When the chips are down: Attribution in the context of computer failure and repair

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Unless otherwise specified in the text, this dissertation is the author's own original work

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Transcription conventions

U or User:	A user's utterance
UC:	User consultant
OBS:	The observer
***	A name or identifiable characteristic censored to preserve anonymity
Underline	Emphasis
=	Overlapping speech e.g. User: Isn't it awful? UC: =shocking
(.)	Short pause
(…)	Extended pause
(2)	Timed pause, in seconds
/	Marks a stutter or word correction without a pause, e.g. "he/he/help"
Ye:s	Elongated sound. Two or three colons for very long elongations, e.g. Ye:::s.
Huhuh	Laughter
(U1: Ya?)	A short interjection by another speaker, e.g. UC: From your tree? (User: ya) In your garden?
CAPITALS	Indicate that speech is LOUDER
~soft~ ~~very soft~~	Quiet speech is enclosed in ~tildes~ Very quiet speech is enclosed in double tildes.
(inaudible)	Marks inaudible speech
(Probably)	The probable transcription of hard-to-hear speech
((Comment))	Transcriber's comments, e.g. ((Loud background noises))
[Information]	Additional explanatory information to contextualise obscure talk.
…	A short section of transcript is omitted

Abstract

Cognitive attribution theories provide convincing and empirically robust models of attribution. However, critiques include the scarcity of empirical research in naturalistic settings and the failure of cognitive attribution theorists to account for why, when and how much people engage in attributional activity. The present study draws data from naturalistic recordings of the common experience of computer failure and repair. A simple content-analysis explores the extent to which everyday attributional talk is modelled by the cognitive theories of attribution. It is found that everyday talk matches the cognitive theories of attribution reasonably well for socially safe *operative* information about the problem, but poorly for socially unsafe *inspective* information about the agents and their actions. The second part of the analysis makes sense of this empirical pattern by using conversation and discourse analysis to explore the social functions of observed attributional talk. Participants use attributional talk to achieve two broad social goals: to negotiate and manage the social engagement and to construct and defend positions of competence and expertise.

1 – Introduction

Attribution theory is a branch of social psychology that, roughly speaking, investigates how people answer 'Why' questions and how they make attributions of causality. This is clearly an important aspect of individual and social life. Hewstone and Moscovici (1983) go so far as to argue that requesting and offering explanations – asking and answering "why" – is a universal element of human life in all societies and all eras. Certainly, social psychologists have had high hopes that a better understanding of the psychological and social mechanisms involved in attribution would help us to better understand such diverse aspects of social life as courts of law (Atkinson & Drew, 1979) and romantic relationships (cf. Harvey, Wells, & Alvarez, 1978; Orvis, Kelley, & Butler, 1976; Regan, 1978).

The field caught the imagination of experimental social psychologists in the 60's and was the focus of a great deal of research activity. By the late 70's, research into attribution accounted for about 11% of published work in social psychology (Hewstone, 1983). However, it became increasingly clear that certain puzzles in the field were becoming more –not less– intractable as the research results piled up, and the popularity of the field dwindled rapidly in the 80's and 90's.

In retrospect, it seems problematic that experimental studies generally failed to account for the differences between the social context of the laboratory and everyday settings. Very few studies have explored the adequacy of the core theories of attribution in everyday social settings, and this study contributes to growing body of research that investigates attributional talk in naturalistic contexts (cf. Anderson & Beattie, 1995; Antaki, 1985a; Antaki & Naji, 1987; Bennet, L., 1992; Bennett, M., 1989; Bies & Sitkin, 1992; Bonaiuto & Fasulo, 1997; Cody & McLaughlin, 1988; Edwards & Potter, 1992; Emihovich, 1986; Fisher & Groce,

1990; Gill, 1998; Hilton, Mathes, & Trabasso, 1992; Maynard, 1985; Potter & Edwards, 1990; Weber & Vangelisti, 1991). Like many of these, this study investigates the functional value of attributional talk in social life.

The social processes of attribution have been so seldom studied in naturalistic everyday settings that the actual choice of setting was relatively unimportant, so long as it could be reasonably expected to yield plenty of situations in which participants try to answer "why" questions. The setting that was chosen is that of computer failure and repair – a very common situation in modern life that centres around attributional troubleshooting processes.

The present study explores the extent to which talk recorded in this everyday, attribution-rich social setting corresponds to the patterns expected if the core cognitive theories of attribution hold true. While it will be shown that participants do indeed request and offer the types of information predicted by cognitive theories of attribution, they also differ from the predicted logical and rational modes of interaction in puzzling ways. These puzzles will be explored in detail and it will be shown that they begin to make sense when attributional talk is viewed in its social context. Attributional talk, far from being a residue of cognitive processes, is a social resource that can be used to regulate forms of social life.

To these ends, the analysis consists of two sections. The first is a rough content analysis that attempts to discern the extent to which cognitive theories of attribution describe attributional talk observed in a real-life setting. The second stage of analysis is a conversation analysis (CA) and discourse analysis that shows how participants make use of attributional talk to regulate social life in certain ways.

This study is not generalisable in the traditional sense of the word. Instead of finding general principles that describe every instance of attribution, as the cognitive theorists attempted to

do, this study shows that attributional talk is a social resource that *can* be drawn on by interactants to achieve certain social ends (cf. Silverman, 2000). This is not to say that interactants will *always* draw on attributional talk to achieve these ends, that there are no other ways of achieving these ends or that these are the only ends that can be achieved through attributional talk! One of the outcomes of the present study will be to show how attributional talk is useful for constructing and defending social positions of expertise, and it will be shown how this process may be different in the context of computer failure and repair compared to other social settings, such as doctor-patient interactions (Gill, 1998).

That ordinary people may draw on attributional talk as a social resource, and that attributional talk is a powerful way of achieving certain social ends, is an important finding for the field of attribution theory and, at the same time, feeds into our knowledge of how people use talk to regulate and manage social interactions. In particular it will be shown how attributional talk is useful for the construction, defence and living-out of social positions of expertise.

Incidentally, the choice of setting allows the study to address a second gap in the literature, this time in the field of Human Computer Interaction (HCI). Although computer failure is a common occurrence, the field of HCI has been overwhelmingly concerned with *interaction* and has not acknowledged computer failure as a common experience involved in computer use. HCI research assumes a functioning user-interface, and the interruption or curtailment of interaction is generally glossed over rather than studied. Of course, HCI researchers have studied the issue of computer *reliability* in some detail. Their broad project has been to improve design practices to limit error, and therefore to increase reliability to the greatest extent possible (see Carroll, 1997; Enfield, 1987; Gerlach & Kuo, 1991; Lewis & Norman, 1995; Lieberman & Fry, 2001; Neumann, 1993, 1995; Norman, 1990; Sommerville, 1995). However, the field in general has failed to ask what happens to users when things do

(inevitably) go wrong. As such, computer failure has been an almost entirely invisible aspect of researched computer use. This study, although it is not a central aim of the analysis, draws attention to the experience of computer failure and thereby feeds into the HCI literature.

2 – Cognitive Theories of Attribution

From its early roots in cognitive psychology, the field of attribution theory has become incredibly broad and has splintered in numerous directions, from Discourse Analysis to Bayesian Nets. It will be impossible to cover all of these areas in this brief discussion. Instead I will outline a small part of the attribution theory terrain that will be useful in unlocking the social interactions surrounding computer failure. It is convenient to divide the discussion into three sections that will cover cognitive, linguistic and discursive theories of attribution. The cognitive models are well suited to unlocking the practical aspects of troubleshooting, and the linguistic and discursive approaches should shed some light on the social aspects of the event of computer failure. These theories will be presented in a more-or-less chronological history.

Although, in many ways, the classical cognitive theories of attribution are now outmoded, I will nevertheless pay them a fair amount of attention for two reasons: Firstly, the classical theories offer robust and empirically confirmed explanations of how a person could attribute a failure to a cause, and they should be useful for investigating the technical aspects of the troubleshooting process. Secondly, most of the later literature 'talks back' to these earlier models and debates, and it is therefore important to cover them well enough to provide a framework for addressing the linguistic and discursive models.

2.1 Heider

The field of attribution theory is generally acknowledged to have sprung from the work of Fritz Heider, especially from his 1958 work *The Psychology of Interpersonal Relations*. Heider was interested in 'person-perception', or how an untrained observer (which he called a "naïve psychologist") makes sense of the actions of others. Operating from the starting point of Gestalt psychology, he was interested in how an observer can organise a chaotic melange

of perceptions into an experientially cohesive perception of causation. Possibly the most important axiom of Heider's argument is that any individual naturally attempts to predict (and therefore control) the environment, and that causal attribution is a key means by which this is done. This process "serves to build up and support the constancy of our picture of the world" (1958, p. 92). This environment includes other individuals and prediction is attained, according to Heider, by determining whether events result from dispositional properties or exceptions to rules.

In contrast to Skinner's behaviourism and other dominant paradigms of the time, Heider acknowledged that the internal world of an individual is vitally important to their attributions and behaviour. He gives the example that "if a person believes that the lines in his palm foretell his future, this belief must be taken into account in explaining certain of his [sic] expectations and actions" (1958, p. 5). At the same time, Heider argued that ordinary people constantly make observations of their environment and are naturally inclined to update their lay theories to better fit their experience, much as a scientist would. The difference is that the 'naïve' psychologist lacks the technologies for experimental control and scientific objectivity available to the 'scientific' psychologist and is therefore more vulnerable to subjective biases.

In a nutshell, Heider (1958) proposes that the 'naïve psychologist' attributes causality in two stages. Firstly, the forces present in any action or event must be categorised as originating in the observed person or in the environment. Secondly, if the action is judged to be intentional, the actor's level of responsibility must be ascertained. To do this, the perceiver must determine whether the actor had the *ability* to cause the event, the *foresight* to anticipate the consequences, the *intention* to produce the consequences and whether any extenuating circumstances are present. These perceptual tasks are seen to operate together by forming a Gestalt field and are not necessarily conscious. For example, if a talented student who fails an

examination has recently lost a parent, then it is likely that the teacher will attribute the failure to the environmental force (losing a parent), rather than to an internal disposition of the student such as laziness or lack of ability. To give an example more relevant to this study, if a computer user were to cause a system failure by infecting a server with a virus, the technician would determine whether the virus infection was a result of the user's actions (downloading shareware for example) or some aspect of the environment, such as a new virus or worm infecting computers worldwide. If the user were judged to be responsible then the technician would need to make a judgement of the extent of the user's responsibility.

Although Heider (1944, 1958) worked in a Gestalt framework, he raised questions about the processes and mechanisms of attribution that were ideally matched to the technologies of cognitive research methods. Firstly, he argued for a view of the individual as an active and rational, if not necessarily conscious, perceiver of stimuli. This notion of the individual attributor became a central thread running through mainstream attribution theory. Secondly, Heider (1944, 1958) noticed that the perceived intentions of the actor are vital to an observer's attributions of causality. This idea was later taken up by Jones and Davis (1965) in their theory of 'correspondent inferences'. Thirdly, Heider (1944, 1958) saw a strong similarity between everyday causal attribution and the technologies used by social-science researchers to determine causality, such as experimental methods and statistical procedures. This was later taken up in Kelley's (1967) 'man-the-scientist' model in which naïve causal attribution is likened to a simplified form of ANOVA. The theories of Jones and Davis and Kelley will be discussed in detail a little later.

While Heider's (1958) work did raise the key concepts that were to become the central projects of "Attribution Theory", it failed to spark the flurry of research activity that made attribution theory one of the most prolific fields in twentieth-century social psychology. It

was left to later authors, particularly Jones and Davis (1965) and Kelley (1967), to translate Heider's (1958) conceptual breakthroughs into empirically testable frameworks that encouraged experimental investigation. However, it must be noted that some of the richness of Heider's original ideas were lost in this conversion between paradigms. Later authors focussed almost exclusively on Chapter Four: "The naïve analysis of action" in their interpretations of *The Psychology of Interpersonal Relations* (1958) and sidelined many of Heider's original ideas. Perhaps the most important of the neglected ideas was Heider's conviction that everyday language and 'common-sense' are essential components of attributional processes. He argues that a systematic understanding of everyday language would be a good place to start a scientific analysis of attribution. This important hunch was ignored by cognitive theorists and was only taken up much later in the linguistic and discursive approaches to attribution.

2.2 Jones and Davis

Following Heider (1958), Jones and Davis (1965) start from the assertion that people are fundamentally motivated to predict and control their environment, and that causal attribution is a primary means of doing so. Since other people are an important part of one's environment, predicting the actions of others is seen to be an important aspect of everyday life. They argue that actions generally spring from intentions which, in turn, originate in stable dispositions. If perceivers can infer intentions from observed actions, and then infer dispositions from intentions then they can understand, predict and control the behaviour of others (see Figure 1, below).

It may be useful to start with a concise statement of the model and then flesh out each component. Jones and Davis summarise as follows:

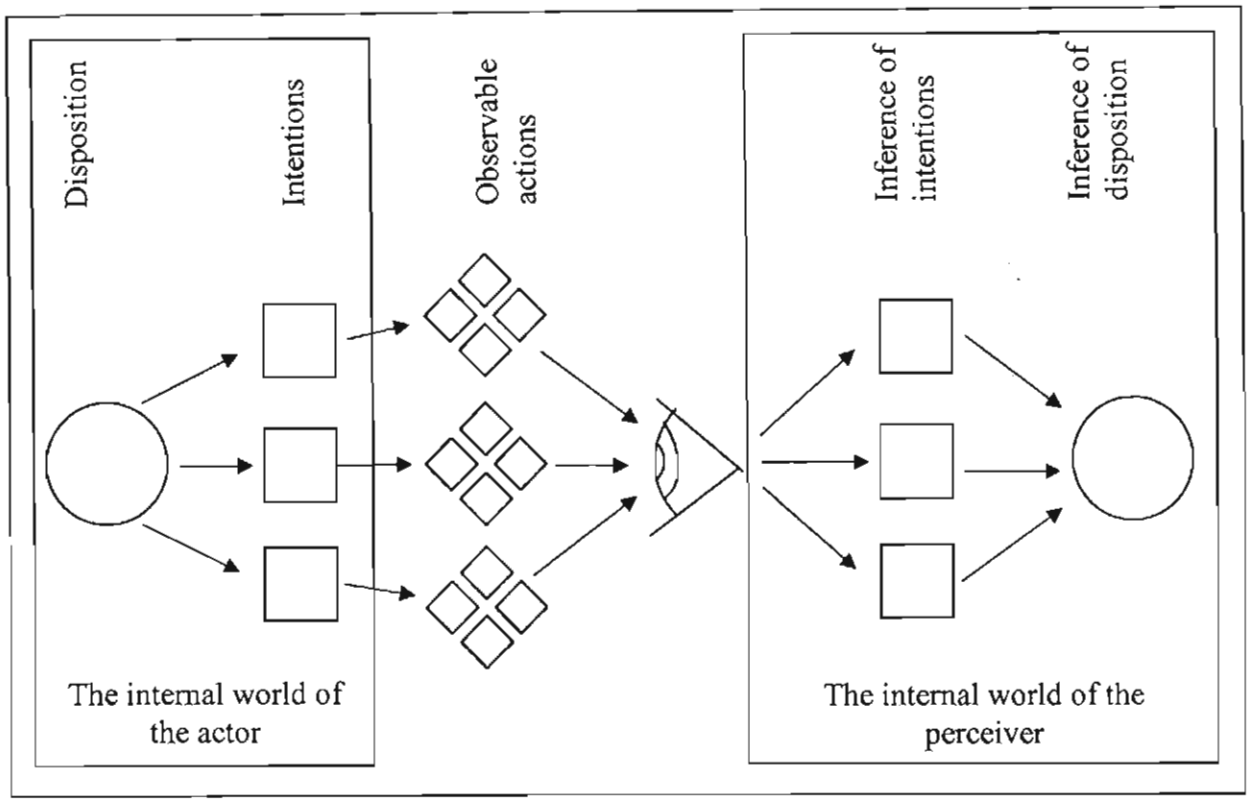

Figure 1: Jones and Davis' theory of correspondent inference

> Actions are informative [about intentions] to the extent that they have emerged out of a context of choice and reflect a selection of one among plural alternatives.... it is apparent that the distinctiveness of the effects achieved and the extent to which they do not represent stereotypic cultural values determine the likelihood that information about the actor will be extracted from an action. We have used the term 'correspondence of inference' to refer to variations in this kind of informativeness. To say that an inference is correspondent, then, is to say that a disposition is being rather directly reflected in behaviour, and that this disposition is unusual in its strength or intensity. (1965, p.264)

Jones and Davis (1965) remind us that this model of attribution has little to do with generating *veridical* causes of behaviour. Instead "the perceiver tries to find *sufficient reason* why the person acted and why the act took on a particular form" (p. 264, emphasis original).

The attributional process is oriented towards generating causal explanations that satisfy the observer's need to predict and control the world.

The foundation of this model is the assertion that any action may have many effects and, from the perspective of the observer, any of these could be the 'reason' for the action. The key task for the observer is to determine which of the effects of an action was the *intended* consequence in order to infer underlying intentions and dispositions. Of course, after Heider (1958), the observer must first be satisfied that the actor intended the consequences of the observed action, in which case they must have both the knowledge and ability to cause such effects. If either of these is perceived to be absent, then the evidence suggests that the root cause of the action was chance or luck rather than intention or disposition and the process of causal attribution is complete.

Assuming that the action was intentional, Jones and Davis (1965) argue that, in most situations, people have a range of potential actions to choose from and the chosen action can be compared to the hypothetical non-chosen actions in order to make inferences about the intentions and dispositions of the actor. They argue that, at the very least, the actor must have had two choices – between action and inaction. Alternatively, an action may be selected from a large array of plausible alternatives. Since each potential action would be associated with a set of potential effects, the observer can compare the effects of the hypothetical non-chosen alternatives to the effects of the chosen action. Some of these effects may be common to all potential action choices, but certain effects will be unique to individual potential actions. Jones and Davis call these the 'non-common effects' and argue that these are informative of the actor's intentions; the knowledge that the agent has *chosen* an action to generate certain effects and not others provides grist for the mill of inference.

Assuming that the action was intentional, "inference from action to attribute is correspondent as an inverse function of (a) the number of non-common effects and (b) the stated social desirability of those effects" (Jones & Davis, 1965, p. 228). In other words, in order for the perceiver to generate a strong inference of intention, the agent should appear to be choosing from a small pool of non-common effects and the chosen action should be unexpected in some way. As Jones and Davis put it, "the more distinctive reasons a person has for an action, and the more these reasons are widely shared in the culture, the less informative that action is concerning the identifying attributes of the person" (1965, p. 228) and "to learn that a man makes a conventional choice is only to learn that he is like most other men [sic]" (p. 227).

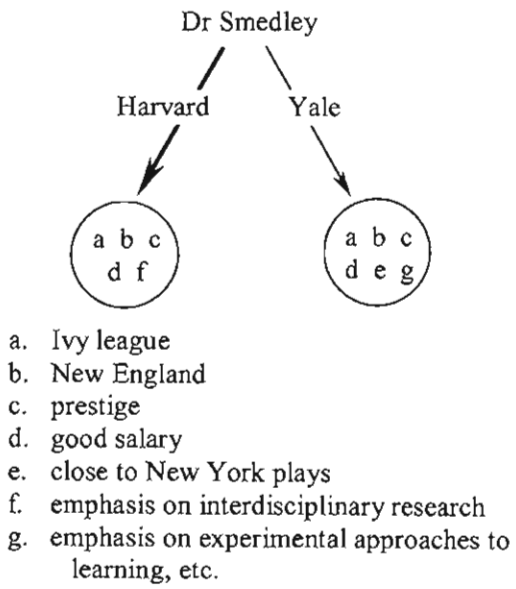

Figure 2: Smedley's choice, from Jones and Davis (1965)

Jones and Davis (1965) give the hypothetical example of a Dr Smedley choosing between accepting a job at Harvard or at Yale (see Figure 2, above). In this case, the task of determining the set of potential actions is not an issue since Smedley's options are already known. There are several similarities between these two potential actions: they are both positions at 'Ivy League' institutions in New England with high prestige and good salaries.

However, Yale is "close to New York plays" and places emphasis on "experimental approaches to learning" while Harvard places an emphasis on "interdisciplinary research". Smedley has chosen Harvard and it is now up to an observer to infer his most likely intention for this act.

Jones and Davis (1965) argue that the effects 'a', 'b', 'c' and 'd' offer little information on which to base a dispositional inference since they are common to both potential choices. Effects 'e' and 'g' and effect 'f', however, are unique to the choice of Yale and Harvard respectively, in other words, they are 'non-common'. It is these non-common effects that are most useful for inference.

In some instances there may be only one non-common effect of an action, or several very similar effects and the observer could immediately makes inferences about the actor's intentions. More often there will be several different non-common effects that would allow quite different (and possibly contradictory) inferences of intention. Consequently the observer must attempt to determine which effects were desirable or intended and which were undesirable or unintended.

Jones and Davis (1965) offer a useful heuristic for establishing the desirability of effects. Firstly, it is assumed that the agent intended personally desirable effects and did not intend undesirable ones. It follows that the perceiver may consider the non-common effects of the chosen alternative to be more desirable than the non-common effects of the spurned choices. For example, since Dr Smedley has chosen Harvard, the perceiver may assume that he is either attracted to effect 'f' ("emphasis on interdisciplinary research") or aversive to effects 'e' ("close to New York plays") or 'g' ("emphasis on experimental approaches to learning") or both. Secondly, the extent to which the undesirable effects in the set are negative will amplify the desirability of the positive effects. However, although highly desirable effects are

"more likely to enter into attribute-effect linkages than effects assumed to be variable or neutral in desirability" (p. 227), universally desired effects do not reveal much about the dispositions of the actor.

		ASSUMED DESIRABILITY	
		High	Low
NUMBER OF NON-COMMON EFFECTS	High	Trivial ambiguity	Intriguing ambiguity
	Low	Trivial clarity	High correspondence

Figure 3: Relationship between assumed desirability, the number of non-common effects and the 'correspondence' of an inference, from Jones and Davis (1965)

The relationship between the number of plausible non-common effects and their desirability is illustrated in Figure 3, above. The more plausible alternative actions available to the actor, the more difficult it will be for an observer to make a firm inference of intention based on the chosen course of action. At the same time, the more desirable the chosen non-common effects, the less informative they are about the reasons for the action. The case that allows a robust and accurate ('correspondent') inference of intention is when the number of non-common effects is low and the chosen course of action is perceived as undesirable. For example, if there is only one vegetarian dish on a menu and it is undesirable compared to the other options available, then a person who chooses it is most likely a vegetarian. Such a choice allows a robust inference of intention and disposition.

The perceiver must also determine whether the actor's behaviour is in-role or out-of-role. In-role behaviour reveals little about the agent's dispositions or intentions beyond that they are conforming to a norm.

> Most people want to avoid embarrassing others by not meeting their expectations, most people want to gain the rewards implicit in approval from authority figures, most people wish to manifest their intelligence by showing that they understand what is required of them, and so on. Each of these effects is a 'plausible reason' for in-role behaviour (Jones & Davis, 1965, p. 236).

Although the authors may not make this link themselves, Jones and Davis (1965) are essentially arguing that participants hold 'interested' positions and perceivers must take this into account, as will be discussed later. Out-of-role behaviour demands explanation and is therefore more revealing of intentions and dispositions than behaviour that conforms to role expectations.

Jones and Davis (1965) add, almost as an afterthought, that the extent to which the actor's action impacts on the observer may influence the observer's attribution of causality. For example, where a colleague's success may be attributed to good fortune or luck, the observer's own success is more likely to be attributed to skills, abilities and achievements. They call this the 'hedonic relevance' of the action, but they do not go into much depth about how it influences attribution except to say that actions with high hedonic relevance will be more likely to be understood as personally motivated.

In summary, when an action is observed, the observer is thought to go through the following steps:

1. The observer judges whether the actor has the knowledge and ability to cause the observed effects and, therefore, whether the action was intentional or accidental.

2. Given that the action was intended, the observer imagines the set of potential actions that were available to the actor.

3. The observer considers the probable effects of each potential action and determines which are non-common, i.e. unique to particular actions.

4. The observer determines the desirability of each non-common effect and, in the context of this matrix, the relative desirability of the non-common effects of the chosen action.

5. The observer determines whether the behaviour is accounted for by role expectations.

6. The observer determines the motivation for, or the hedonic relevance, of the action.

7. The observer makes an inference of intention.

Although this model has great parsimonious appeal, each of the steps in the model presents difficulties in operationalisation, both for the lay attributor and for the scientist who is attempting to observe and analyse attributional processes. Perhaps the most intractable is the difficulty of calculating the perceived desirability of effects. Jones and Davis (1965) offer the heuristic that the observer treats the non-common effects of the non-chosen alternatives as effects that the actor is trying to avoid, and the non-common effects of the chosen alternative as desirable effects. In this case the observer uses the actor's choice as a basis for determining the subjective desirability of each non-common effect for the actor. However, they also argue that the chosen action must be associated with non-desirable non-common effects in order for a correspondent inference to be made. Therefore the perceiver must disregard the heuristic and assume that certain effects cannot be desirable simply by virtue of being bundled with the chosen course of action. Although Jones and Davis (1965) accept that determining the desirability of effects is one of the greatest difficulties of the model, they bypass it by suggesting that the perceiver's past experiences, their stereotypes about the "members of identifiable classes or cultural groups" (p. 233) and the appearance of the actor, may play an

important role in expectations of desirability. Given the importance of this issue to the model, it is surprising that they avoid "going too deeply into the problem" (p. 233).

Nevertheless, the model provides some important theoretical footholds for the current study. Perhaps most importantly, it introduces the idea that actions are selected from a range of possibilities, and the chosen action has implications for an actor's self-presentation. This is an idea that I will return to when discussing the discursive approach to attribution.

2.3 Kelley's 'man the scientist' model

Kelley (1967) also takes Heider's early work on attribution as a starting point, especially the notion that people are naturally motivated to predict and control their environment and that causal attribution is an important means of doing so. Heider (1958) suggested that attribution depends on a kind of naïve factor analysis. Kelley (1967) developed this idea that attribution utilises some kind of intuitive statistical procedure, but chose Analysis of Variance (ANOVA) as a core metaphor. Where factor analysis provides a technology for *pattern recognition*, ANOVA provides a means of analysing differences between *predefined categories* to determine whether an apparent difference is genuine or due to random 'noise'.

Kelley's (1967) model centres around J.S. Mill's 'method of difference', which provides a philosophy of science for linking cause and effect through covariation. In a nutshell the method provides an 'analytic tool' to attribute an effect to "...that condition which is present when the effect is present and absent when the effect is absent" (Kelley, 1967, p. 194). In other words, if an effect occurs in the presence of a condition and does not occur in the absence of that condition, then the effect can be attributed to the condition.

Kelley gives the example of watching movies and trying to attribute the cause of one's enjoyment (the effect) to either the 'self' or to some 'external thing'. He divides conditions

into four categories: time, modality, entities and persons. Kelley applies Mill's method of difference to this example as follows:

> This basic notion of covariation in cause and effect is used to examine variations in effects (responses, sensations) in relation to variations over (a) entities (movies), (b) persons (other viewers of the movie), (c) time (the same person on repeated exposures), and (d) modalities of interaction with the entity (different ways of viewing the movie). The attribution to the external thing rather than to the self requires that I respond *differentially* to the thing, that I respond *consistently,* over time and over modality, and that I respond *in agreement* with a consensus of other persons' responses to it. In other words, the movie is judged to be enjoyable if I enjoy only it (or at least not all other movies), if I enjoy it even the second time, if I enjoy it on TV as well as at the drive-in theatre, and if others also enjoy it. If these conditions are not met, there is indicated an attribution to the self (I enjoy all movies, or I alone have a weakness for this particular type) or to some juxtaposition of the circumstances (I was in an especially susceptible mood on the one occasion) (1967, p. 195).

Kelley is (conveniently) able to represent these four conditions as a three-dimensional cube (see Figure 4). The notations 'X', 'Y' and 'Z' represent distinct *effects* (for example, enjoying a movie), 'N', 'O', 'P' and 'Q' represent *entities* (for example, different movies), 'T1M1', 'T2M1', 'T1M2' and 'T2M2' represent different combinations of *time* and *modality* (for example, Wednesday night on TV and Thursday night at the cinema) and 'self', 'O1', 'O2' and 'O3' represent different persons.

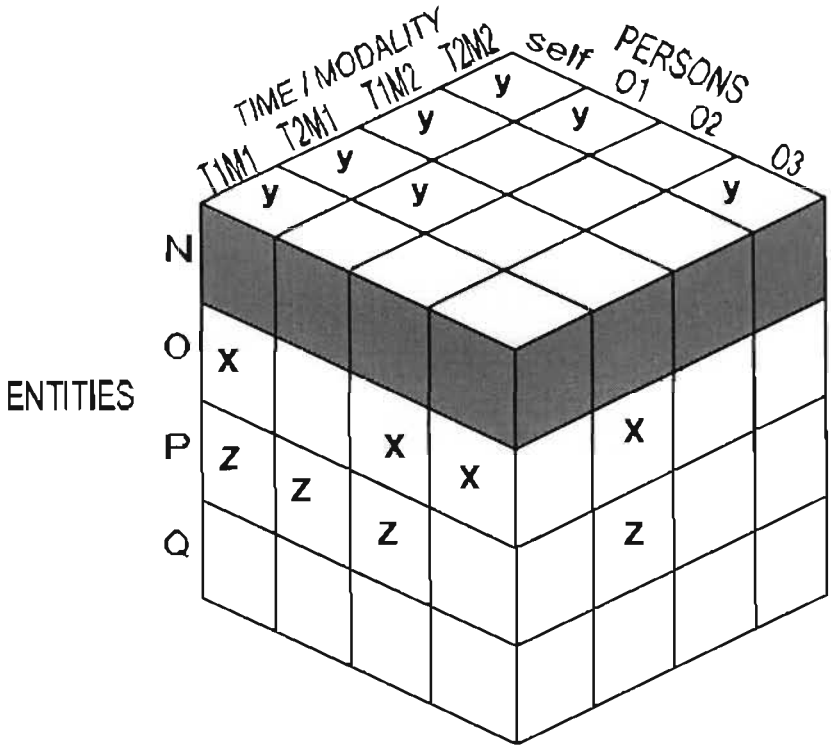

Figure 4: Kelley's ANOVA cube (1967, p. 195)

In this illustration, 'self' experienced effect 'Y' when experiencing entity 'N' for all combinations of time and modality. However, person O1 experienced 'Y' in response to entity 'N' for both modalities, but only at time two and not at time 1. Person O2 did not experience 'Y' at all, and person 'O3' experienced 'Y' in response to entity 'N' only for the second time and second modality. Kelley argues that, according to Mill's method of difference, since only 'self' experienced 'Y' in response to entity 'N' under all conditions of time and modality, it is probably something to do with 'self' that generates effect 'Y' (in this case, liking the movie). If the slice of the cube corresponding to entity 'N' had been marked 'Y' for all persons and for all combinations of time and modality, then the perceiver would assume that it is something about entity 'N' that generates effect 'Y'. Furthermore, for this attribution to have "external validity" and to be accepted by the individual as a veridical attribution, effect 'Y' would have to be produced invariably in response to entity 'N' for all

possible conditions. Kelley summarises the axes by which effects and conditions are compared as follows:

1. *Distinctiveness:* the impression is attributed to the thing if it uniquely occurs when the thing is present and does not occur in its absence.

2. *Consistency over time:* each time the thing is present, the individual's reaction must be the same or nearly so.

3. *Consistency over modality:* his [sic] reaction must be consistent even though his mode of interaction with the thing varies

4. *Consensus:* attributes of external origin are experienced in the same way by all observers

(1967, p. 197)

Kelley argues that attributions only have external validity when distinctiveness, consistency and consensus are all present. He compares these axes to the elements of the *F*-ratio used to calculate the significance of a statistical ANOVA. When running an ANOVA, within-groups variance represents random error, and between-groups variance is understood to contain both random error and systematic error. By expressing these terms as a ratio, the components of random error in the numerator and denominator essentially cancel each-other out, leaving the *F*-ratio as an estimate of systematic variance. According to Kelley, consistency and consensus in the naïve ANOVA cube correspond roughly to the within-groups term of the *F*-ratio. That is, the degree of disagreement that entity 'N' causes effect 'Y' over time, between modalities and between people is the estimate of random error in the naïve ANOVA. Similarly, the distinctiveness axis corresponds to the between-groups term of the *F*-ratio. That is, the greater the degree of correspondence between entity 'N' and effect 'Y', and the more exclusive the association, the greater the degree of confidence about the causal relationship between the entity and the effect.

Kelley does not claim that this model of attribution generates veridical attributions of causality, but rather the subjective experience of "external validity".

> To the degree a person's attributions fulfil these criteria, he [sic] feels confident that he has a true picture of his external world. He makes judgements quickly and with subjective confidence, and he [sic] takes action with speed and vigour. When his attributions do not satisfy the criteria, he [sic] is uncertain in his views and hesitant in action (1967, p. 197).

However, attributional processes that deviate from the naïve ANOVA model result in "biases, errors, and illusions" (1967, p. 197). Kelley argues that the lay attributor "for the most part … generally acts like a good scientist, examining the covariation between a given effect and various possible causes" (1971, p. 2). Nevertheless, there are many occasions when the attributor "… under the press of time and the competition of his other interests … often makes incomplete analyses, settling for small samples of data and incomplete data patterns. In these instances, even though his available information does not allow him to make a 'covariance analysis', the lay attributor still uses it in a reasonable and unbiased manner" (1971, p. 2).

Kelley (1967, 1971) argues that, since attribution is a subjective process, certain "biases" or "errors" may obstruct the objectivity of an attribution. He suggests that such errors and biases are likely to be due to one or more of the following:

- Ignoring the relevant situation
- Egocentric assumptions
- Underestimation of the magnitude of the affective consequences
- Conditions in which the situation is misleading, due to unforeseen circumstances or because of the illusion of freedom
- Hidden causal factors affecting the subjects actual responses

- Erronous information about the subjects responses
- Erronous information about the consequences of responses

However, it is not clear that any everyday situation could ever be free of such sources of 'bias' or 'error'.

Although this model is logically convincing, perhaps its greatest difficulty lies in assuming that the scientist has a god-like ability to decree the essential questions, conditions, entities, modalities, times and effects from the stream of experience and to discern the "correct" attribution in a given circumstance. Neither the relevant question, nor the social context of an attribution are self-evident or indisputable to participants or to scientific observers, nor can they be summarily fixed or revealed by the omniscient scientist.

For example, imagine two friends walking in a park at night who inadvertently flush out a sleeping pheasant and are suddenly startled. The first friend screams, followed shortly by the second. This example highlights two central problems. The first concerns the difficulty of dividing the continuous flow of experience into discrete events. Depending on the context of this story the central event could be (inter alia) the walk ("why are they walking together when they have recently had a fight?"), the venue ("why are they walking in the park when the city is under attack?") or their experience with the pheasant ("why are they distressed?"). Kelley refers to this problem only obliquely, noting that if there is disagreement (that is, a lack of consistency information), "[Person] A will wonder whether B is reacting to the same cause as he himself is" (1967, p. 206). The second problem concerns the difficulty of dividing perceptions into effects and conditions. If you were to ask, "Why did you scream?" the answer may well be "Because we were startled". However if you were to ask, "Why were you startled?" one may answer "because my friend screamed". In other words, the screams could be effects of a startling condition or conditions that generate the effect of being startled

(or both) depending on the questions that are asked. Whether a stimulus is unambiguously a condition or an effect is dependent on a dialogical context, but Kelley takes them to be self-evident categories and gives no guidelines for classification.

He touches on these issues when he talks about the difficulties of gathering consensus information. He notes that it may be difficult to tell whether someone 'really' agrees or whether they are merely appearing to agree for reasons of their own (for example, trying to fit in). Kelley asks:

> What does it mean that another person's reaction is similar to my own? This question is too complex to take up here, concerning as it does basic matters of interpersonal communication and comparison, ranging from emotional expression and perception to semantics and verbal labels (1967, p. 204).

Thus he reveals that the apparently parsimonious principle of 'consensus' masks a tangled web of sociality that his model does not address. These social and linguistic aspects of attribution form the theoretical core of the discursive approach to attribution and will be discussed below.

2.4 Empirical support for cognitive attribution theory

The theories of Heider (1944, 1958), Jones and Davis (1965) and Kelley (1967) formed a theoretical anchor for an enormous volume of work in attribution theory in the years that followed. However, by the early 80's, there was a growing realisation that the enormous research output was not making the core concepts of attribution theory any clearer. Instead, a large volume of research was generating increasingly specific exceptions to the prevailing theories (Harvey & Weary, 1984). Two influential reviews, by Kelley and Michela (1980) and Harvey and Weary (1984) offer a useful summary of the research output in the field and form the core of this brief review. I will discuss the empirical findings regarding the theories

of Heider (1944, 1958), Jones and Davis (1965) and Kelley (1967) in turn before moving on to some of the more general challenges to the field.

2.4.1 Empirical support for Heider's theory

Heider's (1958) theory of attribution did not directly attract much empirical verification. By the mid-80's the keystone of cognitive attribution theory – that the desire to predict and control is a fundamental and universal motivation for attribution – was still unverified. Nevertheless, the proposition was not disconfirmed by any empirical studies. Pittman and Pittman (1980, as cited in Harvey & Weary, 1984) found that attributional activity increases after experiences of lack of control, suggesting indirectly that attribution may be associated with achieving control.

Perceived intentionality of behaviour received more empirical attention. Heider's (1958) model predicts that intentional actions are more likely to be attributed strongly to the actor than unintentional ones. Several authors have confirmed that actions judged to be intentional are more likely to be responded to personally (e.g. by praise, blame or retaliation) than those that are judged to be unintentional (Dyck & Rule, 1978; Shaw & Sulzer, 1964; Tedeschi et al., 1974, Weiner & Peter, 1973; all as cited in Kelley & Michela, 1980). However, help is more likely to be given to people whose need is judged to be unintentional (Ickes & Kidd, 1976; Piliavin et al., 1969, all as cited in Kelley & Michela, 1980). Therefore the empirical evidence suggests that the effect of perceived intentionality on attribution is contextual rather than universal.

Heider's (1958) statement that "behavior ... tends to engulf the total field" (p. 54) was later taken up as the 'fundamental attribution error' (Ross, 1977) in which attributors place too much emphasis on dispositional determinants of behaviour and ignore situational factors. This is well supported by empirical evidence (e.g. Quattrone, 1982, as cited in Harvey &

Weary, 1984) but there has been a great deal of debate about whether this is a naive attribution *error* or a sophisticated response by participants to the demands of the research setting (e.g. Funder 1982; Hamilton, 1980; Harvey et al., 1981b; all as cited in Harvey & Weary, 1984).

2.4.2 Empirical support for Jones and Davis theory of correspondent inference

One of the clearest empirical findings in the field is that attributions are stronger and more confident when the number of non-common effects is small, and become less confident as the number of non-common effects increases (Azjen & Holmes, 1976; Newtson, 1974, both as cited in Kelley and Michela, 1980).

Jones and Davis (1965) gave the motivational element of "hedonic relevance" and other motivational factors a relatively minor role in their original model, but this aspect has received a great deal of empirical attention. Three comprehensive reviews conclude that empirical results show that attributions for success are generally internal and attributions for failure are generally external, in other words, that success is generally attributed more to the person and failure more to the situation (Kelley & Michela, 1980; Miller & Ross, 1975; Zuckerman, 1979). However, Younger et al. (1977, as cited in Kelley & Michela, 1980) found that, in the case of extreme financial success or failure the opposite holds, suggesting that even this consistent finding is somewhat contextual. The general conclusion drawn is that such attributions are due to 'self-serving' or 'ego-defensive' motivations, but it is also acknowledged that recognizing the social and communicative aspects of attribution explains this 'bias' to some extent.

Kelley and Michela (1980) report that many empirical studies based on elements of Jones and Davis's (1965) model have yielded ambiguous results. However, they argue that such ambiguity can be resolved when it is acknowledged that people engage in attributional talk

with some awareness of its social and interactional effects. "Attributions are an important part of what people communicate about themselves" (1980, p. 475), and the self-presentational expectations and constraints experienced by subjects influences the attributions they report (Bradley, 1978; Feather & Simon, 1971, both as cited in Kelley & Michela, 1980; Orvis et al., 1976; Scott & Lyman, 1968).

2.4.3 Empirical support for Kelley's 'man-the-scientist' model

McArthur (1972) tested all eight patterns of covariation between distinctiveness, consensus and consistency and reported results "largely consistent" with Kelley's ANOVA model. These results have been consistently replicated (see Frieze & Weiner, 1971; Ruble & Feldman, 1976; Zuckerman, 1979). However, McArthur (1972) found that consensus information is given much less weight than distinctiveness and consistency information. Major (1980, as cited in Harvey & Weary, 1984) showed that, when given a choice, subjects are less likely to request consensus information than consistency or distinctiveness information in order to come to attributional conclusions. Nisbett and Borgida (1975, as cited in Kelley & Michela, 1980) show that consensus has no effect on attribution at all, but others have found that consensus information is very sensitive to order effects (Ruble & Feldman, 1976; Zuckerman, 1979). Hansen and Donoghue (1977, as cited in Harvey & Weary, 1984) found that knowledge of one's own behaviour influences attribution more than knowledge of others' behaviour. Harvey and Weary (1984) make sense of this riddle by arguing that the influence of consensus information depends on situational constraints (e.g. Kassin, 1979; Solomon et al., 1981, both as cited in Harvey & Weary 1984).

Empirical results are more consistent when it comes to the importance of consistency and distinctiveness information in attribution (Harvey & Weary, 1984; Kelley & Michela, 1980). Himmelfarb (1972, as cited in Kelley & Michela, 1980) demonstrated that consistency and

distinctiveness information is given more weight if derived from situations similar to the presented attributional puzzle. Several authors have verified the prediction that the more consistent the prior behaviour, the more the outcome is likely to be linked to a stable attribute of the actor (Bell et al., 1976; Regan et al., 1974; Zuckerman, 1979, all as cited in Kelley & Michela, 1980). Others show that inconsistent behaviour is often attributed to situational factors (Frieze & Weiner, 1971; Hayden & Mischel, 1976; as cited in Kelley & Michela, 1980; Karaz & Perlman, 1975, as cited in Kelley & Michela, 1980).

Several caveats to Kelley's parsimonious model have been identified and explored. For example, the primacy of a stimulus has been shown to have an effect on its importance in the naïve ANOVA (Feldman & Allen, 1975; Jones & Goethals, 1972; Jones et al., 1968; Ross et al., 1975, all as cited in Kelley and Michela, 1980). An effect is most likely to be attributed to the potential cause that is most salient at the time the effect is observed (McArthur & Post, 1977; Taylor & Fiske, 1975; Taylor et al., 1978, all as cited in Kelley & Michela, 1980). Also, Chapman and Chapman (1969, as cited in Kelley & Michela 1980) introduce the concept of "illusory correlation" in which prior beliefs can result in observers detecting non-existent covariation and failing to see genuine covariation (cf. Golding & Rorer, 1972 as cited in Kelley & Michela, 1980). It has also been found that actors and observers make different attributions (Jones, 1976; Jones & Nisbett, 1972; Lay et al., 1973; Lenauer et al., 1976; Nisbet et al., 1973; Taylor & Fiske, 1975, all as cited in Kelley & Michea, 1980). This difference is possibly due to "... their different interests in how a given event is explained, in particular, the actor's concern to receive credit for the good consequences of his actions and to avoid blame for the bad consequences" (Taylor & Koivumaki, 1976; Snyder et al., 1976, both as cited in Kelley & Michela, 1980, p. 478). This is related to the growing realisation that *reported* attributions fulfill self-presentational functions in social interaction, and that observers respond in predictable ways to expressed attribution (Arkin et al., 1980; Forsyth et

al., 1981; Greenberg, 1982; Greenberg et al., 1982; Jones & Sigall, 1971; Orvis et al., 1976; Tetlock, 1980; Weary & Arkin, 1981; Weary & Bradley, 1979; Weary 1980; Weary et al., 1982, all as cited in Harvey & Weary, 1984). Therefore an understanding of attributional processes requires the observation of people *using* attribution in naturalistic settings.

Harvey and Weary conclude their review with the following words:

> As should be clear from this review ... the field is alive with controversy and issues. On the one hand, this controversy reflects the lack of consensus about certain key concepts and about the most defensible theoretical interpretations for phenomena. It also reflects the fact that in certain domains of attribution work, the relevant evidence and the appropriate paradigms and procedures are in question. On the other hand, the controversy that has swirled about in the attribution literature may reflect the vitality and appeal of the topic and its constituent set of phenomena (1984, p. 453).

The following discussion outlines some of the challenges and controversies that began to be raised at that time by both insiders and outsiders to the field. It is not my intention to resolve any of these disputes, but merely to draw attention to the voices of dissent that had begun to make themselves heard. Many of these challenges were later addressed or shown to be inconsequential by the linguistic models (cf. Au, 1986; Brown & Fish, 1983; Semin & Fiedler, 1988) and the social constructionist approaches (e.g. Antaki, 1994; Edwards & Potter, 1993) that will be discussed below.

2.5 Challenges to cognitive attribution theory

2.5.1 When do people make attributions?

Three of the central assumptions of mainstream attribution theory are that people make attributions to predict and control their environment, that attribution is a spontaneous and continuous part of everyday life and that people are fundamentally rational with a sprinkling

of occasional 'biases' or 'errors'. These assumptions mean that mainstream attribution theorists are spared the trouble of asking when, how much, and why ordinary people engage in attributional cause-and-effect explanation in everyday experience.

By the late 70's and 80's, several voices were beginning to question these assumptions (e.g. Antaki & Naji, 1987; Regan, 1978). Lalljee and Abelson note that "some events need explaining – others do not. For some, simple explanations are adequate, while others call for complex answers" (1983, p. 67). Bond argues that the blind-spot regarding the frequency and extent to which people spontaneously engage in attributional activity "... has arisen because attribution theorists have been much more concerned with testing theories about attribution than with testing the ecological validity of attribution" (1983, p. 149).

Langer (1978), in an influential broadside to mainstream attribution theory, argues that people engaging in routine and habitual behaviours are not compulsive attributors but are rather as mindless as possible. She argues that attributional processes are only called into play when something out-of-the-ordinary happens, or when a person is confronted with a novel experience. On the other hand, Gergen and Gergen argue that "the ordinary person seems at such pains to establish that things do not happen by chance, that an explanation is given even though a real cause is lacking" (1980, p. 122). This apparent contradiction may be partially resolved by noting that Langer (1978) is referring to cognitive attributional processes while Gergen and Gergen (1980) are referring to the use of attributional explanations. Nevertheless, their divergent perspectives highlight the need to investigate when, why and how much ordinary people in everyday contexts engage in attributional activity.

2.5.2 The functions of attribution

Heider (1958) originally wrote that an important principle of attribution is that "... man [sic] grasps reality, and can predict or control it, by referring transient and variable behaviour and

events to relatively unchanging underlying conditions, the so-called dispositional properties of his [sic] world" (p. 79). This view of the function of attribution was adopted by Jones and Davis (1965), Kelley (1967), and those who followed after (see Harvey & Weary, 1984; Shaver, 1975) and became a central axiom of cognitive attribution theory. However, in retrospect it seems that there may have been a misunderstanding. Jones and Davis (1965) and Kelley (1967) seem to assume that such attempts to predict and control reality are essentially logical and rational, that people are scientists in miniature. However, in Heider's *The Psychology of Interpersonal Relations* (1958), this rational component of person-perception, discussed in chapter four: *The Naïve Analysis of Action*, occurs in conjunction with several other less rational processes, as discussed (for example) in chapter five: *Desire and Pleasure*, chapter seven: *Sentiment* and chapter eight: *Ought and Value*. In fact, for Heider, even apparently scientific attempts to discern the dispositional properties of the environment do not have to be rational in order to be successful, because poor causal explanations can be excellent predictors. For example, the causal belief that my computer is crammed with little pixies that move letters around the screen when I type is a perfectly good predictor of what will happen when I press a combination of keys, but it is by no means an adequate causal explanation (c.f. Gergen & Gergen, 1980). Heider acknowledged that "if a person believes that the lines in his palm foretell his future, this belief must be taken into account in explaining certain of his expectations and actions" (1958, p. 5).

The assumed rationality of attribution processes in cognitive attribution theory was challenged by, among others, Weiner, Russell and Lerman (1978) who examined the role of affect in attribution and Moscovici and Hewstone (1983) who challenged the reification of positivistic rationalism in the study of everyday attribution. Bond (1983) argued that the assumption of rationality may be an artifact of Western culture (and more specifically, the

academic context) in which attribution theory has developed, rather than a fundamental and universal aspect of sense-making that attribution theorists claim to tap.

Towards the late 80's there was a growing sense of frustration that being able to predict people's attributions did not help much in predicting their behaviour. E. E. Jones, when asked in an interview about the "...relationship between attributions and behaviour", replied:

> I think some people may be buying the assumption that people always behave in line with their attributions. If you can find out their attributions, you can, in a sense, explain why they behave the way they do. But we know that's not really true. There are many occasions when there is a slippage between the way in which people explain reality and how they respond to that reality (Jones & Kelley, 1978, p. 377).

This 'slippage' may be understood when the social functions of attribution and attributional talk are acknowledged (Kelley & Michela, 1980). This is particularly apparent in studies of accounts (Scott & Lyman, 1968), studies that investigate theories of cognitive attribution theory in the context of close relationships (c.f. Harvey et al., 1978; Orvis et al., 1976; Regan, 1978) and studies of attribution in courtrooms (Atkinson & Drew, 1979). There are many other situations where ordinary people exploit attributional talk to generate favourable impressions, for example, blaming a broken mug on the cat, or taking credit for the work of a colleague. It was becoming increasingly obvious that the types of information used to generate attributions, and the attributions themselves, have a social currency. Attribution in an everyday social context should therefore be seen as a malleable process that can, to some extent, be controlled by its actors. The *process* of attribution cannot be studied in isolation from its *function*.

This is beautifully illustrated in Kelley's (1980) tentative discussion of attribution in magic tricks. Here we have a specialised (but not unusual) context in which the performer knows the

'real' cause of events and carefully manipulates the clues that are offered to a naïve audience so that they arrive at an erroneous ('magical') attribution of causality. Kelley's analysis offers several useful insights on attributional processes. He shows that people are not necessarily 'naïve' about attribution. The magician, in order to pull off the illusion, must have a keen insight into attributional processes (even though he or she is not a scientist). The audience, while they are aware that they are being 'tricked', participate willingly in the deception and enjoy it. Moreover, if the audience were to find out how the trick were pulled-off (i.e. the 'real' cause) they might be disappointed. This is an excellent example of attribution for purposes other than prediction and control.

2.5.3 The difficulty of defining actions and effects

One of the key criticisms of mainstream attribution theory concerns the general conception that the activity of attribution operates on unitary and discrete actions. Jones and Davis argue that acts and their effects are the raw material for attributional process. They define an act "… as a molar response … which has one or more effects on the environment or the actor himself" (1965, p. 225). The dictionary definition of a "mole" is "the basic SI unit amount of substance; … the entity may be an atom, a molecule, an ion, a radical, etc." (The new Collins concise dictionary of the English language, 1985). So it seems that Jones and Davis (1965) are arguing for an 'act' as a unitary, discrete and definable entity that can be unproblematically measured with standardisable precision. From this confident definition one would assume that Jones and Davis were in possession of a valid, reliable and universal means of quantifying discrete acts amongst the melange of everyday experience. Instead, they hope that the units of action should be self-evident to any reasonable observer:

> Delimiting the unit with which we shall be concerned is more a problem in theory than in practice. If we observe that a man leaves his chair, crosses the room, closes the door, and the room becomes less noisy, a correspondent

> inference would be that he intended to cut down the noise (Jones & Davis, 1965, p. 225).

They give no justification for starting and ending this micro-narrative at these points, and yet the sequence of actions they relate must surely be sandwiched between a stream of activity that stretches endlessly in either direction depending on the level of granularity chosen by the narrator. The same "act" could have been described in one sentence (e.g. "the man closed the door") or in several pages of prose. For example, in *Ulysses,* James Joyce (1983) follows two characters for one day and devotes a lengthy chapter to each hour. Jones and Davis (1965) seem unaware that they are not providing the reader with a stream of perceptions, but rather with a small number of symbolic representations of action that form a simple narrative structure. The familiarity of this narrative masks the fact that they are omitting infinitely more detail than they are providing—and the details that *are* provided tell a recognisable story.

By adding a single detail to this narrative it can be re-contextualised to the extent that the meaning is entirely different. Let us suppose that the man closes the door from the *outside*. Now the "correspondent inference" is that he got up and crossed the floor in order to leave the room. One could even argue that the room became less noisy simply because the man was no longer in it. Thus it is clear that "delimiting the unit [of action] with which we shall be concerned…" (Jones & Davis, 1965, p. 225) is self-evident more for contextual and narrative reasons than because actions are discrete atomic units with universal definitions. Their illustration seems to be a more powerful demonstration that narrators have a great deal of control over the meaning of the stories they tell than of the self-evident unity of action sequences.

Newtson (1976) was one of the first to test the empirical validity of the assumption that the atomic units of action are self-evident to perceivers. He explored "… how it is that the continuous undifferentiated stream of physical stimulation that impinges on our senses is rendered into discrete, discernable, describable actions" (p. 223). He exposed participants to filmed action sequences and asked them to press a button when they felt that one action sequence had ended and the next had begun in order to determine whether acts are perceived discretely, as had been supposed. He found that naïve subjects were extremely consistent in the way they broke up a "continuous stream" of perception into discrete events, although they showed a great deal of flexibility in the level of granularity at which the action was analysed. Moreover the subjects could easily change their level of granularity on the request of the researcher. Newtson admits that "given the discretion of the observer in behaviour perception … it is likely that expectancies, or sets, could affect behaviour perception by the mechanism of altering the set of features monitored" (1976, p. 240). In other words, individual perceivers have a great deal of flexibility in combining perceptions to form symbolic action-units. This finding is a considerable confound to the naïve assumption, relied on by the greater part of cognitive attribution literature, that atomic action sequences are self-evident.

However, even if the notion of unitary and self-evident acts was well justified, there is still the issue of dividing the perceptual field into acts and effects for any particular context. Imagine that a person climbs a ladder, appears to stumble on the top step and falls off, to the amusement of several observers. Is the fall an *effect* of the act of stumbling? Or, if the person is wearing a clown-suit, is the fall an *act* intended to cause the effect of laughter? Perhaps there are contexts in which act and effect are unambiguously distinct, but it seems that, in most instances, they define each other mutually and contextually.

2.5.4 Dominant methodologies

The closed-ended pencil-and-paper rating scale was the methodology of choice in the heyday of empirical cognitive attribution theory. It was generally assumed that language-mediated self-report measures could unproblematically quantify attributional process (Kelley & Michela, 1980). Such techniques, for example the presentation of literary vignettes, tended to be used uncritically and without a great deal of consideration of issues of validity and reliability (Farr & Anderson, 1983; Heckhausen, 1980; Hewstone, 1983; Streufert & Streufert, 1980).The prototypical example, cited widely in later updates, critiques and revisions of attribution theory (e.g. Au, 1986; Edwards & Potter, 1993; Hewstone, 1989) is McArthur's (1972) test of Kelley's (1967) ANOVA model. McArthur (1972) presented subjects with a number of brief sentences such as "John laughs at the comedian". Subjects were then required to select the most appropriate 'reason' for John's action from forced-choice responses such as "Something to do with John" or "Something to do with the comedian". Although such measurements produce interval data and allow parametric analysis, they presuppose the type of attributions that people may make and how they make them.

More recently, attribution theorists have expanded their horizons. Many studies have used free-response (e.g. Cooper & Burger, 1980; Darom & Bar-Tal, 1981; Elig & Frieze, 1979; Frieze, 1976; Miller, Smith, & Uleman, 1981; Orvis et al., 1976) and others have studied naturalistic data (e.g. Antaki & Naji, 1987; Cody & McLaughlin, 1988; Gergen, 1988; Harvey, Turnquist, & Agostinelli, 1988; Hilton et al., 1992; Malle & Knobe, 1997; Potter & Edwards, 1990; Regan, 1978). These more adventurous approaches to methodology may not be as suited to parametric analysis, but they have resulted in theories of attribution that have greater ecological validity – even if they lack parsimonious appeal.

2.5.5 Naivety concerning the role of language in attribution

Heider (1958) writes that...

> Though we know the meanings of words like "promise," "permit," or "pride" we do not know them in the same way we know meaning of words like "two" and "four," or of words like "speed" and "acceleration." The words referring to interpersonal relations are like islands separate from each other by impassable channels. We do not know how to reach one from the other, we do not know whether they contain a certain number of basic principles of variation, or basic elements, different combinations of which produce the manifold of qualitative differences. These words have a tantalizing quality; they seem to present important concepts in their full meaning, and yet we cannot quite get hold of these concepts, because so much is hidden (p. 8).

Heider argues that his main aim in *The Psychology of Interpersonal Relations* is to explore and systematize some of the psychological knowledge implicit in vernacular language. Therefore, to Heider, everyday language forms part of the data for analysis. However, this approach to language was obscured as attribution theory made its transition to the cognitivist frameworks of Jones and Davis (1965) and Kelley (1967) where language is taken as an unproblematic medium for data *transfer*, rather than being acknowledged as data in itself. Language came to be understood as a neutral and invisible medium for empirical observation and a means of disseminating results. As such, the methodologies used to study the attributional mechanisms of "naïve scientists" were themselves rather naïve. In retrospect it is not at all clear whether the methodologies employed were, in fact, measuring 'attributions' since they ignored the role of language in research and obscured the role of language in attributional processes (Eiser, 1983; Farr & Anderson, 1983; Gergen & Gergen, 1980; Hewstone, 1983).

3 – Linguistic and discursive approaches to attribution theory

As the field of attribution theory has advanced, it has become increasingly clear that the social context of attribution plays an important role in attributional processes. For example, Slugoski, Lalljee, Lamb and Ginsburg (1993) observed the effect of mutual knowledge on explanations and found that participants construct explanations that are sensitive to the perceived knowledge of the listener and to conversational norms. Malle and Knobe (1997) found that attributional processes are sensitive to social factors. For example, they found that actors and observers explain different things depending on their roles (as actors or observers) and on the audience to which the explanation is given. Ordinary people clearly talk about attribution in more thoughtful ways than attribution theorists have generally given them credit for.

Kelley's early work (1967, 1971) introduced the image of "man-the-scientist" and assumed that ordinary people are honest and guileless in their attributions and what they say about them. However, towards the end of his career, Kelley became very interested in how attributions can be manipulated to achieve social ends. In particular, Kelley (1980) became interested in magic tricks as a social context in which attribution is wilfully manipulated to achieve purposes other than the simple (scientific) aim of better understanding one's environment.

The goal of the magician is to conceal the 'real cause' of an event ('RCS') from the audience and persuade them that an unexpected and incredible 'apparent cause' ('ACS') has brought about the effect in question. Not only is the audience to be hoodwinked, but they expect (and often *want*) to be deceived. In this context, 'information' has currency and is deployed by the

magician to achieve certain ends. If the apparent cause of the event is to be credible, then its construction must take advantage of plausible (although misleading) attributional cues, and conceal cues that could allow correct attribution to the RCS. In this sense the stage magician "may have an implicit understanding of the attribution process that in some ways is superior to that of their audience and even to our own [as scientists]" (Kelley, 1980).

Kelley (1980) notes that "the magic trick is always an interpersonal event" (p. 20) and meanings are generated jointly between the magician and an audience. In this context the magician intends to deceive by skillfully managing the ACS and concealing the RCS. The audience is presumably caught between wanting to be deceived (since a bad magic trick makes for poor entertainment) and wanting to 'see through' the trick. The social interaction is oriented to building a believable (although implausible) account through what Kelley calls attribution management. This is done using physical props, verbal misdirection and sleight of hand. Although Kelley allows himself the luxury of a 'god's eye view' (by virtue of his access to a beginner's book of magic tricks), the audience have no means of generating a 'true' description of the sequence of events that they observe (or think they observe).

Kelley argues that understanding how attributions can be managed may "... suggest ways in which persons other than magicians – political leaders, salesmen, and others – can create false scenarios of the causes of events" (1980, p. 34). This acknowledgement that people (including experimental psychologists) may be tricksters who knowingly produce false accounts with intent to deceive is a great step forward from the general assumption in cognitive attribution theory that lay-attributors, as naïve scientists, generally do their best to be unbiased information generators and processors. Kelley even acknowledges that scientists themselves may be fallible, and an understanding of this arena of attribution "... may also

tell us something about how nature 'plays tricks' on us, leading scientists to interpret the causal structure of the world in false ways" (p. 34).

Kelley's (1980) discussion of magic tricks introduces two important points: firstly that attributions may be socially produced and, secondly, that people may be skilled producers of attributional effects. However, in magic tricks and experiments at least one person has access to a veridical RCS. In everyday life there are many contexts in which the cause of an event is an unknown that emerges through social processes. Hilton et al. (1992) trace how the causal explanation for the *Challenger* space shuttle disaster evolved in the press on a day-by-day basis after the event. They make the important point that causal attribution is often socially negotiated over time and that there may be several plausible causes competing for prominence. Although, Hilton et al. (1992), in their role as psychological historians, are still working from a position of retrospective omniscience, the participants in the drama they study are not. It is a realistic everyday scenario in which no one knows the answer until it has been negotiated.

In this case the 'real cause' of the disaster was eventually identified as a design flaw in a small seal on a booster rocket that made it brittle at low temperatures. But it is also true that mission control gave the go-ahead for the launch despite having been told that the seals might not function in cold weather. Hilton et al. (1992) argue that:

> In everyday conversation, we typically mention just one or two factors as 'the' cause. Which one we select may depend on our audience. For example, it may seem more relevant to answer an engineer's enquiry as the causes of the accident by reference to the faulty design of the O-rings. However, on the basis of the same scenario, we might prefer to mention the decision making failures in response to an identical enquiry from a management consultant (p. 47).

Although Hilton et al. (1992) use this example to illustrate the principle that people will generally communicate relevant information, it also introduces the idea that attributions to one cause or another are not socially neutral. In this example it is in an engineer's professional interests to attribute the cause of the disaster to the decision-making failures of mission control. Conversely a member of mission control may be equally motivated to attribute the disaster to the design flaw. Both explanations are objectively 'true', but they have very different social currency and effects.

Gergen and Gergen's (1980) critique of the field of attribution theory argues that many (and perhaps all) taken-for-granted social and psychological categories are socially negotiated and depend on shared understandings that are constantly held together through social interaction and language. They argue that "there is little reason to believe that the attributional processes with which the field has been traditionally concerned are somehow fashioned by the genetic code, essentially built into the physiological system" (1980, pp. 199-200), but rather that "the manner in which we attribute causality appears to reflect a system of normative social agreement. Our understanding of "why" we act as we do may primarily serve as a means of rendering action socially accountable" (p. 205). Farr and Anderson (1983) build a similar argument and, further, argue that language is a primary means of generating the types of social inter-subjectivity upon which "systems of normative social agreement" depend (pp. 45-46). These observations signalled the beginning of some promising new approaches to attribution theory in the years that followed. For the purposes of this study, there are two streams of attribution theory that are important in this regard. The first, the linguistic approach, investigates how attributional information is normatively encoded in language whilst the second, the discursive approach, explores how attributional language may feed into social processes.

3.1 The linguistic approach

Hilton and his colleagues (Hilton, 1990; Hilton, Mathes, & Trabasso, 1992; Hilton, Smith, & Kim, 1995), noticed that many seemingly conflicting results of the different streams of attribution theory could be resolved when one took notice of the conversational nature of 'why' questions and the fact that explanations are made relevant by questions, in other words, that if you ask a different question you get a different answer. The same observation had previously been made by E. E. Jones himself, who admitted that, in attribution research, "...distortion [is] introduced by the attributional questions you ask .... You can get almost anything you want, depending on how you phrase the questions" (Jones & Kelley, 1978, p. 378). This observation forces researchers to look at the linguistic context in which attributions are expressed and perceived – a previously obscured aspect of the research situation.

3.1.1 Conversational rationalism

Hilton and others noticed several things about the context of attributional talk that are important to the development of attribution theory as a whole (Hilton, 1990; Hilton, Mathes, & Trabasso, 1992; Hilton, Smith, & Kim, 1995). Firstly, where several meanings can be attached to a phrase or segment of speech, a listener will tend to assume a meaning that is 'conversationally rational', in other words, that fits with the context of both the preceding conversation and the social roles that apply within the social interchange. Hilton gives the following example: if a researcher asks a participant to describe her relationship with her husband and then to describe her relationship with her family, the 'conversationally rational' response is to assume that the "family" in the second instance refers to her children and excludes her husband. Secondly, Hilton realised that a rational listener must go beyond the strict boundaries of any message in order to generate a rational meaning. So, for example, if asked a typical question used in cognitive attribution research such as "Ted telephoned Bill.

Why?" Hilton would argue that a rational response requires knowledge about telephones and the possible reasons for telephoning other people or being telephoned by them. Thirdly, Hilton argues that the social context of research is not invisible to a research participant. They are aware that they are research participants and their knowledge of their relationship with the researcher necessarily influences their answer to such questions. If this were not the case then it would be possible to walk up to strangers in the street, ask "Ted phoned Paul. Why?" and get the same responses as are given to researchers in laboratories. Hilton builds a good argument to show how conversations are built around both the logical content of the conversation and the social context of interaction, such as participants' attributions about other participants' group membership, knowledge and intentions.

Hilton (1990) argues that the social and logical orientations of conversations are cooperatively managed by mutual adherance to Grice's maxims (1975, as cited in Hilton, 1990). These are the maxims of *quality*, *quantity*, *relevance* and *manner*. The maxim of quality demands that speakers say only things which they know to be true and for which they have sufficient evidence. The maxim of quantity posits that good communication requires just enough information for the purposes of the conversation – not too little or too much. The maxim of relevance charges speakers to give only information that is relevant to the topic of conversation and the maxim of manner "enjoins speakers to be perspicuous by avoiding obscurity and by being brief and orderly[1]" (Hilton, 1990, p. 68). Hilton argues that the maxims of quality and quantity are related to the logical or 'truth value' of explanations and the maxims of relevance and manner relate to the linguistic and social demands of

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[1] I find it somewhat ironic, in the context of Grice's maxim of manner, that I had to look up "perspicuous" in a dictionary.

interaction. Although later authors have cast doubt on the extent to which these Gricean ideals are adhered to in everyday conversation (cf. Edwards & Potter, 1993), it is still useful to note that participants in a conversation operate within a social and linguistic framework which makes certain explanations 'good' and other explanations 'bad'. An important subtext is that speakers have a degree of choice about what they say and how they say it.

3.1.2 Linguistic-cognitive models of attribution

E.E. Jones's observation that, in attribution research, "you can get almost anything you want, depending on how you phrase the questions" (reported in Jones & Kelley, 1978, p. 378) has further implications for attribution theory. If this is indeed the case, then studies that rely on responses to vignettes and 'why' questions (the majority of laboratory studies) are fundamentally flawed.

Brown and Fish (1983) realised that the English language contains advanced and reliable mechanisms for speakers to tell attributional stories in unambiguous ways. They found that verbs, in particular, assign responsibility for an action to either the agent or subject of a sentence in tightly constrained ways. They take a prototypical example from a frequently cited cognitive attributional study by Cunningham, Starr and Canouse (1979) as an example:

> *"Ted likes Paul"*
> How likely is it that this is because:
> A. Ted is the kind of person that likes people?
> Not likely 1 2 3 4 5 6 7 8 9 Definitely likely
> B. Paul is the kind of person that people like?
> Not likely 1 2 3 4 5 6 7 8 9 Definitely likely
> C. Some other reason?
> Not likely 1 2 3 4 5 6 7 8 9 Definitely likely
>
> *"Ted helps Paul"*
> How likely is it that this is because:
> A. Ted is the kind of person that helps people?
> Not likely 1 2 3 4 5 6 7 8 9 Definitely likely
> B. Paul is the kind of person that people help?
> Not likely 1 2 3 4 5 6 7 8 9 Definitely likely

C. Some other reason?
Not likely 1 2 3 4 5 6 7 8 9 Definitely likely

Brown and Fish (1983) found that first-language speakers almost invariably say that Paul is the type of person that people like (he is likeable), but Ted is the type of person that helps people (he is helpful). Prior to this, an attribution theorist would have assumed that this invariability reflected some aspect of the cognitive processes of attribution, whereas Brown and Fish quite conclusively show that the invariability in 'response' is in fact a product of the properties of the language used to frame the 'stimulus'.

In particular they found that causality is assigned to Ted as the grammatical object or Paul as the subject, depending on various attributes of the verb itself. Furthermore, they found that various classes of word forms constrain perceptions of attribution in different ways and to different extents. They found that *action* verbs (typically referring to voluntary actions) such as 'phone', and *state* verbs (typically referring to involuntary states) such as 'love', differentially engender attributions to either the subject or object of a sentence in highly predictable ways.

Although some theorists, such as Semin and Fiedler (1988) would dispute the specific taxonomies of attributional features of language developed by Brown and Fish (1983) and taken up by those who followed (cf. Au, 1986), there is broad agreement that "language mediates between social cognition and social reality", and that this mediation has "cognitive implications ... in the interpersonal domain" (Semin & Fiedler, 1988, p. 558).

These findings have been consistently and reliably replicated (see Rudolph & Försteling, 1997, for a comprehensive review) and represent a serious challenge to earlier cognitive theories of attribution. Firstly, the methodologies of mainstream attribution-theory studies are contaminated (and confounded) by attributional cues integral to the language used as a

stimulus. The syntactical and grammatical properties of the language used to phrase the 'why' questions and written vignettes used in the bulk of mainstream attributional research constrain the reported attributions that are supposed to be the object of study. Secondly, communications can be (and possibly must be) structured in ways that constrain the attributions of causality that are communicated. In fact, according to these findings, action *cannot* be communicated without implying certain features of causality because these attributions are implicit in the language available to do so. The language of attribution constrains attribution in predictable ways that are understandable to users of language.

This realisation prompted a shift in analytic focus from attribution as an individual perception to attribution as a dialogically constructed phenomenon. However, as useful as this mindshift may be, there is more to language than semantics. Antaki (1994, p. 30-31) argues "... verbs are not the only features of speech that have this kind of predisposing effect, and such predispositions can be overriden by syntactic markers and by pragmatic and discursive contexts." For example, Harré (1988) makes a strong argument that pronouns are powerful linguistic mechanisms for negotiating and enforcing accountability. It seems clear that language constrains attributional processes, and that speakers have considerable flexibility in the language they use to construct events.

The linguistic approach offers two main insights for the purposes of the present study. The first, offered by Hilton's conversational rationalism, is that attribution generally takes place in social settings and that participants are keenly attuned to social requirements and constraints. Therefore any realistic study of attributional processes must take note of the social setting and participants' social orientations. The second, offered by the linguistic models, is that language encodes normative ways of doing attribution in talk. These elements are combined in the discursive approach.

3.2 The discursive approach

Several authors have approached traditional attribution territory from within a constructionist framework (e.g. Antaki, 1994, 1996; Antaki & Leudar, 1992; Edwards & Potter, 1992; Gergen & Gergen, 1980; Gergen, 1988; Gill, 1998; Harré, 1988; Heritage, 1988; Parker, 1988; Potter & Edwards, 1990; Shi, 1999, 2000). Although there are many differences in approach, there is general agreement that a constructionist approach to attribution must be sensitive to the social nature and functions of real-life attributional talk. Instead of assuming that such talk is a simple residue of cognitive processes, or a window into the cognitive workings of the mind, the discursive approach acknowledges that talk is a social resource. For example, imagine that I bump into an acquaintance who is more eager for friendship than I am who says, "I haven't heard from you in ages!" I could explain by saying, "yes, I've been very busy" or "I know, I've been avoiding you." Both of these accounts may be true, but they have different attributional implications and they perform very different social functions.

Discursive approaches to psychology are generally organised around three simple principles: that people interact socially from particular social positions, that talk in general is an indispensable means of managing social life (including the defence and modification of social positions), and that speakers are generally held accountable for their utterances and so choose their utterances with careful reference to their own social accountability (Edwards & Potter, 1993). Discursive approaches to attribution are particularly interested in how attributional talk can be useful for the social production of factuality and thereby for the management of stake and interest in social interactions. Where cognitive (and to a lesser extent linguistic) approaches to attribution take people as fundamentally oriented to determine 'real' causes for events, the discursive approach assumes that people generally try to manage their talk and behaviour to their own social advantage. In other words, the core metaphor shifts from understanding people as naive scientists to seeing them as naive politicians.

3.2.1 Subject positions, felicity and footing

Succesfully negotiating a social interaction depends on the skillful management of 'subject positions' (Davies & Harré, 1990) and 'footing' (Goffman, 1981). These concepts refer to the types of identities that people claim or deny and how they shift between them.

Davies and Harré (1990) explain that a 'subject position' is something like a social role. But where the label 'role' emphasises "static, formal and ritualistic aspects" of sociality, 'subject position' refers to a dynamic sense of self (and others) that unfolds through discursive interaction. A subject position offers a repertoire of socially meaningful social powers, vulnerabilities and actions that people may actualise or exploit in interaction. For example, a medical doctor may claim a great deal of power to control proceedings and make convincing attributions during a consultation, but runs the risk of unwelcome requests to make attributions about rashes and discharge at cocktail parties.

> A subject position incorporates both a conceptual repertoire and a location for persons within the structure of rights and those that use that repertoire. Once having taken up a particular position as one's own, a person inevitably sees the world from the vantage point of that position and in terms of the particular images, metaphors, story lines and concepts which are made relevant within the particular discursive practice in which they are positioned. At least a possibility of notional choice is inevitably involved because there are many and contradictory discursive practices that each person could engage in. Among the products of discursive practices are the very persons who engage in them (Davies & Harré, 1990, pp. 262-263).

Subject positioning is an interactive process and positions are constructed through interaction. A participant may advance a position for themselves, or may be positioned by others. In either case the position may be resisted or embraced by other interactants. This dialogical haggling over identity is not necessarily conscious or intentional. "One lives one's life in

terms of one's ongoingly produced self, whoever might be responsible for its production" (Davies & Harré, 1990, pp. 262-263).

Of course any individual, at any time, has access to numerous subject positions and these do not necessarily form a unified or coherent whole. Each position is coherent within particular story-lines of self and has a different constitution of social powers and vulnerabilities. People often shift from one position to another as the discourse shifts and different story-lines are taken up in the course of an interaction.

This shifting of subject position is what Goffman (1981) refers to as managing 'footing'. He gives an example taken from the press where President Nixon of the United States, after signing a bill, stands up and comments on a female reporter's appearance. The woman and the president engage in a short dialogue which culminates in a "broad grin" from Nixon and "roars" of laughter from the other reporters and bystanders. This incident illustrates the social management of footing on several levels. The president first shifts from his ceremonial and official position, in which he signed a bill on behalf of a nation, to a more informal personal position. He manages the shift, firstly by standing up, and secondly by engaging with the commoners. However, the way he does so emphases his personal social power. By commenting on the reporter's appearance he forces her to shift footing from her position as a professional reporter to her position as a woman on public display. Nixon asks the woman if her husband approves of her appearance, pushing her further into a position as a woman subject to male authority. In the interaction reported by Goffman, the reporter has few opportunities to challenge or resist being positioned and the president has the last word, emphasizing his position of personal power. It is argued that the management of footing is a universal feature of interaction and people constantly orient to footing even if this is not apparent from the surface value of their talk.

A subject position is generally associated with a repertoire of socially meaningful and acceptable stories, vocabularies, images, action possibilities, powers and vulnerabilities. In order to maintain social coherence, a participant must interact by drawing on the resources offered by the subject position that they are holding. Drawing on different repertoires requires shifts in footing. The degree to which one is faithful to the demands of a position is referred to by Antaki as 'felicity', in other words, "your right to perform [an] act, your sincerity [and] the obligation and ability of your hearer to respond in the appropriate way" (1994, p. 54). Felicity conditions are intricately associated with subject positions, and are both normative and negotiable.

For example, a tramp may give you a veracious ('true') account of Einstein's theory of relativity that would be less believable than a lab-coated scientist's incorrect account. In this context, the scientist fulfils felicity conditions for this sort of talk better than the tramp and is therefore better able to rhetorically position the account as believable. If one discovered that the tramp was a down-and-out Nobel laureate then the felicity conditions for the interaction would shift and the tramp's account would be more believable.

In a 'scientific' context, veracity is itself a felicity condition. There are other everyday contexts in which felicity has little to do with veracity. For example, when joking with friends or running a psychological experiment, truthfulness is not a requirement for a felicitous engagement. Edwards and Potter argue that "within a discursive psychology of attribution, the current speaker's accountability for what is said, in terms of such talk's occurrence within an interaction sequence, comes before the issue of accountability in the report itself" (1993, p. 25). Maintaining stake within an interaction takes priority over establishing 'true' or 'accurate' representations of 'reality'. In other words, felicity comes before veracity, although lack of veracity may threaten felicity in many (but not all) contexts.

The undue focus of cognitive attribution theory on 'scientific' laboratory conditions means that veracity is confused with felicity in the vast majority of attribution research, with a resultant focus on the 'errors' and 'biases' of the lay-attributor.

> The lay person's laws of thinking are therefore incriminated, in a peculiar way, as if he or she had a different brain from that of the scientist, lived in another society, or belonged to a particular species of primate, separate and distinct from the human race (Moscovici & Hewstone, 1983, p. 106).

Of course, we do not have access to the full transcripts of the key experiments in attribution theory. If we did we might find that there was a great deal more dialogical interplay concerning meaning than the published papers portray. The dominant technology for extracting information from subjects was forced-response paper-and-pencil questionnaires that, by their predetermined nature, conceal the contested nature of the knowledge that they crystallize. The questions that participants asked about what was expected of them are not recorded; only their final responses are. Moreover, participants who failed to respond as expected, for example, those who made comments in the margin or refused to answer certain questions were routinely dropped from such studies (Antaki, 1994). In any event, even if the participant's responses were included in the data, their comments and questions certainly were not. This has had the effect of hiding the contested (and contestable) nature of attributional talk from the gaze of the analyst. When such negotiations are taken as objects of study in their own right, it becomes clear that 'facts' and 'inferences' are contested territory (Edwards & Potter, 1993; Potter & Edwards, 1990). Even the taken-for-granted concept of 'consensus' is discursively constructed between people and between texts, rather than being a self-evident and empirically measurable construct. As Edwards and Potter say, "facts are the outcome, not the prior condition, of attributional discourse" (1993, p. 37).

The constructionist approach accounts for the difference between 'scientific' and 'lay' attribution by noting that the felicity requirements differ from context to context. Even within Psychology, one small branch of 'science', the felicity conditions have changed considerably since the 1950's[2]. The differences between different everyday contexts is even greater and, therefore, any account of everyday attribution or explanation must be sensitive to contextual demands.

3.2.2 Talk as a means of managing social life

Neither subject positions nor repertoires of social powers and vulnerabilities are static. On the contrary, people constantly tug at these positions as they interact. An utterance or action is socially meaningful in the context of the respective subject positions of the interlocutors, and their subject positions are built around and modified by their actions. That is, there is a dynamic and mutually-constitutive relationship between social actions and social positions.

Goffman (1981) makes it clear that the management of footing is a complex and subtle affair that requires the careful management of appearance, facial expressions, gestures, talk and many other elements of social interaction. In constructionist modes of psychology the most important of these is talk and the production of texts, partly because these are such prominent features of everyday life, but also because they fit best with available technologies for recording and analysis.

Discursive 'models' of attribution theory take attributional talk to be one of the many means of tugging at social meaning and positions (cf. Potter & Edwards, 1993). If a theory of naturally occurring attributions in text or conversation fails to take this identity-generating

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[2] And this thesis would certainly not have been an acceptable submission if they had not!

nature of talk into account then it risks mistaking discursive displays for cognitive processes. To give a jaded example, if I were to ask a woman out for a drink and she pauses and says "I can't … because I have to wash my hair," her response fulfils the discursive function of rejecting an invitation without causing offence by drawing on a lexicon of socially acceptable ways to do so. While the woman may indeed have greasy hair (and I may nevertheless take offence), I can be reasonably certain that she does not wish to pursue a relationship with me. This intuitive understanding goes far beyond the surface value of the 'because' statement, but is understandable as such because the question and response are predictable moves by which social engagements can be initiated and sidestepped. Therefore a study of attributional talk must acknowledge that such talk has multiple orientations and that the surface value of talk is underpinned by social and discursive processes related to subject positions and footing.

Gergen and Gergen (1980) argue that attributional talk "functions primarily as a device for making oneself intelligible or justifying one's behaviour within the structure of normative understanding" (p. 202). They argue that such talk is a means of advancing one's 'moral career' and social standing (after Goffman, 1959, 1961, 1963). The point is that people are invested in the outcomes of their talk and neither their choice of words nor their silences are *incidental* to some underlying cognitive mechanism; people deploy language to defend their interested positions (Edwards & Potter, 1993; Heritage, 1988; Potter & Wetherell, 1987).

3.2.3 Accountability and variability

As touched on previously, Heider had some foresight about the role of language in attribution. With a certain degree of dismay, Heider notes that "the words of the vernacular … present such an endless variety of concepts that it is hopeless to study the nature of interpersonal relations by simply classifying them" (1958, p. 10). His theoretical project was partly an attempt to lay the theoretical foundations for a formal calculus of language that

would allow the scientific representation of the *exact* meanings contained in vernacular language. He proposed that attributional words were comprised of various combinations of irreducible elements and that words could (and should) be reductively described by a linguistic calculus. In this he pre-empted the work of the linguistic attribution theorists who attempt to pin down the exact attributional meaning of words (cf. Au, 1986; Brown & Fish, 1983; Rudolph & Försterling, 2002; Semin & Fiedler, 1988).

It is now widely agreed that the exact expression of an account matters and that one turn of phrase cannot be substituted for another without a subtle (or not so subtle) shift in meaning (e.g. Antaki, 1994; Edwards & Potter, 1993). On the other hand – to Heider's dismay – language "has an infinite flexibility" (1958, p. 7) and no event or action can be uniquely associated with an immutable or invariable description (Davies & Harré, 1990; Hilton, 1990; Kress, 2001). Gergen and Gergen (1980) argue that a state of affairs may be explained "in virtually any manner" if enough social support can be produced for its defence (p. 201). Therefore language is not 'losslessly' reducible to a parsimonious calculus of the type proposed by Heider (1958). Interactants have great flexibility in choosing and holding positions and the exact means of expression is an essential part of the enterprise of building, holding and defending them (Antaki, 1994; Antaki & Leudar, 1990, 1992; Buttny, 1993; Davies & Harré, 1990; Draper, 1988; Edwards & Potter, 1993; Gergen & Gergen, 1980; Harré, 1988; Heritage, 1988; Leudar & Antaki, 1988; Potter, 1996; Potter & Edwards, 1990; Radley & Billig, 1996; Shi, 1999, 2000).

With choice comes responsibility, and interactants are held accountable for the way that they construct explanations and accounts and must be prepared to defend or modify them if necessary (Edwards & Potter, 1993). Attribution-in-language is therefore the focus of contention in ordinary conversations. Edwards and Potter (1993) give an example taken from

a lecture by Harvey Sacks where a defendant in a courtroom is asked whether he 'hit' someone. That man replies that he was dancing and he 'clipped' someone. Here it is obvious that the attributional force of the verb 'hit' is being deployed to construct an account of intentional aggression that is resisted by the defendant. This construction is then counter-attacked by the modification of the verb from 'hit' to 'clip'. Not only are the verbs the focus of struggle, but the attribution of unintentionality implied by the verb 'clip' is modified, or highlighted, by juxtaposing it with the action of dancing (an activity which can easily result in accidental contact). In this instance, it is clear that conversation is an arena in which attribution is contested, not only in the choice of verbs, but in the use of narrative to modify, contain or amplify a verb's attributional meanings.

In the courtroom narrative it is obvious that the defendant is very interested in contesting these attributions, because the context is one in which much is at stake for the various parties. However, numerous examples can be shown of stake being contested by the re-coding of attributional language in mundane, everyday situations. Antaki (1994) analyses an interaction in which a participant of a conversation returns from a cafeteria without an ice-cream that had been requested by another participant. Several turns of talk pivot around the culpability of the ice-cream defaulter and the reasonableness or unreasonableness of her failure to provide the promised ice-cream. This situation, compared to the courtroom scenario, has trivial consequences for all concerned, and yet the accounts and attributions generated by participants around the lack of ice cream are vigorously contested.

Not only are seemingly trivial accounts and explanations important aspects of interaction, but accounts and explanations are normatively expected aspects of social interaction. As such, the *failure* to provide an account, or the sidestepping of such an expectation, may be itself an analysable act (Draper, 1988; Heritage, 1988).

3.2.4 Ways of deploying attributional talk

Since there have been relatively few empirical studies exploring the functions that attributional talk can play in everyday conversations, it is not possible at this stage to produce a comprehensive list of purposes to which attributional talk can be put. In any case, ordinary people are flexible and opportunistic users of language who have scant respect for analysts' careful lists and categories (Antaki, 1994). Nevertheless, attributional talk has, so far, been shown to be have multiple (and sometimes opposing) purposes in conversation and interaction. Firstly, it can be a means of locating personal experience in broader ideological, moral or normative frameworks (Radley & Billig, 1996). For example, if fatigue can be attributed to illness, then work can be avoided without censure. Secondly, many attributions are associated with particular types of social accountability. For example, someone who *accidentally* kicks a puppy may be considered 'clumsy' while someone who does so *intentionally* may be considered 'cruel' or 'evil'. Such attributions carry social value and, in many cases, social consequences. Attributional talk is therefore used to contest, shrug-off, enforce or satisfy various types of social accountability (Buttny, 1993; Cody & McLaughlin, 1988; Fisher & Groce, 1990; Turnbull, 1992). Thirdly, attributional talk is a powerful means of constructing dialogical intersubjectivity, shared meanings and/or agreement (Hammer & Ruscher, 1997; Potter & Edwards, 1990). For example, friends commiserating with each other about an unpleasant interaction with a boss can generate shared meaning (and camaraderie) by jointly constructing the boss's behaviour as 'unreasonable' and attributing it to a dispositional quality of the boss. Fourthly, attributional talk can be an interactional strategy or conversational device for tugging at the content, direction or outcome of dialogue (Antaki, 1985b, 1996; Fisher & Groce, 1990; Weber & Vangelisti, 1991). In particular, attributional talk can be a powerful means of winning arguments or fortifying one's position by generating 'facts' that are difficult to assail (Antaki & Leudar, 1992; Edwards & Potter,

1993; Potter & Edwards, 1990; Shi, 1999, 2000). Finally, and in many cases as a function of the functionality discussed above, attributional talk is a powerful resource for living-out interpersonal power relations (cf. Gill, 1998). For the purposes of the present study, the functions of attributional talk in the generation of factual discourse (Edwards & Potter, 1993; Potter & Edwards, 1990; Potter & Wetherell, 1988; Shi, 2000) and in the social production of expertise (Gill, 1998) are key and need further explanation.

3.2.4.1 Producing factuality

In many contexts attributional talk is particularly useful in the management of stake and footing because, although people inevitably hold interested positions, it is often detrimental to a position to *appear* to hold it too fervently (Edwards & Potter, 1993). Attributional talk can construct a position of detached factuality that, nevertheless, is oriented towards defending stake and interest (cf. Hilton et al., 1992). Furthermore, by constructing *factuality*, one can rhetorically undermine alternative accounts in a way that, for example, anecdotal or biographical talk simply could not do.

3.2.4.2 Expertise

By definition, experts have a socially sanctioned handle on the 'facts'. Where a non-expert has to work hard at explaining, accounting and claim-backing, an expert is allowed to produce factual accounts simply by virtue of their expert status in a particular field. The expert, as part of an inner-circle, has a mandate to adjudicate between matters of opinion and matters of fact in a specialized domain (Moscovici & Hewstone, 1983). To do so, the expert must carefully construct 'expertise'. Gill (1998) studied attribution in the context of doctor-patient interaction and found that attribution-response sequences are an essential tool in the construction of expertise, or "a distinctive social order where knowledge and authority are distributed unequally" (p. 342).

In such interactions it is the patients' responsibility to provide enough relevant information about symptoms to allow the doctor to make a diagnosis. The doctor has the authority to adjudicate on the relevance of symptoms and ask intimate questions that direct the course of the interaction – but bear in mind that the patient has no such sanction to ask personal questions of the doctor. Gill (1998) demonstrates that patients are experts of the self; they are 'authorities' on their own symptoms – in other words, authorities in the empirical realm. However, patients were not recognised as analysts or 'theorists' regarding their symptoms. They did not have a mandate to infer causes from symptoms and, although they often mentioned their own theories about the causes of their ailments, they put these forward tentatively and tended to downplay them. Gill argues that these 'displays of uncertainty' should not be confused with the cognitive state of 'not knowing', but should rather be understood as "conversational devices that patients use to display their lack of entitlement to … knowledge about causation" (p. 345). These displays of uncertainty were inversely related to the extent to which an evaluative response is required. In other words, strong claims about causality were made in such a way that the doctor was not required to respond. When patients did demand responses from doctors, they phrased their questions and theories tentatively. Gill argues that patients did this to protect themselves from 'dissafiliative' responses such as having a direct question ignored.

In this context, doctors were not authorities on patients' subjective experience and they generally ratified the patients' knowledge of their own symptoms. However, doctors did have power to decide which elements of the patients' experiences were important, to ask intimate and penetrating questions and to ignore or respond to utterances as they saw fit. They had the final authority to objectify experience by inferring fact from symptoms.

Gill (1998) argues that the asymmetrical power relationship is both constructed and perpetuated by the rhetorical production of factuality. She noted that patients did not invite this subordination, and doctors did not enforce it. Rather, the asymmetrical power relationship was constructed and maintained in and by forms of talk. It was largely through the collaborative management of attributional talk that the doctor's position as an expert with authority to adjudicate between fact and conjecture was maintained.

3.2.5 The present study

Although the bulk of research in attribution theory has been carried out in experimental and laboratory settings (see chapters two and three), there has recently been a flurry of research in, and into, widely varied contexts including interviews (Antaki, 1985a, 1985b, 1996), 'everyday' contexts (Antaki & Naji, 1987; Draper, 1988; Malle & Knobe, 1997; Weiner, 1992), medical interactions (Fincham, 1983; Fisher & Groce, 1990; Gill, 1998; King, 1983; Radley & Billig, 1996), the media (Edwards & Potter, 1992; Hilton et al., 1992; Potter & Edwards, 1990), testimony, law and the judiciary (Aronsson & Nilholm, 1992; Atkinson & Drew, 1979; Bennet, L., 1992; Cody & McLaughlin, 1988; Edwards & Potter, 1992; Felson & Ribner, 1981), attribution and explanation amongst children (Bennett, M., 1989; Emihovich, 1986; Hewstone, Jaspars, & Lalljee, 1982; Hofer & Dobrick, 1980; Maynard, 1985; Weiner, 1980), different cultures (Bond, 1983; Harré, 1988), attribution in interpersonal attraction and intimate relationships (Fincham, 1992; Harvey et al., 1978; Orvis et al., 1976; Regan, 1978; Weber, Harvey, & Orbuch, 1992), magic tricks (Kelley, 1980) and attribution in organizations (Bies & Sitkin, 1992).

As researchers have begun to explore attributional processes in contexts outside of the laboratory, it has become increasingly apparent that, firstly, attribution is a socially produced resource that may be deployed in many contexts to achieve various ends. Secondly,

attributional talk is but one of many such resources available to interactants as they conduct their daily lives. Thirdly, the ways that attributional talk can be deployed are contextually constrained.

Since the cognitive theories of attribution historically had such a theoretical and methodological stranglehold over the field, a great deal of critique has been required in order to develop an approach that is more sensitive to social, linguistic and discursive concerns. However, although linguistic and discursive accounts of attribution are very convincing, we run the risk of throwing out the baby with the bathwater if we then argue that attributional processes are infinitely flexible and not at all subject to the frameworks revealed by cognitive theorists. The aim of the present study is to try and reintegrate some of the insights of cognitive attribution theorists into the new frameworks of attribution theory. The question, then, is to what extent do cognitive theories of attribution describe or predict the content of everyday attributional talk, and to what extent does everyday talk differ from these expectations? In line with the discursive understanding of attributional talk, it will then be necessary to attempt determine the interplay between modes of attributional talk and the social dynamics in a given setting. Some previous studies have investigated cognitive models of attribution in everyday interaction and some have investigated the discursive functions of attributional talk, but an extensive review of the literature has failed to find other studies with the same integrative goals. The present study may therefore play a role in recontextualising, repositioning and reintegrating "attribution theory" within contemporary social psychology.

4 – Method & data

This study has two distinct foci: firstly, to explore the extent to which cognitive theories of attribution successfully model the talk observed in a common everyday setting and, secondly, to explore the social functions fulfilled by such attributional talk. Accordingly, two methodologies are drawn upon. The first phase of analysis draws on a crude form of content analysis to identify attributional talk and to explore the extent to which it matches theoretical expectations, and the second uses a combination of discourse and conversation analysis to tease out the social functions of such talk. However, before specific methodologies are discussed, it will be useful to explain the source and nature of the data.

4.1 The setting

A study of everyday attribution requires a setting in which attributional talk can be reasonably expected to occur. A very common experience in modern life is that of computer failure and the process of trying to restore the failed technology to functionality. Personal experience suggests that almost anyone who uses computer technology on a regular basis experiences failure with some degree of regularity. A survey undertaken by the American magazine PCWorld, with approximately 16 000 respondents, found that, in July 2000, 56.6% of Personal Computers in American homes had at least one "problem" (Jones, 2000). Even though it is not perfectly clear what Jones means by "problem", these figures make it clear that computer failure is something that a vast number of computer users have experienced and will experience again in the near future. Dvorak (2003) quotes Bill Gates, Chairman of Microsoft Corp, as saying that 5% of Windows™ machines 'crash' twice a day. Although we are not sure exactly what Bill Gates meant by 'crash', Dvorak uses this rare statement of reliability to build a flimsy, although not implausible, argument to "estimate that there are a minimum of 30 billion Windows system crashes a year" (p. 1). He estimates, using

information from the Computer Industry Almanac, that there are approximately 700 million PC's worldwide. If Dvorak's figures are credible, then the average PC crashes approximately once a week. Even if Dvorak over-estimates computer crashes by a factor of ten, failure would still be experienced five times a year by the average computer user. The BBC News quotes Symantic, an internet security company, as estimating that "nine out of ten [users] are regularly annoyed by slow, crashing machines" (BBC News, 2003). Even though hard figures are not readily available, it is safe to say that failure is practically an unavoidable and inevitable aspect of interaction with computers.

Returning failed computers to functionality must regularly involve attributional processes. Furthermore, as soon as more than one person is involved in the troubleshooting process, participants must communicate attributional information. Therefore a troubleshooting interaction can be expected to be a rich source of attributional talk.

4.2 Data

The Information Technology (IT) bureau of a large organisation was approached for assistance and management agreed in principle to participate. The organisation had approximately 5000 staff members and, of these, approximately 2500 were equipped with personal computers. The organisation operated from four physical sites, although only one of these was sampled in this study. Approximately one third of the organisations' computers and users were located at the participating site. The decision to sample only one site was partly to limit the dataset to manageable proportions, partly to control research costs and partly for convenience.

The IT bureau is divided into several departments and each is responsible for different aspects of the IT infrastructure. For example, networking infrastructure and file servers are maintained by one department and user support is performed by another. On this site the

estimated 800 computer users were, at the time, supported by five user consultants (UC's). At the time there was a sixth position that had recently been filled but the incumbent had not yet begun work. Although approval had recently been granted for a seventh post, the selection process had not yet begun. As a result these five user consultants were under a great deal of pressure at the time of data collection.

In general, the UC's divided their time between the telephone helpdesk and fieldwork on weekly and bi-weekly rotations. Working the helpdesk involves opening "logs" for user's complaints on the computerised call-logging software. When a problem is logged it is placed in a computerised queuing system that coordinates the workload of the consultants. Where possible problems are resolved remotely by issuing verbal instructions on the telephone or by accessing the user's computer remotely via the network. While staffing the helpdesk, time that is not spent on the telephone is used to do major repairs to computers such as installing peripherals, reinstalling operating systems and so on. Fieldwork involves visiting the users' offices, which are spread across quite a wide area. Although consultants are expected to make appointments in advance, they never know how long any particular problem may take to resolve and so coordinating their own movements between users can be a challenge. They are expected to attend to a certain number of logs every day and their performance is monitored by the computerised helpdesk system and by weekly reports to their managers.

4.2.1 Ethical and procedural issues

The line-manager of the UC's was contacted first and he granted permission for the study on condition that each UC agreed as well. The project was described to them in an emailed document and in a staff-meeting attended by all but one of the UC's. They were informed of the purposes of the intended study and how the data would be used. All of the UC's agreed to

participate and actually showed great enthusiasm for the study and felt that it was long overdue.

4.2.1.1 Autonomy:

The participants were assured of anonymity along with the greatest possible degree of confidentiality, and more specifically, that management would never be provided with access to the tapes or the raw data and that their names would be changed in any transcripts. All participants agreed that the analysis could be published in the academic and popular press. Each participant signed an informed consent form to acknowledge that they had been thoroughly informed of the purposes and requirements of the study and, as a group, they agreed to participate. The UC who was not present at this meeting was on leave for the duration of the sampling process so his permission was not needed in the end.

4.2.1.2 Non-maleficence:

The transcripts recorded here represent 'slices of life' from a large institution in a small city and, at the time of observation, participants were certainly not oriented to the extended audience that may read these transcripts, although they had given their consent to be observed. Given that the study is partly concerned with deconstructing expertise, it is important that the participants do not experience any professional censure as a result of the study. Therefore it is essential that user consultants and users remain anonymous on the printed page, even to people who may know them. Names were changed during the initial transcription and, from that time, the only way of linking the alias to the real name was through an alias table kept by the researcher. Great care has been taken in the analysis to conceal any recognisable characteristics of users and UC's in the published transcripts, even when such signs are omitted at the expense of the analysis itself.

4.2.1.3 Beneficicence:

In conversation with UC's it emerged that they feel that they often seem to bear the brunt of users' frustrations and their work often goes unnoticed and unrewarded. The present study had an immediate benefit for the participants of noticing in detail what they do for the organization, and several UC's commented that it was a gratifying experience. It was also agreed that, after the study is completed, a summarized report will be sent to management. The UC's felt that this might help to highlight important issues to their line-managers.

4.2.2 Sampling and data collection

Of the four user consultants who were eventually observed, three were female and one was male. All were first-language English speakers. The UC who was away was male and a second-language English speaker, so it was a great pity for the representativeness of the sample that he was not able to participate.

The aim of the data collection process was to observe the UC's in the course of their everyday interactions. I accompanied UC's on their rounds and tape-recorded their interactions with users as inconspicuously as possible. I negotiated convenient times with each UC, but tried to sample on different days of the week. In the end I observed UC's on two Fridays, a Tuesday, and a Thursday over a three-week period. Three of the UC's were observed in the field and one was observed on the helpdesk. Unfortunately the only male UC was sampled on the helpdesk, rather than in the field, since this was the only way that we could fit the sampling into the UC's schedule. The female UCs have a theory that male and female UC's take different approaches to users and, as such, it was a pity that it was not possible to observe the two male UC's in the field to investigate this claim.

In total I observed 16 separate interactions which involved 21 different users. To make things more complicated, users would often introduce new problems while the UC was on site, so

the dataset contains 35 relatively discrete problems. Most users were quite willing to be observed and tape-recorded and, where possible interactions were recorded in their entirety. Only one user did not agree to have her voice tape-recorded and, due to the fine-grained nature of analysis, this interaction has been dropped from the study.

4.2.3 Transcription and data processing

The tape-recorded interactions were transcribed in their entirety by the researcher and two research assistants. Due to the fact that interactions were recorded in user's natural work environments, tapes were often noisy and difficult to make out. The use of a sensitive piezo-electric microphone ensured that soft speech was picked up, but it also resulted in excessive background noise. Transcription was done in several passes using a professional transcription machine and passing the signal through noise suppression filters[3] where necessary. Most of the speech was picked up reasonably clearly using this method. The final dataset consisted of approximately 200 pages, or 87,000 words of transcript.

The transcripts were transferred to QSR Software's Nudist/Nvivo™ which was used for the majority of the coding and analysis. The first step involved re-organising the data into discrete interactions and, thereafter, into discrete problems. This was a somewhat artificial way of coding the data, since a UC is often called on to solve two or more problems at once. One utterance can therefore refer to more than one problem and, in some cases, a single solution solves more than one problem. In these cases the same text was coded into two or more problems.

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[3] The noise suppression filters used are part of an effects unit for a guitar, but they were quite effective for this application.

4.2.4 Strengths and weaknesses of the data

This dataset is immensely detailed, as will become apparent in the analysis. The recording and detailed transcription of everyday interactions allows a fine-grained analysis of this slice-of-life. Enough data was recorded to get a detailed snapshot of how attributional talk may function in the attributional arena of computer failure in this organisation. In addition it allows us to identify multiple ways of using attributional talk, including those described by cognitive theories of attribution.

However, there are several reasons to avoid inferential generalisations based on this data. Firstly, sampling is non-random and there are too many potential systematic biases to justifiably assume that the exact patterns identified in the analysis are universal. Secondly, sampling was limited in time and scope. Five days worth of interaction in a single sphere of activity does not provide a firm footing to make generalisations about how attribution is always done in every context. Thirdly, the obvious presence of an observer may subtly change the way that participants make attributional talk.

However, the purpose of this analysis is not to make generalisable claims of how attribution must always be done. Rather the aim is to show how attributional talk is employed in this specialised (but common) environment, to show that this is a way of employing attributional talk and to describe what functions such talk may perform in this context.

Although my original aim as an observer was to be almost invisible, this was not possible in practice. Firstly, at the start of each interaction I needed to be introduced and the purpose of the research was explained. Users whose voices were tape-recorded were required to sign informed consent forms, and this further foregrounded the observation process. It is possible that my presence interfered with some of the social processes (for example, by amplifying participants' need to defend their subject positions) but since the point of the analysis is to

show how attributional talk *can* be employed in social interactions this does not present any threat to the findings. Unlike experimental studies of attribution, this study acknowledges the research situation as a valid context for attributional talk in spite of potential differences with unobserved everyday contexts. Although the talk recorded may have been different in the researcher's absence, this does not mean it is not a valid way of doing attributional talk (cf. Silverman, 2000).

4.3 Methods of analysis

The chosen context did, indeed, turn out to be a rich source of attributional talk. However, the task of analysing over 87,000 words of undifferentiated everyday talk was a daunting one. Participants – somewhat inconveniently – did not limit themselves to attributional talk, but conversed about diverse topics such as sport, politics and weather as well as the problem at hand. The first challenge was to organise the data corpus into analysable units.

4.3.1 Organizing the data

Of the 16 interactions between users and UC's, only five were confined to solving one and only one problem. Other interactions dealt with up to four problems in the course of the consultation and many of these were dealt with concurrently. Many of these problems were introduced casually rather than reported through the official channels. For example, a UC might start a diagnostic procedure such as a virus check and, while they were waiting, the user might introduce an additional problem. The UC might then switch to troubleshooting the other problem and return to the original problem a few minutes later. The second analytic task, then, was to tease out individual problems from the undifferentiated stream of dialogue. An aspect of a computer's behaviour was considered to be a 'problem' if it was mentioned by the user or UC as less-than-ideal or requiring attention *and* it was either ratified by the other party with some kind of troubleshooting activity or an explanation. Take the following

dialogue as an example (where UC refers to the User Consultant, OBS to the observer and U would refer to the user):

Extract 1

1	UC1:	(3.0) Done it. (3.0) Just terribly slow and everyone's complaining about
2		~the stiffy disks from these [brandname] machines~.
3	OBS:	[Oh really?]

This extract is taken from an interaction where the primary problem concerns the inability to read a file from the disk drive. Here the UC successfully saves a document to disk and mentions that it was 'slow' but that 'everyone' is 'complaining' about the disk drives on this brand of machine. Although the slowness of the disk drive could conceivably have been coded as a problem, it was not ratified by the user and was not taken up in later turns of talk. The failure of participants to orient to the slowness as a problem indicates that this particular information exchange constructs the slowness as something that does *not* need to be addressed since it is something that 'everyone' is experiencing with those machines. Since it is framed by participants as an intractable, non-fixable condition it was coded as information exchange, but not as a problem distinct from the parent problem of disk failure.

Another difficulty was that problems were often dealt with concurrently and were sometimes related to a common underlying cause. For example, in one interaction the UC is troubleshooting two problem machines in the same room: a computer that is booting very slowly and a computer that will not print. During the course of the interaction the UC frequently shifts between the two computers and, finally, discovers that both problems are caused because the room only has one network connection and the users are swapping the network cable between the two computers. The approach for coding such overlapping problems was cautious. Where a stretch of dialogue covered two problems, or where it was

not clear which of the problems the talk referred to, it was coded into each of the problem categories.

The final outcome of this stage of coding was 34 documents, each containing talk oriented to information exchange regarding a distinct problem. Although 35 problems were observed, one participant did not give permission for the interaction to be recorded, so the problem could not enter the analysis. Some of these contained only a few short turns of talk and others extended over several visits and several hundred lines of transcript.

Most of the observed problems were oriented to discussing or repairing faults that required a solution or, perhaps, oriented to discussing *perceived* faults for which a solution was expected. I will call these attributional problems because they are generally oriented to the social goal of co-operatively returning the system to functionality (although, this is not always the case, as I will discuss later). However, three of the problems were procedural rather than attributional. By this I mean that their resolution required some kind of straightforward action that did not involve attributional activity of any kind. Problem 16 required the UC to carry a new printer to the site, take it out of the box and install it. Problem 17 involved upgrading Microsoft Office 97 to 2000, and Problem 21 involved explaining to a user how to go about navigating the correct bureaucratic channels in order to replace an old PC. Although these problems required actions for their resolution, the interactions could not be considered attributional and, as such, they did not enter the analysis.

Some attributional problems, although they were clearly valid problems, were terminated by participants without substantial engagement. Since I will talk in detail in later chapters about the discursive work involved in managing the practical terms of engagement, it is useful at this stage to discuss the different ways that problems were terminated or dealt with by participants.

Of the 31 attributional problems, 18 ended in a classic resolution in which the participants agreed that a satisfactory solution had been achieved and that the problem was no longer a problem. The balance of the problems did not result in a clear resolution – in other words, UC's were not able to 'close the case'. Participants dealt with these cases in one of two ways (and occasionally both): Firstly, problems were sometimes "explained away" in a way that allowed the termination of the problem-solving episode without substantial engagement, as illustrated in Example 1. Once the 'problematic' behaviour is reframed as normal then the problem can be terminated without much attributional activity.

Example 1

U:	[the user describes an unexpected computer behaviour]
UC:	O.K. That would be your F-Prot updating itself.
U:	OK (.) Right. OK I just wondered because I thou(h)ght I(h)'ve clo(h)sed the viru(h)s che(h)ck what's it doing n(h)ow?

Secondly, if a problem could not be solved or explained away, then it was deferred so that the problem could be dropped until some (often unspecified) time in the future. This is illustrated in Example 2 and Example 3, below.

Example 2

U2:	(3) So (.) uh (.) for the virus (.) your/you'll (1) bring a disk across to get that fixed up.
C1:	yes
U2:	I've got a (.) Monday and Tuesday (inaudible) ***'s got (1) the key to my office (C1: Ok)
C1:	(4) Thank you::

Example 3

UC:	Oh OK: (.) So if it doesn't work I'll just ...(F1:= Ya) (7) I'll/I'll pop by tomorrow?
OBS:	OK (.)
UC:	Just as long as that Groupwise still (prints) hey?
U1:	Mm.

U2: Oh thanks very much.
U1: OK.
U2: Good bye.
UC: We'll see you tomorrow.
U1: = Ya
UC: (.) (inaudible) (2) [Sigh] Alright (inaudible)
OBS: = Thanks
U2: OK, Bye.

Table 1, below, provides details of each distinct problem identified in the dataset. For each, the problem is described, the agents are identified and the outcome of the problem is specified. This set of problems formed the basis for the rest of the analysis.

Table 1: Distinct problems identified

Problem	Agents	Outcome
1. Floppy drive faulty	UC1, U1	Deferred
2. U2 worried about automatic "Copying Files"	UC1, U2	Explained away
3. Undue hard-disk fragmentation, "hangs a lot" & "very slow"	UC1, U1, U2	Deferred
4. New computer very slow	UC1, U5	Solved
5. Not printing	UC1, U3, U4, U5	Solved
6. Difficulty reconnecting cables and peripherals	UC1, U6, U7	Solved
7. Update anti-virus from internet	UC1, U6	Deferred
8. Misplaced document	UC1, U6	Solved
9. Printing problem	UC1, U6	Solved
10. Blank monitor	UC2, U9 with U8 present	Solved
11. Printing problem	UC2, U8 with U9 present	Deferred
12. Printer repair (mechanical)	UC5, U9 with U8 & UC2 present	Solved
13. Printing problems related to virus	UC2, U10	Solved
14. Blank monitor	UC2, U11	Solved
15. Unable to open Adobe Acrobat file received as email attachment	UC2, U11	Solved
16. New printer installation	UC2, user absent	Procedural, not attributional

Problem	Agents	Outcome
17. Upgrading Office from 97 to 2000	UC2, U12, U13	Procedural, not attributional
18. Request to fix faulty installation of Real Player	UC2, U12	Deferred without engagement.
19. GroupWise not responding; Anti-virus software corrupt	UC2, U14	Solved
20. Printer "not set"	UC2, U14	Solved
21. Computer is too old; replacement required	UC2, U14	Procedural, not attributional
22. Slow machine	UC2	Solved
23. Printing problem	UC3, U15	Solved
24. Machine hangs occasionally	UC3, U15	Deferred
25. PC hanging and problem with GroupWise attachments after installing Windows 2000	UC3, U16	User did not give permission to record interaction.
26. Web browser not working	UC3, U17	Deferred
27. Student users lack rights to save on the local drive	UC3, U19	Solved
28. Proxy configuration used in office is not working at another machine.	UC3, U19	Explained away/Deferred
29. Modem not working	UC4 and others. No Users.	Solved
30. Setting up unfamiliar peripherals	UC1 and others, no users	Solved
31. Virus	UC1, U20	Explained way/Deferred
32. MS Word 'misbehaving'	UC1, U20	Explained way/Deferred
33. Machine is slow	UC1, U20	Explained way/Deferred
34. Known virus. Continual re-infection	UC1, U21	Deferred
35. Network problem	UC3, U18	Solved

4.3.2 Defining attributional talk

Harré (1988) makes the bold claim that the demanding and giving of explanations is probably a universal element of every human society. However, when researchers began to investigate

'attribution' in natural contexts, it soon became clear that defining what attribution *is*, and how to identify it in an undifferentiated stream of dialogue and discourse, is not as easy as it appears in strictly controlled laboratory conditions. So far in this discussion, I have already used 'attribution', 'attributional talk', 'explanation', 'accounts' and 'excuses' to refer to the varieties of talk that do attributional work. Other authors add 'exoneration' (Antaki, 1994; Scott & Lyman, 1968), 'attributive explanations' (Slugoski, Lalljee, Lamb, & Ginsburg, 1993), 'causal explanation' (Edwards & Potter, 1993; Hammer & Ruscher, 1997; Hilton, 1990; Hilton et al., 1992; Hilton, Smith, & Kim, 1995), 'factual description' (Edwards & Potter, 1993), 'claims' and 'claim-backing' (Antaki & Leudar, 1990, 1992), 'cause-reporting' (Antaki & Leudar, 1992), 'reasons' (McClure, 1992; McLaughlin, Cody, Dickson, & Manusov, 1992), 'failure-event-accounts' (Aronsson & Nilholm, 1992), 'causal or explanatory statements' (Harvey et al., 1988), 'justification' (Antaki, 1988; Cody & McLaughlin, 1988), 'attributional explanation' (Shi, 1999), 'attributional response sequences' (Gill, 1998) and 'argument' (Antaki, 1994; Potter & Edwards, 1990). While this is by no means a complete dictionary of the terms used by researchers to refer to talk involved in attribution, it does give an idea of the diversity (and looseness) of the terminology in the field. These categories are somewhat artificial; they overlap, and are not necessarily identifiable from the surface value of talk (Antaki, 1994; Antaki & Leudar, 1990; Draper, 1988).

Antaki (1994), provides a useful guideline for analysis. He argues that the most useful classification of talk is one that orients to the participants' understandings – and these can only be identified through their responses. For example, if a participant orients to a statement by backing a claim, then that statement can be identified as a challenge to a previous (and possibly implicit) claim. Basing the coding of utterances on the *speaker's own practices* bypasses many of the epistemological difficulties of naturalistic observation.

Cognitive approaches to attribution take explanations to be directly oriented to causes, and to correspond directly to cognitive processes happening in the head. We have already seen that language does not have this simplistic relationship to 'cognition'. Instead, Antaki (1994) argues that explanations can be any utterance that clarifies some contested aspect of an interaction, whether there is a direct challenge (such as a 'why' question) or not. Proponents of the 'strong' constructivist position (e.g. Edwards & Potter, 1993; Parker, 1988; Potter & Wetherell, 1987; Wetherell & Potter, 1988) take the stand that *all* talk is oriented to constructing identity positions and defending against potential counter-claims, and is therefore explanatory in nature. Antaki (1994) takes a more moderate stance:

> The important thing to recall is that this 'making clear' is a relational matter: what makes something a making-plain rather than (or as well as) a mere report of information is its force as a response to some puzzle. But this puzzle has to be something more substantial than a mere lack of information, otherwise we should be extending 'explanation' too widely, allowing *it's half-past four* to count as an 'explanation' when it is more simply a flat response to a simple request for the time. Puzzles which require 'making clear' lean towards the 'accountable': social or interpersonal thorns on which something in the moral order has snagged, however temporarily, until it is unhooked and proceedings can continue (pp. 3-4).

He therefore divides talk into two rough and ready categories – explanatory and non-explanatory talk. However, even these broad distinctions are not always easy to observe in talk. For example, if the statement '*it's half-past* four' follows '*what's the time?*' then it may be understood as "simply a flat response to a simple request for the time" as Antaki suggests, above. However, if it's said by a shop-attendant to a customer without a preceding question, then it might be interpreted as an explanation that the shop is about to close and as a request for the customer to conclude their business and leave. Antaki (1994) concludes that "the safest thing is to take no strict line on what will count as an explanation beyond the very

general principle that it be some stretch of talk hearable as being a resolution of some problematic state of affairs" (p. 4). Of course, this does not make things easier for the analyst since "explanations may contain any kind of information ... [and] almost anything may, in the right circumstances, count as an explanation..." (Draper, 1988, p. 16). Following the approach of conversation analysis, Antaki insists that the analyst must attend to the participants' own orientations in talk and to be very sensitive to the sequential structuring of dialogue. For example, if this approach is applied to the example above, then the 'meaning' or function of "*it's half-past four*" is defined by its status as a reply to a previous utterance (such as "*what's the time?*") or in the context of a sequential response (such as "*sorry, I'm almost done*").

The first thing that stands out about real-life attribution, in comparison to textbook cognitive models, is the lack of distinct boundaries between attributional and other types of talk. Take the following interaction as an example:

Extract 2

1	U10:	Disin-/It/it will automatically disinfect it [(inaudible)]
2	UC2:	It will disinfect it, ja (2) (U10: okay) because I've set it to automatically do
3		that (U10: Hmm okay)
4		(3)
5	UC2:	~~Okay I just want to::~~
6		(2)
7	U10:	So you guys walking around this way?
8	UC2:	No, no. no (.) I:: drove (.) down because we have to go to Law after this
9		(U10: (inaudible)) he doesn't mind getting wet hhh
10	U10:	[hhh].hh
11	UC2:	.hh (2) ~ I just don't like (.) the minute I/my hair gets wet it's all fuzzy
12		bleh:: ~ (1) I mean all the (1) it's got a bit of (.) curl in it (.) so it .hh (1)
13	U10:	Curls bette::r (UC2: huh?) Curls bette:r (.) I'd rather go for I'd go for curl
14		any day
15	UC2:	No:: it's not um (.) proper curl curl (.) it's a bit of a wa:ve I think
16	U10:	Hm (.) you just lost me UC2
17	UC2:	.hhh

Lines 1 to 6 are a continuation of an extended stretch of dialogue about computer viruses, how the computer may have been infected and how to detect and remove them. Notice how seamlessly the conversation switches to the weather and then to the effect of dampness on hairstyles. The most obvious markers of the shift are the pauses at lines 4 and 6, and many shifts between attributional and non-attributional talk are even less distinct than this. Rules for the identification of specific types of attributional talk will be outlined below.

4.3.3 Content analysis

At its most basic level, content analysis involves counting instances of categories in talk or text and ranges from the extremely simple, such as counting instances of predefined words in newspapers, to very complex, such as counting instances of "racism" in media reports. There is a great deal of flexibility in how categories can be defined, counted and confirmed, and the degree of complexity in each of these stages of analysis depends on the level of rigour required and the purposes to which the results will be put (Weber, 1985). The aims of the content analysis component of the present study are modest. Firstly, the content analysis aims to provide a springboard for a more intricate conversation and discourse analysis and is therefore not expected to stand alone as a comprehensive response to the research problem. Secondly, the content analysis investigates the extent to which the patterns of information predicted by cognitive attribution theories are observable in naturalistic conversation. Consequently its aims are confirmatory rather than inferential, and generalisability is not an important goal. For these reasons it was acceptable to carry out the content analysis with fewer checks and balances than a study based solely on a content analysis would require. For example, since it is standard practice for an individual analyst to perform a conversation and discourse analysis, it was unnecessary to employ multiple coders and calculate inter-rater reliability for the less important content analysis.

4.3.3.1 Categorical rules

This content analysis required, firstly, the identification of any kind of attributional talk from the undifferentiated streams of dialogue and, secondly, some way of determining whether such attributional talk corresponds either to Jones & Davis' (1965) theory of correspondent inferences or Kelley's (1967) 'man-the-scientist' model or both.

The first task was to reliably distinguish between attributional and non-attributional talk. Since cognitive theories of attribution are always concerned with the exchange of information, the data set was first split into talk that offered or requested information – about the problem or the agents – and that which did not. Even this apparently simple task is complicated by the lack of clear markers in dialogue to distinguish between talk that is informative about the problem and that which is not. To avoid prematurely ignoring potentially valuable data, this stage of coding erred on the side of over-inclusiveness (cf. Potter & Wetherell, 1987). Essentially only dialogue that was very clearly *not* related to the problem at hand (or a problem introduced later) was coded as non-informative and everything else was coded as informative. These categories were considered mutually exclusive and a search in NVIVO for text coded in neither or both categories ensured that all text was coded as one or the other.

For the bulk of recorded dialogue, distinguishing between informative and non-informative talk was a self-evident affair. For example, Extract 3, below, is clearly about an attributional problem and Extract 4 clearly is not.

Extract 3

1 2 3 4 5	UC1:	Aha! (3) OK… (3) I can't think of any possible cause of that problem can you? (4) It's not the drive (.) the drive is functioning fine (3) It's not the program (1) the program's functioning fine (.) it's not (.) the specific disk she's using ((inaudible word)) (.) on another machine (2) unless it's been formatted on another machine and the heads were not aligned properly and

she's (.) had (.) had to use the (OBS: mmm) same machine (2) That's what I should do (.) is get the stiffy (1) from her now and see if it can be read here.

Extract 4

U14:	No (.) I'm/I'm just putting the stationery inside the cupboard
UC1:	Oh (.) ok (.) yes
	(2)
UC1:	You're getting really organised here. I long for an office (.) like this (.) I still have my small space (.) You haven't been to our offices is it? (2) In a room:: about this wide (.) smaller than this I think (1) No about this size huh (.) We've got three people (2) Three people.

Antaki's (1994) conversational approach to distinguishing between attributional and other kinds of talk was not drawn on in such cases where the nature of talk was clear. However, when it came to determining the boundaries between kinds of talk, and to categorising instances where the purpose of talk was not clear, then coding proceeded by using participants' orientations to talk to flag its purpose, as Antaki suggests.

The next step was to try to associate the information exchanged in each problem with the types of information exchange required or predicted by the cognitive theories of attribution. Broadly speaking, these theories are concerned with two types of information. The theories of Heider (1958) and Jones & Davis (1965) are concerned with information about the agents, particularly about intentions and dispositions, while Kelley's (1967) model is concerned with information about the problem divided into three subtypes: consensus, consistency and distinctiveness information. Consensus information concerns how other individuals experience an effect, and how the effect changes when experienced by other people. For example, in Kelley's movie example (see section 2.3), if no other individuals enjoy a movie that I enjoy very much, then the effect of enjoyment can be attributed to something about me as an individual. Consistency refers to the change in the problem over time and over modality while distinctiveness refers to the change induced in the effect when different 'things' are substituted into the activity.

While information about intentions, dispositions and consensus information are relatively easy to identify, there are two main problems in operationalizing consistency and distinctiveness information. Firstly, investigating the behaviour of two different things (distinctiveness) almost invariably involves a change in time between trials. This means that distinctiveness information almost always overlaps with consistency information. Secondly, in this context it is often difficult to determine whether something that changes is a 'thing' (and should be coded as distinctiveness) or a 'modality' (coded as consistency). In Kelley's (1967) movie example, two different titles are clearly 'things' and different venues such as a theatre complex and a drive-in are clearly 'modalities'. However, some of the factors that may influence enjoyment at the movies are not clearly one or the other. For example, if I eat popcorn the first time I watch a movie and jelly-tots the second time, are these different 'things', or different modalities of snack? This problem is amplified when dealing with computers, since many of the 'things' that influence their behaviour are intangibles. For example, are the email clients GroupWise and Outlook two different programs, or two modalities of the same type of program? In an example that actually occurred when troubleshooting a printing problem, the UC did a test-print from the printer dialogue of the control panel and another from MS Word. If the test-print worked but the MSWord print job did not, is this because Word and the printer control panel are different applications (i.e. different 'things ') or because they are different modalities of the same 'thing' (i.e. different applications that both access an underlying print driver)? With computer problems it is rare that 'things' and 'modalities' are easily distinguishable. This ambiguity is contained in Kelley's (1967) original model and cannot be nullified by sophisticated coding schedules or inter-rater reliability indexes. This is not necessarily a problem with the model since, as long as information has been consistently represented, the ANOVA cube will still isolate the cause of the problem. In the current study the participants' orientation to the utterance was taken as

the strongest indication of its purpose, but in sufficiently ambiguous cases, extracts have been coded for both consistency and distinctiveness. Since the time invariably changes between trials in any case this coding practice is not considered problematic.

These basic principles were elaborated and operationalized in a detailed coding protocol. I will present each coding rule with at least one example to demonstrate how these somewhat abstract concepts were applied in practice. This will demonstrate that, although this content analysis may be more 'subjective' than proponents of the method may be used to, it is nevertheless rigorous and robust in ways familiar to discourse and conversation analysts.

TALK ABOUT INTENTIONS AND DISPOSITIONS:

Firstly, in a few cases, participants spoke directly about their own plans, intentions and/or dispositions. This type of direct talk about intentions is reflected in Example 4 and Example 5. Of course, a cognitive analyst might argue that what people *say* may not represent their *true* internal state. However, since this study aims to investigate how cognitive attribution theories are reflected in *talk*, this is not problematic.

Example 4

UC:	O.K I'd like to come down and make (.) a (.) well (1.0) have a look and see what the problem <u>is</u> …

Example 5

UC:	<u>Now</u> I'm gonna have to get her <u>back</u> here because it's working for me and now I want her to come here and show me <u>what</u> she was doing.

Secondly, participants may engage in conjecture about the motivation, intentions or dispositions of other participants, as reflected in Example 6. In this instance, the UC is discussing the possibility that the user may have "lied" about the problem. This would have a bearing on the user's intentions for reporting the problem – clearly if she was "lying" then her

intentions would be other than the simple desire to have her computer fixed! In the final line of the example the UC sets up a dispositional dichotomy between liars and people who are "OK" – and categorises the user as "OK". Although I will show in the analysis that this extract performs other functions, the talk is clearly codable as concerning intentions and dispositions. Similar instances of talk concerning dispositions can also be seen in Example 7 (helplessness), Example 8 (callousness) and Example 9 (humility).

Example 6

UC:	~And she (.) she can't be lying.~
OBS:	No.
	(3)
UC:	If we can open that document twice (1) ~and one day you don't~ (manage to) sa:ve. ~~~She's not lying~~~ (1) She's OK.

Example 7

UC:	… and then at the day there's a kind of (3) u::m (3) helplessness (.) on the part of the users here (2) They don't perceive it as their problem.

Example 8

UC:	A:nd we can be quite callous (.) and say well (1) sorry we have to delete the files.

Example 9

UC:	… he's not (1) very humble …

Thirdly, instead of talking about intentions or dispositions of individuals as shown in the examples above, participants may draw on or generate stereotypes that have a bearing on the intentions or dispositional qualities of all members of a group. This kind of stereotyping can be seen in the following examples. In Example 10 a specific group of users are "computer literate", in Example 11 "people like that" like to have things explained, in Example 12 a particular user belongs to the group of "our nasty users", and in Example 13 a user is

admonished to be an "excellent computer user", presumably in contrast to a less-than-excellent kind of user.

Example 10

UC: The academics I was doing in Agric yesterday (1) they're all (.) very computer literate.

Example 11

UC: So it's, you know, the people like that (.) they love it when you explain something more to them (2)

Example 12

UC: She's one of our (3) nasty users …

Example 13

UC: OK bye [User] (.) enjoy the rest of (.) your day=
U: Hopefully you won't have to see me very soon
UC: Hopefully (U: hh) Don't forget to open (inaudible - both talking together) (3) You'll be an excellent computer user (.) no more viruses

TALK CONCERNING CONSENSUS INFORMATION

In this dataset any information offered by, or requested from, another individual regarding the presence, absence or behaviour of the problem or effect was coded as consensus information. Of course, the organizational procedure by which the problem is reported to the support helpdesk by the user prior to the consultant's visit means that all official problems already contain consensus information at the start of the interaction. However, unless this information is made explicit by the participants during the recorded interaction, it has not been included in the analysis. There are a number of ways in which consensus information can be spoken about (or around). Firstly, a participant may make a *request* for information about another individual's experience of the problem, as demonstrated in Example 14. Such a request is coded as consensus information even in cases where a reply is not forthcoming.

Example 14

UC:	It's only U21::: (.) who:: (.) had a problem on her machine (.) not you? (1)
U20:	Ja (.) er later on it (.) it came on my machine (2)

Secondly, a participant may *offer* information about their own or another individual's experience of the problem with or without a request, as demonstrated in Example 15 and Example 16. The key here is that information is framed as personal *experience* of a problem and is offered in comparison to the experience of another participant. For example, in Example 15, if the user had replied "that screen *always* comes up" then it would have been coded as consistency information because it would concern the permanence of the behaviour over time. As it stands, however, the use of first person pronouns marks the talk as oriented to consensus.

Example 15

UC:	(one moment) (.)
U:	I had that scree:n.
UC:	No there was another one. (.)

Example 16

UC:	(1) I'm not finding it particularly slow.

Thirdly, any clearly marked attempt to *observe* another individual's actions or compare experience was coded as consensus information. This can be seen in Example 17 where a UC asks a user to corroborate her experience of the reported problem. Similarly, in Example 18 the UC says that she needs to observe the users actions. This would be coded as consensus even if the proposed observation did not occur.

Example 17

UC:	[User]?
	(1)
U:	Ja?
UC:	Would you like to come through (.) I would just like to do a test print (1) because you'll know at what point it was throwing up an error …

Example 18

UC:	Now I'm gonna have to get her back here because it's working for me and now I want her to come here and show me what she was doing.

Fourthly, appeals to other individuals for information about the problem or for corroborative evidence about their experience of the problem were coded as consensus. This type of request was generally made by a user consultant to another user consultant, as is the case in Example 19.

Example 19

UC:	[another user consultant] said he noticed that there was a problem with your NT (.) that it (.) that the (.) directory structure was incorrect. That it all...
U:	What was that?
UC:	Okay (.) he didn't mention anything to you? (.) About it (.) 'cause he said to me I might have to redo the machine.
U:	All he said to me is that (.) the machine hasn't bee:n (.) reformatted for some time (.)

TALK CONCERNING CONSISTENCY INFORMATION:

Any attempt to gain or offer information about the changing nature of the problem over time or over different modalities has been coded as consistency. This may take the form of, firstly, requests or offers of information about the specific behaviour of the problematic item (such as a computer) in the past, a comparison between current behaviour and past behaviour, or predictions of such behaviour in the future. This is illustrated in Example 20 in which a user consultant compares the present behaviour of a diskette with its previous behaviour and in Example 21 where the UC makes a prediction that the user's modem "will be fine now". The

key here is that the participants' talk relates to the change, potential change or lack of change in the behaviour of a specific item over time.

Example 20

UC:	OK, can access the files on this stiffy that you were using last week so it's not a problem with the stiffy drive.

Example 21

U:	Ok. (5) um (.) my modem often (.) wouldn't (.) connect (.) The internet (inaudible) try a connection (3) (inaudible) (8) (inaudible)
UC:	Ya.
	(7)
U:	Could you set it up for me (.) (before you go)
UC:	Ah no (.) it'll be fine now
U:	=all/it's ok now?

Secondly, consistency information may take the form of an offer or request for history or biography regarding the problem. While this historical information may relate to the user, UC, computer or any other subject, the talk must be relevant to the problem in order to be coded as consistency, as in Example 22. This passage does contain consensus information, in the sense that it may be referring to the experience of two users with the same machine, but it also concerns consistency information because it provides a history of the computer's behaviour over time. (I will discuss the issue of overlapping codes below.)

Example 22

User:	(.) There was a bit of a/a: reshuffle of our machine's and I inherited this machine from my (.) colleague next door (.) (OBS: Ya) (.) An:d since the:n (.) hasn't been too bad (.)

In contrast, although Example 23 is historical and biographical, it could not be coded as consistency information because it does not concern any aspect of the problem.

Example 23

P14:	Um no that's my son's zulu name

C1:	Oh (.)
P14:	Mmm (.) given names my friend used to name us
C1:	Who gave him the: (.) the names
P14:	Um years back we had (.) um:: (.) a bi:g (inaudible) (men put in Concrete Fencing) and these 2 brothers (1) who were very close to the guy who owned the business and um (.) and (.) um (1) they just sort of became friends and they (.) gave him (.) the name (.) (MS'bu)

Thirdly, consistency information may take the form of an offer of or request for information relating to the frequency, transience or permanence of an action, effect or problem. This is illustrated in Example 24 where the user says a particular set of symptoms occur "every time" and, later, "every single time". In Example 25 the UC requests information about the frequency with which the user accesses a disk drive.

Example 24

U:	Every time I go into Group-wise I've actually got to go in (.) and:: (.) um (4) into display:: it doesn't display everything I've got to put all items. (1) Every single time. (1) It doesn't come up automatically

Example 25

UC:	How often (.) do you use this drive?

TALK CONCERNING DISTINCTIVENESS INFORMATION

Any talk related to the experience of the problematic effect when different 'things' have been substituted into the problem is coded as distinctiveness information. This is a common troubleshooting approach and coding is generally unproblematic, as can be seen in Example 26 where a user consultant suggests that they remove a component of the computer system to try to isolate the fault. Similarly, in Example 27, the UC suggests that a different document be substituted into the problem to see if the effect (inability to save the document) is experienced with all documents.

Example 26

UC:	I'm just wondering if we can't take your (2) scanner out of the loop (3) All the stuff that's (2) connects to the scanner (.) maybe that's
U:	=causing the problem?

Example 27

UC:	OK so there may be a problem with on of the documents that you were using (.) So I wonder if you could (.) er call up one of those documents (.) and try to save that?

Secondly, any problem-related talk concerning the differences between computers, applications or diagnostic tools has been coded as consistency. This is illustrated in Example 28 where the user consultant explains why she should run her own virus check even though the user ran one the day before.

Example 28

U:	I did virus check yesterday.
UC:	(2) Ya. (1) This is not (.) this is not (.) the F(.)Prot virus checker (.) it's another one and you have to (2) load Windows (.) into memory in a different way (2) to run these (3) scans (2) I'll
U:	=mmmmmm

Thirdly, diagnostic talk related to specifying the current components of the computer system has been coded as distinctiveness. This can be seen in Example 29.

Example 29

UC:	(3) U:m (1) You've still got ABSA Internet Explorer.
U:	=Yes.

Fourthly, distinctiveness information includes talk related to exploring what components are different at the time of problem compared to before the problem originated. An example of this is displayed in Example 30.

Example 30

UC:	what is this other device here? (2) Oh it's video (.) do you know what it's for?
U:	It's like a video camera
UC:	=video camera (3) O::h!
U:	I haven't got it to work (huhuh) My son gave it to me from England
UC:	(5) How long ago did you put it in?
U:	About (2) two years (.) (inaudible) ago.

Finally, consistency information includes talk related to components that might be changed in diagnostic or repair processes in the future, as illustrated in Example 31.

Example 31

U:	(2) Ya um one problem is sorry (.) sorry (.) one problem is that uh::: um (2) the machine is slow
UC:	Ya
U:	So they are also have to put in a (.) what they call it, a
UC:	Video card
U:	A video card (.) that's right

DEALING WITH OVERLAP

It should already be apparent that speakers are not particularly concerned with analytic categories, and a single utterance may work on multiple types of attributional information at once. I have already mentioned that consistency and distinctiveness information are difficult to separate, since testing the impact of a component on an effect must, by definition, involve a change in time as well. This is an overlap inherent in Kelley's (1967) model. While this overlap almost always concerns consistency and distinctiveness information, it is also occasionally present in cases where attempts to generate information about intentions, dispositions or consensus involve a change in time as well (see Example 5, Example 14, Example 18 and Example 19).

In addition to this theoretical intertwining, participants often combine different types of information in single utterances or conversational sequences and therefore work at two or more types of information concurrently. This is illustrated in Example 32 where the User offers consensus information and the UC reframes it as consistency information.

Example 32

U:	I think [another UC] came and he (inaudible) checked
UC:	It appears now Nimda is still with you

Example 33 concerns consensus, consistency and distinctiveness information in the same conversational sequence. The user brings in corroborative evidence (consensus) and at the same time offers a history of the problem (consistency) and the UC draws in distinctiveness information.

Example 33

U:	(.) Nimda (2) ja I've got the third of the tenth (.) and (.) UC4 checked these (1) and they are fine
UC1:	Did he check them on this machi:ne? (.) or did he take them away and check them?
U:	He checked them on this machi:ne when I wasn't linked to the LAN.

In all such cases, each type of information was coded individually. As a result, a single utterance or conversational sequence can, conceivably, be coded as every type of attributional information.

BOUNDARIES

It is very difficult to determine the exact point where different types of talk begin and end in a continuous stream of dialogue, and the methodology would lack integrity if it claimed that boundaries have been exactly and reliably marked. Instead, it was decided that the analysis would focus on the dichotomous presence or absence of each type of information in the

interaction as a whole, rather than ineffectually attempting to count exact frequencies of each type of talk. This analytic decision means that the fuzziness of boundaries between types of talk is unimportant in this analysis.

SURFACE VS DEPTH CODING

Although these rules for dividing attributional talk into types are somewhat simplistic, it must be remembered that so are the theories upon which the categories are based. Since it is the aim of this study to show that the use of attributional talk in social settings goes beyond the surface value of such talk, it was acceptable for the purposes of the first stage of analysis (that is, the content analysis) to stick roughly to the surface value of the talk when counting categories. Holders of strong constructionist positions, such as Potter and Edwards (1993), would argue that such surface coding of text is problematic because conversational objects such as 'problems' are discursively produced social achievements, rather than self-evident artefacts. However, it will be left to the second phase of analysis (that is, the more detailed conversation and discourse analysis) to show how attributional talk constructs problems, and how such talk is used to generate and defend larger social objects such as 'expertise'. The content-analysis coding forms the platform from which the conversation and discourse analysis proceeds.

4.3.4 Relevant aspects of discourse and conversation analysis

4.3.4.1 Explanations and accounts

Since explanations and accounts are very broad categories of attributional talk, and there is much confusion amongst theorists about their exact definitions and boundaries, it would be a futile and purely academic exercise to attempt to distinguish between them. This study will make use of Antaki and Leudar's definition of an 'account' as a sub-type of explanation that

is "... meant to excuse, justify or otherwise exonerate the speaker from socially sanctionable behaviour ..." (1992, p. 41). An account tells a story about the world, and about the individual's responsibilities in it, and therefore is an essential means of constructing attributional representations (Radley & Billig, 1996). Accounts and explanations make sense of social life and, in so doing, they reconstruct it.

4.3.4.2 Descriptions, opinions and the generation of 'factuality'

As discussed earlier, people hold interested positions and attend to their footing in dialogue. In many contexts, however, it is a disadvantage to reveal one's interestedness (or 'bias'). One of the problems with explanations and, particularly, with accounts, is that they may betray a position as interested when the context may demand impartiality or disinterestedness. Edwards and Potter (1993) argue that factual descriptions are essential tools for constructing explanations and accounts that appear to be neutral, unbiased and impersonal. Descriptions can serve as 'externalising devices' that generate a sense of factuality by appearing to be "simple, uninterpreted, and unmotivated". Therefore "... descriptions are likely to be constructed...for...attributional effects." (p. 33). Appropriate factual description may underpin particular explanations or may, occasionally, be explanation enough (Antaki, 1985a, 1985b).

If speakers are to believably report 'the facts', then they must attend to constructing their reliability as factual reporters with a privileged view of the 'facts'. If the felicity conditions for one's reporting are not firmly established, then a factual account may be undermined by an opposing description that reveals (or constructs) the interestedness of one's position. Therefore, a speaker must "...handle the dilemma of stake or interest to show that their report is justified by the facts, or warrantable, rather than merely prejudiced, biased, or self-serving confabulation" (Edwards & Potter, 1993, p.36). This type of externalisation is especially

likely in situations where the speaker's accountability is challenged (Edwards & Potter 1993, citing Pomerantz 1984b).

The types of discursive and linguistic resources that may serve externalising functions include the reporting of detail, the use of perceptually rich descriptions and the use of narrative structures to anchor and connect descriptions in socially familiar meanings (Edwards & Potter, 1993; Gergen, 1988). An account can also be given attributional weight through vagueness, or by calling on cultural common-places such as idioms and metaphors (Edwards & Potter, 1993).

Shi (2000) argues that *opinions* are commonly used to construct factual accounts. Although 'fact' is produced as an objective representation and opinion is produced as a personal and individual belief, Shi argues that opinion is often used as a substitute for factual discourse. While 'facts' are disputable terrain, 'opinions' are unassailable since they are individual possessions. As such, it is socially acceptable to dispute 'facts' proposed by an individual speaker but, since opinions are 'owned' by individual speakers, they are not disputable or subject to debate in the same way. For example, if I say "*it's* very cold today" I am speaking in the language of fact and may easily be contradicted. However, if I say "*I* am very cold today" then I am speaking in the language of opinion and it becomes more difficult for another speaker to dispute my utterance in socially acceptable ways. Opinions are therefore useful resources in the production of factuality since "opinion discourse becomes virtually indistinguishable from fact when viewed in its argumentative context" (Shi, 2000, p. 281).

> "From a discourse analytic standpoint, the facts or information on which the attribution reasoner supposedly relies are not 'naturally' given but are as much a part of the social process as the inferences themselves. Indeed this fact/inference distinction becomes an analytic topic in it own right rather than a research presupposition" (Potter & Edwards, 1990, p. 407).

The production of facts, and the defence of the factual high-ground, is central to attributional talk such as explanation and accounting. Edwards and Potter (1993) argue that this understanding of factual accounting opens up two lines of enquiry. The first investigates the means by which people construct their explanations and accounts as factual and believable. The second unpacks the social function of such factual productions in dialogue and discourse.

4.3.4.3 Identifying the function of utterances

Sometimes descriptions have attributional functions, and talk that appears to be attributional sometimes fulfils descriptive functions. To investigate the nature and functions of attributional talk we need, first, a means of identifying it in natural interaction and, second, a methodology for determining its effects.

Antaki (1994) argues that analysis should grounded within the boundaries of the text and the interactants should be considered to be a step ahead of the analyst. Although he accepts that the analyst must work from *some* predefined framework, he suggests that "the safest way forward is to keep the category system as simple as possible, and to keep in mind always that what we analysts think matters less than what the participants in the interaction make of it" (pp. 66-67). For Antaki, the best way to infer the work done by an utterance is to take note of how other interactants orient to it. For example, if an utterance elicits an excuse, then it is reasonable to treat it as an accusation even if the surface value of the talk does not flag it as such (see also Drew & Heritage, 1992).

This approach turns Grice's maxim of relevance, much loved by proponents of the conversational model of attribution (c.f. Hilton, 1990; Turnbull & Slugoski, 1988), on it head. Instead of assuming that people will always try to say relevant things, Antaki (1994) argues that it is more useful to assume that people will always respond to an utterance *as if it were relevant* – in other words, that the running index that makes conversation possible demands

that people try to make sense of each-other's utterances. He argues that this type of orientation to an utterance can be treated as automatic. For example, if someone asks "Should we have tea?" virtually any response can be meaningful, from "yes, please", through "I've just had some", to "it's been a long day". This is not because these replies are essentially meaningful in themselves, but because their placement in response to a prior utterance means that hearers will extract whatever meaning they can from them. Of course, this is placing a lot of trust in the participants to be alive to the meaning of the talk that they are involved in – but Antaki (1994) challenges the notion that the analyst observing talk through a dusty transcript has a better insight into what is 'really' going on between people than the people do themselves. Analysis depends on noticing regular markers of challenge and response, misunderstanding and repair and other conversational signposts. Therefore, the analyst must be extremely sensitive to the organization of explanations. No utterance, particularly not one made in a conversational context, has an invariant meaning divorced from its position in the surrounding text or dialogue. The basis for analysis, then, is to take the participants' responses to attributional talk as a signal of its purpose. The aim is to investigate and describe the ends to which attributional talk may be deployed in everyday troubleshooting interactions, and to describe how these purposes are achieved.

4.3.5 Reading the data

Conversation and discourse analysts have identified several fine-grained features of talk that are useful for identifying the social functions of utterances. The present analysis will use these features of conversation as a springboard to discuss the social aspects of attributional talk.

4.3.5.1 Taking turns

A central tenet of CA is that talk is a tightly organised activity that accomplishes interactive social functions. The organization of talk is accomplished through the simple mechanism of taking turns. If a speaker says something that requires a response, then politeness conventions require that a response be given. Failure to do so may be a breach of conversational norms that itself performs a social act. Meaning in conversation is built up sequentially, and each turn is intelligible only in light of what has already been said – and usually what has been said immediately before. An utterance not only generates meaning in terms of its position in the running index of conversation, but sets a field in which certain responses may be expected (Heritage, 1997). For example, when a telephone is answered with "Hello", recipients almost invariably reply "Hello" (Sacks, 1997) – it would be strange to reply with "Goodbye". By opening the conversation in a particular way, the first participant opens a slot in which certain responses are conversationally meaningful. In general, each utterance will open a slot for another speaker until the conversation is concluded.

An *adjacency-pair*, is a specialised sequential exchange in which a first part makes a particular type of reply expected or appropriate (Buttny, 1993). For example, a question generally requires an answer, or an accusation requires a defence. Adjacency-pairs are therefore a powerful means of directing the flow of conversation.

CA has shown that a fine-grained analysis of the sequential organisation of talk is a fruitful means of exploring the social functions that such talk performs. Deviations from turn-taking conventions often reveal what participants are achieving in conversations.

4.3.5.2 Changing the subject and setting the agenda

Since conversation happens in sequential turns, a topic may be introduced by taking a turn that opens a slot to be filled by another conversational participant. For example, the topic of

the weather may be introduced by a participant who says, "Isn't it hot today?" A reply to this question that satisfies the turn-taking conventions of talk will usually concern the weather. However, in everyday conversation between peers, the topic cannot be independently and summarily changed at any time. The shift can generally only be brought in when the immediate demands of previous turns have been satisfied (Sacks, 1997). Such demands can include demands for explanations and accounts, and participants have strong obligations to provide conversationally appropriate responses to such demands. Departures from these conventional patterns are analysable and are regular features of institutional talk, as discussed below.

4.3.5.3 Pauses, silences & failures to take things up

In general, talk flows smoothly and without pause from speaker to speaker. A pause of a second or more between turns is considered large and is analysable (Buttny, 1993). The meaning and effect of pauses is variable, and it is safest to rely on participants' orientations in conversation to interpret pauses and silence.

In particular types of talk, the turn-taking conventions are so powerful that the absence of a reply is an analysable event. For example, if an appropriate response to an adjacency-pair is not forthcoming, then it can be seen to be "relevantly absent" (ibid.). Again, the meaning of such silences should be analysed with reference to participants' orientations to them in the conversation.

4.3.5.4 Repairs

A common feature of talk is "repair", when a speaker recognisably begins to say something, stops and modifies the utterance in some way. In most cases, a hearer can recognise both what the speaker was about to say and what the speaker ended up saying. For example:

USER: ((enters)) I just did a virus check on the file? It was fine? (1.0) And then I started doing a Worper (.) ah er (.) Microsoft Word document and suddenly a screen came up saying COPYING FILES to somewhere it was (.) (strange)

In this case the user clearly began to say "Wordperfect", but repaired to "Microsoft Word document". Although we must avoid the temptation of trying to look inside the speaker's head to read motive or intention, we can read the effect that an utterance has in a conversational sequence. Here the repair shows the user as someone who faithfully and correctly reports details to a user consultant. The repair is not simply a mistake, but a conversational feature that may perform social actions.

4.3.5.5 Explanation slots

Antaki (1996) argues that aspects of an interaction that are marked by participants as problematic in some way create a strong normative need for an explanation. These "explanation slots" may be set up in what participants do, say or even fail to say. However, once the explanation slot is initiated there is a strong obligation for the recipient to provide a satisfactory account. This is related in many ways to the concept of adjacency-pairs. However, an adjacency-pair is a fine-grained unit of analysis and the initial utterance generally demands a contiguous or adjacent response. An explanation slot may similarly be satisfied in a few turns of talk, but may also take much longer to satisfy.

In the context of the following analysis, Antaki's (1996) terminology is not entirely appropriate, because participants are called on to make attributions that explain a failure or problematic state of affairs as well as to account for their own actions. I will use the more general term 'attribution slot' to refer to a conversational unit consisting of two parts: a problematisation of a state of affairs and an attribution that satisfies the expectations of the first.

4.3.5.6 Relevant features of institutional talk

In work-related settings the power-relations are often imbalanced (Drew & Heritage, 1992), and some participant have greater power over proceedings than others by virtue of their roles as people doing their job. This power may be evident in all of the above markers of talk, but is especially evident when it comes to setting the agenda by introducing new lines of talk and by failing to take up topics introduced by other participants. This power imbalance allows participants to politely do things (such as diagnostic interrogation) that could not be politely approached in everyday talk between peers. Therefore an analysis of institutional talk must be sensitive to the institutional goals that the participants are orienting to.

4.4 Integrating the results of the analyses

Although this study draws on multiple methods, the intention is not to triangulate the results of each mode of analysis as one would in a more positivist study. In this case, the two methods are exploring different aspects of the problem and the intention is to build a layered and composite understanding of attribution in talk. The endpoint is not a simple validation or refutation of the cognitive theories of attribution, but rather an exposition of how the modes of talk identified by cognitive attribution theorists may be used (or may not be used) to achieve multiple social ends in a particular context.

5 – Counting categories: correspondence between cognitive theories and observed interactions

The first stage in analysis was to determine whether the traditional theories do, indeed, describe real-life attributional processes. This was done by attempting to match the type of information expected by the theories to the information actually exchanged in real-life troubleshooting situations. The presence of these types of information in observed conversation does not prove that these processes operate in the brain, and nor does their absence prove that they do not. However, if the information required by cognitive theories of attribution appears (or does not appear) with regularity in dialogue then it will at least show that these theories offer some insight into attributional processes as they occur in this everyday context.

Once talk was categorised and categories were counted, as described in 4.3.3.1, above, it became clear that the vast majority of information exchanged or requested by participants was about the problem and corresponded well with Kelley's (1967) 'man-the-scientist' model. In comparison, talk concerning information about participants' intentions and abilities corresponding with Jones & Davis' (1965) model of correspondent inferences was scarce. Initial coding only identified 17 instances of this type of information exchange compared to 254 instances where information was exchanged about the problem (i.e. concerning consensus, consistency and/or distinctiveness information). Talk about intentions and ability was generally treated cautiously and often approached circuitously compared to the direct approach taken to exchanging information about the problem. Although this makes the analysis a little less straightforward, it is far from problematic and integrates well with social and discursive models of attribution, as we shall see a little later.

To explore the ways in which problem-related information was spoken about, Table 2 lists each problem along with the eventual outcome of the troubleshooting process and the presence or absence of information about dispositions or intentions (corresponding to the models of Heider, 1958 and Jones & Davis, 1965), and consensus, consistency and distinctiveness information (corresponding to the model of Kelley, 1967) in the course of the interaction. The most striking feature is that consistency and distinctiveness information was exchanged or requested in 93% and 97% of problems respectively, compared to consensus information which was observed in 66% of the problems, and information about dispositions or intentions that was exchanged in only 28% of problems. This is roughly consistent to the empirical findings from experimental tests of Kelley's (1967) model of attribution which have found that consensus information is generally under-represented compared to consistency and distinctiveness information (see page 36).

Table 2:Consensus, consistency, and distinctiveness information by problem[4]

Problem	Length (in characters, including transcription conventions)	Dispositions or intentions	Consensus	Consistency	Distinctiveness
1	18926	Yes	Yes	Yes	Yes
2	464	Yes	No	Yes	No
3	5055	No	No	Yes	Yes
4	16392	Yes	Yes	Yes	Yes
5	10729	No	No	Yes	Yes
6.	4072	No	Yes	Yes	Yes
7.	9253	No	Yes	Yes	Yes

[4] See Table 1 on p. 81 for more detailed descriptions of problems and information about missing problems.

Problem	Length (in characters, including transcription conventions)	Dispositions or intentions	Consensus	Consistency	Distinctiveness
8.	3189	No	No	No	Yes
9.	11504	No	Yes	Yes	Yes
10.	7524	No	Yes	Yes	Yes
11.	30322	No	Yes	Yes	Yes
12.	4392	No	Yes	No	Yes
13.	13316	Yes	Yes	Yes	Yes
14.	2115	No	No	Yes	Yes
15.	3925	No	No	Yes	Yes
19.	15839	No	Yes	Yes	Yes
22.	884	No	Yes	Yes	Yes
23.	9788	No	Yes	Yes	Yes
24	1192	No	No	Yes	Yes
26.	17129	Yes	Yes	Yes	Yes
27.	5308	No	Yes	Yes	Yes
28.	2932	No	No	Yes	Yes
29.	25920	No	Yes	Yes	Yes
30.	2369	No	Yes	Yes	No
31.	14043	Yes	Yes	Yes	Yes
32.	1731	No	No	Yes	Yes
33.	1750	No	No	No	Yes
34.	9915	Yes	Yes	Yes	Yes
35.	3569	No	Yes	Yes	Yes
Frequency		8	19	27	28
Total valid attributional problems		29			

The types of information required by cognitive models of attribution are clearly being offered and sought by participants. However, certain types of information are scarce, particularly

information about intentions and dispositions and consensus information. The analysis will initially focus on exploring the patterns of information relating to Kelley's (1967) model and will then return to the general pattern of under-representation with a possible explanation.

It is puzzling that consensus information is under-represented (observed in 19/29 problems) compared to consistency (26/29) and distinctiveness (27/29) information. In Table 3, below, this information is condensed, sorted by the length of the problem and highlighted if consensus information was observed. It is quite striking that consensus information was exchanged least often during short problems and most often during more extended problems.

Table 3: Consensus, consistency, and distinctiveness information sorted by the length of the problem and highlighted (in grey) if consensus information is present

Problem	Length (in characters, including transcription conventions)	Consensus	Consistency	Distinctiveness
2	464	No	Yes	No
22	884	Yes	Yes	Yes
24	1192	No	Yes	Yes
32	1731	No	Yes	Yes
33	1750	No	No	Yes
14	2115	No	Yes	Yes
30	2369	Yes	Yes	No
28	2932	No	Yes	Yes
8	3189	No	No	Yes
35	3569	Yes	Yes	Yes
15	3925	No	Yes	Yes
6	4072	Yes	Yes	Yes
12	4392	Yes	No	Yes
3	5055	No	Yes	Yes
27	5308	Yes	Yes	Yes
10	7524	Yes	Yes	Yes
7	9253	Yes	Yes	Yes

Problem	Length (in characters, including transcription conventions)	Consensus	Consistency	Distinctiveness
23	9788	Yes	Yes	Yes
34	9915	Yes	Yes	Yes
5	10729	No	Yes	Yes
9	11504	Yes	Yes	Yes
13	13316	Yes	Yes	Yes
31	14043	Yes	Yes	Yes
19	15839	Yes	Yes	Yes
4	16392	Yes	Yes	Yes
26	17129	Yes	Yes	Yes
1	18926	Yes	Yes	Yes
29	25920	Yes	Yes	Yes
11	30322	Yes	Yes	Yes

It is worth exploring these intuitive observations further to determine whether they can be considered statistically significant or due to sampling error or chance. I will do so in two stages: firstly I will use the Binomial test to see whether consensus information can be considered significantly under-represented compared to consistency and distinctiveness information, and secondly, I will use the Gamma statistic for ordered categorical variables to determine whether consensus information is more likely to be absent from short interactions than long ones. For the purposes of this discussion, consensus information will be referred to as *Cs*, consistency information as *Cy* and Distinctiveness information as *Dt*. The presence or absence of each type of information will be referred to by a plus or minus sign. For example, Cs^{+} indicates that consensus information is present for a particular problem.

The binomial test is used to determine whether an observed distribution of a dichotomous variable can be thought to significantly deviate from a predetermined pattern – determined by the probability of the variable falling into either of the two conditions under the null

hypothesis (Siegel & Castellan, 1988). In this case, Kelley's (1967) model predicts that attribution typically requires all three types of information to generate a "subjectively veridical" attribution and this will form the null hypothesis. Table 4 displays the observed frequency of problems displaying each combination of Cs, Cy and Dt and, clearly, the majority of cases (n=17) are consistent with Kelley's model and display all three types of information. However, the remaining 12 cases are inconsistent.

Table 4: Frequency of problems displaying different combinations of consensus, consistency and distinctiveness information

Combination of Cs, Cy and Dt	Deviation from Kelley's model	Consensus Present/Absent	Frequency
$[Cs^-]$ $[Cy^-]$ $[Dt^+]$	Yes	-	2
$[Cs^-]$ $[Cy^+]$ $[Dt^-]$	Yes	-	1
$[Cs^-]$ $[Cy^+]$ $[Dt^+]$	Yes	-	7
$[Cs^+]$ $[Cy^-]$ $[Dt^-]$	Yes	+	0
$[Cs^+]$ $[Cy^-]$ $[Dt^+]$	Yes	+	1
$[Cs^+]$ $[Cy^+]$ $[Dt^-]$	Yes	+	1
$[Cs^+]$ $[Cy^+]$ $[Dt^+]$	No	n/a	17

While Kelley (1967) admits that attributions may sometimes be made with incomplete information, he provides no firm grounds for suggesting that one type of information is less likely to be used than the others. Therefore, in Kelley's model, it would be equally likely for any of the three types of information to be lacking in any particular problem-solving interaction. However, eyeballing the data (see Table 3) suggests that consensus information is more likely to be lacking (10/29) than either consistency (3/29) or distinctiveness (2/29). Therefore it seems reasonable to divide the various possible combinations of Cs, Cy and Dt that deviate from Kelley's model into those in which Cs information is present and those in

which it is not, as I have done in Table 4, above. We now have two groups that each contains three of the six possible ways of deviating from Kelley's model. Under the null hypothesis (where each possible pattern of deviation is equally unlikely) there is a 1/6 chance that any individual deviation will match any of the patterns displayed in table 3. Since three patterns fall into each group, there is a 50/50 chance that any individual deviation would fall into either of the groups – and we can therefore use a binomial test to see whether the patterns of deviation observed deviate significantly from the uniform pattern predicted by Kelley's model.

Given that 10 of the deviant cases fall into the Cs-absent group, compared to two in the Cs-present group, it seems unlikely that these results are random. A two-tailed binomial test confirms this ($n = 12$; $p = 0.039$) and allows us to reject the null hypothesis that the observed pattern is not significantly different to that predicted by Kelley's (1967) model. In other words, when deviations to Kelley's pattern occur, they are significantly likely to be related to the absence of consensus info.

Having shown that there is something significantly different about consensus information, the second task is to investigate the relationship or association between consensus information (or the lack thereof) and the length of interaction. Here we are looking to determine the strength of association between a variable measured on a ratio scale (length) and an ordinal dichotomous variable (absence or presence of consensus). The most obvious test of association would be to calculate Spearman's correlation coefficient (r_s), but this is not appropriate due to the large number of tied values present in the dichotomous variable. Obviously, if the variable length is converted into a categorical variable ("short" and "long") then a chi-square test of association can be performed. However, a drawback of this approach is that chi-squared will not directly measure the strength or direction of the association.

Instead, a less commonly used categorical statistic, Gamma, will be used. Gamma measures both the strength and direction of the relation between two ordered categorical variables. While it may perform a similar function to Spearman's r_s, it does not have the same problems when ranks are tied (Siegel & Castellan, 1988). Much like a correlation, Gamma may range between -1 and 1, where -1 represents a strong negative association and 1 represents a strong positive one.

In order to calculate Gamma, the length of interaction was first converted into a categorical variable by splitting the cases into two equally sized groups and coding them "short" and "long". (The small sample size prevented the use of more categories.) This was cross-tabulated with existing information regarding the presence or absence of consensus information to calculate Gamma. This resulted in a 2x2 contingency table where both dichotomous variables could be considered ordinal (directional) rather than nominal.

The calculated Gamma statistic is significant ($p < 0.0005$), and high ($\gamma = 0.924$), allowing us to conclude, firstly, that the presence or absence of consensus information cannot be considered independent of length. In other words, there is an association between the length of the interaction and the presence or absence of consensus information. Secondly, Gamma is positive and close to 1, indicating that the association between consensus and length is positive and very strong. In other words, short interactions are significantly less likely to contain consensus information and vice versa.

One problem with this analysis is that it stands to reason that the longer the interaction, the more likely it is that any particular type of information is represented – and it is therefore likely that length has a similar relationship to consistency and distinctiveness information. However, both consistency and distinctiveness are represented in such a large proportion of the interactions observed (26/29 and 27/29 respectively) that calculating the relationship

between their absence and the length of interaction is not a particularly meaningful question. What the analysis does show is that consensus information is significantly more likely to be absent than consistency or distinctiveness information and that consensus is far more likely to be absent in shorter interactions than longer ones. There is clearly something different about the practice of exchanging consensus information – compared to consistency and distinctiveness information – such that participants exchange it seldom and do so only after other avenues have been tried. It is possible that consensus information is less useful for returning computers to functionality, but this is not predicted by Kelley's model. In fact Kelley (1967) postulates that, if anything, consistency information should pose the greatest problem in everyday attribution because of the difficulty of running multiple 'trials' of everyday problems. So now there are two major puzzles concerning the types of information actually exchanged in relation to the cognitive models of Jones & Davis (1965) and Kelley (1967). Firstly the information actually exchanged is largely about the problem rather than about the agents and, secondly, information about the problem is far more likely to be oriented to Kelley's axes of consistency and distinctiveness than to that of consensus.

In order to make sense of these puzzles it will be useful to examine some examples of these types of talk in detail. The first example is one in which most of the attributional traces predicted by cognitive attribution theory are present and will be a useful illustration of the kinds of ways that participants approach these different types of information exchange. The second example is one in which the information exchanged is a site of struggle with clear implications for dispositional attributions. The third is an exchange in which information is exchanged in such a way that dispositional roles are amicably reinforced.

5.1 A WordPerfect Disposition

Prior to the exchange the user had reported that her 3½" floppy disk drive was faulty. The interaction begins when the UC makes contact with the user by telephone:

Extract 5

1	UC:	Hi ***, this is *** from ITD (.) How are you? (1) I'm O.K. thanks (.) I see
2		you've got a problem here with your stiffy drive? (2) O.K I'd like to come
3		down and make (.) a (.) well (1.0) have a look and see what the problem IS
4		(.) Will it suit you if I come down now?

In this interaction the UC starts by validating the claim made by the user that there is a problem and then by setting an agenda for their social engagement – to 'see what the problem is'. Notice that the articulated agenda is quite clearly to find the root of the problem, in other words, to make an attribution. Notice also that the UC does not suggest or imply that the user herself, or her recent actions, may be under scrutiny. If we go on verbalised dialogue alone, the agenda is set for an analysis of events along the lines of Kelley (1967), rather than an analysis of actors' abilities and intentions as suggested by Heider (1958) or Jones and Davis (1965). The UC proceeds to the user's office and the interaction continues there with the troublesome computer as the focal point:

Extract 6

1	UC:	... and do you have some (.) a new stiffy disk?
2		((One sentence inaudible))
3		(5)
4		((2 sentences inaudible))
5		How often (...) do you use this drive?
6		And those problems started (.) on Wednesday?
7	USER:	='esday (.) ya
8	UC:	~OK~ (1.5) ~Ah~ Ri:ght I:'m going to check for viruses 'n things too (1.0)
9		they can also affect ... (User: Yeh) the stiffy drive.
10	UC:	Then I mi:ght also have to open up your computer and check what's inside
11	USER:	[mmm]

The UC begins by requesting a new 3½" media, suggesting that she is looking for covariation between failure with one disk and success with another, that is, distinctiveness information. The next two questions are about the history of the problem, which can be understood as a request for consistency information. The user confirms that the problems only started on Wednesday. According to the type of naïve ANOVA predicted by Kelley, if the user uses the disk drive often (i.e. prior to Wednesday) and the problem only started on Wednesday then the problem is probably not attributable to the user. However, this logical leap is not mentioned by the participants.

After I asked the user for consent to observe and record proceedings, and a short (two minute) interruption by a different user about another problem, the interaction proceeded as follows:

Extract 7

1		((User absent))
2	UC:	(5.0) Um… (35) OK, can access the files on this stiffy that you were using
3		last week so it's not a problem with the stiffy drive.
4	…	((3 unrelated turns omitted))
5		(45)
6		~The stiffy drive can read ~
7		(5) No problem there …
8		(20) OK
9		(10) (~~What was the name of the file?~~)
10		((User leaves the room))
11	…	((4 unrelated turns omitted))
12	UC:	Now I'm gonna have to get her back here because it's working for me and
13		now I want her to come here and show me what (OBS: OK) she was doing?
14	UC:	And there (OBS: Mmmm) may have been a problem with what she was
15		doing.
16	UC:	The user
17	OBS:	Or the
18	UC:	(in the problem)
19	OBS:	Is that the disk she was using?
20	UC:	Um … it's taken an awfully long time to save such a small file.
21	OBS:	~Ya~
22	UC:	Maybe when writing (.) ~there's something not right~.
23	UC:	(3.0) It's done it. (2.0) ~I'll just call her now~ …
24		(3.0) Done it. (3.0) Just terribly slow (.) and everyone's complaining about
25		~the stiffy disks (OBS: Oh really?) from these [brandname] machines~.

26 27	UC:	So I need to call her now and ask for her to come (2.0) and show me what she was doing?

The UC checks that files can be accessed on a disk that was written prior to the failure on Wednesday and finds that she can. This can be understood as an attempt to gain more consistency information. Since the user has already reported that the drive was functioning prior to Wednesday and the drive can read a disk that was working at a time prior to the failure, the UC concludes that the problem does not lie with the drive. She then asks what the name of the file was, probably in an attempt to test whether the drive reads the specific file that was problematic. She does not verbalise the result of this line of questioning. However, having failed to discover distinctiveness or consistency information to isolate either the disk media or the disk drive she switches her focus to the user. Noting that "it's working" for her, the UC begins to search for consensus information between the actions that she has taken herself to operate the disk drive and the actions taken by the user to perform the same function. After suggesting (in the user's absence) that the user may be at fault, the UC shifts her attention slightly. She notices that the drive is slow and suggests that "Maybe … there's something not right". When the drive eventually completes the operation, she notes that other people also experience this brand of drive to be slow (consensus information) and she returns to her strategy of verifying the user's actions. Notice as the interaction unfolds that the UC never reveals to the user that her goal is evaluative and takes the approach of asking the user to demonstrate what she did in order to observe her actions. The user returns shortly and the interaction continues:

Extract 8

1		((USER returns))
2	…	

3	UC:	I've (2) opened (2.5) a file (user: ~mmm~) on here that can read this disk
4		perfectly (.) 'n then (1) I used a new disk an' I made a small file (.) and I
5		saved it to (inaudible) that.
6	USER:	~~Ahhh~~
7	UC:	OK so there may be a problem with one of the documents that you were
8		using (.) So I wonder if you could (.) er call up one of those documents (.)
9		and try to save that? (1) Onto this disk
10	USER:	because (.) you see what happened? (.) I tried (1) two disks (1.5) One was an
11		old one (1) I tried two new ones. An' I just got (inaudible)
12	UC:	mmmm
13	UC:	So with a new document (2) OK?
14	USER:	ya (2.5) Every time (UC: What) I get an error message (UC: Ya)
15	UC:	What error message do you
16	USER:	u:::m (.) Unable to write to disk (.) and it came up (.) u:m (Inaudible) It just
17		came up.
18	UC:	(2) Ok. (1.5) Um. Do you want to just try do something now? (1.5) While
19		I'm here? (1.5) um (2) and then (.) I will check for viruses I haven't done
20		that yet.
21	USER:	~OK~ (Inaudible)
22	UC:	No uh just make (1) a small ~document~ (or something) you just want to
23		make (.) a new one or call up something (inaudible) that you've saved on to
24		the stiffy disk
25		(10)
26	UC:	Oh you're using WordPerfect
27	USER:	I was using ~it~.
28	UC:	Oh. (2) Right?

The UC explains to the user that she has been able to open a file on an old disk and has created a file on a new disk. She appears to be exchanging consistency information about the disk which leads her to conclude that the problem is not with the disk subsystem. The UC mentions that it's working "perfectly" for her, "so there may be a problem with one of the documents that you were using" and then asks the user to demonstrate the actions that resulted in the failure situation. Although the UC *appears* to be offering consistency and distinctiveness information, the user responds by defending her own actions (lines 10-11). The user has oriented to the UC's apparently neutral request for information as a possible accusation. She begins her defence by mentioning that she has tried exactly the same actions as the UC (trying different disks, both new and old). The UC does not respond directly, but instead repeats her request for the user to demonstrate her actions with a new document (line 14). Once again, the user responds by defending herself. She says that she gets an error

message "every time". She begins to say "it came up" but corrects herself and says "it *just* came up" (lines 16-17, emphasis added). The addition of the word 'just' uncouples the error message from her actions and modifies the types of attribution that can be read into her account. The UC then asks the user a third time to demonstrate her actions but, this time, softens the blow by saying that if that is unsuccessful then she will perform a virus check (lines 22-24). Finally, in silence, the user demonstrates her actions (line 25).

It is fascinating that the nascent attribution that "... there may be a problem with one of the documents that you were using..." (line 7) is responded to by the user as an accusation requiring a defence. The tone of the engagement shifts from cooperative to confrontational and it is clearly the UC's attempt to gather consensus information that prompted the shift. In this engagement, consistency and distinctiveness information are 'safe' and can be exchanged at will. Consensus information is 'unsafe'– it is gathered with caution and probing is responded to with resistance.

For simplicity's sake I have discussed this engagement as if information about intentions and dispositions discussed by Heider (1958) and Jones and Davis (1965) do not enter it. This omission was for the sake of convenience and clarity, and it is worth returning to the exchange to investigate how these types of information are tiptoed around.

Lines 25 and 26 of Extract 7 (user absent) and line 25 of Extract 8 (user present) contain clear instances of this type of information. The notion that observing the user saving a document will provide information about the failure relies on the assumption that the presently observed actions could correspond to the actions taken at the time of failure. In other words, the UC is attempting to observe some persistent or dispositional quality of the user. Although it is unlikely that the UC would suspect that the user *intended* such a failure, if a dispositional

inadequacy or lack of ability were detected then the responsibility for the problem would shift from the equipment to the user.

The exchange (in lines 27 to 29 of Extract 8) is fascinating. The UC notices that the user was using WordPerfect and, by saying so, emphasises her earlier assertion that the point of the demonstration was to see whether "there may be a problem with one of the documents" that the user was using (lines 7-8). However the user has a strange response. She says "I *was* using it" (line 27, emphasis added) and, in so saying, implies that she does not *always* use WordPerfect. Once again the user has resisted any kind of dispositional inference, even though the UC has made a valiant attempt to reframe the exchange in non-dispositional terms. It seems strange that being classified a "WordPerfect user" is a dispositional category to be resisted, but the user certainly resists it. At this point it is necessary to move beyond the strict bounds of the exchange to contextualise the user's response.

Several years prior to this exchange, WordPerfect had been the standard word processing software used across the entire site. Over time, Microsoft Word was increasingly installed on new computers until, approximately a year previously, the information technology department had announced that WordPerfect would be retired and removed from all computers. Many users protested, and it was agreed that the site-license for WordPerfect would be extended to accommodate users who were reluctant to change. Therefore the comment "Oh you're using WordPerfect" may carry implications of backwardness or reluctance to adapt to new technology. Although it is impossible to say with certainty exactly what would be implied by a "WordPerfect disposition", the user certainly resists such a classification.

5.2 "I was also kind"

In Extract 9 we find a much simpler example of talk about intentions and dispositions that illustrates a struggle over dispositional attributions. The exchange is situated in an extended search for a known virus. The computer has been repeatedly re-infected over a period of about a month and it is possible that the user will have to revert to backups and lose approximately two months of financial records as a result. We join the interaction while the user and UC are ascertaining what has been done to troubleshoot the situation by the UC working on it previously.

Extract 9

1	U21	He checked them on this machi:ne when I wasn't linked to the LAN (2)
2		'cos (.) um:: (.) ok remember (1) some of the tests that we did (.) were the
3		stand-alone tests (.) in other words (.) not linked (1) so you have this
4		reinfection occurring (2) Always when I opened up and connected to U22
5		(2) then it came back down again. (2) This thing runs and scuttles and hides
6		(.) you know
7	UC1:	(This is a (.) share (.) their files) (.) on the network
8	U21:	Mmm
9	UC1:	U20, U22 and U23
10	U21:	Mmm
11	UC1:	Now it's only when U22 connected to:: (.) the shares today
12	U21:	Mmm
13	UC1:	So she gets reinfected (.) The other 2 machines
14	U21:	But if I stand alone, ja
15	UC1:	Those two two machines (1) But without them being connected to the
16		network (.) you were still infected (.) therefore it isn't on the network
17	U21:	Ja
18	UC1:	You (.) they scanned your (.) network share and there was nothing there
19	U21:	Mmm, 'cos the moment I'm disconnected from the network (.) I'm
20		absolutely fine it doesn't hassle me (.) at all (1) plug me in again and then
21		(inaudible). Do you want to take these (.) and just check them? (1) I've got
22		two sets. (1) Ok, oops, um
23		(3)
24	UC1:	I hope my:: machine is free of viruses! (2) ((Chuckle))
25	U21:	Mmm
26		(2)
27	UC1:	Huh (.) Oh (.) also I've got a problem with my stiffy drive so I mi::ght not
28		be a::ble to:: (.) to read these (2) but I can try them on (inaudible) (2) I'm
29		just doing a check for another kind of virus now.
30	U21:	(Which type?)
31	UC1:	Sircam (1) that's the one that came out before Nimda
32	U21:	Oh:::
33	UC1:	Just in case

34	U21:	Was that the one where people said (.) um plea::se he::lp me:
35		(1)
36	UC1:	Ye::s
37	U21:	That one (1) yes (.) I was also kind (.) I opened that too
38		(1)
39	UC1:	No:: (1) no Sircam (.) infection on this machine (7.0) Now we're going to
40		scan all files (2) just generally for viruses
41	U21:	Mmm::

The first thing to note is the way that participants talk about virus "infections": "I wasn't linked to the LAN" (line 1), "you have this reinfection occurring" (line 3), "when I opened up and connected" (line 4), "she gets reinfected" (line 13), "you were still infected" (line 16), "'cos the moment I'm disconnected from the network (.) I'm absolutely fine" (lines 19-20), "plug me in again" (line 20) and so on. Participants are naturally linking in to the medical paradigm of viruses, vectors and infections. However, the 'body' to which the infection belongs is not the computer, as one would expect, but the user. Since the user is being continually reinfected, there seems to be a subtext that she may be the kind of user that is susceptible to viruses (whatever that may mean). The user resists this position by offering consistency information to argue that 'she' is reinfected whenever she 'opens up' and 'connects' to the network or the potentially infected computers of her colleagues (lines 4-5 and 14). However, the UC disputes this argument with consistency information of her own (lines 15-16) that allows her to conclude that "it [the virus] isn't on the network". The user appears to agree (line 17) and the UC reinforces this conclusion by mentioning that the user's network share had been scanned but no viruses had been detected. In spite of the user's apparent agreement in line 17, she insists that she is "absolutely fine" as long as she does not connect to the network. Notice how the types of consistency information offered by the user and the UC respectively are tugging at the types of attributions that can be made and, more importantly, how each of these arguments offers a very different basis for determining

responsibility for the virus infection[5]. The user is offering information to defend an attributional schema that positions the virus as an alien invader that "runs and scuttles and hides" (line 5) and makes incursions from the outside. The UC is leaning towards an attributional model that would locate the virus in the user's computer and therefore – in the language of the participants – in the user's ambit of responsibility.

In spite of the UC's strong case against the user's external hypothesis, the user repeats information that she has already mentioned and which has already been disputed. She seems to run out of steam and the end of her sentence is inaudible (line 21). However, she abruptly changes tack and asks if the UC would 'want' to check a set of 3 ½" disks for viruses (lines 21-22). Now disks are interesting. Although they clearly belong to the user, they are still objects that are external to the body of the computer that must be inserted in order for a potential infection to be transmitted. Although the user has not been able to successfully dispute the UC's argument that the virus "isn't on the network", she is able to introduce the possibility that the source of infection is still external.

After a long (3 second) pause the UC enigmatically replies that she hopes that her "machine is free of viruses" with a chuckle (line 24). Notice two things: firstly that the object of potential infection in this case is the UC's computer rather than the UC herself, and secondly that the user does not laugh or otherwise ratify this response. After another (2 second) pause the UC mentions that she "might not be able to read" the disks because she has a 'problem' with her disk drive. Again the user does not respond and, after another two second pause, the UC admits that she could check them but her sentence tails out into inaudibility. Two things

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[5] It is intriguing that the virus talk seems homologous to promiscuity talk (Silverman, 1997), but unfortunately there is not quite enough information here to tease out the connections.

are clear from this exchange: firstly that the UC is displaying reluctance to take the user's disks away to check them, and secondly that the user is displaying reluctance to sanction the UC's attempts to refuse the request.

At this point the UC and user both abruptly change direction. The UC ignores the user's suggestion that the floppy disks may be the site of infection and begins to search for "another kind of virus" (line 29) "just in case" (line 33). The user suddenly admits that she did, in fact, open a contaminated email (line 37). Where previously she spoke in a way that located responsibility with others, she now admits that she may be at fault. However, the manner in which she does so is very careful. She asks if the Sircam virus is associated with emails "where people said plea::se he::lp me:", and emphasises the words 'please' and 'help' through elongation (line 34). However, although admitting something about her responsibility (and possibly her dispositional susceptibility) for infection, she modifies this by saying she acted because she was 'kind'. In other words, she constructs herself as a Good Samaritan who was taken advantage of, rather than as careless or ignorant user. The word 'too' (line 37) is somewhat ambiguous. One potential meaning is that this is not the only dodgy email that she has opened, and another is that being taken advantage of in such a way is not unusual or deviant.

5.3 Needing a refresher course

The previous discussion showed that dispositional attributions may be a site of struggle. This struggle is not always adversarial, as in the previous extract, but may instead be cooperative. In the following interaction participants work hard to ensure that role-based dispositional qualities are preserved in spite of evidence to the contrary. Extract 10 is part of an interaction in which the user has reported that students are unable to write files to a specific directory location. The computer has Windows 2000 installed, and at the time, the IT bureau was not

yet supporting it on a large scale. The problem was investigated with the user present and asking questions and this extract cuts into the exchange just after the UC has successfully set up a new user account and modified the rights to solve the user's problem.

Extract 10

1	UC3:	so they don't have full administrative rights (.) so certainly they won't be
2		able to do (1) I think it's the power users, they have got rights to …
3	U19:	Excellent, hey, excellent
4	UC3:	They will be able to save what they are asked to save (inaudible)
5	U19:	Uh, they can (3.0) get on to the web I suppose
6	UC3:	Should be able to …
7	U19:	In-I-In fact, ja, in fact I could um I tried on the guest account previously and
8		I could, I just had to (.) set the proxies (.) every time (.)
9	UC3:	Ye::s, ja, OK
10	U19:	So the proxies got wiped out every time you wiped out
11	UC3:	Right, It shouldn't ((keyboard typing:)) (3) I need to put myself on a
12		refresher course for 2000 (.) it's a (.) I don't have any machines running it
13		(1), so you, you tend to forget where things are because its so different
14		((keyboard typing)) (3)
15	U19:	Ja (.) I'd like to do a basic course in (1) 2000
16	UC3:	Mmm ((keyboard typing)) (6)

One of the dispositional qualities expected of a computer expert is that they have extensive knowledge of computers. The UC is very careful throughout the troubleshooting process to specify that any apparent lack of knowledge or skill is confined to Windows 2000 by sporadically saying things like "I haven't worked on this for a while" and "I've forgotten exactly where the users are". Even in this slice of talk, whilst testing the successful solution, the UC is circumspect about Windows 2000. She uses vague phrases like "I think" (line 2) and "shouldn't" (line 11) to signal that she does not claim to have infallible knowledge about this operating system. However, when it comes to the current problem, she expresses herself with unmitigated certainty (line 4). Then, in lines 11-12, she says "I need to put myself on a refresher course for 2000". The way she phrases this does a lot of work on the types of dispositional attributions that the user can make. Firstly, by saying she *needs* to go on a

course she admits that this is essential knowledge. Secondly, by saying she needs a *refresher* course she implies that she already knows the required knowledge but that she could use some reminding. Thirdly, by saying she needs to *put herself* on a course she positions herself as someone who is intrinsically motivated to learn the necessary skills. Finally, she reiterates that her ignorance is limited to Windows 2000 only.

The user's response is very accommodating. He says that he would "like to do a basic course in 2000" (line 15). This is another utterance that does a lot of attributional work. By saying that he would *like* to do a course he positions himself as someone who, like the UC, is eager to learn but as someone who does not 'need' to. His desire to do a *basic* course is most informative in relation to the UC's need for a *refresher* course to remember what she has forgotten. In contrast, he is positioning himself as someone who has never known about Windows 2000 and thereby affirming the UC's expertise. By the end of the interaction the user is positioned as someone who is ignorant but eager to learn, and the UC is positioned as someone whose memory may be hazy but is nevertheless committed to acquiring the necessary knowledge and skills.

5.4 The multiple functions of attributional talk

These three interactions reveal several important things about real-life attributional talk that is not predicted by the cognitive models of Heider (1958), Jones and Davis (1965) or Kelley (1967). Firstly, I have already mentioned the difficulties in the initial coding of trying to decide whether an utterance represents consistency or distinctiveness information. These interactions now make it clear that it is possible for one utterance to fill many attributional functions, and that these functions regularly cross between cognitive theories. For example, in the "I was also kind" extract it is very clear that the user is employing consistency and distinctiveness information (1967) to constrain the kinds of attributions that can be made

about her dispositions. Secondly, these extracts each demonstrate that attributional talk is not dispassionate, neutral and scientific. Instead, it is a site of constant verbal struggle as participants try to constrain the kinds of attributions that can be made by the other while, at the same time, trying to solve a problem and restore a system to functionality. Thirdly these interactions show that attributional talk performs social functions as well as practical ones. The participants are clearly exchanging information that matches the requirements of the cognitive theories of attribution, but they are working at much more socially sophisticated levels of exchange than these early theories predicted. This puts us in a position to address the empirical puzzles mentioned above – namely the glut of consistency and distinctiveness information and the relative paucity of everything else.

5.5 Safe and unsafe

Exchanging attributional information is sometimes a social minefield, but a great deal of information is exchanged freely and without complication. It seems that the types of information exchanged in typical repair interactions can be roughly divided into two types. The first is 'safe' information that can be exchanged freely, and generally corresponds to Kelley's categories of consistency, distinctiveness, a subtype of consensus information and knowledge relevant to the problem. It usually concerns observable and physical symptoms and behaviours of equipment and I will classify it as *operative* information. The second is 'unsafe' and must be approached by participants with caution. It roughly corresponds to the remainder of Kelley's consensus information and to information about ability, intention and disposition discussed by Heider (1958) and Jones and Davis (1965). I will call this kind of information *inspective*, in the sense of 'looking into'. This inspective information generally concerns things for which one or both participants are socially accountable. As a result, participants are cautious with this type of information because it closely relates to the construction and defense of subject positions.

6 – Exploring the social functions of attributional talk

The following discussion will attempt to document how participants in this study employed attributional talk to achieve certain social ends. This is not to say that attributional talk is always used this way and I do not presume to have identified all the potential functions of attributional talk, even in this sample. Nevertheless the following analysis will demonstrate that attributional talk is an important device for sustaining and regulating certain social positions, and that particular social positions may be necessary to sustain certain types of attributions.

The first social function of attributional talk that I will discuss is the management and administration of the parameters of social engagements. The UC's occupy a delicate position in the interface between the institution and the users. High demands are placed on them from both sides, and they are constantly required to compromise between management directives and informal requests and demands from users. However, their activities are coordinated and recorded through a computerised call logging system that allows their superiors to generate reports in terms of number of calls resolved, average length of time taken per problem and so on. The UC's are well aware that their movements are recorded through the computerised call logging system and that their performance is measured quantitatively by their superiors, as two UC's explain in Extract 11 and Extract 12.

Extract 11

UC1:	It's stressing me because (1) um (2) if you take a long time on a log? (1) then you're deemed to be incompetent?
OBS:	Oh really (1) OK. (1) So it's a: constant race to (1) keep your time down so that (1) ~ok~
UC1:	And that is the nature of the logs.

Extract 12

1	UC2:	… they don't have a:: (.) the whole picture (OBS: right) (1) just a part of the
2		picture (OBS: ja) (2) And it's even when you're in the office (1) Mike (.)
3		all the interruptions (OBS: ja) and I/I doubt they see that (OBS: ja) (2) um::
4		uh like U24 walking in (.) you know what I mean (.) (OBS: Mmm) with her
5		query um:: (1) (OBS: Mmm) or somebody just coming in (.) about
6		something else (.) uh (.) or the 'phone ringing or: (.) (OBS: ja) and then you
7		have to answer that and (OBS: ja) and (1) uh they don't see the (.) whole
8		picture (1) because we get all these extra ta:sks (.) that they expect us to do
9		.hh (OBS: ja) a:nd (.) they wonder why it's not getting done (.) they can't
10		understand they wo (.) they just (.) think that it's the logs (OBS: ja) you had
11		ten logs how come you didn't do the ten logs (OBS: hm, hm) (1) but all the
12		extras (that we're wading through) (1)

The ability to cordially manage social exchanges in a way that satisfies both local and institutional demands is therefore an essential skill. The following analysis will show that attributional talk is an important tool in regulating interactions.

The second focus of the following analysis is the role of attributional talk in constructing and living-out both expertise and laity. Gill (1998) has shown that the type of social position that is being occupied influences the types of attributional talk that may be employed. It follows that an understanding of the social and institutional positions of the UC's and users in this context might inform our readings of their interactions.

It is worth remembering that only users who have problems that they could not solve themselves become involved in problem-solving interactions with UC's. These users have jobs to do for which the computer is supposed to be a productivity-enhancing tool. Their work is disrupted to a greater or lesser extent until the computer is returned to functionality and the UC plays an essential role in resolving (or prolonging) the interruption. Thus, even before the user and UC come together, there is a strong power differential based on practical need. There is also a power differential based on expertise. By reporting the problem the user is usually admitting defeat and deferring to the superior expertise of the 'helpdesk'. There is a

strong expectation that the expert who arrives should be able to solve the problem. However, computer problems are cryptic by nature, and many are deferred or simply left unresolved. Therefore the task of constructing and defending expertise in a context where success is not certain is an important part of doing the work of a UC.

In the following sections I will first discuss in detail how attributional talk is employed in the management of interactions and the generation of exit points and then how attributional talk is essential to the management of expertise. These two themes are related, because early (or otherwise improper) exiting can threaten the social conditions for expertise.

6.1 Attributional talk and the regulation of social interactions

Attributional talk, in this context, is often used for the purposes of "contract negotiation" – that is any talk oriented to negotiating the purpose and boundaries of a troubleshooting interaction or arriving at a termination. Extract 13 is a prototypical example, and one that I will return to. U8 informally reports a problem to UC2 who tries to resist taking it on. U9, with the support of U8, finally convinces UC2 to take on the job with the proviso that it is a "five minute job".

Extract 13

1	UC2:	Are you enjoying your [brand-name computer] (.) U8?
2	U8:	Um:: (2) ye::s (1) In the beginning it wasn't (.) shutting down but there's a
3		few things that needs to be done .hh (1) I have um (1) 'phoned (2) ITD (2)
4		my um:: (2) to do with Word
5		(1)
6	UC2:	To do with?
7		(1)
8	U8:	To do with GroupWise
9		(1)
10	UC2:	What's the problems you've got?
11	U8:	Everytime I go into Group-wise I've actually got to go in (.) and:: (.) um (4)
12		into display:: it doesn't display everything I've got to put all items. (1)
13		Every single time. (1) It doesn't come up automatically
14	UC2:	Have you logged it at the desk?
15	U8:	Yes. (UC2: ~ok~) (2) Quite a while back (1) About a month ago

16	UC2:	They would've responded by now (U8: Ye::s, I think so) I'll check them/I'll
17		check it out for you (2) When I get back I'll check the logs (U8: okay)
18	U9:	But that's quite important for us, Date, time (who they are)
19	U8:	And also the date. (.) I can't get the date display every time I (.) print (1)
20		um::=
21	UC2:	=Oh your views are incorrect you (.) are you unable to do anything? (U8:
22		hm:::) ~Okay~ (2) maybe I can look at it while I'm here (1) five minutes
23		(U8: Five minutes huhuhuh) (2) Hopefully it's a five minute job.

Notice that much of the work involved in securing engagement is done through attributional talk. Lines 11-13 and 19-20 are primarily concerned with establishing that the problematic effect happens every time (consistency information). This has the dual effect of proving that the effect is indeed a problem and motivating for attention, since it is not a transitory glitch. I will return to this example in detail a little later.

For coding purposes, "contract negotiation" is understood as any talk oriented to defining the terms by which a troubleshooting interaction can be concluded. Table 5 represents the frequency at which such talk occurs in each of the problems covered in the dataset. It is striking that only five of the 34 recorded problems did *not* contain any talk oriented to negotiating the boundaries for the interaction. This pattern becomes even more pronounced when one takes a closer look at the five problems lacking contract negotiation information (Table 6).

Table 5: Frequency of instances of contract negotiation for each problem-solving exchange

Number of instances of contract negotiation in a problem	Frequency of problems displaying this many contract negotiation exchanges
0	5
1	6
2	10
3	1
4	5

5	4
6	1
12	2

Table 6: Details of problems displaying no contract negotiation

Problem Number	Circumstances
2	Problem explained away. No substantial engagement. This was the shortest recorded problem at only 464 characters.
8	Misplaced document. Quickly diagnosed and solved in the context of a much longer interaction.
22	User not present.
29	User not present.
30	User not present.

In three of these problems the user was not present, and one was explained away without entering a troubleshooting engagement as such. Problem 8 is therefore the only one recorded in which there was no talk explicitly oriented to contract negotiation. However, the problem occurs as a tangent to a much more involved troubleshooting exchange. Prior to the engagement the UC had expressed a great fondness for the genial semi-retired user – in the UC's words a "sweetie-pie". The lack of contract negotiation talk may be a result of the UC's affection for this user and her declared eagerness to please in this instance. Talk oriented to contract negotiation can therefore be seen as a regular feature of UC's interactions with users.

Contract negotiation talk is oriented to the focussed social purpose of regulating the work of the UC, within the bounds of professionalism and protocol, and with respect to the immediate needs of the user. There are potentially three stages. First, many problems are sidestepped without engagement where this is possible within the bounds of politeness and professionalism. Second, UC's are generally careful to negotiate the terms of engagement

before accepting the social contract. Third, whether a solution has been found or not, the pressures of the job require UC's to find a polite way to leave so that they can move on to the next item on their list. This does not mean that the problem is left unsolved, but rather that if it cannot be solved in a reasonable amount of time then it is deferred and/or escalated. Generally as soon as the UC begins to troubleshoot they are committed to the spoken and unspoken terms of the engagement and an exit point must be negotiated with respect to such terms. In the following sections I will show that attributional talk plays an important role in the management of these social contracts.

6.1.1 Sidestepping engagements

Extract 14 displays problem 2 (see Table 6, above) in its entirety. This was a case where it was not clear whether there was a problem at all and, in the initial coding, it was very much on the borderline. In the end it was decided to code it as a distinct problem because there are clear symptoms that are clearly diagnosed, and the practice of coding according to participant's orientations prevailed. This coding decision could easily have gone the other way because the 'symptom', even though it seemed like a problem to the worried the user, is normal behaviour of functioning anti-virus software.

Extract 14

1	U2:	((enters)) I just did a virus check on the file? It was fine? (1.0) And then I
2		started doing a Worper (.) ah er (.) Microsoft Word document and suddenly
3		a screen came up saying COPYING FILES to somewhere it was (.)
4		(strange)
5	UC1:	O.K. That would be your F-Prot updating itself.
6	U2:	=OK (.) Right (.) OK ((The
7		following said while laughing)) I just wondered because I thought I've
8		closed the virus CHECK WHAT'S IT DOING NOW?
9		(5.0)
10	UC1:	Um…
11		(35)

It is interesting that the user never actually requests an opinion from the UC. Simply mentioning a symptom and saying that it is "strange" is enough, in this context, to elicit an attributional response from the UC. In this environment, a description of behaviour and symptoms opens an attribution slot that can only properly be closed with an attribution. The UC makes a firm and certain diagnosis (line 5) and the user accepts it (line 6). Following the UC's confident attribution the user drops the issue. The UC's response is based on expert knowledge (to which the user does not have access) that gives the UC power to pronounce judgement. At this point the user is in a position where she has erroneously concluded that a perfectly normal (and desirable) behaviour is "strange". Her response, said while laughing, restates her 'problem' as something not serious. Her immediate shift to the past tense signals that she has accepted the UC's diagnosis and, by emphasising that her suspicion was in the context of having already "closed the virus check" she defends her position as a vigilant user rather than an ignorant or stupid one.

In this case, the UC is able to close the attribution slot by making a firm and confident diagnosis that the symptoms reflected a benign behaviour. In so doing the UC is able to sidestep further engagement with the 'problem'. Extract 15 shows a similar use of a description to open an attribution slot as a means of attempting to initiate engagement – and this time it that is more difficult for the UC to sidestep.

Extract 15

1	U12:	You know what? (1) I installed (1) um::: (.) Real (.) Player Basic (UC2: ja)
2		you know from the thingy? (1) But I can't get it (.) to/to/to play (1) I don't
3		know what I've done (1) but (1) it/it's (UC2: okay) insta:lled fine (1)
4		the/the/the
5	UC2:	When I get to your machine?
6	U12:	Ja:: maybe you can just (.) if you can't get it right it's not a major thing
7	UC2:	But we do not support Real Thing on the machine (1) (U12: I kno:::w) the
8		that's/that's just a little bit of entertainment
9	U12:	Ja it is (.) it's my entertainment hh .hh (.) Let me open for you UC2
10	UC2:	Okay (.) that's fine (1)

In lines 1-4 the user attempts to initiate engagement by describing her actions and the computer's behaviour – that she installed Real Player but she can't get it to play. Just as in Extract 14, the user never directly asks the UC for help. She pleads ignorance by saying "I don't know what I've done" (line 3). Both of these strategies – detailed description and pleading ignorance – serve to subtly open an attribution slot. This is a compelling means of initiating engagement because it sets up a powerful conversational demand for an attribution, and therefore an engagement with the problem.

The pattern of silences in this conversation is important. Notice that, as the user opens the attribution slot, she is forced to extend four one-second pauses after stating the problem in which the UC fails to respond. (lines 2-3). It is clear that the UC repeatedly resists engaging with this problem, but in line 5 she comes very close to accepting it. There are two factors that may explain this. Firstly the user has not given enough information to make an instant diagnosis that would allow the UC to brush off the problem as in Extract 14. Secondly, the user has constructed a strong position of weakness to elicit help from the helper. It is now difficult for the UC, in her professional role, to decline the engagement. Her initial response is to attempt to *defer* engagement (line 5). The user's response is ingenious – "If you <u>can't</u> get it right it's not a major thing" (line 6). This statement presses the UC's buttons at two levels. Firstly, it is a reminder that an attribution slot is open and waiting to be filled. Secondly, it reframes the UC's reluctance to engage as an *inability* to solve the problem. The result is that it becomes difficult for the UC to sidestep engagement without casting aspersion on her own expertise.

The UC's response (in lines 7 & 8) outflanks the user on two fronts. Firstly she appeals to an institutional policy by informing the user that Real Player is not officially supported by the IT bureau. This allows her the space to decline the request without compromising her position as

a professional. Secondly she points out that Real Player is "entertainment" (line 8) and thereby sets up a dialogical opposition between work and non-work related problems. This bolsters the legitimacy of her reluctance to engage – if the software is not work-related for the user then fixing it is not part of the UC's work. By undermining the legitimacy of the open attribution slot, the UC is able to sidestep the conversational demand to close it.

In many cases UC's were not able to successfully sidestep engagement. As soon as they touch on troubleshooting talk then they are committed to making an attribution of some type and, as I will discuss later, become bound by the demands of professionalism and expertise. However, in almost every case where problems were reported informally, rather than through the official channels of the helpdesk, UC's negotiated the terms of engagement in advance to set boundaries on the extent of their involvement.

6.1.2 Negotiating terms of engagement

Now, returning to Extract 13 (page 133), I will discuss a problem that the UC is unable to sidestep and unable to resolve. The problem-solving escapade that begins here is somewhat poignant, since it is sparked by a polite attempt to make conversation (line 1) but was still unresolved after several hours of work and at least two visits to the site. The UC asks the user if she's "enjoying" her fairly new computer. The user signals disagreement with a pregnant two second silence before offering an elongated "ye::s". Her opening gambit is sophisticated. She reframes the aspects that she is not "enjoying" as "things that need to be done" (line 3). Now she is no longer talking in the subjective language of enjoyment, but about problems that objectively "need" attention. She then mentions that she has already reported a problem through the official channels. Even then, the UC is reluctant to engage and fails to respond in five pregnant silences left open by the user (lines 3-4). In conversational terms, a two second pause can be an eternity (ten Have, 1999), and it is unusual for a speaker to avoid

conversational turns in this way (Antaki, 1996). The UC's repeated silence signals her reluctance to respond. When she does respond she asks "what's the problems you've got" (line 10) and, from this point, becomes increasingly committed to the engagement. The user responds with a description of the problem that, in a similar way to Extract 14 and Extract 15, opens an attribution slot.

However, the UC does not engage with the problem yet, and there is strong evidence that she is still reluctant to get involved. First she confirms that the user has followed the correct channels by logging the call at the helpdesk (line 14). The UC would be under less obligation to help if the fault was not reported through the proper channels – in other words, the strength of the social obligation is related to its legitimacy (cf. Extract 15). The user doesn't initially orient to this question as a challenge, simply answering "yes" (line 15). However, the UC replies with a very quiet "ok" (line 15) and leaves it at that, as if the fact that it is logged at the desk (and therefore in the process of being responded to) means that she does not have to deal with it *now*. Again, notice the pattern of silences in the user's response and how the user is forced to escalate her description until the UC responds (line 15). The user adds that the fault was logged "quite a while back" (line 15). This gets no response, so she adds "about a month ago". Finally the UC admits that "they would have responded by now" and agrees to "check it out" (line 16). However, it turns out that the "it" that she intends to "check out" is the *helpdesk database* to ensure that the complaint is still on the system. U8 seems to agree (line 17) and, if it were not for U9, this could have been a successful sidestep. However U9 makes an argument for the importance of a resolution and U8 concurs. In the context of the slow response, this forces the UC to engage with the problem.

The UC's response is to make a firm attribution, similar to the one which successfully sidestepped engagement in Extract 14. Her next response is interesting – she asks if the user

is "unable to do anything". This question is a double-edged sword. If the user says "no" then she is admitting incompetence especially since it has already been made clear what the problem is. On the other hand, if she says "yes" then she protects her competence but admits that she does not need help and allows the UC to terminate the engagement. Her non-committal response forces the UC, after *another* two second pause, to make a tentative and guarded offer to "look at it". She tries to set a boundary of five minutes on her engagement to which the user responds with a chuckle – in other words, fails to validate. After leaving a two second pause, the UC modifies her terms to "hopefully it's a five minute job". Now, instead of a time-based obligation, the UC has committed to an open-ended "job" that she hopes will take five minutes. In other words, she has finally committed to closing the attribution slot opened by the user in lines 11-13. In the end, this engagement consumed several hours and several visits and, by the time I stopped observation, had still not been resolved. Clearly, once the UC has committed, it becomes difficult to terminate the engagement without producing an appropriate attribution or solution.

In Extract 16 the user engages the UC in passing and we see many of the patterns already outlined above.

Extract 16

1		((The noise of the microphone being moved obscures a few seconds in
2		which U11 enters and seems to ask UC to look at a problem before she
3		leaves))
4	UC:	(Inaudible) if it's not too long::
5	U11:	Well I think it will be really quick
6	UC:	Okay.
7		(1)
8	U11:	Uh (.) I've received an attachment (.) which is apparently I read the article
9		in:: (1) Adobe Acrobat (.) or whatever
10	UC:	Ja uh-huh because it's in p-d-f format (U11: ja))
11		(1)
12		You got Adobe installed?
13	U11:	I'm assuming so because
14	UC:	=If you just (.) if you:: (.) just say (.) open

15 U11: ='cause we
16 haven't had
17 UC: =just say open if you've got Adobe it will defau::lt it
18 U11: It does nothing (.) you see=
19 UC: =Okay let me just check=
20 U11: =Does that mean I haven't
21 got it?
22 (2)
23 Sorry, if it's going to take long then I'll have to log a fault
24 UC: No no not at all (.) let's just see:: um
25 (13)
26 UC: No (.) you don't have it installed um:::: (1) U11 (1) .hh it won't take long
27 I'll just put it on it takes
28 U11: =Oh! Ok.
29 UC: = it's about five minutes (.) I've got it on a
30 CD so I'll put it on
31 (1)

Lines 1-3 do the work of setting up the terms of engagement. The user makes a request (inaudible in this case), the UC responds with the grounds on which she is prepared to accept the contract ("if it's not too long"), the user accepts these terms ("I think it will be really quick") and the UC confirms that she is prepared to have a look at the fault. Although it is simple, this is clearly a social contract. It has terms and conditions that are negotiated and agreed to by both parties. In this case the condition is not to persevere until the problem is solved, but to work at it for a reasonable amount of time. The amount of time that would be reasonable is not clear, but is defined in some way by the difference between informal and formal requests (line 23). In engagements where problems were logged through the helpdesk UC's are expected to persevere until the user offers release, as I will discuss later.

Once again, the attribution slot is opened by a description of symptoms and behaviour (lines 8-9). This time it is easily closed (line 26) with a confident attribution and an offer of a solution.

6.1.3 Smokescreening

There were a small number of similar instances where UC's did not resist engagement, and even the following one in which the UC foisted engagement on a reluctant user:

Extract 17

1	U1:	So (.) do you know how much my hard-drive (1) like um (.) uses the
2		network?
3	UC1:	(3) OK, I'll have a look and see which/which (1) version you've got (4)
4		Does your machine hang a lot? (2) Very slow?
5	U1:	Hmmm.
6	UC1:	(5) What we've find is (2) these [brandname] machines they came with the
7		[brandname] Windows 98 (3) that was problematic
8	OBS:	=mmhhhmmm
9	UC1:	and we only discovered that (1) recently
10	OBS:	=Oh, ok.
11	UC1:	(2) ((if)) this has got the [brandname] Windows 98 on it (.) you can (3)
12		improve it's performance a great deal just by reformatting with the standard
13		Windows 98 on it.
14	OBS:	Hmmm? Interesting.
15	UC1:	Mmmm. (3) Those machines (.) the hard-drive (1) I must say though U1 (.)
16		this machine doesn't have the symptoms of (1) the others. (2) With the other
17	U1:	Uhuh.
18	UC1:	machines you heard the hard-drive going the whole time (.) it was going
19		Krrrrrrr like it needed to be
20	U1:	=mmmmmmmm
21	UC1:	defragged? (1) And you run defrag and it (.) starts moving the blocks from
22		the very first one? (1) And
23	U1:	=mmmm?
24	UC1:	then you run Defrag (.) immediately again and it starts all over again from
25		(.) scr(.)start (1) That was the characteristic of those machines.
26	U1:	=yaa
27	UC1:	(3) I'll try (1) I'll have a look at your machine. (2) How recently did you get
28		this one?
29	U1:	(5) A few months ago?
30	UC1:	Oh (1) ok (1) Could be (.) could the old (2) ~operating system~
31	U1:	~I know~ (3) Well I can open it when I phone you all (1) I dunno if I work
32		on it...(2) but then I/(2) I will
33		just try and see (1) if I'm gonna have a problem then I'll (3) ~if I've got
34		work to do~ (.) ~it seems to be fine now~?
35		(3)
36	UC1:	Do you want me to check and see which version of Windows 98 you have?
37		(3)
38	U1:	Not really, no.
39	UC1:	=Do you wanna just =just (.) So you can open that file (.) there (2) Do you
40		want to try saving to that
41	U1:	=ya
42	UC1:	disk again (.) from here?
43		(20)
44	UC1:	And this was the same stiffy that wouldn't work yesterday? (1) ~ok~ (3) I (.)
45		can't (.) give you an explanation.
46	U1:	(2) Ya. (3) It's OK as long as you had a look at it there's no viruses (.) (there
47		so long)
48	UC1:	=No (1) viruses (1) ~That should be fine ok.~
49		(5)
50	UC1:	Defrag can tell you (3) what operating system you've got (.) just by running
51		defrag (1) oops

In technical terms, the user's opening question (line 1) makes no sense and – although it opens a conversational attributional slot – it is not one that can be filled with a meaningful attribution. The UC takes a full three seconds to respond, but does so as if the question made sense (and perhaps it did in the bounded context of the interaction). She begins to gather information that would point to an attribution to a 'problematic' version of the operating system. However, even though the *form* of the attributional interaction is intact, the *content* is disjointed since the information being gathered to address the open attribution slot does not match its root parameters (line 1-2). By offering a plausible potential attribution, even one that is not directly relevant, the UC is fulfilling the formal conversational requirements of the attribution slot. However, she is presumably accountable to the user for the relevance of the attribution she offers. The user's non-committal responses during the UC's extended explanation of the problems with versions of the operating system (lines 5, 17, 20, 23 and 26) fail to ratify the UC's attempt at closing the attribution slot.

Then the UC asks the user directly if she should check whether the operating system is a faulty version of Windows 98 (line 36) and the user declines the offer (line 38). More interestingly, after declining the offer, the user retracts the request for an attribution by quietly saying "it seems to be fine now". How do we explain the user's abrupt release? Soon after introducing the smokescreen line of attribution, the UC casually dropped into the conversation that the performance of a faulty version of the operating system can be improved "a great deal just by reformatting with the standard Windows 98" (lines 12-13) – a solution that would require the user's computer to be taken away for several days. The user seems to express reluctance to accept this potential solution because she has "work to do" (lines 33-34) and, by implication, does not want to lose her computer while it is reformatted. By clever use of a smokescreen that fulfils the formal conversational requirements of the

attribution slot – even though it does not technically address the problem – the UC has manoeuvred the user into dropping her claim for attribution altogether.

I will show in a moment that the UC's spurned offer performs an extremely important function in terms of generating an exit point for the interaction but, in order to discuss it, I first need recontextualise it in terms of a long and frustrating troubleshooting interaction.

Extract 17 is taken from the same troubleshooting interaction concerning a failure to save a file to a 3½" disk that began with Extract 5 and was dipped into again in Extract 6, Extract 7 and Extract 8. By this stage the UC has been working on the problem for about 45 minutes and has not found anything that would explain the primary problem. She is faced with the challenge of making an escape without having solved or explained the problem she was called in to investigate – in other words, the challenge of closing an attribution slot without making an attribution.

6.1.4 Negotiating exit points

By this point (Extract 17) she has made two apparent attempts to leave, yet is still working on the problem. It is worth looking at these in turn. The first occurs about a quarter of the way through the 50 minute engagement.

Extract 18

UC:	It could be: (1) that your (inaudible) are faul:ty?
U1:	But then what can be saved on here?
UC:	Um (inaudible)
U1:	It's having a bad day?
UC:	OK? (1) Well if the same disk works in another machine (U1: ya) there's no problem with the disk (.) so you go back to your machine here (.) It seems like there's either a problem with (2) the stiffy drive of your machine (.) o:r WordPerfect (.) And now the stiffy drive's working OK and WordPerfect's working OK so it could be a virus I will run a (.) scan (U1: mmm.) But OTHER (.) than that? (2) we'll just have to shrug our shoulders and sa:y (.) we don't know caused it (1)
U1:	ya:

13	UC:	Gone now.
14	U1:	I think I'll try (inaudible)
15	UC:	But did you? Huhuhuh
16	U1:	=Huhuhuh
17	UC:	I'll give you the log numbe:r um (.) so that if the problem recurs (.) you just
18		ask to reopen that call. And your name is at the top of it (.) ~ya~.
19	U1:	=ya.
20	U1:	OK.
21	UC:	Well I hope that you (come right)
22	U1:	OK
23	UC:	(7) OK? (1) mystery. (1.5) Mystery.
24		
25		((U1 Leaves))
26		
27	UC:	~And she (.) she can't be lying.~
28	OBS:	No. (3)
29	UC:	If we can open that document twice (1) ~and one day you don't~ (manage
30		to) sa:ve (.) ~~~She's not lying~~~ (1) She's OK.

By this point the UC finds herself in a dilemma. Although she is the 'expert', she is having no more success in determining the cause of the reported fault than the user did. She is left with task of defending her subject position without the luxury of actually having resolved the problem or closed the initial attribution slot opened by the user's complaint to the helpdesk. The user offers her an escape hatch by suggesting that "It's having a bad day" (line 4). This explanation, if it were mutually accepted, would offer both the user and the UC an exit point. However, the UC does not take up offer. Instead she summarises everything that she has done to determine the cause of the problem (lines 5-11). Since these are actions that she has already performed, and spoken about, previously in this interaction, the summary cannot be considered *informative*. Instead, it can be seen as a display of competence. By listing the possible causes for the alleged error, and matching each with a description of the steps she has taken to eliminate it, she defends her own expert status – even though she has ostensibly failed in her task. She admits that, apart from the possibility that the problem was caused by a virus, "*we'll*" (the two of them as a dialogical unit, rather than *her* as an individual) have to shrug it off as unsolvable. However, she goes further and says that the problem is "gone now"

(line 13). This defends her expert status since, if the problem no longer exists, it is reasonable that even an expert would be unable to detect it. More than that – she is exercising her right as an expert to adjudicate between fact and conjecture.

After having made her diagnosis, she says to the user, "Well I hope you come right", which can be seen as an attempt to transfer the responsibility for the problem back to the user, to which the user says "Ok". The UC waits seven seconds and then and says "mystery … mystery" (line 23). However, the user does not respond – instead she leaves the room. After this, the UC keeps searching for a possible cause of the problem for a further half an hour. What is it that keeps her there for so long after declaring the problem "gone now" (line 13)? After about 20 minutes of running disk maintenance utilities and checking for viruses, the UC gives the following unsolicited progress report to the observer whilst the user is out of the room:

Extract 19

1	UC:	OK… (3) I can't think of any possible cause of that problem can you? (4)
2		It's not the drive (.) the drive is functioning fine (3) It's not the program (1)
3		the program's functioning fine (.) it's not (.) the specific disk she's using
4		((inaudible word)) (.) on another machine (2) unless it's been formatted on
5		another machine and the heads were not aligned properly and she's (.) had
6		(.) had to use the same machine
7		(2) That's what I should do
8	OBS:	=mmm
9	UC:	is get the stiffy (1) from her now and see if it can be read here
10		(4) I don't like leaving it (3)
11	OBS:	=mmm
12	UC:	unknown. (3) When I close this log I'm gonna (.)
13	OBS:	=mmm
14	UC:	gonna (.) put (.) that it's gone.

Again, this seems very much like an attempt to conclude the session, albeit in the user's absence – but the consultant keeps at it for a *further* 10 minutes after she has declared the

problem "gone" for the second time. Soon after this the user returns and the interaction recorded in Extract 17 occurs.

Now, in this context, the UC's offer to "check and see which version of Windows 98" the computer has (Extract 17, line 36) makes much more sense. She has failed to find any plausible reasons for the disk-drive failure that has been officially logged at the helpdesk and therefore the original attribution slot remains open – yet she still needs to leave. Then she notices that the computer has a potential fault for which the cure is far worse than the disease, namely that the computer is slow and may benefit from a complete reformat which would take several days. It is in this context that the UC makes the offer that the user refuses (lines 36-38 of Extract 17). The UC *immediately* returns to the original problem (line 39) and asks the user to demonstrate that the disk drive is working (lines 39-43). She admits that she "can't give … an explanation" (lines 44-45) but soon returns to the very problem that the user has refused help with (lines 50 & 51). By re-opening this subject so soon after describing the intractable primary failure, she nudges herself into a dialogical position in which the user does not want the help that she is offering. She goes ahead and does the test that the user declined in line 38 of Extract 17 which initiates a fairly long conversation of the merits of having the hard-drive reformatted. This culminates in the user repeating her refusal thrice more, as can be seen in lines 11, 22 and 33 of Extract 20.

Extract 20

1	U2:	If they take it will they do it while she waits?
2	UC1:	Nah. (1) No.
3	U2:	But if we drop it there this afternoon she could get it on Monday? (2)
4		Afternoon.
5	UC1:	=Um (2) Oh ja (.) w/we work all weekend.
6	U2:	(2) Huhuh come o:n huhuh.
7		(3)
8	UC1:	You definitely wouldn't have it by Monday
9	U2:	=How long will it come back?
10	UC1:	(2) Um (1) depending on my workload.

U1:	I think I'd rather just wait and (.) do it later.
UC1:	(2) Ya. (.) When you've got a free moment when you can afford to not have the machine the machine for a couple days 'cause (.) that's just allowing for UC5 to come pick it up? (1) Bring it to our offices, (1) for UC6 whose doing the (1) refor–
U2:	=But we could drop it off there. (1) you know?
UC1:	=Ya, tha/that would save a lot of time (.) ya (1) and then UC6's got a list of computers that are (1) in a queue already so yours would join the queue.
U2:	=~oh~
UC1:	(2) and then (2) either you come fetch (1) or
U1:	=But I can't afford that now.
UC1:	No, so (.) leave it for another time.
U2:	December?
U1:	ya
U2:	You can work like this for another month (.) so …
U1:	=ya (.) huhuhu
U2:	= Huhuh
	(2)
U2:	We'll give you other stuff to do, U1.
U1:	=How long will it come back?
UC1:	(2) Um (1) depending on my workload.
U1:	I think I'd rather just wait and (.) do it later.

Finally, just before the UC actually leaves, the following interaction occurs:

Extract 21

UC:	OK. (.) I'm sorry I've got no answers for you here (.) but since (1) your (inaudible) (3) is different from the new one … I'm going to upgrade it to (inaudible).
USER:	~Thanks a lot.~
UC:	pleasure (2) Oh! Let me give you the log number (3) if the problem recurs (4) 76 (.) 739 (5) So if this happens again (1) um (3) try to get them to contact (inaudible) so I can see…
USER:	Ya (3) 76...
UC:	=739 (2) it's about the stiffy drive (.) not being able to save to the stiffy
USER:	~~ok~~

This interaction is subtly different from previous attempts to construct exit points. Firstly, the UC apologises for lacking "answers", but offers an upgrade to an unknown software component. The user responds by saying "thanks a lot" which, in turn, allows the UC to say

"pleasure". Now, finally, the UC is free to leave. Where the previous potential exit points were unilateral – and not ratified by the user – this time it is jointly negotiated. In other words, the attribution process only ends when both parties agree that it can end and they release each other from the social contract.

The UC then offers the user the "log number" which will give her a head start "*if* the problem recurs" (line 5, emphasis added). This short phrase does quite a lot of work. Firstly, the word "if" constructs recurrence as a possibility, rather than a certainty. Secondly, by constructing the problem as something that could "recur" (line 5) or "happen again" (line 6), the UC bolsters her earlier assertion that the problem is "gone now" (Extract 18, line 13). This constructs the problem as something that did exist briefly (cf. "she's not lying", Extract 18, line 30) but that has "gone" and is therefore not currently empirically observable or fixable – and the UC's failure to diagnose it does not cast doubt on her expertise. If the problem "happens again" then the UC should be called in while it exists "so [she] can *see*" (line 8, emphasis added). By constructing the problem as "gone", the UC is able to negotiate an exit point – but it is a conditional release, because the recurrence of the problem will require re-engagement.

Of course, the ideal exit point is one where both parties have satisfactorily fulfilled their sides of whatever social contract they have entered into. A prototypical example can be found in the interaction that began with the exchange recorded in Extract 16 and is concluded in Extract 22, below. (Extract 16 and Extract 22 taken together record this interaction almost in its entirety.) At the moment only lines 31-45 are relevant. I will return to lines 1-30 in the following section on expertise.

Extract 22

1	U11:	You're a star (1) Are you guys going out in teams at the moment?

2	...	((A short interlude follows in which the Observer takes his chance to
3		explain the research project and get informed consent. In that time, the UC
4		installs Acrobat reader.))
5	UC:	I've put the latest version five
6	U11:	Thank you very much
7		(4)
8	U11:	That's great (2) .hh It's strange because one (1) almost it seems that one has
9		these things until
10		(1)
11	UC:	It should have been installed on this machine so:: (.) um (1) it's an error on
12		our side .hh
13		(2)
14	U11:	UC I bought another two (UC: hm) (.) um: PCs (1) fo:r (.) us um=
15	UC:	out of your budget? and um oh (yes)=
16	U11:	=Well, um=
17	UC:	[Brandnames]?
18	U11:	through/No they/no they were/they were budgeted for out of the central (.)
19		(UC: oh, okay) thing but they just (.) they just/just (.) hadn't arrived so I
20		phoned *** to pick up them
21	UC:	hm, and?
22	U11:	And they're coming (.) I don't have to specify:::?
23	UC:	=No/no we've got all the::
24		(1) standard
25	U11:	=all the usual:: (1) stuff (UC: that's right) I don't know if you
26		want us to do it
27		(2)
28	UC:	What they'll do is all/when the machines are available they'll also contact
29		you (.) to find out by then if you've changed your mind (.) you want
30		additional stuff put on (U11: okay) so can tell them (.) you can inform them
31		(U11: okay) um: do you want to open this now?
32	U11:	Lets see (UC: Inaudible)
33		(3)
34	UC:	Okay? So is/now you see you've got Adobe there
35	U11:	ja (.) brilliant
36	UC:	Just pull it (.) (on to your desktop there)
37	U11:	Thank you very much
38	UC:	Okay, pleasure!
39	U11:	That's great.
40	UC:	I just need to get my keys (U11: inaudible) No that's fine and it's not too
41		long (.) it's okay (3)
42	U11:	That's great I'm (.) I'm a happy customer
43	OBS:	=Huhuhuh
44	UC:	=Huhuhuh
45	U11:	=Huhuhuh

This engagement was entered into on condition that it was "not too long" (Extract 16, line 4) and an assurance from the user that he thought it would be "really quick" (Extract 16, line 5). Notice that the UC refers back to this negotiated clause when she concludes the interaction in line 40. This termination is a perfect example of a pattern for terminating a *successful*

troubleshooting engagement. Firstly the UC asks the user to ratify the solution (line 31) and the user does so (line 32-35). The user thanks the UC (line and 39) and the UC acknowledges his endorsement (line 38). The attribution slot is officially closed.

Although I have by no means demonstrated that the user is *required* to offer an acquittal before the social engagement can be amicably terminated, it is clear that this is a way that termination *can* be done (cf. Silverman, 2000). It is useful to count instances of exit points that match this pattern to see to what extent it is, in fact, conventional. There are two difficulties with this. Firstly, several problems are embedded in much longer interactions and therefore have no physical exit point in which participants remove themselves. In these cases the termination of the problem engagement is not an exit point and the social work of termination is blurred in with other talk. Secondly, exit points are sometimes difficult to observe due to physical movement of people that disrupts the tape-recording. These difficulties notwithstanding, Table 7 enumerates the presence of this pattern of termination for each of the 35 problems in the dataset. Where a problem is buried within a longer interaction it is marked as "entangled". Obviously the idea of an exit point does not make much sense where a problem has not been engaged with in the presence of the user, and these problems have been marked as such.

Table 7: Occurrence of conventional exit points

Problem Number	Occurrence of pattern or extenuating circumstance	Problem number	Occurrence of pattern or extenuating circumstance
1	Conventional acquittal	19	Conventional acquittal
2	No engagement	20	Entangled
3	No engagement	21	Conventional acquittal
4	Conventional acquittal	22	No engagement
5	Conventional acquittal	23	Conventional acquittal
6	Entangled	24	No engagement
7	Deferred	25	Not recorded
8	Entangled	26	Conventional acquittal
9	Termination inaudible	27	Conventional acquittal
10	Entangled	28	Entangled & deferred
11	Conventional acquittal	29	User absent
12	Conventional acquittal	30	User absent
13	Conventional acquittal	31	User left before termination
14	No engagement	32	Inaudible
15	Conventional acquittal	33	Entangled
16	User absent	34	User fails to ratify.
17	Conventional acquittal (although the ratification stage is unclear)	35	Conventional acquittal
18	No engagement		

In total there are 17 problems in which it would be reasonable to expect a clear exit point. Of these, two are inaudible and thirteen follow the conventional pattern of acquittal to the letter. In one instance (problem 17) the user's ratification of the solution is not clear in the transcript. There is only one exit point (problem 34) that clearly does *not* follow this conventional pattern and it is worth taking a look at this deviant case (Extract 23, below).

Extract 23

1	UC1:	U21 can I leave this printing here?
2	U21:	Ja
3	UC1:	And um pick it up from you later
4	U21:	Mmm
5		(4)
6	UC1:	Just to take that (.) and refer it to the (.) F-Secure people and see if the::y
7		have any comment on it
8	U21:	Mmm
9	UC1:	Whether that should be so
10		(3)
11	U21:	Um, ok thank you
12	UC1:	We've taken (1) we've deleted 1 (.) file that was infected with Nimda
13		(1)
14	U21:	Ja (1) oh did you get rid of that Handel?
15	UC1:	No:: (1) it wasn't infected
16		(3)
17	U21:	Good
18		(3.0)
19		would you like to just check those for me
20		(2) oka:::y
21	UC1:	We've still got to go back to U20's machine
22	U21:	Ja ok

This engagement continues the interaction that started in Extract 9. The computer has been continually re-infected with viruses and at least two UC's have attempted to solve the problem. In this instance the virus-scanner did detect and remove one virus-infected file, but it was unable to scan about 300 files – and the UC believes that this is very suspicious. She has begun printing out the virus-scanner log-file, which she knows from experience will take several hours, so that it can be referred to the manufacturers of the virus scanning software for comment (line 6). Although this has not been displayed in these extracts, the user began the interaction by insisting that a file called "handel" was suspicious and repeatedly expressed her conviction that it was related to the virus. Over the course of the interaction the UC repeatedly ignored the user's assertions or assured her that 'handel' was a red herring.

In this extract the important thing to note is the user's reluctance to ratify the UC's attempts at termination. As always, the UC has made an offer. In this case it is that she will get advice from the überexperts of the anti-virus company. The user's response to this attempt at deferral is a non-committal "mmmm" (line 4) in spite of being left a 4-second slot to fill. The UC tries to repeat the same offer (lines 6-7) and, again, the user fails to approve (line 8). She holds out for another long (3-second) pause before finally yielding a subdued "thank you" (line 11). This is prefixed with "um, ok" which subtly implies that the "thank you" is not entirely sincere and is granted under a degree of duress. The UC picks up on this and reminds the user that at least one infected file was deleted. Again the user's response is non-cooperative and she asks about the file that the UC has repeatedly failed to investigate. The UC makes a confident diagnosis (line 15) which the user, again, treats with silence (line 16). Finally she says "good" (line 17). It really is not clear what function this utterance is performing. The UC certainly does not respond to it as a ratification – in fact, she does not respond to it at all. The user, after a 3 second pause, then requests if the UC would "like to just check" something for her (line 19). The UC is silent for two seconds (line 20), but the user responds as if the silence was informative by giving a drawn out "okay" (line 20). The UC makes an excuse that there are other jobs to do (and draws on the fact that it is already late in the afternoon) and the user says "ja ok" (line 22). This is not a termination – it allows the UC to escape, but it does not close the attributional contract. Although the talk is (at face value) polite, the pattern of silences and the repeated rejection of advances by both participants reveals a subtext of conflict. This is partly explained by the repeated failure of at least two UC's to resolve the problem. Previously in this interaction the UC had asked the user how much she would be inconvenienced if six month's worth of financial records had to be deleted, although this was later modified to "one or two" months. Certainly, from the

user's perspective, this is an important problem, and her clear reluctance to release the UC from the engagement is understandable.

It should be clear from this discussion of the management of engagement that attributional talk does more than simple information exchange for the purposes of cooperatively answering the question "why". Although attributional talk is useful in problem-solving, it also fulfills other social functions and regularly becomes a site of struggle between participants. One of these functions is the regulation of problem-solving encounters and the negotiation and termination of social contracts. So far I have discussed this process as if termination is the primary goal of the UC and engagement is the primary goal of the user. However, there are several signs that this is an overly simplistic view. Take Extract 18 as an example. The user offers an exit point by saying "It's having a bad day" (line 4) which the UC resolutely ignores. Had she accepted this as a valid exit point she would have saved herself a frustrating half-hour. Instead she responds with a display of competence (lines 5-11) which draws her further into the engagement, as I have already discussed. There is clearly something about the user's offer that the UC is unwilling to accept – and this leads us to a discussion of expertise.

6.2 Constructing expertise

By the time the user suggests that "It's having a bad day" in Extract 18, the participants have exhausted most avenues for exploring consensus information, since it has been determined that both the UC and the user experience the same (successful) result with different disks from within different applications. They have explored all the avenues of distinctiveness information and have not been able to demonstrate how the failure situation differed from successful ones. They have also explored consistency information by delving into the history of the machine's behaviour prior to the failure and have come out empty-handed. Finally, almost as a last resort, the user suggests that the machine is "having a bad day?" This

suggests that the failure is due to factors that are both random and unfathomable. The question personifies the machine and endows it with moods – states of being that are unaccountable and de-coupled from cause and effect linkages. In other words, the user is offering an exit point that depends on accepting that rational attribution is not possible in this case. The UC does not accept this but rather explains the actions she has taken to test various possible causes that could result in this effect (lines 5-11). She offers the alternative that they will "just have to shrug [their] shoulders and say [they] don't know what caused it" (lines 10-11). She refuses to accept the user's suggestion that cause-and-effect have somehow broken down and instead constructs the problem as something that could be understood if enough information were available. This reconstruction of the situation does not release her from the engagement (as the users's suggestion could have), but it does protect her position as someone who *could* understand the problem if she only had enough information.

This pattern is repeated in Extract 19 (lines 1-9). However, this time the UC admits to the observer (but not to the user) that she "[doesn't] like leaving it unknown" (lines 10-12) and, instead, she will conclude "that it's gone" (lines 12-14; see also line 13 of Extract 18 and line 14 of Extract 19). A similar construction is made in Extract 21 as the engagement is drawing to a close. The UC apologises for having "no answers" (line 1) and says that the user should contact her "if the problem recurs" (line 5) or "happens again" (line 6). There is a subtle difference between a problem that is gone and one that is unknown. If it is "gone" then how can it be detected? On the other hand, if a problem is present but undetected then the expert may be at fault. Therefore this construction of the problem protects the UC's attributional competence in spite of her failure to solve, or even to detect, the problem.

It is clear that, in this instance, the social goal of defending expertise dominates the practical goal of making an exit since the UC refused an exit point early in the interaction at the

expense of a great deal of time and effort. In fact, issues of competence and expertise have been a central theme around which all of the interactions I have discussed have been organised. For example, in Extract 8 (page 120) the user detected the UC's surreptitious attempt at surveillance and took measures to protect her competence. In Extract 9 (page 124) the user admits to opening a dodgy email that may have led to a virus infection, but paints herself as a 'kind' rather than a negligent user. In Extract 10 (page 128) the UC, after rummaging through various locations to find some settings that need to be changed, carefully constructs herself as someone who once knew but has forgotten rather than as someone who never knew at all. In Extract 11 and Extract 12 (page 131) the UC notes that her competence as a UC is judged on her efficiency. In lines 21-22 of Extract 13 (page 133) the UC asks if the user "can … not do anything?" and, by implication constructs herself as someone who can do something (or anything). In Extract 14 (page 136) the UC's confident attribution positions her as someone with knowledge and the authority to distinguish between problematic and normal symptoms. In Extract 15 (page 137) the UC claims the authority to adjudicate between work and non-work related problems and to pass judgement on whether a problem is worthy of a solution. A similar thing happens in Extract 16 (page 141) where the UC claims the right to investigate and diagnose a problem that the user had judged unimportant. In Extract 18 (page 145) the UC ignores the user's non-technical (but quite probably correct) explanation that her computer is "having a bad day" and so disputes the user's right to make inferences. In Extract 19 (page 147) and Extract 21 (page 149) the UC admits that she is uncomfortable with uncertainty and, instead, will declare the problem "gone". I have already discussed how this defends her position as an expert since, if the problem is "gone" then it cannot be detected by any means (or by any expert) until it reappears. In Extract 20 (page 148) the UC emphasises her "workload" and the impossibility of bypassing the queue, and thereby emphasises the degree to which users in general depend on UC's services. Extract 22 (page 150) is an

unusual case, and I will discuss it shortly. In Extract 23 (page 154) the UC defends her right of inference from the user which I will discuss in more detail below.

Issues of expertise and competence are clearly central to the way that UC's and users behave in these interactions. The way that participants orient to expertise has much in common with Gill's (1998) analysis of attributional talk in doctor-patient relationships. Remember that Gill found that knowledge and authority are unevenly distributed between participants. Patients are experts in the empirical realm of experience but it is doctors who have access to knowledge, the authority to decide on the value of symptoms reported by the patient, and who have a mandate for inference. A similar distribution of power has been evident in many of the engagements discussed so far. An understanding of how participants orient to utilising, reinforcing and resisting this pattern will be useful in understanding how expertise structures these interactions (and how the interactions are structured by expertise).

Extract 14 (p.136) offers an excellent example of this pattern. The user makes only two statements that are not hedged, or marked as uncertain in some way, namely, "I've received an attachment" (line 8), and "It does nothing" (line 18). Here the user is an expert in the realm of his own experience – in the subjectivity of computer use. However, when it comes to anything of a technical or inferential nature, the user hedges his statements thoroughly. It is worth analysing this a little more closely.

In line eight the user is certain about receiving an attachment and about it doing nothing (line 18). Those are the only solid pieces of information that he is able to give. The rest is constructed as provisional, by the use of a one second pause (line 9) and disowning devices such as "apparently", "whatever" and "I'm assuming so". Gill (1998) found that, in medical interactions, "patients exhibit caution when they offer explanations; they downplay their

knowledge and they avoid setting themselves up for disaffiliative responses" (p. 342). This seems to describe the user's talk very well.

Gill (1998) also notes that "... patients do not compel doctors to interrupt information gathering to assess their explanations" (p. 342) and, this pattern is clearly played out in lines 20 to 24. Although the user has already said that he "assumes" that the Acrobat reader is installed, a short time later he then asks, "Does that mean I haven't got it?" This is the type of direct question that Gill argues occurs infrequently in interactions with experts because it opens up potential for contradiction or other types of disaffiliation. The user waits two full seconds, a long time in dialogue, and then says "Sorry, if it's going to take long then I'll have to log a fault". This conditional withdrawal of the attribution slot truncates the disaffiliative silence and reduces the conversational pressure for a response that would interrupt information gathering or result in a premature answer. It also offers the UC a chance to terminate the engagement without hard feelings. Gill (1998) argues that the doctor patient relationship is structured by a power differential. In our case, the UC is not dialogically compelled to respond to the question (line 20) and, in *not* doing so, highlights both the power differential and her expert status. The diagnosis comes some 13 seconds later (line 26), and the UC decides that "it won't take long" and accepts engagement. Extract 22 (page 150) shows how this interaction progresses.

It is interesting that lines 5 and 6 could easily have signalled the end of the interaction. The terms which were agreed in the opening gambit have been fulfilled: the attribution slot is closed, the problem is resolved and it has not taken too long. However, after the user says "thank you very much" (line 6) there is a four second pause which is almost an eternity in conversational terms. We will never know exactly why the UC did not fill this conversational chasm with "it's a pleasure", which could have successfully terminated the interaction

according to the conventional pattern. Instead, it was the user who took the next turn. It is at this point that things start getting interesting.

The user says "That's great" (line 8), pauses for two seconds, takes an audible breath and then notes that "it's strange because one" – and then another pause – "almost it seems that one has these things until …" And then he waits. The UC responds to this as a challenge, and apologises for "an error on our side" (lines 11-12). The user waits a further two seconds and begins a stretch of dialogue that, essentially, asks the question "will this happen again" (lines 14-22). The UC is suddenly on the back foot, trying to defend her "side". After assuring the user that due procedure will be followed in the future (lines 23-26) and that the user will have full control over what is and is not installed on the new computers (lines 28-30), the UC changes tack and asks "do you want to open this [document] now" (line 31). The user cooperates (as does the computer) and the user expresses satisfaction at the successful outcome (line 35). In lines 37 and 39 the user expresses thanks which, this time, is responded to with "pleasure" (line 38) and the interaction draws to a conventional conclusion.

What is the difference between the near-termination in line 6 and the genuine conclusion in lines 37-42? Obviously we cannot infer the motivations of either the user or the UC, but I would like to offer the tentative suggestion that, in the game of computer repair, it is expected that the user test and ratify the solution. If this is the case then, although the UC has the power of decree for diagnosis, it is the user who declares the final acquittal – which releases the UC from the social contract of repair.

It is interesting that, from lines 7-31, participants engage in power relations almost opposite to those found by Gill (1998) between doctors and patients. Here it is the user who has the power to interrogate and the UC who is defending her actions (and those of her 'side'). Clearly, although some of Gill's findings apply, there is a different type of accountability

between doctors and patients than there is between UC's and users. In this instance there seem to be two overlapping domains through which interactants can apply accountability to each other. The first is a pattern of expertise very similar to that of doctors and patients, and the second positions the user as an entitled recipient of services and the UC as a service provider. In this extract the participants have switched seamlessly from the expert/suppliant model to the client/service-provider terrain in line 7 and then back again in line 31. Each of these terrains makes different demands of interactants and allows them different powers and privileges.

A more subtle example of this shift between domains can be observed in the interaction that is dipped into in Extract 9 and Extract 23. To give a brief reminder of the context, the user's computer has been repeatedly re-infected with viruses and at least two UC's have attempted to remove the infection already. Extract 24 cuts in to the interaction about 5 turns after it began, and the last line of Extract 25 runs into the first line of Extract 9.

Extract 24

1	U21:	UC1 I don't know really what you can do to it truly, (2) unfortunately (.) I
2		can't speak (.) computer so (1) I'm happy to scan (inaudible)
3	U21:	Ja
4	U21:	Oh (1) won't you do a (.) er (.) look for a:: (.) file called handel (2.0) H-A-
5		N-D-E-L,
6	UC1:	Ja
7	U21:	I think that's linked to it (2) because it's in Pastel:: (1) and it's got handle
8		dot now
9	UC1:	On your H drive?
10	U21:	No, no
11	UC1:	On your C drive?
12	U21:	Ja, I just run (.) fin::d (1) file (.) handel (.) H-A-N-D-E-L (2) (inaudible) I'm
13		sure that that is linked to it (.) that thing
14		(2)
15	UC1:	What I'll do:: (.) is run a virus scan 'cause (.) we could disinfect it first
16	U21:	Mmm (1) because I don't know where it comes from (.) or what it's (.)
17		purpose is or (3.0)
18	UC1:	You learning zulu?

The first thing to note is how deferentially the user asks the UC to look at a file called "handel" (lines 1-5). By the time this interaction was over, she would have asked no less than five times. This persistence in direct questioning does not correspond to the patterns found by Gill (1998) in doctor-patient interactions, where patients were careful to avoid positions that would lead to disaffiliative responses. However, the first time she asks she is very deferent indeed, prefacing her query with a display of lack of entititlement to knowledge, saying "I don't speak computer but ..." (line 1). Initially the UC is responsive and asks diagnostic questions much as a doctor would (lines 3-11). Then the user repeats the request, but this time states it with less respect for the UC's autonomy. She says "find handel" and that she is "sure that that is linked to it" (lines 12-13). This is the type of strong formulation that Gill found led to disaffiliative responses and, indeed, that is the case here. Instead of acknowledging the user's assertion in any way, the UC remains silent (line 14) and then says that she will run a general virus scan first, in other words, that she will ignore the user's attribution (line 15). The user then reinforces her assertion for the third time (line 15) and the UC ignores her again, and this time changes the subject after a three-second pause by asking her a personal question (lines 17-18). After a brief anecdote about the user's son the interaction continues in Extract 25.

Extract 25

1	UC1:	Would we be able to delete all the pastel files?
2		(3)
3	U21:	Mm (3) ugha
4	UC1:	Because those are the ones that are (U21: I know) Infected (U21:There's
5		just so much history in there) and they keep coming back (3) would you be
6		able to recapture it from print outs?
7		(2)
8	U21:	Um no::: (1) I mean it's about 10 000 invoices it's like 2 years worth of
9		work in there (2) all the::: book stores information
10	UC1:	Have you got back ups from 6 months ago::: (.) or 12 months ago:::?
11	U21:	Yes
12	UC1:	I think go up to 6 months ago (.) and just (.) redo the last 6 months (1)
13		before the (.) virus

14	U21:	Ja (we could)
15	UC1:	Have you got a backup from two (.) months ago?
16	U21:	Ja
17	UC1:	Because this virus only came out in the last month or so
18		(2)
19	U21:	The u:::::h
20		(3)
21	U21:	Uh!
22		(3)
23	U21:	I think UC4 came and he (inaudible) checked
24	UC1:	It appears no Nimda is still with you
25	U21:	Ja:: (.) no (.) he's obviously grown attached to us (inaudible)
26	UC1:	Going onto 18 000 almost 19 000 files, deleted 10
27	U21:	Ja (.) mmm
28	UC1:	Handel wasn't amongst them
29	U21:	But it's, it's um I think it's a suspicious file (2) I really do (1) because it (.)
30		it serves no purpose (.) it doesn't do anything (2) and I never noticed it
31		before (.) prior to (1) Nimrod, er (.) ((chuckles) Nimrod! (.) Nimda (2) ja
32		I've got the third of the tenth (.) and (.) UC4 checked these (1) and they are
33		fine
34	UC1:	Did he check them on this machi:ne? (.) or did he take them away and check
35		them?

The UC suggests that they might have to delete the user's primary set of files (line 1) and, in lines 1-20, the user makes it patently clear that the she does not want to delete her files. She does this by failing to fill numerous pregnant silences (lines 2, 3, 5, 7, 8, 9, 18, 20 and 22) and her description of how much work it represents in lines 8 and 9. She has to admit that she has backups from "two months ago" (line 16) but signals lack of support for such a drastic measure by her silences in lines 18, 20 and 21. The user reminds the UC that UC4 has already checked the files that she is proposing to delete (line 23). This utterance is cryptic, but it seems to fill two functions in relation to the user's obvious reluctance to delete the files. Firstly it is a reference to the fact that the IT bureau have been unable to solve the problem and, secondly, it seems to be a veiled challenge to UC1's expertise. The UC's response is an effective rebuff. By casting the virus as an *active* agent (line 24) she reduces the degree of responsibility that the IT bureau carry for the problem compared to that which they would if the problem were *static* and unresolved. The user signals a reluctant agreement with her drawn out "ja::" and participates in the personification of the virus (line 24). The UC's next

response acts as a display of competence (line 26) as she reminds the user that she has found and deleted some infected files. However she notes that "handel" was not amongst the infected files that have been detected and deleted, in other words she is negating the user's assertion that "handel" is related to the virus (line 28). However, the user refuses to concur and uses consistency information to make another attempt to convince the UC that the file is "suspicious". She mentions again that UC4 checked those files and then gives a detailed description of what he did (lines 1-5 of Extract 9). Then, after the UC has finally admitted defeat and deferred the problem until she has received advice from the antivirus experts, the user asks again "did you get rid of that Handel" (Extract 21, line 14). The UC replies bluntly this time, saying "No … it wasn't infected" (Extract 21, line 15).

In this interaction the user repeatedly refuses to defer to the UC's expertise, and it is by personifying the virus and locating responsibility externally that the UC is able to defend it. The pattern of interaction here is quite different to Gill's (1998) description of doctor/patient interactions because the expert is repeatedly challenged by the user without much regard for disaffiliative responses. From this it seems that Gill's pattern of relations holds true when the troubleshooting process runs smoothly. However, in this instance it had gone spectacularly badly over a number of weeks. Thus it is no surprise that the user is not treating the expertise of the UC with reverence. On the other hand, she still makes displays of "lack of entitlement" as Gill expects (e.g. lines 1-5 of extract 23). Moreover, although the user attempts to share in the task of making inferences, the UC resolutely resists this, defends her own position of expertise, makes the final inferences and decides on a course of action.

7 – Discussion

Cognitive attribution theory has generally taken attribution to be an end in itself, and one which people constantly and almost involuntarily engage in to make sense of the world. Although the central cognitive theories (Heider, 1958; Jones & Davis, 1965; Kelley, 1967) provide plausible accounts of how reasonable conclusions can be arrived at, they do not provide watertight arguments that the attributional processes described exist in the head as cognitive mechanisms. There are three unanswered questions left by the mainstream cognitive approach to attribution that are relevant to the current study, namely: when and why do people make attributions, what functions do attributions in everyday life fulfil and what role does language play in attributional processes?

The first aim of this study was to investigate the extent to which these cognitive theories of attribution describe talk in an everyday naturalistic setting. The outcome is that a great deal of the types of information exchange predicted by cognitive theories of attribution did, in fact, take place. In terms of Jones and Davis' (1965) model of correspondent inferences, it was found that participants are much more likely to talk about the problem than about agents. With respect to Kelley's ANOVA model, it was found that consensus information is under-represented in comparison to consistency and distinctiveness information. These findings are generally consistent with other empirical studies of attribution (see Kelley & Michela, 1980). However, this puzzling pattern of attributional talk makes sense if it is acknowledged that social concerns are taking precedence over technical ones. In particular, participants tend to talk freely about operative information (i.e. socially safe information about the problem) and to treat inspective information (i.e. socially unsafe information about agents) with caution. In other words, by treating everyday people as scientists we might do them an injustice by

ignoring the more delicate and intricate work involved in managing the tangled web of social relations in which they carry out their daily lives.

Participants competently employ attributional statements that, whilst having the appearance of being the output of cognitive mechanisms, are carefully selected to serve particular interactional goals. Where the first part of this study shows that attributional processes are enmeshed with social concerns, the second explores the functions that attributional talk may perform in the living-out of social life. In other words, statements that at first glance confirm the principles of cognitive attribution theory are actually (or concurrently) performing discursive and dialogical functions. They are displays that attack and defend subject positions, as much as they are impartial and cooperative exchanges of information. The process of troubleshooting, then, is not so much a cooperative and benign procedure between two impartial naive-scientists, but a dialogical tussle with social consequences (cf. Edwards & Potter, 1993). Participants hold 'interested' positions in which social factors take precedence over impartial 'scientific' ones in which a correct attribution would be the primary goal of interaction (cf. Heider, 1958; Jones & Davis, 1965; Kelley, 1967).

In particular, attributional talk is shown to be useful in the regulation or administration of social resources, such as time and attention. Users use attributional talk to open attribution slots that, in this context, require an appropriate response from UC's. At the same time, UC's are institutionally constrained and are censured if they spend too much time with too few users. They use attributional talk firstly to negotiate in advance terms of engagement that provide an acceptable limit to their engagement – instead of accepting the default position that interaction should continue until the attribution slot has been filled with a satisfactory attribution. Secondly, UC's employ attributional talk to shrug off 'problems' that are not reported through official channels or to generate conversationally acceptable exit points even

when a satisfactory conclusion cannot be achieved. It seems that, once an attribution slot is open, a polite exit requires one of the following: exploiting a pre-negotiated escape clause, for the attribution slot to be filled in a conversationally congruent way, or for the solution to be deferred by agreement. Moreover, the user is required to ratify that the attribution slot has been satisfactorily dealt with before a polite exit can be made.

At the same time as dealing with the regulation of social resources, participants are oriented to the higher-order issues of their own subject positions. Here attributional talk is useful for constructing and defending positions of expertise and competence, both for the user and the UC. Issues of expertise take precedence over practical issues of social management, and UC's work hard to maintain their expert status. This may be a particularly relevant problem for UC's because they so often have to repair computers in the presence of the user. Unlike a video technician, mechanic or surgeon, for example, they troubleshoot on-stage and so their living-out of expertise must accommodate public displays of uncertainty. As such, the construction, showing-off and defence of expertise in this context is a continual process.

Most of the patterns of expertise identified by Gill (1998) in her study of doctor/patient interactions can be seen in the interactions between users and UC's. In this pattern of power relations the UC has certain social power(s) and rights related to expertise: rights to interrogate, to distinguish between fact and conjecture, to make inferences and diagnoses and to make decisions about future courses of action. The user is generally deferent and avoids behaviour that would result in disaffiliative responses from the UC. However there is occasionally a parallel dimension of power relations in this context that was not observed by Gill (1998) between doctors and patients. Occasionally, in circumstances where the user's rights as a user were not met, the power balance shifted. Suddenly the UC was held

accountable as a service-provider and the user claimed rights as a client. Attributional talk played an important role in dialogical shifts between these domains of power.

The patterns of power that structure the relationship between user and UC are therefore not simple. While the expert does have rights and power in the local context of the interaction such as the power to control the flow of conversation, the user is not simply a naive consumer of expert services. After submitting to the expert's administrations the user has the right to assess the experts actions and provide release or censure.

7.1 Implications and suggestions for future research

Even if attribution is socially produced in local settings it must still conform to some normative standards if it is to be successful. I suspect that the context of the study is a very important backdrop for how participants use attributional talk to achieve these social ends. While there are many similarities between the present study and Gill's (1998) study of doctor/patient interactions, it must be remembered that both doctors and UC's make attributions for a living. In such contexts, there are strong contextual expectations that a competent doctor or UC should provide relevant attributions of a particular type, and such expectations may have far-reaching implications for how attributional talk is used to structure the social engagement. In contexts that value logical rationality, cognitive theories of attribution describe normative frameworks by which attributions can be judged. There are many other professional contexts in which there are no such expectations that the expert should provide logical or rational attributions, such as in the practice of stage magic (cf. Kelley, 1980) or psychotherapy. In such contexts attributional talk can be expected to have different social currencies. There are other contexts that are not even structured by power differentials between professionals and lay-people, such as in couples' narratives for divorce. Once gain, attributional talk is expected to have different sets of currencies in such contexts.

However, the modern world is structured both by scientific rationality and by multiple overlapping domains of expertise (Giddens, 1990). Medical doctors may wear the mantle of expertise in their own consulting rooms, but when they experience a computer problem, need to book an air-ticket for a conference or experience any number of everyday eventualities, they may suddenly find themselves supplicated to experts in other diverse domains. As such, the findings of the current study may be useful for understanding the role of attributional talk in the regulation and living-out of many different aspects of social life governed by relations structured by notions of rational expertise.

While the present study has identified ways in which attributional *can* be used in social interaction, it is far from clear that attributional talk is *always* used in this way or that the full range of uses for attributional talk have been identified. Certain commonalities with Gill's (1998) study of doctor-patient interactions were noted, but also certain differences. It seems likely that, to some degree, the social context structures the potential uses to which attributional talk can be put. Future studies may explore this reciprocal relationship between context, social structure and content of attributional talk. Certainly this would go some way towards addressing the problems of cultural specificity that have been levelled at traditional models of attribution (cf. Bond, 1983). More importantly, an understanding of the social powers of attributional talk in different contexts may shed light on diverse areas of study such as social psychology, philosophy of science, media studies, political psychology and human-computer interaction to mention a few.

8 – Conclusions

This study cannot confirm or deny cognitive processes that may or may not happen in the head. However, it is clear that participants regularly talk *as if* the cognitive theories of attribution hold true. Many of the patterns of talk predicted by cognitive theories of attribution are clearly present in the observed interactions. Such talk seems to be useful in technical aspects of troubleshooting, but it also subject to social concerns. Participants use socially safe 'operative' talk about the problem freely, but they are much more cautious about using socially unsafe 'inspective' talk that concerns the motives and actions of agents. It is argued that these patterns of interaction make sense when the social functions of attributional talk are taken into account. Two such functions were investigated in detail in this study: the role of attributional talk in the regulation and administration of social activity and its role in constructing and defending positions of competence and expertise.

Firstly, attributional talk is an important feature of the regulation and management of social engagement and disengagement. Not only do users have to contend with the social issue of not being able to perform their work, but they need to mobilise social and institutional resources in order to return the computer to functionality. Attributional talk can be a useful device for both the user and the UC to initiate, evade, defer, terminate or otherwise manage the social engagement. Attributional talk is employed by participants to motivate for the importance of problems, to explain problems away, to negotiate exit points and so on. Attributional talk is a prominent means by which users motivate to have their problems attended to and an important means by which experts regulate their involvement with user's problems. It is therefore an important resource for managing responsibilities, rights, movements and personal resources. Interlocutors draw on the patterns of power described above as they negotiate and enforce the terms of engagement.

Secondly, attributional talk often functions as a *display* that generates, protects or challenges positions of competence and expertise. The position of being the user of a failed computer is a tricky one, since there is always an unspoken possibility that the user could be responsible (or irresponsible) for the failure. Similarly, being the UC in attendance for an intractable failure becomes increasingly difficult if an interaction progresses without progress or resolution. Both of these positions require the skilled use of attributional talk to defend positions of competence. Expertise is a socially negotiated position and, particularly in situations where a clear solution is not forthcoming, one that requires active defence.

9 – Reference List

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10 – Appendix A: Information provided to participants and informed consent forms

10.1 Information release for user consultants

1 October, 2001

To all ***-based user-consultants:

RE: Request for participation in research project

The attached information sheet describes a research project which will investigate the dynamics of computer failure and repair. In order to complete this research, to be carried out by a Masters student from the University of *** School of Psychology, we need to find User Consultants who are willing be involved as they go about their day-to-day tasks.

This would involve:

- Being shadowed by the researcher for a day or two.
- Allowing face-to-face interactions with users to be watched and tape-recorded by the researcher.
- Granting a few short interviews to talk about particular repair interactions.
- Allowing the researcher to use transcripts of interactions in published research.

The impact on the day-to-day work of User Consultants would be minimal.

However, this type of research raises some fears, for example, that management might use this type of information for job evaluation. This would certainly not be the case, as participants would be fully protected by the following ethical standards:

- Participants of the study will be fully informed of the nature and goals of the study and participation will be completely voluntary.
- Participants will be fully aware of their right to withdraw their co-operation at any time.
- The identity of all participants will be strictly protected. Only by the researcher and the research supervisor will have access to audio records of interviews. Identities will be protected in all transcripts.
- Management will not have access to raw data or transcripts in order to further protect the identity of participants, although they will be provided with a report detailing some of the research findings. The identity of participants will be strictly protected in all documents and publications.
- The researcher will be bound to strict confidentiality concerning the work and interactions of User Consultants and will under no circumstances discuss the work or performance of User Consultants with management. The only

communication with management about User Consultants will be in the final report about the dynamics of interaction in the repair process in which the identity of consultants will be strictly protected.

Please glance through the attached information sheet for further information. Your participation in this project would be greatly appreciated.

Kind Regards

Michael Quayle
Researcher

Information Release for *** User Consultants

When the chips are down: Dilemmas of human-computer interaction in the context of computer failure

1. Description of Study

Purpose

This study aims to investigate personal computer failure in order to explore the dilemmatic aspects of everyday computer use. These aspects of computer use are very pertinent to average computer users and support staff and feelings often run high. A thorough understanding of the dilemmas faced by average users and the dynamics involved in the situation of computer failure should be practically useful for both for the design of computer systems and for the practice of computer support.

Background

Research into human-computer interaction (HCI) has had a huge impact on the design and implementation of Information Technology (IT) in organisational and individual settings. However, there are two aspects of computer use which have been largely ignored by HCI researchers: the dilemmas of computer use and computer failure. Yet the purchase and use of computer equipment is teeming with dilemmas which can never be fully resolved. Much of the frustration involved in using computer equipment is related to breakdown and failure. This study argues that many personal dilemmas of computer use become apparent when computers break down and therefore aims to investigate dilemmas of use by exploring failure situations.

Possible implications of findings

It is hoped that this study will provide some impetus for the acknowledgement of both failure and dilemma in the field of HCI. Ultimately this shift of focus in the field could lead to a type of organisational computer use that is more aware of both the dilemmas of computer use and the reality of computer failure. Obviously most IT departments and individual users are already aware of this to some extent, but a more formal understanding could make it possible to manage these aspects of computer use more rationally and effectively. Organisational computer support that is informed and aware of the dilemmatic nature of computer use, and the specific dilemmas involved in the situation of computer failure, may be more able to effectively support the activities of users and the organisational goals of the computer system.

Possible benefits to ***
In particular, the results of this study may provide insight to *** management and User Consultants as to the structure and nature of the dynamics that exist in the situation of computer failure. A more detailed knowledge of the dilemmas of use made evident in computer failure may improve the procedures and interactions of the computer repair process.

Research Plan
Data will be gathered from User Consultants and users actually involved in the process of recovering from a computer failure. Their interactions as they negotiate the nature and the extent of the problem will be a rich source of dilemmas of use. Aspects of this interaction will be clarified in individual follow-up interviews with both the User Consultant and the user. These recorded interactions and interviews will be transcribed and analysed using the techniques of discourse analysis and Billig's theories of the rhetorical nature of thought and interaction as a theoretical starting point. For practical reasons, only the *** campus of the University of *** will be targeted.

Duration
Sampling would begin as soon as possible and should, if the research goes well, continue for no more than one month.
Degree of co-operation requested
The practical commitment required from User Consultants would be as follows:

- To allow the researcher to shadow support-consultants
- To allow the researcher to tape-record the repair process with the permission of both the user and the User Consultant.
- To grant a short follow-up interview (approximately 30 minutes) concerning selected repair processes.

It is expected that 10 to 20 sets of interviews will be required to satisfy the sampling criteria. The impact of this research project on the day-to-day operations of *** would be minimal.

Publication of Results
Results of this research will be published in an academic thesis, academic journals and, if possible, the popular press.

2. Human participants
Risks
This study has minimal risks for participants. The possible risks are as follows:

- Since the research is being undertaken from within the organisation that is being studied, there is a risk that audio records and transcripts could be misused by management to professionally censure participants or for purposes of job evaluation.
- The time granted to the research by participants may result in additional stress.
- The study does not aim to judge or evaluate the performance of User Consultants in any way. However, given the study's focus on dilemma and failure, there is a chance that the final report may give biased impressions of

the interactions in the failure situation which could be perceived negatively by both the participants and *** management.

Protection of participants

- Participation of individual User Consultants and users would be completely voluntary and informed consent would be required from all participants.
- The identity of both the User Consultants and the users interviewed will be strictly protected. Only by the researcher and the research supervisor will have access to audio records of interviews. Identities will be protected in transcripts.
- The results of the research will be made available to *** and, if requested, university management, but the raw data will remain confidential in order to further protect the identity of User Consultants and users who participate.
- The corporate identity of *** would be protected to the greatest extent possible

Informed consent procedures
Participating users and User Consultants will be fully informed of the purposes and uses of this research by means of an information sheet similar to this one. They will be asked to give written consent to participate in the research project and for specific interactions and interviews to be tape-recorded. Participants will be made aware of their right to terminate their involvement in this research project at any time.

Potential benefits to participants
Computer failure is a situation involving significant stress and both users and User Consultants may well appreciate a context in which to talk it over.

Costs to participants
Other than time and inconvenience, no costs will be incurred by participants.

For More Information:
Contact Michael Quayle (mquayle@alexhigh.org.za) or Prof. Kevin Durrheim (Durrheim@nu.ac.za).

10.2 Information release for users

Request for participation in research project

"When the chips are down: Dilemmas of human-computer interaction in the context of computer failure"

Researcher: Michael Quayle, Masters Student
Supervisor: Prof. Kevin Durrheim
Affiliation: School of Psychology, ***

Description of Study
Everyone knows that computers rarely work the way they are supposed to. They break down, malfunction and sometimes behave very strangely. However, the computer industry and Human Computer Interaction researchers have been slow to accept that computers can be utterly infuriating as well as completely essential. This study aims to investigate the dynamics of computer failure and repair to shed some

light on the dilemmas of use experienced by average computer users and technicians. Ultimately it is hoped that this type of research may lead the computer industry to begin to consider the problem of computer breakdown as social issue as well as a technical one.
In order to complete this research we need to find computer users who have experienced computer failure and are willing to participate in this project.

Participation in this study will involve:

- Allowing your interactions with *** User Consultants to be watched and tape-recorded by the researcher.
- Possibly allowing the researcher to tape-record your side of any calls to ***.
- Granting a short interview with the researcher to talk about particular repair interactions.
- Allowing the researcher to use transcripts of interactions in published research.

No risks are expected

- You will be fully informed of the nature and goals of the study and your participation will be completely voluntary.
- You have the right to withdraw your co-operation at any time.
- All your information you will be confidential.
- The results of this study will be published but, if any of the information you give is used, your identity will be strictly protected.
- Management will not have access to this information, although they will have access to the final report if desired.

The benefits of this research include:

- A chance for you to express some of the frustration of computer failure and breakdown.
- Contributing to knowledge about Human-Computer Interaction.
- Contributing to ***'s knowledge of the dynamics involved in computer repair.
- You will be sent an electronic version of the final report, if desired.

Please feel free to ask questions if anything is unclear. Either the researcher, Michael Quayle (972112855@students.unp.ac.za) or the supervisor of this project, Professor Kevin Durrheim (260 5348 or durrheim@nu.ac.za), will be happy to discuss any reservations or problems you may have in participating in this study.

10.3 Informed consent form

Informed Consent Form

Research Project: "Dilemmas of human-computer interaction in the context of computer failure"

Researcher: Michael Quayle, Masters Student
Supervisor: Prof. Kevin Durrheim
Affiliation: School of Psychology, ***

Description of Study
Computers break down, malfunction and sometimes behave very strangely. This study aims to investigate the dynamics of computer failure to shed some light on the dilemmas of use experienced by average computer users and those who fix them.

Please sign below if you:

- Are willing for this interaction to be tape-recorded.
- Are willing for the tape-recorded data to be used in research.
- Are willing to grant a short interview with the researcher if required.

Please be aware that:

- Your participation is completely voluntary.
- You have the right to withdraw at any time.
- All information will be confidential and your identity will be strictly protected.

The benefits of this research include:

- A chance for you to express some of the frustration of computer failure and breakdown.
- Contributing to knowledge about Human-Computer Interaction.
- Contributing to ***'s knowledge of the dynamics involved in computer repair.

Please feel free to ask questions if anything is unclear. Either the researcher, Michael Quayle (972112855@students.nu.ac.za) or the supervisor of this project, Professor Kevin Durrheim (260 5348 or durrheim@nu.ac.za), will be happy to discuss any reservations or problems you may have in participating in this study.

If you agree to participate in this study, understand the terms and have had the opportunity to ask questions, please sign below.

Name: _____

Signature: _____

Date: _____