# NOTES ON NEUROSCIENCE, COGNITION AND HUMAN INTERACTION

**Jonathan Potter**

Department of Social Sciences
Loughborough University
Loughborough
LE11 3TU
UK

J.A.Potter@lboro.ac.uk
http://homepage.ntlworld.com/jonathan.potter1/potterhomepage.htm

Paper for the multidisciplinary seminar:
**Brain, Mind and Social Interaction**

This paper draws on:
Potter, J. & te Molder, H. (2005).  Talking cognition: Mapping and making the terrain.  In H. te Molder & J. Potter (Eds). *Conversation and cognition* (pp. 1-54).  Cambridge: Cambridge University Press.

24 November 2005

# INTRODUCTION

What is the relationship of interaction research to cognitive science and neuroscience? This is a complex question. Part of the complexity comes from it not having been posed before. Indeed, interaction research has developed largely independently of cognitive psychology and cognitive science, and is even further removed from neuroscience. Another complexity is that interaction research cognitive science, and neuroscience are each diverse fields with competing theories and modes of explanation – they are not simple objects to relate one to the other. Nevertheless, this is an exciting time to pose this question because after 30 or more years of very sporadic consideration of the relation of interaction research, broadly considered, to cognitive and neuroscience, equally broadly considered, there has been a flurry of recent interest. Many of the foremost interaction researchers in the world came together in a book (te Molder & Potter, 2005) and a special issue of the journal Discourse Studies (forthcoming, 2006). Furthermore discourse researchers have started to address issues of brain damage and disability (Goodwin, 2003) as well as topics such as theory of mind or autism that were previously considered the province of psychology or neuroscience (Leudar & Costall, 2004; Ochs, et al., 2004). Many of the fundamental arguments about the relation of interaction and cognition will have implications for the relationship of interaction research to neuroscience.

Three strands of interaction research are most relevant here. Ethnomethodology was founded by Harold Garfinkel in the 1960s (Garfinkel, 1967); conversation analysis (CA) was developed by Harvey Sacks and his collaborators Emanuel Schegloff and Gail Jefferson (Sacks, 1992; Sacks et al., 1974); and discursive psychology (DP) refined from a broader discourse analytic approach in the early 1990s by Derek Edwards and Jonathan Potter (1992).

In this paper I will give an indication of how these strands of work have engaged with relevant issues to the meeting and I will highlight some current questions and possibilities. I will not be developing a single argument (although my interests and allegiances will no doubt be clear).

# SOME HISTORY

Ethnomethodology

Some time ago Garfinkel (1963) famously wrote that there is nothing interesting under the skull except brains. This was not an early sparking of interest in neuroscience (he wasn't really interested in the brains); rather it reflected the Wittgensteinian influences on ethnomethodology. This emphasised the importance of considering the situated uses of mental notions

and the public criteria relevant to those uses (Wittgenstein, 1953).  Jeff Coulter has developed this strand of ethnomethodological work in a series of trenchant critiques of cognitive science (Coulter, 1983, 1990, 2005).  He argues strongly that the whole enterprise of cognitive science is conceptually incoherent.

A key work in ethnomethodological engagement with cognitive science is Suchman's (1987) book Plans and Situated Actions.  She followed the implications of ethnomethodology's critique of conventional theories of action for underestimating the extent to which actions are dependent on features of local and idiosyncratic settings and ad hoc procedures of interpretation.  Following Wittgenstein arguments about rules she notes that for a plan to operate in practice it needs to have specified connections to all of the available details of settings and the various contingencies within them.  The risk is that a plan that can guide activity through a sequence of actions will need to become huge, perhaps impossibly huge, as it attempts the formidable task of encoding all those details and contingencies in symbols.

Suchman develops a subtly, but importantly different view, which has plans as resources for projecting and reconstructing courses of action in terms of prior intentions.  The consequence of this view is that 'the prescriptive significance of intentions for situated actions is inherently vague' (Suchman, 1987: 27).  This vagueness is not a flaw – it is precisely what makes plans useful for their projective and reconstructive tasks. They can be applied to an indefinite number of situations in deft and locally specific ways.  In effect, plans are notions that we use to make our actions accountable and orderly and the search for their representational equivalent in some mental space prior to action, instantiated in patterns of neuronal activation or whatever, is to fail to understand the local pragmatics of action.  All of this was illustrated by a detailed ethnographic study of the operation of a photocopier.

Potter & te Molder (2005) spell out the broader implications of Suchman's work for cognitive science:

> The implications of Suchman's work, along with a range of similar studies, comes from the questions it raises for the assumptions that action is based on plans.  Insofar as cognitive scientists have assumed that human actions works in this kind of planful way, and attempt to model the psychological requirements for such planful behaviour, the models may be flawed by the failed assumptions.  In particular, it raises problems for approaches such as Fodor's that posit a language of thought in which plans, etc. are developed.  At its strongest it suggests that the whole enterprise of cognitive science may be limited by its failure to provide an adequate account of human action in its natural habitat.

This argument is likely to extend to any neuroscientific work that posits a Fodoresque modularization (Fodor, 1983) based on the everyday language notions such as goals, plans, needs, expectations and so on.

Conversation Analysis

Conversation analysis only recently started to engage directly with issues of cognition.  However, Sacks (1992) pictured language as a practical public medium very much in contrast to the John Locke picture of language as a set of signs for transporting thoughts from one mind to another (what Harris, 1988, calls 'telemention').  Sacks focused on the practicality of talking.  In

particular, he considered the fundamental issue of how language can be something learnable and understandable.  This led very early on to a caution against researchers using intuitions about cognition to constrain analysis.  His very first published lecture (delivered in the Spring of 1964) ends:

> When people start to analyze social phenomena, if it looks like things occur with the sort of immediacy we find in some of these exchanges, then, if you have to make an elaborate analysis of it - that is to say, show that they did something as involved as some of the things I have proposed - then you figure that they couldn't have thought that fast. I want to suggest that you have to forget that completely.  Don't worry about how fast they're thinking. First of all, don't worry about whether they're 'thinking.'  Just try to come to terms with how it is that the thing comes off.  Because you'll find that they can do these things.  Just take any other area of natural science and see, for example, how fast molecules do things.  And they don't have very good brains.  So just let the materials fall as they may.  Look to see how it is that persons go about producing what they do produce (Sacks, 1992, vol. I: 11).

Conversation analysis has largely followed through this injunction in its practice, and this has had the effect of disengaging it from cognitivist thinking.  Instead of attempting to work out what entities and processes may 'underlie' talk as a prerequisite for analysis, the conversation analytic programme has developed through considering the organization of actual talk.

Part of the logic of this disengagement for Sacks is his positive focus on what is visible/hearable in interaction.  He started from the point of view of conversationalists making sense of one another via what is said (in all its rich detail of intonation, stress, timing and so on).  From this point of view cognition – mind, thoughts, intentions and so on – are relevant to, and involved in, interaction in terms of their current hearability in the interaction itself.  We can illustrate this with Antaki's recent CA and DP inspired approach to 'theory of mind':

> The fundamental objection is that 'mind-reading', as a criterion of ordinary mundane competence, sets the bar impossibly high. It assumes a referential theory of meaning, where claims about 'mind' and mental terms like 'beliefs', 'thoughts', and so on, can in principle be checked against a known object. A discursive reading would reject this and start from the proposition that people get along by judging what their interlocutor is visibly doing, as meaningful action. On this reading, ToM's alleged test of competence is impossible. When we see people use mental terms, we ought to see them as doing something, not reporting something (2004: 667).

Let me take another example which has been discussed by CA for some time.  Schegloff addressed the implications of conversation analysis for the notion of shared knowledge in the early 1990s.  He started with Garfinkel's procedural sense of shared knowledge, which moved the question from the classic cognitive question of underlying mental equivalence to the practical question of the way particular methods deployed in interaction could be used to confirm (or deny) that knowledge is 'held in common'.

The start point of conversation analysis is different from most cognitive science.  Rather than beginning with the isolated individual and adding 'the social aspect for supplementary consideration' Schegloff argues that 'the fundamental or primordial scene of social life is that of direct interaction between members of a social species' (1991: 154).  One of the central

features about conversation highlighted by Sacks is the way that the turn taking system of talk is fundamental to coordinating understanding.

Take this simple example. A speaker makes an invitation of some kind in a turn of talk. The recipient's very next turn of talk is the place where they can accept (or reject, or put off, or query) the invitation. Moreover, and relevantly here, in so doing, that speaker shows that that they have understood that they have been invited (and what kind of invitation it is, to what kind of event, and so on). The display of understanding is crucial, because it is the idea of understanding as an interactional phenomenon that is live here. Any shortcomings in this display may occasion repair in the very next turn, or very shortly after – the displayed 'misunderstandings', 'confusions' and so on can be picked out, commented on, fixed.

Note the way common understanding is treated here as a procedural problem by Schegloff, on an analytic level, and by the participants at a practical level. There are different places for checking and modifying understanding, with different possibilities and constraints on them. These procedures are there for producing and constituting common understanding (or 'socially shared cognition', or 'intersubjectivity'). There is no way for participants to check such understanding independently of those procedures. Cognitive scientists have often tried to bypass this, and the brain imaging of modern neuroscience further tantalizes with this possibility. Yet the attempt to bypass this 'rich surface' of interaction risks missing precisely what is live for the participants (Edwards, forthcoming). This raises major questions for work on, for example, common knowledge that attempts to consider it as an issue best studied through the examination of individual performance.

Discursive Psychology

Discursive psychology draws on ethnomethodological and conversation analytic work, and also on the strand of constructionism developed in the sociology of scientific knowledge. DP is a perspective that starts with psychological phenomena as things that are constructed, attended to, and understood in interaction. Its focus is on the ways descriptions can implicate psychological matters, on the ways psychological states are displayed and receipted in talk, on the way psychological categories figure in practical settings, and on the way people are responded to as upset, devious, knowledgeable or whatever. It starts with a view of psychology that is fundamentally social, relational and interactional. It is not just psychology as it appears in interaction; rather, it understands much of our psychological language, and broader 'mental practices', as organized for action and interaction. It is a specifically discursive psychology because discourse – talk and texts – is the primary medium for social action.

The distinctiveness of discursive psychology can be illustrated by its approach to the phenomenon of scripts (Edwards, 1994, 1997). He notes the way that in cognitive science scripts have been treated as abstractions from experienced reality which instruct people what to do in familiar situations (Nelson, 1986; Schank & Abelson, 1977). They are mental representations that help people know what to expect and do in restaurants, cinemas and other familiar settings, as well as allowing exceptional or unusual events to be identified through their deviation from the script. Scripts play a foundational

role in cognitive science – they are representations that provide order to human conduct.

Edwards suggests that there are actually three domains where scripts might be live – actual order in the world (Script-W), the order that is provided by person's perception and cognition (Script-PC), and the order that is produced in people descriptions of action as orderly or not (Script-D). In classic script theory the order of development of scripts is:

$$\text{Script-W} \rightarrow \text{Script-PC} \rightarrow \text{Script-D}$$

The objective order of events (Script-W) provides perceptual information which is the basis for building up cognitive scripts (Script-PC). These scripts, in turn, provide the semantics for people talking about, describing and recalling routine places and events (Script-D). In a move similar to that made in ethnomethodology and conversation analysis DP proposes that this order can be inverted. In this inversion the practical role of script talk in interaction is treated as primary.

Edwards analyses script formulations as interactionally occasioned phenomena. That is, they are not produced haphazardly as conversational non-sequiturs, rather they construct events in particular ways as parts of particular actions at particular moments in interaction. In particular, they present actions as orderly and following from standard routines (as anyone would follow) or as deflected from such routines by idiosyncratic personal dispositions. DP starts with the practical role of Script-Ds in actions, and providing accountability to those actions.

Edwards observes that in practice cognitive psychological work on scripts does not, and cannot, access Script-PCs directly, but typically works from Script-DS to Script-PCs. This is true of theoretical treatments, researchers' accounts of scripts, experimental and simulation procedures and studies of narrative completions. Thus research on script formulations and their role in situated actions is likely to be fundamental to appreciating what any possibly reformulated script theory in cognitive science is required to explain. Just as with Suchman's (1987) work on plans, the general implication is that simplified ideas about the 'language of thought' and the relation between scripts and actions are likely to be flawed. As Edwards puts it, script formulations provide:

> a basis for accountability, rather than a program for generating the activity itself. We should add that they may also be invoked reflexively within action sequences as formulations of the kind of activity it is, as a criterion for what to do next, or for what has gone wrong. But each time they occur in these ways they feature as actions in their own right, in the form of situated descriptions (1997: 166).

## SOME CURRENT ISSUES

I have just laid out the broadest features of the way these approaches to interaction have, and can, provide a different treatment of cognition and just possibly brain processes. To keep this background paper short I will make

very brief comments on a series of current issues that might address the broad topic of the Brain, Mind and Social Interaction seminar.

1.    The empirical base of research

One of the features of these traditions of interaction research is a focus on practices of interaction taking place in natural settings.  Researchers have increasingly worked closed with audio and video records, backed up by transcriptions that highlight features of talk that have been found to be interactionally live.  The tradition of work has been descriptive and inductive, developing more like botany and astronomy than physics and chemistry.  Arguably, one of the negative aspects of the cognitivism in psychology has been a devaluing of studies of peoples' practices.  Chomsky's work was massively influential in the founding of cognitive science and final rejection of behaviourist notions.  However, the competence performance distinction, and the way it has been refined in cognitive research has pushed away from a study of practices.  Chomsky argued for a move beyond what he saw as the flawed world of linguistic performance to a more fundamental world of competence.  What this meant was that active, practical, situated and interactional features of language were treated as secondary.  Indeed, the focus was very much placed on the object 'language' 'rather than for example, talk (something that happens between people in settings), conversation (with its interactional nature), or discourse (with its performative emphasis)' (Potter & te Molder, 2005).

Schegloff (2004) has recently formulated the empirical focus of interaction studies in the following way that highlights in particular features that are often sidelined or ignored for a range of theoretical, procedural and methodological reasons in current cognitive science:

> For most humans on the planet since the species developed "language," the overwhelmingly most common ecological niche for its use has been (1) the turn at talk, (2) as part of a coherent sequence of turns, (3) through which a course or trajectory of action is jointly pursued by some or all of the participants (not necessarily cooperatively, but jointly), (4) in an episode of interaction, (5) between two or more persons, (6) organized into two or more parties, (7) the occasion of interaction being composed of one or more such episodes. If that is where language as a publicly deployed resource and utility resides, it is plausible to expect that it has been designed and fashioned by its users and uses in a manner adapted to the contingencies of its "environment" – that is, by the contingencies of talk-in-interaction (of which the foregoing are but several aspects) and its virtually omnipresent bodily companions – gesture, posture, gaze deployment, facial expression, and so on. Such an expectation is not merely plausible; detailed and repeated examination of recorded episodes of naturally occurring talk-in-interaction shows it to be so – indeed, at a thoroughly implausible (and yet demonstrable) level of detail (2004: 207).

Without having to endorse all of the elements of this (evolving) list it indicates the sorts of things a study of performance might be interested in.

2.    Problems of comparable methods and assumptions

Another issue for any comparison or consideration of the connection between interaction research and cognitive or neuroscience is that they take radically different positions on key topics (for more see Potter & te Molder, 2005: 19-23).

a. Abstraction

Since at least Shannon's work in the 1950's cognitive science has worked with an abstract notion of information. Interaction work has moved in the other direction, increasingly highlighting the consequential specifics of seemingly (for some perspectives) tiny delays, laughter particles or even sniffs.

b. Psychological reality

Psychological reality sometimes has a rather ambivalent status in cognitive and neuro research, where the first goal can be identify a system that can produce relevant output. CA and increasingly DP wire a version of psychological reality deep into method. The focus on interaction is, inter alia, a focus on uptake and what would traditionally be called interpretation. It places participants' own orientations and 'understandings' at the centre of research.

c. Ecological naturalism

Although figures such as Hutchins and Neisser in cognitive science have called for greater ecological naturalism the overwhelming majority of work is laboratory based and experimental. Even here the representational practices used for making interaction public are limited. Ecological naturalism is not an issue for CA and (most) DP because it is based in studies of interaction in naturalistic settings. This is not the dangerous wild for these researchers, but the natural environment for research (cf. Hutchins, 1995).

d. Experimental manipulation

For many interaction researchers the problem of hypothetico-deductivism and model testing is that the models assume misleading ideas about conversation and cognition. Moreover, from a CA perspective the manipulations may break up precisely what is constitutive of talk. Hence the use of an inductive, descriptive form of study where normative organizations are identified through working with a corpus of cases (e.g. Schegloff, 1996).

e. Representation

Representation is at the heart of cognitive science, yet very differently understood in CA and DP. While in cognitive science representations are mental entities (maybe symbolically or neuronally encoded) in CA and DP the focus is on actual descriptions in actual settings as elements in actual actions. Lexical selection is understood here in terms of its relation to the action at hand (rather than, say, grammatical organizations or referential accuracy).

3.    Resisting reification of a vision of cognition

From its earliest studies DP has been concerned with the way the empirical objects of cognitive science have been methodologically wired into research practices. I have already illustrated this with Edwards' work on

scripts above. The problem is any conception of relating interaction research with cognitive and brain research that avoids the (potential) re-specification of the relevant cognitive phenomena risks incoherence. Although there are possibilities of constructive interchange (as the current meeting shows) the questioning of well-established assumptions about the objects of study has not always met with a supportive response. The logic of what is going on here is illustrated by Edwards & Potter:

> Topics recognized in mainstream psychology such as 'memory', 'causal attribution', 'script' knowledge, and so on, are re-worked in terms of discourse practices. We study how people ordinarily, as part of everyday activities, report and explain actions and events, how they characterize the actors in those events, and how they manage various implications generated in the act of reporting. DP often generates a critical stance on cognitive psychology. For example, cognitive theory and measurement of 'attitudes' is criticized and replaced by the study of argumentative and evaluative practices in discourse (Billig, 1987; Potter, 1998; Potter and Wetherell, 1987; Wiggins, 2002; Wiggins and Potter, 2003). Similarly, cognitive methods and theory on 'causal attribution' are critically opposed by analyses of how people manage accountability in everyday talk (Antaki, 1994; Edwards and Potter, 1992, 1993)' (Edwards & Potter, 2005: 241).

In a sense, for many in DP the question of what is the relation of interaction research to cognitive research is an odd one. DP is about cognition; it is just not cognitivist. That is, it focuses on cognitive practices – remembering, evaluating, emoting etc. – but not in a way that treats them as the surface manifestations of a more real and important underlying world of states and processes (Edwards, forthcoming). At its most extreme, it is not a matter of wondering how DP and cognitive science join together, it is a matter of wondering what exactly the point of cognitive science is.

4.      Performance as the limits of what is to be explained

One picture of the relation of interaction research to cognition and neuropsychology is that interaction research in general, but leading edge CA in particular, provides the most complete and finessed picture of human ('linguistic') performance currently available. Put at its strongest, this picture would suggest that cognitive scientists and neuroscientists have often simply not known what is to be explained; they have been modelling a competence for an imagined, simplified, or normative performance.

In a forthcoming paper Schegloff has developed this argument. He highlights a number of phenomena of conversation that have an intricate orderliness discovered by conversation analysis that might be interesting candidates for attention from cognitive and neuroscientists. For example, he considers the phenomena of the current speaker blocking the production of the next sound in a word currently in the process of being spoken. In CA such things are treated as possible initiators of repair (because this how speakers and recipients understand them), but not as determining the source of trouble to be repaired and which 'repair operation' (replacement, reformulation etc.) will happen. All this is highly ordered, yet highlights a contingency of possibility to be dealt with by interactants:

> the cut-off serves as an alert to the hearer that what comes next may not be a possible continuation of the talk as so far articulated and projected, and that the

hearer should be prepared for something unfitted -- maybe a replacement of something already said, maybe an insertion into what has already been said, maybe a deletion of something already said, maybe … And the hearer now has to be prepared for all these "possible nexts," and many more as well (as well as cut-offs on the very thing that has just been inserted, or that has just replaced something, or what sounded as if it were a replacement turns out a few moments later to have been an insertion). And all this while monitoring the developing course of the [turn constructional unit] toward "possible completion," at which point the hearer may be responsible for replying after one beat of silence to the "possible action" that that turn was doing (forthcoming, ms. 12-13).

The point that Schegloff is making (and illustrating with examples, of course, in the paper) is that the delicate organization of performance is to be discovered rather than assumed, and that it has an intricate order to be studied. Such study reveals the very phenomena that cognitive and neuro scientists might address. Schegloff issues a cautious invitation:

> If colleagues in the neuro- or cognitive sciences of cognition are to work with us, there could hardly be a more strategic place to do it. But it cannot be done in the conventional experimental settings of the past; it cannot be the product of individual minds planning and performing in splendid isolation… Still, here is a place where students of brain/mind/cognition can bring their resources to bear on what we must suppose they care most about – how humans do what they do: here is that place; devotees of the neuro- and cognitive sciences are most welcome to come and do what they do. We are waiting to help, and to be helped. What forms that help might take remains to be discovered as well.

5. Can cognition (mental states) be discovered through interaction analysis?

Schegloff's invitation to cognitive and neuroscientists involves them working within their current job titles – they are the ones who are attempting to weave an appropriate cognitive or neuronal story to account for what underlies the rich competences documented in CA. However, some have wondered if the resources of CA can more directly allow the identification of cognitive states or entities. This is a tricky and complex topic – a number of contributions to te Molder & Potter (2005) make some attempt in this direction, notably the chapters by Hopper, Heritage and Drew. Hopper (2005), for example, works through a corpus of phone calls made in the early days of the LBJ presidency. He wonders if it is possible identify the operation of strategic planning on Johnson's behalf as he subtly changes the design of very similar activities (thanking supporters, accepting congratulations and so on). One possible strategic element is the introduction of the notion of 'thrift' (prefiguring changes of economic policy) into the calls:

| | | |
|---|---|---|
| C→ | DC: | …congratulations on what I thought was a magnificent performance this morning. |
| CR→ | LBJ: | Well, I did the best I could |
| C→ | OC: | Well, I thought it was just exceptional (.) really |
| CR+T→ | LBJ: | Bob Anderson and General Eisenhower did say (.) they're glad we were talking about economy and prudence and watching the dollar ((LBJ continues)) (C=compliment, CR=compliment receipt, T= "thrift" mention) |

Hopper explores the possibility that these mentions are a strategic ('thought out' in some way) procedure for developing the cost-cutting agenda that was part of his agenda while deftly doing compliment receipts.  Hopper concludes that this is suggestive of planning, but by no means conclusive evidence.

Even if Hopper was able to conclusively pin down something 'strategic' this still leaves basic cognitive science questions unanswered.  In particular, although it might suggest a practice that we might call 'strategic' (in the way we might describe a colleague as acting strategically in meeting, say), that does not show that the practice is equivalent to or the surface manifestation of mental entities or neuronal events.  As Potter & te Molder suggest:

> The sort of evidence that is provided is of modifications to standard forms, or standard forms being organized to allow them to piggyback further actions.  The implication is that the standard forms are automatic and strategy allows a further level of orchestration of the automatic forms, e.g. to build references to thrift into complement receipts.  However, that does not demonstrate that such a 'higher order' plan was 'represented' in 'consciousness', perhaps in a propositional form, although it implies a picture of that kind.  It clarifies the deep cognitive science question, because it directs research attention to particular phenomena, but it does not answer that question.  For example, could we conceive the sorts of 'higher order' strategic 'thinking' suggested … to be itself standardized, more off-the-shelf than bespoke, not requiring a unique propositional solution but dependent on the kind of rich conversational learning history that a human would have who used talk as their major means of getting things done, day in day out, throughout their lives (2005: 51)?

Drew (2005) offers a different kind of argument for the identification of mental states through the methods of CA.  In an intricately argued piece he suggests that the normative organization of conversation provides 'cognitive moments' where 'cognitive states' manifestly come to the interactional surface, despite not being overtly expressed.  He takes the example of invitation refusals (declinations) and notes that they have a regular pattern:

1    Appreciation (+ maybe marking + maybe delay)
2    (mitigated) Declination
3    Account

The key point is that the regularity of this pattern allows recipients to identify upcoming refusals very early.  Take the following example:

```
1    Emma:        Wanna c'm do:wn 'av [a bah:ta] lu:nch w]ith me?=
2    Nancy:                        [◦It's js]  ( )◦  ]
3    Emma: =Ah gut s'm beer'n stu:ff,
4          →    (0.3)
5    Nancy:  →   Wul yer ril sweet hon: uh:m
6               (.)
7    Emma:   →   [Or d'y] ou'av] sup'n [ else ◦( )◦
8    Nancy: [L e t-]  I : ] hu.  [n:No: i haf to: uh
9               call Roul's      mother, h I told'er I:'d call'er
10              this morning . . .
```

Drew argues that Nancy's refusal starts to become apparent to Emma by around lines 4 and 5 when she can hear the delay and appreciation that are both characteristic of refusals.  Emma picks up on these features in line 7 which offers Nancy a potential account for refusing.  This contribution of Emma's is, according to Drew, contingent on the mental state of realizing that Nancy is to decline the invitation.  Or as he has it:

> This is a 'cognitive moment', in a double sense: in order to make that move, before Nancy makes explicit her declination, Emma has to have realized that Nancy might be going to decline her invitation; she thereby reads Nancy's mind, attributing that intention to her (2005: 170, emphasis in original).

Drew's arguments are brilliantly developed and show an acute appreciation of conversational organization (this is just one fragment in a broader argument about the identification of confusion in talk). Nevertheless, I have elsewhere (Potter, forthcoming) suggested that it is not (yet) a demonstration of cognitive states beyond talk. The issues are complex, but let me focus on one line of argument from the paper. Drew's chapter makes a characteristically cognitivist move in treating Emma's conduct as contingent on her 'state of mind', that is, not only a mind/conduct distinction made, but the latter is made contingent on the former: Emma has a realization and that realization leads to her, in line 7, offering the account which anticipates the declination. The evidence Drew offers for Emma's realization is the conventional preliminaries to turning down an invitation (delay+appreciation). It is not clear, however, that:

> this analysis provides sufficient evidence for a particular 'state of mind' leading to (causing? influencing?) Emma's actions. There is the interactional evidence of Emma's account (line 7) which 'anticipates' Nancy's declination, and its placing in the sequence is evidence that it is oriented to the conventional features of the declination that have become apparent. But it is a cognitivist contention that somewhere around line 6 (presumably) Emma has a 'state of mind' that generates the account on line 7. That is not demonstrated by the CA. Note that this does not show that Nancy does not have such a 'state of mind'. There might be further analytic moves to establish such a thing, or to show its absence; or there might be conceptual arguments about the coherence (or not) of that object (Potter, forthcoming, ms. 9).

I have suggested here that Drew is identifying the 'cognitive state' on the basis of the sorts of public features of conduct that are available to participants, and are crucial to them in organizing that conduct. Yet he is then treating that conduct in a circular manner as both evidence of a cognitive state and contingent on that cognitive state.

6.     Cognitions as methodic productions

A different way in which interaction research can contribute to the study of cognition, and perhaps neuroscience, is through studies of method in practice. The issue here is how the procedures of method, worked through in a particular interactional occasion, produce singular, individual, countable cognitive entities. Let me just indicate three very brief examples. Antaki (forthcoming) considers the way the 'beliefs' of someone treated as 'learning disabled' are generated through interaction between two participants. Puchta & Potter (2002) studied procedures used by focus group moderators that have the effect of constructing opinions as objects contained within individuals. Finally, Schegloff (1999) studied the administration of a test for pragmatic deficits with patients who have had an operation to separate brain hemispheres to treat various problems. Schegloff was able to highlight in the pragmatic competences that the patients nonetheless displayed in the course of not doing well on the test. Whatever the practical use of these methods,

these studies suggest caution when they are treated as simple pathways to mental events of some kinds.

This is an area with considerable future promise for interchange between fields of interaction research and cognitive and neuroscience.

6.     The emotional frontier

One place where brain, cognition and conduct are often seen as rather close together is in the study of 'emotion' (Edwards, 1997, 1999; Hepburn, 2004; Locke & Edwards, 2003).  Without going into detail, this is one area where discourse and conversation researchers have started to address issues that might be seen as bound up with the 'wet stuff' of nervous systems and brain structures.  Of particular interest is the use of emotion terms in interaction and the way 'emotion' is displayed and receipted.  For example, Hepburn (2004) has started to consider the social organization of crying – how sobbing, wet sniffs and so on are heard and responded to.  This also is at the boundary of a different way into the notion of embodiment from DP (see, for example, Wiggins, 2002).

Hopefully these rather less than brief notes on brain, mind and social interaction can provide a backdrop to some specific points of discussion.

References

(note that highlighted articles can be downloaded as PDFs)

Antaki, C. (2004).  Reading minds or dealing with psychological implications?  T*heory & Psychology, 14*, 667-683.
Antaki, C. (forthcoming). Producing a 'cognition', *Discourse Studies.*
Antaki, C. (1994). *Explaining and arguing: The social organization of accounts.* London: Sage.
Billig, M. (1987). *Arguing and thinking: A rhetorical approach to social psychology*. Cambridge: Cambridge University Press.
Coulter, J. (1983).  *Rethinking Cognitive Theory.*  London: Macmillan.
Coulter, J. (1990).  *Mind in action.*  Oxford: Polity.
Coulter, J. (1999).  Discourse and mind, *Human Studies, 22*: 163-181.
Coulter, J. (2005).  Language without mind.  In te Molder, H. & Potter, J. (Eds.).  *Conversation and cognition* (pp. 79-92).  Cambridge: Cambridge University Press.
Drew (2005).  Is confusion a state of mind? In H. te Molder & J. Potter (Eds).  *Conversation and cognition* (pp. 161-183).  Cambridge: Cambridge University Press.
Edwards, D. (1994). Script formulations: A study of event descriptions in conversation. *Journal of Language and Social Psychology, 13* (3), 211-247.
Edwards, D. (1997).  *Discourse and cognition.*  London and Beverly Hills, CA: Sage.
Edwards, D. (1999). Emotion discourse. *Culture & Psychology, 5* (3), 271-291.

Edwards, D. (forthcoming). Discourse, cognition and social practices: The rich surface of language and social interaction. *Discourse Studies.*

Edwards, D. and Potter, J. (1992). *Discursive Psychology*. London: Sage.

Edwards, D. & Potter, J. (1993). Language and causation: A discursive action model of description and attribution. *Psychological Review, 100* (1), 23-41.

Edwards, D., & Potter, J. (2005). Discursive psychology, mental states and descriptions. In H. te Molder & J. Potter (Eds). *Conversation and Cognition* (pp. 241-259). Cambridge: Cambridge University Press.

Fodor, J. A. (1983). *The modularity of mind*. Cambridge, MS: MIT/Bradford Press.

Garfinkel, H. (1963). A conception of, and experiments with, 'trust' as a condition of stable concerted actions. In O.J. Harvey (Ed.), *Motivation and social interaction* (pp. 187-238). New York: Ronald Press.

Garfinkel, H. (1967). *Studies in Ethnomethodology*. Englewood Cliffs: Prentice-Hall.

Goodwin, C. (Ed.)(2003). *Conversation and brain damage*. Oxford: Oxford University Press.

Hepburn, A. (2004). Crying: Notes on description, transcription and interaction. *Research on Language and Social Interaction, 37, 251-290.*

Hopper, R. (2005). A cognitive agnostic in conversation analysis: When do strategies affect spoken interaction. In H. te Molder & J. Potter (Eds). *Conversation and cognition* (pp. 134-158). Cambridge: Cambridge University Press.

Hutchins, E. (1995). *Cognition in the Wild*. MIT Press.

Leudar, I. & Costall, A. (Eds)(2004). Theory of mind: A critical assessment, *Theory & Psychology, 14(5),* 571-755.

Locke, A., & Edwards, D. (2003). Bill and Monica: Memory, emotion and normativity in Clinton's Grand Jury testimony. British Journal of Social Psychology, 42 (2), 239-256.

Nelson, K. (Ed.) (1986). *Event knowledge: Structure and function in development*. Hillsdale: Erlbaum.

Ochs, E., Kremer-Sadlik, T., Sirota, K.G. & Solomon, O. (Eds)(2004). Autism and the social world: An anthropological perspective, *Discourse Studies, 6(2),* 139-284.

Potter, J. (1998). Discursive social psychology: From attitudes to evaluations, *European Review of Social Psychology, 9*, 233-266.

Potter, J. (forthcoming). Cognition and conversation. *Discourse Studies.*

Potter, J., & Wetherell, M. (1987). *Discourse and social psychology: Beyond attitudes and behaviour*. London: Sage.

Potter, J. & te Molder, H. (2005). Talking cognition: Mapping and making the terrain. In H. te Molder & J. Potter (Eds). *Conversation and cognition* (pp. 1-54). Cambridge: Cambridge University Press.

Puchta, C. & Potter, J. (2002). Manufacturing individual opinions: Market research focus groups and the discursive psychology of attitudes, *British Journal of Social Psychology, 41,* 345-363.

Sacks, H. (1992). *Lectures on conversation* (2 Vols, edited by G. Jefferson). Oxford: Blackwell.

Sacks, H., Schegloff, E. A., & Jefferson, G. (1974). A simplest systematics for the organization of turn-taking for conversation. *Language, 50* (4), 696-735.

Schank, R. C. and Abelson, R. (1977). *Scripts, Plans, Goals and Understanding*. Hillsdale: Erlbaum.

Schegloff, E. A. (1991). Conversation analysis and socially shared cognition. In L. Resnick, J. Levine, S. Teasley (Eds). *Perspectives on socially shared cognition (pp. 150-171).* Washington, D.C.: American Psychological Association.

Schegloff, E. A. (1996). 'Confirming allusions: toward an empirical account of action', *American Journal of Sociology* 104: 161-216

Schegloff, E.A. (1999). Discourse, pragmatics, conversation, analysis, *Discourse Studies* 1: 405-3

Schegloff, E. A. (2004). Putting the interaction back into dialogue, *Behavioral and Brain Sciences*, 27(2), 207-208.

Schegloff, E.A. (forthcoming). On possibles, *Discourse Studies*.

Suchman, L. (1987). *Plans and situated actions: The problem of human-machine interaction*. Cambridge, UK: Cambridge University Press.

te Molder, H. & Potter, J. (Eds)(2005). *Conversation and cognition*. Cambridge: Cambridge University Press.

Wiggins, S. (2002). Talking with your mouth full: Gustatory 'mmm's and the embodiment of pleasure. Research on Language and Social Interaction, 35, 311–336.

Wiggins, S. & Potter, J. (2003). Attitudes and evaluative practices: Category vs. item and subjective vs. objective constructions in everyday food assessments, *British Journal of Social Psychology, 42*, 513-531.