT. Social constructionism, symbolic interactionism, situated and distributed cognition, activity theory, and ethnomethodology have informed in different ways the analysis of the object and a diverse range of studies that (re)configure the relationship between social action and material realities. These studies and the diverse perspectives they embody crisscross a range of substantive and disciplinary boundaries, from semiotics to sociology, from cognitive science to anthropology.

Nevertheless, and despite the substantial contributions of this growing body of work, there remains relatively little research concerned with

the ways in which objects feature in specific courses of action and interaction. So, for example, how individuals notice, invoke, refer to, examine, assess, discuss, even simply look at objects, both alone and together, remains unexplicated and underexplored. So, although the idea that objects in our environment have a fundamentally interdependent relationship with social organization is not new to the human sciences, there has been very little empirical research on the ways in which objects feature in specific courses of action and interaction. As a result, we have relatively little understanding of how objects enter into and are interconnected with social organization and indeed how they feature in practical activities, such as collaborative work.

In this article, we begin to address this issue. In particular, we examine how personnel within a complex working environment refer to and examine objects and, through their interaction, constitute the occasioned sense and relevance of particular features of those objects within the course of their workplace activities. In this way, we use the term *objects* very loosely, as a way of glossing a diverse range of (features of) tools; technologies and materials; paper documents such as logbooks and manuals; digital displays of text; diagrams and images; and artifacts such as pens, keyboards, telephones, and the like. In this article, we are particularly concerned with the ways in which personnel view paper documents and screen displays together and how they momentarily establish a mutually compatible frame of reference.

We also describe the ways in which these sequences are critical to the organization and coordination of workplace tasks within the research setting. The setting, the Restoration Control Office (RCO) of BT (formerly known as British Telecom), is a collaboration-intensive and tool-saturated environment, in which colleagues recurrently discuss aspects of their work in relation to the various documents, monitors, and technologies at their disposal. Therefore, we aim to demonstrate both how objects are constituted in and through the workaday world of the RCO and how the constitution of those objects is critical to the ways in which the work is accomplished. Thus, the article is concerned not only with the practices in which objects are constituted in social interaction but also with the import of such practices for personnel in the RCO. Indeed, we argue that the interactional practices of object constitution underpin collaborative work in these kinds of modern workplaces.

AN EMERGING SOCIOLOGY OF THE OBJECT

Although ANT is probably the field most closely associated with the sociology of the object, it is by no means the only recent work within the social sciences to have fostered a keen interest in inanimate objects. Indeed, there is a growing and broad interest across the social and cognitive sciences with the social construction of the physical environment and the production of mutually compatible representations of objects and artifacts, for example, empirical studies of scientific practice and representation (e.g., Lynch and Woolgar 1990), investigations into the "shaping" of new technologies by social forces (e.g., MacKenzie and Wajcman 1985), and analyses of the semiotics of various artifacts, "things," and components of material culture (e.g., Riggins 1994; Freake 1995).

This multifaceted body of work makes profound contributions to our understandings of social activity and organization. In particular, there are certain themes that thread throughout the work: a concern with the ways in which objects reflect social structures and have symbolic significance, the ways in which the production of objects is shaped by social forces, the agency of objects in networks of interaction, and how the sense or meaning of objects is constructed or attributed in social relations. These issues have been variously debated with regard to any number of different objects, from scientific charts (Amann and Knorr-Centina 1990) to bird-watching manuals (Law and Lynch 1990), from automatic door closers (Latour 1992) to windsurf boards (Dant 1999), and from paper strips (Hughes, Randall, and Shapiro 1992) to asthma inhalers (Prout 1996).

Dant (1999) provides a useful and insightful overview of many of the themes and issues most pertinent to these studies of the object and material culture. However, one of the key concerns of many of the social studies of the object is the social construction of objects by individuals and societies. These discussions typically present interpretations of the meanings of objects as understood by specific groups, cultures, or societies. For example, Freake (1995) examines how the mainstream introduction of the wristwatch involved a struggle to overcome the dominant ideology that saw it as a "bracelet," "usually considered to be a female adornment" (p. 72). Valentine and Longstaff (1998) describe how seem-

ingly mundane objects, such as dinner trays and aluminum foil, take on distinctive significance within prisoner subculture, namely, and respectively, as potential weapons and useful drug paraphernalia. On the other hand, contributions to studies of the social shaping of technology (e.g., MacKenzie and Wajcman 1985) highlight the various ways in which organizational and institutional politics shape the very design, success, and eventual character of technologies such as refrigerators.

There are very few empirical studies, however, concerned with the very characterizations that individuals themselves bring to bear on objects when engaged in activities with others. Therefore, we want to highlight the relevance of the mundane discriminations displayed by participants in the course of mutually attending to objects. To this end, the article focuses on moments when individuals encourage a colleague to attend to some feature of an object during an ongoing or emerging activity. In doing so, we draw on Smith (1996), who presents a stimulating argument concerned with developing a sociology that does not present knowledge of the social in abstract but rather attempts to know the social as people bring it into being. In the course of this argument, she turns to focus on the dialogic practices of reference. As Smith notes, practices of referring "organise among participants in a social act a shared universe of objects" (p. 185). Moreover, as Garfinkel (1960, 2) suggests in his discussion of the "congruence theory of reality," members' displayed treatment of an object is "the" object, for that particular occasion.

In turn, this article is not designed to engage in a theoretical debate about the existence or nonexistence of an "external, preexistent reality" but rather to consider the ways in which participants themselves orient to and organize and, in so doing, constitute material realities for the here and now. Thus, the article considers the interactional practices in and through which participants constitute the intersubjective or "interindividual" (Smith 1996, 187) object for the practical purposes at hand. We are solely concerned with how people collaboratively refer, and attend, to objects in social interaction. As Smith (1996) notes,

> The social organization of referring constitutes the object as independent of the experience or perception of any one individual. The independence is not theoretical; it is produced in the socially organized practices that co-ordinate different subjectivities with different perspectives and

> experience in relation to what becomes for them, in common, an object. (p. 187)

In addressing these concerns with the object in interaction, we aim to reveal the practical relevance of such activities for the organization and coordination of workplace tasks. Indeed, the article can be seen as part of a broader program of research that has emerged in the past decade or so concerned with the ways in which tools and technologies, and objects and artifacts feature in collaborative work. This growing body of naturalistic research, commonly known as "workplace studies" (see Luff, Hindmarsh, and Heath 2000), has begun to delineate how personnel in working environments coordinate a complex array of co-located and distributed activities through artifacts and objects. While primarily sociological and anthropological, these studies are relatively little known within these disciplines, and yet, they have begun to demonstrate how a detailed understanding of work, collaboration, and organizations necessarily involves a consideration of objects, whether those objects are screen or paper documents, diagrams, images, or whatever.

This rich body of work has begun to delineate the various ways in which objects feature within collaborative work in numerous domains. Studies of settings such as offices and control rooms have shown that individuals use objects and artifacts—such as screens, documents, plans, diagrams, and models—not only to accomplish their various activities but also to coordinate those activities, in real time, with the conduct of others. Examples include how strips of paper form foundational resources with which to coordinate and reveal a working division of labor within air traffic control rooms (Hughes, Randall, and Shapiro 1992), how an individual's glance toward a particular screen can inform a colleague of what they are doing and its relevance to the emerging activity (Goodwin and Goodwin 1996; Heath and Hindmarsh 2000), and how artifacts, such as compasses, can be seen to embody or externalize cognitive processes (Hutchins 1995). Within this study, however, we focus on explicit discussions about, and around, a range of objects but most notably information presented on computer screens and in paper documents. In these sorts of discussions, personnel, in the course of collaborative activity, display their understandings of objects to colleagues. In addition, this provides the analyst with access to their displayed treatment of those objects in situ.

Such an interest in the social and interactional constitution of objects demands a relevant analytic framework and form of data. The analytic framework adopted here is drawn from ethnomethodology and conversation analysis (Garfinkel 1967; Sacks 1992), which provides various resources through which we can begin to unpack the social and interactional constitution of objects. More specifically, the article contributes to a growing corpus of studies that analyze video to explore the organization and coordination of collaborative work and interaction (e.g., Goodwin 1995; Goodwin and Goodwin 1996; Heath and Hindmarsh 2000; Wootton 1994). This emerging tradition of ethnomethodologically inspired work interleaves field observations with the detailed analysis of video data. A fundamental principle of this type of work draws on the concern of conversation analysis to examine the moment-to-moment organization of interaction in which each action is both context sensitive and context renewing (Heritage 1984), both organized in the light of the prior and framing the next.

Given the complex organizational domain at hand, these audiovisual recordings must be augmented by field observations. In this study, the fieldwork involved observation within the research setting and the collection of relevant documents, and also informal interviews with personnel. This allowed the researcher to collect a variety of information with regard to the nature of the work tasks being engaged in, the kinds of jargon that feature within the setting, and the various technologies at hand. As this study is particularly concerned with the ways in which participants use, discuss, and invoke artifacts in the workplace, the analyst requires some sense of what those artifacts are and how they may contribute to the ongoing work. Therefore, many of the questions asked related to these artifacts. For example, the researcher sought to discover how information is organized on computer screens and how it may be interpreted.

Nevertheless, field observation, while a critical part of our own research, fails to provide the necessary resources to enable the researcher to examine how participants refer to, examine, and handle objects, that is, access both to the object and the talk, visual, and tactile conduct of the participants. Video recordings and the ability to capture (versions of) naturally occurring action and interaction and participants' conduct to repeated scrutiny using slow motion facilities and the like provide an unprecedented opportunity to consider the details of action and interaction with and around objects as they emerge in situ.

The field study stretched over a period of two years and included a series of intensive bursts of observation, video recording, and informal interviews with all members of the staff. The camera was positioned and set by the researcher after initial discussions with personnel and then left to record. The ethnographer returned to the camera only to change tapes. Meanwhile, he observed and discussed work in the setting.

"TOOLS OF THE TRADE" FOR THE RCO

The particular environment that forms the focus for this article is the RCO of BT. Staff members in the RCO monitor the state of the telecommunications network within Britain and telecoms links to other European countries. When a circuit fails—for instance, when a trawler catches a cable in the English Channel—staff members at the RCO identify the problem and organize a temporary transmission line (a "make-good") until the fault is repaired. So, for example, if a circuit fails between London and Brussels, alternative routes would be used, one possibly running between London and Paris and another from Paris to Brussels.

To identify and deal with problems in transmission, staff members rely on various tools and artifacts (see Figure 1). These include alarm screens that display which circuits have failed, touch screen telephones to access and communicate with different branches of BT and other European telecommunications companies, a "media wall" that runs the length of the control room (providing, among others things, up-to-date news stories that might indicate a sudden increase in demand in certain regions of Europe), logbooks to record the status of restorations and their management, and documents that illustrate alternative transmission routes for particular circuits.

Dealing with problems involves collaboration between staff, both those at the RCO and others who may be based in other domains, such as engineers. It is not unusual to find two or three people in the RCO working closely together to plan a new route when a major circuit has failed. Furthermore, there is no strict division of labor at any particular moment in the RCO, so any query concerning a restoration could be dealt with by any of the officers on duty, although formally, one will

have overall responsibility for the shift. Also, they are required to engage in activities that take them away from their desks in the control room, which means that they continually have to update one another and discuss possible actions in the light of incoming information to plan a make-good, negotiate ad hoc divisions of labor, and so forth.

Given the vast array of technological and documentary information sources relevant to the work of restoration, discussions about work often are focused around particular objects found on various displays and in documents. So, for example, questions are asked with reference to codes on alarm screens that represent particular restorations in progress, discussions ensue about who recorded a particular entry in the logbook, and problems are discussed with mutual regard to maps displayed on the media wall. So, a range of objects serve as the principal foci for developing a coordinated response to problems and difficulties. These tools of the trade are resources with which colleagues establish divisions of labor, identify solutions, select between alternative strategies, and the like. The objects become, if only momentarily, critical sites of collaboration. We will particularly focus on the practices in and through which they share a range of "representational artifacts," such as paper documents and computer screens and how they discriminate elements depicted on these kinds of objects.

EMBEDDING OBJECTS IN WORKPLACE INTERACTION

It has been noted that a range of objects and artifacts, documents, and screens are critical resources in the RCO and that they routinely feature in discussions and debates. To explore the ways in which they are oriented to, how they are treated and used—indeed, their relevance to the debates and discussions in which they emerge—we need to consider specific courses of action and interaction. The fragments we discuss may appear slight, even trivial, and yet, it is through these passing and momentary exchanges that personnel within the control center identify problems and develop a coordinated response to difficulties and emergencies. In this way, we hope to reveal both the interactional production of the interindividual object and the relevance of these to the coordination of work and dissemination of information in the RCO.

One of the most common occasions in which personnel refer to and invoke objects within the control center is when one individual queries another concerning some matter that is documented on screen or in a logbook, for instance, debating next actions for a problem presented on an alarm screen or asking who made a particular entry in a logbook. Such queries are a recurrent feature of work in the RCO, a feature that was particularly prevalent during the time of the fieldwork. In part, this was due to three new staff members' entering the RCO. Although they were senior staff members, and expert in the telecommunications network and traffic management, they were still developing their understanding of certain specialized aspects of the RCO. In the course of actually "doing the job," they were simultaneously in the process of familiarizing themselves with the tools, technologies, and everyday practices and procedures peculiar to the working life of the RCO. Interestingly, this state of affairs produced an added bonus for the researcher, as their process of familiarizing themselves with the RCO involved the explicit discussion of issues and activities that may have remained hidden in collaborations between experts alone. However, we also observed numerous other instances in which colleagues queried, discussed, and debated documents to plan and organize their tasks and activities.

Questions and queries at the RCO not only recurrently include reference to a particular document but, more often than not, require an individual to examine features of that document to answer their colleague's question. Therefore, they provide useful means for exploring the ways in which individuals display to one another (and therefore the analyst) their understanding(s) of these features of documents in the course of their work and in the context of the activity at hand. Moreover, they provide us with example contexts in which personnel collaboratively encounter and share documents in the RCO.

Consider the following simple example. Chris and Steven have not been discussing anything for some moments when Chris asks a question with regard to the status of a time recorded in their logbook. More specifically, he asks whether that time refers to British Summer Time (BST) or Greenwich Mean Time (MG). As the control room deals with both British and European telecoms stations, this can be useful information when establishing exactly when some action has been taken and therefore when subsequent actions should (or could) be expected. The logbook lies open on the desk, and as Chris asks, "Is that B.S.T:, or

M.G:?" he simultaneously points with his finger to one part of that document.

Fragment 1: RCO11/5/93-12:16:30[1]

C S

((C points at document))

C: is that B.S.T:, or M.G:?

(1.7)

S: I dunno:^, I didn't take

that call.

To explore how this line of text features in the activity and its relevance for the work, we shall first turn to the demands on Steven's having been asked a question. One feature of questions is that in certain ways, they constrain (or project) the potential range of next actions by the hearer. They set up a particular "sequential environment" in which certain actions are encouraged to happen "next." More specifically, questions provide for a sequential environment in which an answer to that question (or an account for its absence) is an appropriate, expectable, or relevant next turn.

In this fragment, there are particular everyday moral, and also specific workplace, demands for Steven to attend, and attend as soon as possible and without excessive haste, to the question. First, nonresponse to direct questions in casual conversation, when one is not observably engaged in another (maybe more pressing) activity, can be treated as rude, impolite, or even antagonistic (Schegloff 1968; Goffman 1967). Second, the work of the RCO is both time critical— that is, the longer telecommunications circuits are down, the longer that BT is losing money—and team oriented. The team has an institutionally set "target time" of sixty minutes to organize and set up a make-good between the endpoints of the faulty cable. This involves temporarily reallocating

spare capacity from other circuits and forming a route (which is sometimes rather circuitous) to manage the job. The sixty minutes include time to establish that there is indeed a problem with a circuit showing up on their screens as "faulty" (as sometimes the alarm screens themselves can be at fault). Indeed, it is interesting to note that when a fault appears on their screens, they do not tend to immediately begin work on it, but rather, they wait for a verbal confirmation of the failure from one of their colleagues at an International Repeater Station, which receives and transmits telecoms traffic. Staff members said that this is due to the fragility of the alarm system.

Restoration work can also involve negotiating the use of spare capacity with a range of telecommunications operations centers (in pidgin varieties of numerous languages, but most often English). Although all potential failed circuits have prenegotiated make-goods, when the suggested spare capacity is already in use, ad hoc alternatives need to be arranged. It can also involve getting engineers to drive to a switching station to manually unplug and redirect cables. Nevertheless, and despite these time-consuming activities, they routinely meet their target. In part, it rests not only on cooperation between a range of external centers and individuals but also on cooperation and collaboration between colleagues in the RCO. Having established that there is a range of factors that would encourage Steven to attend to the question, we can start to see how he encounters the object.

To attend to the question (appropriately), Steven must identify the referent; he must find "that." He cannot answer without understanding what "that" refers to. So, because the question does not explicitly name the relevant feature of the document, it encourages Steven to locate the referent elsewhere. In part, these resources are provided by the orientation of Chris. However, there are other resources that also allow Steven to see the object, including his knowledge of what might be a queryable object within such an environment and, indeed, by the nature of the question and to which kinds of text "BST or MG" could potentially relate. It is a question about time, and thus lines of text that look like "times" or "potentially ambiguous times" are most relevant. After briefly inspecting the entry, Steven says that he does not know and that he did not answer or log the associated call.

This reply provides Chris with a basis to assess who might have the relevant information. Indeed, it may help him to pinpoint only one or two others who possibly recorded the entry, given the time that the entry

was made, the details of the shift work, and the relatively limited number of people working in the RCO. Moreover, acquiring this information will provide the resources to assess whether action is needed on this make-good, what action to take, and so forth.

So there are practical and organizational grounds for Steven's involvement. In other queries, coparticipants are brought in to look at documents in similar ways, with utterances such as "What do you know about that?" or "Here, have you seen this?" Other initiation utterances in the workplace have similarly practical bases. For example, requests such as "that, to go out" demands that the recipient sees the relevant document before they can action the request or agree to do it. With the initiation utterance, the recipient is routinely provided with additional embodied resources (e.g., gaze and pointing gesture) to help find the relevant object. Also, of course, their knowledge of the workplace, the activities therein, the local history of the day, and so forth, all contribute to their ability to see the object (see Hindmarsh and Heath, forthcoming).

This simple instance, then, starts to reveal how documents are brought into the workaday world of the RCO and how they raise matters that are of critical importance to the identification and management of problems and events. Chris engages Steven in a common activity (attending to the query), and in doing so, he encourages him to look at and discuss a specific feature of the local environment. These kinds of initiation turns draw the other into a particular course of action (to discuss alternative routes, to note a recurrent problem with logbook entries, etc.), that hinge on common regard to lines of text and the like. The ways in which personnel encounter objects in interaction, then, is in and through shared activities, such as dealing with queries. These activities provide the context in which the objects are perceived and understood. Moreover, and in turn, the objects act as a focus from which activities are embedded and emerge.

THE BUSINESS OF OBJECT "APPRECIATION"

The previous section pointed toward good practical, interactional, and moral grounds for individuals to attend to a particular document that a colleague happens to bring to their attention. Once the discussion begins, individuals inevitably display whether they have seen the

relevant features of the document and, critically, seen them in the appropriate way, given the practical purposes at hand. We now turn to discuss the practice in and through which they display their understanding and *appreciation* of an object that has been pointed out to them.

Consider Fragment 2, in which Rob directs his colleague's attention to a flashing icon on the telephone touch screen (TTS). During the course of asking Steven a question, Rob momentarily stops talking and jerks his body forward to examine the screen (see image ii). He then starts a new question ("what's that one. That's not us, is it?"). The interest here is in how Steven's actions display both for Rob (and to the analyst) that he has seen the icon and seen the potential import of that icon.

Fragment 2: RCO 11/5/93 12:36:44

R S

i 

R: ere. >d'you< know if there was anything from Jeff 'ea:th, >or anyone< abou:t-
(0.4)

ii 

R: what's that one. That's not us, is it?
(0.2)
S: oh:˅

iii 

(1.2) *((S touches the TTS and picks up a handset))*

R: (fuckin ell) (0.3) I've not seen that^ one before^

(2.1) *((S touches the TTS and puts down the headset))*

S: ee-I think it forwards through to the N.T.M. people.

The TTS displays approximately thirty icons that flash when a call is incoming. Although some of the more common callers are represented by stable icons on the screen and merely ring and flash when a call is incoming, there is additional space in which other, less common calls subsequently appear before flashing and ringing. Only certain icons are relevant for the work of the RCO. Here, Rob encounters, for the first time, a flashing icon with which he is unfamiliar.

The question that Rob asks about the flashing icon is designed such that the referent is not named; it is merely described as "that one" ("what's that one. that's not us, is it?"). However, Rob also jerks his upper body toward the telephone touch screen and widens his eyes, so Steven is able to use these visible resources, alongside others, to direct his own looking and locate "that one." The witnessing is marked as somehow "extraordinary," as it would seem to warrant the sudden jerking movement and the interruption of the prior, cutoff question ("d'you know if there ws anything from Jeff 'eath, or anyone about-"), and therefore, Steven's looking can be honed to focus not only on a flashing light (because there may be many) but also on an unusual light or one that could be relevant for them. Indeed, it is presented as potentially demanding their immediate attention ("that's not us, is it?"), because if indeed it is a call for them, they need to answer it right away.

Steven's seeing of the object is displayed through his subsequent actions. In particular, and following the question, Steven turns away

from what he is doing to look at the screen. Moreover, he then actually touches part of that screen when he presses one of the touch pads depicted on it. This physical display helps to make Steven's orientation to "that one" available to Rob. Indeed, it would be curious if Steven were to look at something on the other side of the room or under the table, for example. Rather, the domain to which Rob is attending is treated as the appropriate visible focus of the interaction. Moreover, this bodily orientation displays a strong alignment to the same object as Rob.

Sometimes, recipients are already looking in the same direction as the speaker when a collaborative viewing is initiated; and yet, within a number of fragments, recipients still seem to move their head slightly (e.g., tilting the head, leaning an inch closer, or whatever). In many cases, these movements would not seem to afford a better view of the referent, but rather, they work to display that they are actively attending to the pointing and have found (or are in the process of looking for) the relevant object. This phenomenon is an example of Goffman's (1971) "body gloss," in which the individual "pointedly uses over-all body gesture to make otherwise unavailable facts about his situation gleanable" (p. 11). In these cases, in which an individual can quite easily see the referent without moving, they make slight shifts in posture displaying that they are attending to it, and displaying their coorientation.

The ways in which someone is looking for an object can also reveal troubles in seeing or finding it. For instance, if a person is looking in the wrong direction, their coparticipant may be able to discern that they cannot be looking at the relevant object (even if they claim to be). For example, in the course of Heath's (1986, 11-4) discussion of the impact of recording equipment on his study of medical consultations, he introduces a sequence in which a child points out the video camera to her father. Although her father turns to look where she has pointed, he does not swing his head around far enough to see it. The child, recognizing this, in part by virtue of the character and timing of his response, then encourages him to turn farther.

Also, participants may not only assess the direction in which someone looks but also discriminate different types of looking to reveal

whether the other has seen the object. As Coulter and Parsons (1990) note,

> The characterization of our visual orientations to the world is both variable and extraordinarily subtle in its range of possibilities. Blanket attributions of "seeing" to normally sighted persons in ordinary circumstances will not capture these distinctions. Even if we grant that many visual-perceptual verbs in their conventional contexts of use can be subject to attributions of "seeing," it is clear that we can, and do, *distinguish between* [them]. . . . We say such things as: . . . "You weren't just looking at me, you were *staring* at me!" (p. 262)

Within particular sequential positions (and in the light of the demands of the initiation), certain bodily movements and gestures may reveal that they are reading, inspecting, or merely glancing at an object. In turn, this can inform the other of whether they are appropriately attending to the object given the activity and the workplace demands at hand. Thus, the way in which someone looks can be used as a resource to determine how they are attending to an object or treating a scene.

So, seemingly mundane actions and subtle distinctions between actions (glances, stares, inspections, etc.) are critical to the ways in which colleagues can establish whether colleagues are discussing the same object and thus whether their conversation is grounded in a common referent. These seemingly slight features of action and interaction are a critical aspect of collaborative work in the RCO; they underpin the ways in which colleagues are able to maintain a common or mutually compatible orientation to the "job or business at hand."

Returning to the fragment, Steven attends to Rob's prior actions by trying to answer the call. For him to be able to engage in this activity demands that he has understood where and what "that one" is and, moreover, has understood its local relevance as (potentially) a call to be answered. By trying to take the call, Steven displays that he has found both the object and discerned its relevance for the here and now—why it is remarkable. When Steven is unable to take the call, however, he explains that it may forward through to personnel in National Traffic Management, located elsewhere in the control center. However, the initial talk by Rob encourages Steven to look at and assess the relevance of the flashing icon. As a result, he attempts to instigate a course of action

that involves answering the call. It then forms the basis for a discussion about the use of the telephone system.

So, the initiation of the activity builds the sequential environment in which objects are encountered and, moreover, the local, practical relevancies with which the icon is encountered. Moreover, the initiation suggests how the icon may be appropriately seen and appreciated in next turn. In this case, attempting to answer the call or explaining why it should not be answered are two possible responses. By appreciating the icon, in terms of progressing the activity appropriately, Steven makes publicly available his recognition or seeing of that icon. They must have found the object to be able to appropriately attend to the activity at hand.

This highlights the interactional and sequential organization of object constitution. As Smith (1996) suggests,

> The object produced ostensively as "interindividual" is produced in a *sequence* of interaction among people. It is completed in the interindividual mode in the other's "recognition" of what the speaker names and points to. (p. 188)

Evidence of whether an individual has seen and recognized what has been referred to is bound up in their displayed appreciation of that object in the context of the activity at hand. So, for example, attempting to answer the call represented by the flashing icon or answering a question appropriately are ways in which participants display that the relevant object has been seen and seen in the relevant way. The activity at hand, and in particular the sequential relevance of the actions that engender a looking, provides the framework in which participants display that they have seen the object. Indeed, certain situations demand no more appreciation than is embodied in a look. For example, Christensen (1993) has discussed the use of the command "look" by school children. It would seem that an appropriate response from other children can be simply to look with the person who points out the object, be that a swollen toe or a bleeding finger; indeed, it can prove problematic if they comment on that mutual witnessing further. So, the very appreciation of such a pointing or showing can be embodied in the act of looking and nothing more.

Moreover, the very way in which an individual initially introduces an object provides them with the resources to assess whether their

colleague has seen the object that they have pointed out. By asking a question with respect to an object, they are able to assess whether the forth- coming appreciation of that object is appropriate. The introduction of an object then projects potentially appropriate responses to the object, both for the other and for themselves. It is to the identification of troubles, misunderstandings, and misapprehensions that we now turn.

REVEALING TROUBLES

In the preceding instance, we began to see how colleagues display their understanding and appreciation of objects to one another in sequences of action and interaction through their talk and bodily orientation. These passing moments contribute to a more general sense for personnel that they have a common frame of reference for the job at hand. Individuals, however, may also display their lack of understanding in their "next" actions, and in turn, this provides a foundation for further discussion. This may then elicit elaborated instruction from their colleague about where to look, how to look at it, and/or what to do having seen it. The ways in which individuals display their (mis)understanding of an object, therefore, allows their coparticipant to address those problems and to help them find or understand it. To illustrate this, consider Fragment 3.

RECONCILING COMPETING VERSIONS

Two colleagues (Chris and Rob) have been collaborating over a particularly problematic restoration and have put in place a set of actions to be undertaken by colleagues elsewhere in the United Kingdom and Europe. They are currently waiting for notification of the completion of their make-good on one of the alarm screens. This involves a series of circuits noted as failed (red text) on the alarm screens changing color to indicate that the alternative route is temporarily in place and carrying their traffic. As the transcript begins, Chris turns to ask Rob about the current status of the restoration, or as he phrases it, "how we doin' son?" Then, while he inspects it himself, Rob also invites his colleague to see or judge for himself by encouraging him to look at one of the alarm screens. It is the subsequent discussion and interpretation of the

information presented on the screen that is of interest, particularly as competing readings of it emerge.

Fragment 3: RCO10/5/93-17:27:25

R C

C: how we doin' so:n?

(1.0)

R: well, d'know.

(0.6)

C: well it's all [quiet on the

Western.

R: [presumably that's

up there:, so=

C: =<u>yes::</u> (0.7) <u>ye</u>[s::

R: [no. (.) no,

it's re:d still.

(0.5)

C: w'that's alright it's only

<u>Sto:ck</u>holmˆ(0.6)

prrrh: (1.0) °<u>hhh</u> (1.0)

Th(h)ey'reused to being

cu(h)t o(h)ff. ha-ha-ha °huh

The utterance of particular interest is Rob's "no. no. it's red still," in which he challenges Chris's prior turn. The concern here is to establish what resources Rob has available, to recognize that Chris has not treated the information presented on the screen in the same way as himself.

Chris is the first to proffer a reading when he says "it's all quiet on the Western" or "it's all quiet on the Western Front," a British colloquialism meaning everything is calm or fine at the moment. During Chris's utterance, however, Rob begins to project his own assessment ("presumably that's up there, so"). Before he finishes, however, he is interrupted as Chris excitedly says "yes, yes." Chris's reading of the information suggests that their job is done and the restoration is successfully being accomplished without their further (immediate) involvement. Certainly, Rob treats it as a positive assessment, as he provides an alternative, "no, no, it's red still."

Chris's assessment enables Rob to conclude that Chris has not interpreted the screen in the same way as himself. Rob proceeds to point out that one of the relevant lines of text is still colored red, marking the circuit's continued failed status. The first way in which they would be able to tell if the restoration had been successfully accomplished would be if the relevant red signals on the alarm screen disappeared, and there would be a number of lines of text that would have to change color to indicate a successful restoration.

However, Chris does not say "oh I didn't see that there," but rather, he suggests that that feature of the alarm screen, that red line of text, is irrelevant for the practical purposes at hand, that it is irrelevant for assessing whether the restoration has been successfully coordinated. In particular, he notes that the failed circuit that persists only continues to cut off a telecommunications route to Stockholm and that this is a minor concern. In between his laughter, he suggests that Stockholm is "used to being cut off."

Rob is a fairly recent recruit to the RCO, so in certain informal ways, and within the course of this sequence, he is instructed on how to read information on their alarm screens in situations such as these. Although in theory all red lines of text indicate problems yet to be dealt with, Chris provides Rob with an alternative practical understanding, that is,

that some lines of text are "more red than others" as it were. Some display more pressing working concerns, whereas others, like this circuit to Stockholm, are less problematic (due to a fairly minor amount of traffic on that route or whatever). Thus, the discussion of the alarm system display has implications both for the present, in terms of suggesting that no further work is required by them and that they do not need to chase up actions that they have requested, and also potentially for the future, when Rob is engaged in subsequent and similar cases.

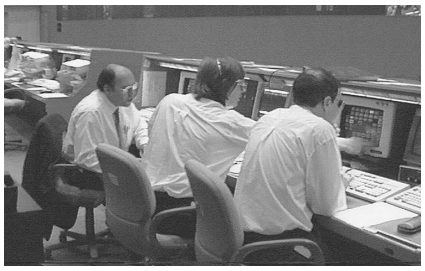
Interestingly, it is the very way in which individuals initiate the collaborative viewing that builds the resources with which they are able to assess the orientations of the other. The sequential environment in and through which the other is encouraged to look at an object constrains the potential ways in which that object might be appropriately attended to. This, then, enables individuals to see whether their colleague has found the relevant object in the appropriate way. Here, for example, Chris's "yes. yes." assessment is treated as problematic by Rob when heard in the light of the question "how we doin' son" and juxtaposed with his own interpretation of the screen details. Chris's reading of the screen ("yes. yes.") is treated as a positive assessment by Rob, who is then able to take issue with this such that they can address their competing interpretations. It is the initiation of the collaborative looking that provides a sequential environment in which colleagues can assess whether they are looking at the same object and in the same way.

Such troubles can be discovered in "next" position (c.f. Wootton 1994 on adult-child object transfer), but as we shall see, problems in establishing a shared referent are not always spotted immediately. Sometimes, individuals display that they have unproblematically appreciated the object, and yet, it transpires that they have not. The next fragment provides an example of one such misapprehension.

MISAPPREHENSIONS AT WORK

As we join the action, Chris is finishing one telephone call just as another incoming call (from the Mondial telecoms station) is flashing up on the touch screen telephone display. At this very moment, Martin asks him a question about the current state of a restoration displayed on

an alarm screen and, more specifically, what Chris knows about it. In lines 6 and 7, Martin leans toward the alarm screen and points to a part of it as he refers to "that" ("th:a").



Fragment 4: RCO 12/2/93 15:56

		M C
1	C:	*((call completion))*
2		(0.4)
3	M:	.hhh (.) >right?< before you
4		answer Mondial's call,
5		what do you know ab^ou::t
6		(1.4)
7	M:	th:a.
8		(1.4)
9	C:	nothing.

In line 9, Chris provides an answer to Martin's question. He says that he knows nothing about the case that has been pointed out. If the sequence had ended at this stage, a claim could have made that "nothing," by appropriately answering the question, adequately appreciates (and embodies recognition of) the text being referred to. For them, at this moment, they have constituted an object in common. That is, Chris seems to display an appropriate appreciation of the text in the light of

the question that has been asked. Indeed, Martin seems to treat the referent as mutually secured, that they are both orienting to the same text, at least for the purposes of dealing with the question. He certainly treats his colleague's response as adequate within his next turn, as he goes on to introduce the reason for his question, "I got a bloke here claiming that we know all about it." He is talking about "it" without pointing toward the screen. Therefore, he has begun to develop the discussion with regard to the now-assumed common referent.

This reveals the proactive nature of appreciations as Chris' appreciation provides a context from which the discussion develops. However, moments later, evidence arises that renders problematic the assumed mutual orientation:

Fragment 4 continued

9	C:	nothing.
10		(1.4)
11	M:	I got a bloke here claiming
12		that we know all about it
13		(0.8)
14	C:	no-ones^ spoken to me about Zagreb.
15		(1.2)
16	M:	not^ Za:greb^, Gloucester.

When Chris asserts that no one has spoken to him about this case, a misapprehension is discovered. Maybe Chris is treating the prior turn as challenging the fact that he knows nothing about the case, or maybe, he is asserting that not only does he have no details about the case but no one has even mentioned it to him, thereby contesting the caller's claim. He may even orient to the potentially problematic nature of the identification of the referent as a possible solution to the dilemma facing them: that the caller claims to have spoken to someone in the RCO who knows all about it. Whatever the reason, Chris certainly finds it relevant to assert that no one has spoken to him about the case and names the referent in terms of a location to which the cable runs ("Zagreb").

This is the first point at which one of the participants names the feature of the screen that has been pointed at. It is also the moment they discover that they have been discussing completely different cases displayed on the alarm screen, as Martin then says, "not Zagreb,

FIGURE 2: The Alarm Screen

Gloucester." Given that the alarm screen provides a list of current circuit failures (see Figure 2), all items on that screen potentially constitute aspects of current work in the RCO. Therefore, any item on that screen could be asked about and is potentially relevant to the work at hand.

Each line of text invokes a different local history of events and projects a different range of potentially relevant organizational activities. The Zagreb failure has not been called in to the RCO and ratified as a bona fide problem to be dealt with. Therefore, claims by the caller that "we know all about it" would be rendered highly problematic. The next action to be taken in the light of the call, if it were to relate to the Zagreb instance, would be different to those relating to the Gloucester instance; for example, what to say to the caller, who else to speak to, what to do next, all would be fundamentally effected.

Martin and Chris had assumed that they were looking at and discussing the same case. Martin had pointed to it, and Chris had not displayed any problem in finding it. They had begun to develop their discussion with common regard to it, but moments later, they discover that they were not talking about the same case at all. So, a recipient can

seemingly produce a sequentially appropriate display of appreciation, participants can assume that they have secured a common referent, and yet, later on, this assumption can be proved incorrect.

So, misapprehensions may be discovered in next position, following the displayed appreciation of the object. However, displays of appreciation may also conceal a misapprehension, and it may only be discovered later in the encounter or, plausibly, at some later date when the participants are required to refer once again to that activity. Therefore, participants' orientations toward particular objects *ongoingly* provide a resource for their interlocutors to ascertain whether they are indeed looking at the same object and in the same way. That is to say, each and every subsequent action by the recipient provides further evidence for their coparticipant to establish whether they are looking at the same object, and vice versa.

Fragment 4 provides further illustration of this, as further misapprehensions develop. Although Martin recognized that Chris had been orienting to a different line of text and therefore a different restoration, it turns out that even after securing the same line of text, a particular feature of that text is then missed or ignored by Chris.

Fragment 4 continued

16	M:	not^ Za:greb^, Gloucester.
17		(0.8)
18	C:	oh:^ Glou^cester.
19		(0.3)
20	M:	yeah
21		(0.3)
22	C:	ye:ss its its: been made good. erm Wales and
23		West have made it good.
24		(1.0)
25	M:	it doesn't look very made good to me.
26		(0.5)
27	C:	oh that^, no thi-I mean the-the- (.) the-the-
28		they're just sti:ll trying to make it good,
29		I've got to get onto em=
30	C:	=in fa[ct I'll do it right now.
31	M:	[oh right, okay.

Once Martin has said that his question was in reference to "Gloucester," not "Zagreb," Chris renews his appreciation of the original

question in the light of, what is for him, the "new" case (lines 22-23). He explains that their colleagues in the Wales and West district have already dealt with it; that is, they have already set up a make-good. However, this is also rendered problematic, as Martin says "it doesn't look very made good to me." Whereas, previously, Chris was looking at and dealing with a different line of text than was Martin, now their misunderstanding revolves around a particular feature of the same line of text, probably that the text is still colored red, indicating that it has not yet been "made good." Thus, the misapprehension rests on how to view that object. Once again, the confusion is dealt with, and Chris begins to attend to a new course of action, by recontacting the Wales and West office.

Notice how there is a members' distinction between recognition and appreciation. In particular, see how the expression "oh Gloucester" reveals a recognition of the object while not committing to a renewed appreciation for some moments later (lines 22-23). Chris merely marks that he has found the relevant line of text, before turning to assess it in the light of the activity at hand (which he then does with "ye:ss its its: been made good. erm Wales and West have made it good."). So, it can be seen that although appreciation can be conflated with recognition, they can also be distanced, as in this case.

Smith (1996) suggests that the object is constituted or produced following recognition by the recipient and that this marks the completion of the triad and the production of the object. This type of statement is similar to those made within discussions of the social construction of objects, which suggest moments of "interpretive closure." They would argue that eventually, the object is held in common, even if it involves a series of mistakes and misapprehensions to get there. However, what we are suggesting is that these referring activities may reveal a misapprehension at any moment, that there is no interpretive closure, but that the sense of the object for the activity at hand is always open for representation or definition.

This short sequence has several implications for the work in the RCO. As the sequence begins, Martin has put an incoming caller on hold. The caller has asked for information about the "Gloucester" case and has claimed that the RCO know about it. The nature of the team's response to that request for information rests on the subsequent discussion between Martin and Chris, a discussion that revolves around common recognition of the text on the alarm screen. Indeed, in the course of

the discussion, Chris suggests that he will chase up action by the Wales and West office, and then, Martin returns to attend to the call. The simple discussion over a line of text on the alarm screen spirals into a series of actions that are undertaken ahead of, and in preference to, others (such as answering Mondial's call). Mutual regard to the text not only suggests what action should be taken, but around the alarm screen, Martin and Chris also establish an ad hoc division of labor, such that Chris contacts Wales and West and Martin returns to deal with the caller.

If the misapprehension had remained, such that Chris continued to implicitly refer to Zagreb, then the outcome and subsequent course of action for both Martin and Chris—and indeed the incoming caller—would have been quite different. So, it is critical to their work that colleagues, as a matter of course, have the resources (built into the machinery of interaction) to discover, and *ongoingly* assess, misapprehensions that may arise. These object-focused encounters can set off a sequence of actions, all of which rest on a common notion of the object. However, if that object is found to be at odds, then, the subsequent tasks can be critically undermined. Indeed, these objects are critical sites for collaboration, and their mutual constitution has great import for the tasks initiated or developed afterward.

OBJECTS AND ORGANIZATION

This article has focused on the ways in which colleagues in a control center constitute, if only momentarily, the sense and significance of features of their workplace such as documents, screens, and other objects. The collaborative viewing of these objects is critical to discussion and debate in the RCO and embedded in the practical demands and activities associated with the work.

Although we have only had space to include a handful of cases with which to explore these themes, it is hoped that the relevance of these kinds of instances is transparent and that colleagues can draw on their own experiences of workplaces to identify examples of where discussions of documents, diagrams, models, charts, and so forth have a critical impact on the organization and production of work. However, it may be worth elaborating on the relevance of these sequences.

Discussions of the "tools of the trade" are central to the ways in which personnel are inculcated into the local "community of practice"

(Lave and Wenger 1991, 94-100). The kinds of sequences discussed in this article provide clear instances of learning embedded in the everyday workplace. The people featured are competent, indeed expert, members of the RCO, and yet, in the course of doing the job, they are learning more and more about procedures, practices, and reading technologies. This, of course, refers to not only the technical competence of reading a screen but also the contingent significance of different color changes, for example. Moreover, they are learning the implications of different configurations of objects. For example, they learn the institutional character of particular circuits, evidenced by comments such as "it's always the goddamn Brussels Eight" that are commonplace in the RCO. Also, of course, they give rise to a shared and common "professional vision" (Goodwin 1994, 1995). In his accounts, Goodwin discusses how a professor of archaeology instructs a student to view and categorize a cross section of soil (and colorings of that soil) for analysis. These fragments provide further examples of instances of professional vision ubiquitous to modern organizational workplaces, examples of discussions about mundane aspects of the working milieu—the relative importance and accuracy of different alarms, the nature and implications of different flashing icons, and so forth.

Object-focused discussions in the course of the work not only provide sites for informal learning but also are central to organizational and individual accountability and certainty. It has been noted that a critical "affordance" of paper is its ability to flexibly support workplace discussions (see Harper and Sellen 1995; Heath and Luff 1996). For example, Harper and Sellen (1995) have begun to outline how the physical properties of paper support exchange in face-to-face encounters, enabling "verbal annotation" of texts such that two (or more) participants can verbally "walk through" the document. Within the RCO, these kinds of walk-through include discussions of what work needs to be carried out on a document (for instance, when someone is asked to dispatch copies of a document), what work has been done on a document (for instance, returning a document having distributed it), or the ways in which the document should be read (for instance, by informing a reader which bits should be ignored). This may be important for reasons of accountability. Participants may want to know that another has received a document. For instance, when charting why some work has not been completed or some action has not been taken, it may prove important to

ascertain whether a particular document has been passed on, that the relevant person received it, and that they know that they received it.

However, the critical importance of objects in organizations to which our studies point concerns the coordination and organization of tasks and activities. In this article, we have started to chart how various screen images and paper documents are used to form the foci to the identification and management of problems and events with which the RCO deals. In a sense, the objects under discussion and the ways they are momentarily constituted form the foundation to coordination and collaboration among personnel (both those within the center and colleagues working elsewhere). Indeed, the objects, and their occasioned determination, implicate specific courses of action by particular participants, courses of action that in one way or another form the foundation to managing the problems and difficulties that arise in maintaining robust and reliable telecommunications networks. So, colleagues come together, over and around these objects, to discuss work and then move apart and away to engage in resulting and consequent tasks. In this way, such objects can be seen as *organizational hubs* in which colleagues come together to discuss them and move apart with new and projected courses of action. Each time they discuss, and thereby constitute, a feature of an object, they use it as a momentary hub for their work, as the discussion of the object implicates subsequent and next actions and tasks.

Interestingly, Smith and Whalen (1997) chart how the physical distribution of texts through an organization stimulates new courses of action in an emergency dispatch unit. However, here we are suggesting that the very discussion of the tools of the trade in the modern organization provides the basis for, and is used to engender, directions and trajectories of actions within the workplace. These object-focused discussions "knit together" disparate tasks and work in the organization, providing a momentary hub through which divisions of labor and courses of action are managed and coordinated. These can spiral from the local level of the discussion between two individuals about the relevance of the color of a line of text to the ways in which they will then deal with a problem, communicate with colleagues in other divisions and organizations, and share the workload.

As these object-focused discussions promote courses of workplace action, the very practices in and through which the interindividual object is constituted turn out to be critical to the ways in which

collaborative work is organized. It is essential that colleagues can ensure that they are discussing the same object as another, because it can have fundamental implications for the course of action that is pursued, the accuracy of information disseminated, and so forth. Thus, the success or failure of the projected actions rests, at least in part, on the seamless ability for two colleagues to discuss the same object and in the same way. Therefore, the ability to achieve, and confidently achieve, common orientation to some feature of the workplace knits together the various, sometimes seemingly distinct, tasks of the RCO. Hopefully, this article has contributed to our understanding of the ways in which the objects in the RCO are encountered, shared, and constituted in the course of collaborative work and interaction. Moreover, we hope it has demonstrated the need to examine the minutiae of interaction to uncover the significance of these encounters for personnel.

So, within the RCO, and in many of the other domains that we have examined, the tools of the trade become hubs for the organization of work. They are critical sites of collaboration within the workplace, where colleagues refer to and discuss objects in the course of training activities, solving difficulties, organizing ad hoc divisions of labor, and planning courses of action. Without the ability to refer to (and constitute) the visible attributes of these objects resources for such discussions, the activity would develop far more precariously, demanding extended and complicated descriptions of things and situations.

OBJECTS, INTERSUBJECTIVITY, AND INTERACTION

This case study of the RCO also provides a basis from which to draw out more general concerns with the constitution of objects in interaction. Schutz (1970) suggests that individuals assume and experience individual perspectives on objects due to differing physical and biographical orientations. However, for the practical purposes of telling a joke, giving an instruction, answering a question, and so forth, they do see and constitute a common, interindividual or, in Schutz's terms, "empirically identical" object.[2] They only need to be able to engage in a common object-focused task to be constituting the interindividual object. This article has begun to discuss the practices in and through which colleagues in the workplace constitute such interindividual

objects. In doing so, the analysis has demonstrated how these practices are *embodied*, *locally managed,* and *ceaselessly reflexive* to the activity at hand.

Participants' understanding of the objects to which they refer are presented and organized as embodied. As such, practices of discussing objects critically involve talking, looking, and maybe pointing. Note, for example, how attempting to answer a telephone call can display a member's treatment of, and orientation to the significance of, a flashing icon on a computer screen. The characterization is not verbal but, nevertheless, an acute and exquisitely indexical display of appreciation of the object within the emergent activity.

Here, we have focused on workplace queries, but we could equally have considered debates about courses of action, storytelling or joketelling, and indeed any interactional activity involving reference to objects. In and through these activities, the participants manage their looking at, and sharing of, the object, including dealing with mistakes, misapprehensions, corrections, and so forth. In particular, the fragments discussed in this article reveal how the person who has pointed out an object can then assess whether the other has found that object, that is, with reference to the other's publicly displayed appreciation of the object. The way in which they introduce the object provides for the potential range of actions that may be seen as appropriately and relevantly appreciating the object, for example, with regard to the question asked.

The appropriateness of those actions in next position reveals whether they could have found the relevant object. For example, have they turned around far enough to see it? Are they having trouble producing an answer? Does the next turn make sense as an answer to the question? Does the answer contradict the questioner's characterization of the object? Indeed, does the recipient explicitly say that they do not know where to look or do not know what to do having seen the object? Of course, answers to each of these questions can only be achieved in situ and with regard to the activity and ecology at hand. If troubles are identified, then the questioner can provide further instruction in how to see the relevant object.

So, as Schegloff (1992) argues, the "defense of intersubjectivity" is *locally managed*. That is to say, although it is an ever-present resource, it is invoked as and when deemed situationally relevant by the

participants themselves in the course of their everyday affairs. Moreover, he also argues that it is *interactional* and *sequential*.

> It is set into operation in a turn-by-turn metric at just the point at which problematic understanding appears incipiently consequential, as evidenced in the ostensibly interactionally responsive conduct of an interactional coparticipant. (p. 1338)

Of course, Schegloff (1992) refers purely to spoken interaction, whereas here, we are dealing with the full gamut of embodied conduct evident in face-to-face (and object-mediated) interaction. Thus, there are not only discrete turns at talk to be considered but also the accompanying layers of bodily conduct that are produced along with, and alongside, that talk. Nevertheless, and in spite of the increased complexity of the conduct, the participants display an overwhelming orientation to sequential character of activity.

Participants make sense of objects, produce the sense of objects, and constitute interindividual objects with regard to the activities, and sequential environment, in which they emerge. These activities provide the framework within which participants both see an object and make judgments about whether some intersubjective alignment toward that object has been achieved. Similarly, of course, the objects invoked and their displayed use contributes to the production and sense of the activity at hand.

In these examples, the objects at hand, whether computer screens or documents, have different local relevancies and import. Crudely, different features of them have been brought to bear on different occasions, and their relevance to the work is constituted differently each time that they are invoked. As the article's opening quote highlights, although many "meanings" are attributable to an object, on any occasion, it is encountered by participants with regard to particular, local concerns. The concept of "object" can then be exploded as a gloss for a huge number of participant distinctions and treatments (both verbal and/or visual). In such a way, the focus is on the members' own relevantly invoked distinctions, produced in situ. The sense of the object is therefore indexical, as it cannot be retrieved apart from the interactional context in which it is encountered.

Of course, many others have argued that the sense of an object is assembled in the occasion of its use and in the practical activities in which it is embedded. However, the common notion of situation that

has been used has tended to be rather broad cultural contexts, such as discussions of how the meanings and uses of objects are attributed differently within particular subcultures (e.g., Valentine and Longstaff 1998, on prisoners) or periods of time (e.g., Freake 1995). This is not to deny the import of, and interest in, these broader notions of context but, rather, to suggest that to explicate the constitution of the interindividual object in interaction, we should play closer attention to (the sequential organization of) the activities in which those objects are constituted. Indeed, these have broader repercussions. For example, when an adult points to objects and names them for a child, they are teaching that child not only what names are attributed to different objects but also the very practices through which objects are appropriately named (Smith 1996). Similarly, in many ways, these short instances in the RCO contribute to the dissemination of a broader "professional vision" (Goodwin 1994, 1995). More generally, over time, these sorts of moments furnish colleagues with the workplace knowledge they invoke when they encounter any next object.

Some of the most radical, flexible, and situated notions of object constitution can be found within the sociology of science. Studies in this field, for example, have studied "interaction" or "lab talk" as the occasion of scientists' constitution of scientific phenomena (e.g., Amann and Knorr-Cetina 1990; Woolgar 1990). However, even within this work, there is a sense that the object is somehow fixated or stabilized, if only for the duration of an encounter; that is, that there would seem to be a moment of interpretative closure. In contrast, the fragments discussed here suggest that the sense and significance of objects emerge within the developing course of action and interaction; their objective and determinate sense is intersubjectively and momentarily accomplished "here and now." Drawing on Garfinkel's discussion of rules with Strauss and his colleagues (in a footnote in Strauss 1964), we might suggest that the sense and significance of objects should not be so much characterized by successive periods of flexibility and fixidity but, rather, is continually and unavoidably accomplished "in flight."

Each and every action within an activity and with regard to the object provides a basis to uncover misapprehensions. Thus, an individual's subsequent orientations to the object provide a resource with which their coparticipant can assess whether they are looking at the same object. This never stops; there is no time-out in the production of the

world. Rather, the object is ongoingly and momentarily (re)produced. As Garfinkel (1952) explains,

> While we say there is an outer horizon—which means other relevant objects—the relations between these objects changes with each moment of activity. Just like the physical horizon that changes with every change of perspective, the world of the natural attitude is altered by every action. (p. 341)

We do not aim to promote a thoroughly constructionist argument, in which nothing exists outside of discourse. Rather, we would like to highlight that participants themselves assume the availability of a world in common, objectively standing before them, as a resource to reflexively produce or constitute it (cf. Pollner 1974). Consider, for example, how individuals initiating a collaborative viewing often do not name the object but rather use deictic terms such as "this," "that," or "there." Therefore, they assume at least its potential mutual visibility and availability. In such a way, they contribute to the constitution of the object while reflexively assuming its preexistence as an objective fact, as part of a world standing before them.

So, the assumption that there is "one intersubjective world which is right there in front of us" (Schutz 1970, 193) is also, and intriguingly, a resource with which individuals actually constitute (common features of) that world. Imagine the alternative for colleagues in a workplace. They would have to provide long descriptions of the referent prior to asking a question about it—totally impractical in time-critical work environments. Rather than embedding the collaborative viewing of an object within the activity, securing the referent would become a long and arduous activity in its own right.[3] Indeed, it might lead to the precarious production of workplace tasks, each colleague unsure of the other's common sense of the job at hand. However, individuals can and do assume a preexistent and common environment. They assume that when they point toward an object, their coparticipant has, at least potential, access to seeing that object. Moreover, the sequential ordering of activities provides the resources with which they can ongoingly test those assumptions. Each and every time we encourage a colleague to look at an object with us and establish some shared sense of that object, we once again affirm our existence in a common workplace (and world)

with others. It is moments and practices such as these that underpin the organization of collaborative work.

NOTES

1. The transcription orthography was developed by Jefferson (1984). The figures in brackets mark the length of pauses in seconds, and up and down arrows in the text mark rising or falling intonation.

2. Note that Schutz (1970) uses the term "object" in a broader sense than adopted in this article. For Schutz, this term includes not only physical objects but also features of the social environment (cultural artifacts, language, etc.).

3. Indeed, we get some notion of the kinds of problems that could arise when we look at interaction through advanced telecommunications technologies, such as media spaces (Heath, Luff, and Sellen 1997) and virtual reality (Hindmarsh et al. 1998).

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