

Through a Glass Darkly: Fact and Filtration in the Interpretation of Evidence

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Abstract: For almost three decades, the primary fault line in information systems research has been between positivist and interpretivist research philosophies. The kernel of the debate between these two approaches rotates around the meaning of reality, two aspects of which are what constitutes a fact and what constitutes evidence. In this paper the nature of fact in interpretivist research is explored. The range of filters through which research must travel is catalogued and it is argued that a taxonomy of fact emerges from interpretivist research.

Keywords: Fact; interpretivism; research; filters.

"For now we see through a glass, darkly; but then face to face: now I know in part; but then shall I know even as also I am known" (The Bible; 1 Corinthians, 13:11)

1. The elusive nature of the real

Akira Kurosawa's 1951 film, *Rashomon*, opens with three people sheltering from the rain in the ruins of a large gate – a woodcutter, a priest and a third man. The woodcutter and the priest are relating to the third man a story about a series of recent events including a rape and a murder in a nearby forest. In the film, four versions of what happened, those of the woodcutter, the raped woman, her dead husband (through a medium) and the bandit responsible, are related. Each account differs from the other three on several important points. Kurosawa uses the device of multiple perspectives to explore the motives and personalities of each of the players and what starts as a seemingly straightforward tale gradually takes on depth, complexity and ambiguity, ultimately leaving the viewer to make up his or her own mind - if he or she can.

As an artistic device, Kurosawa's use of multiple perspectives is far from unique. It has been explored in all literary forms. Ayckbourn's trilogy of plays, *The Norman Conquests* (Ayckbourn 1988) is a clever exploitation of this device and Joyce (1922) uses the trick of multiple perspectives extensively in *Ulysses*. As an artistic structure, it can be used either to demonstrate the problem of determining reality or for building up an holistic picture of reality or both. Part of the vividness of Joyce's *Ulysses* for example, comes from

the way in which the reader is constantly reminded of the same event seen through different eyes; Joyce takes this to an extreme in the famous *Cyclops* chapter. However what may serve to intrigue, tease or disorient the reader in a fictitious world, is a serious problem for the interpretivist researcher in the real world. The charges that perception is reality and/or that there is no privileged viewpoint are ones with which all interpretivist research must deal. Against such relativism, what can be established? Is there such a thing as a 'fact' at all? To ask this is to ask a version of one of the oldest questions of all: what do we know and how do we know that we know it?

This purpose of this paper is to explore this question in the specific context of qualitative interpretivist research. In so doing, it will be suggested that in practice there is a taxonomy of 'fact' in which emerges from such research. To do this, a common form of interpretivist research, the multiple case study, will be used as a basis for discussion. Other research methods such as action research, grounded theory, ethnography, participant observation and so on present their own variants on this theme, but there is insufficient space in one paper to consider everything. Because of its popularity as a research methodology, the case study provides a particularly good basis for exploring the problem of fact.

This is a topic that has been explored, expressly by Walsham (1993a, 1993b, 1995a, 1995b) and more obliquely Klein and Myers (1999). This paper looks at the problems involved at a more detailed level and using a thought experiment based on a made-up, but plausible research project.

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It would be simple enough to use a real case or a collection of real cases, but an artificial case avoids possible sensitivities and allows for a single example that encapsulates and illustrates various aspects of the problem.

2. A hypothetical case study

The hypothetical piece of research is being carried out by an experienced IS academic and researcher called Jane. Jane is investigating the failure of large packaged application software implementations. The definition of failure that she is using is that the project must either have already been abandoned or terminated or that such an action is currently being contemplated by management. One of the companies that she is studying, Acme Industries, has been trying to implement an enterprise resource planning (ERP) system without much success. Acme is one of five cases Jane is examining. This is an academic study. Jane hopes that she will be able to use this research to publish one or more papers in leading Information Systems (IS) journals.

At the time Jane arrives on site, the ERP implementation project has been in progress in Acme for about eighteen months, during which time there has been a number of personnel changes in the project team and a series of missed deadlines. The project is already well over its scheduled budget at this point and considerable tension has built up both within the project team and between the team, users and senior managers. The (former) Head of Finance, who initiated the project, left the company a little over three months ago and has been replaced by a newly recruited Financial Controller (Sandra). Sandra has instructed the project manager (Harry) to take stock of the current position with a view to establishing what, if anything, can be salvaged from it at this stage. Terminating the project is one of the options she is considering. The project is an ambitious one, endeavouring to integrate manufacturing planning and control with financial, human resources and distribution management systems. A number of key decisions were made early on, including a decision to use an industry leading package and a decision to minimise the use of external consultants.

Despite the latter, when the project began to run into trouble, Acme brought in an experienced consultant (Ted) who has been advising on various aspects of the project for the past six months.

While considering the broader picture, the discussion will focus on an incident that happened about two months before Jane started her investigation and shortly after Sandra had taken up her post. On the 6th of April, Harry had called a crisis meeting of the project team to review the state of play. The full team, comprising twelve people, were present including Harry, Sally (the team leader on the data transfer project), Ted and a technical representative from the package supplier (Eleanor).

The first time Jane hears about this meeting is during her 'kick-off' interview with Sandra, when a reference is made to the meeting in question. Sandra is vague on the details, but has the impression that the meeting did not go smoothly and that there had been a confrontation between Harry and Sally. To brief herself, Jane first obtains a copy of the minutes of the meeting. She finds that these are terse and formal, merely recording those present, decisions made, actions to be taken and who is responsible for those actions. Jane decides that it would probably be best to start with a 'neutral' party and chooses to speak with Alan, another of the team leaders. Alan, Jane discovers, has definite views, describing the meeting as "*unpleasant and tense*". Alan adds that, at the meeting, Harry seemed to be on the lookout for a scapegoat and had picked on Sally just because (in Alan's opinion) Sally is not well organised. There had indeed been a confrontation which became "*a bit heated*". Alan did not think Harry's criticism of Sally was entirely fair, but given the mood that Harry was in, Alan felt that it was better to keep his head down and did not try to come to Sally's defence. Neither, he adds, did anybody else.

Wanting to find out more, Jane then interviews three of the others present (Peter, Paul and Mary) before interviewing Sally, Harry, Ted and Eleanor in that order. Each of the first three actors confirms Alan's depiction of events although they use different words and paint different pictures of the degree of

tension and emotion at the meeting. While the accounts that they give vary on points of detail, a consistent picture of Harry's behaviour, if not his motives, emerges. Harry, all agree, was aggressive from the outset, seeking to spread blame rather than look for solutions. None of the three thought Harry's approach constructive, although Mary hints that it was out of character. All agree that Harry confronted Sally about problems with data transfer. A sample comment from each is:

Peter "He really went for Sally. Mind you, she gave as good as she got."

Paul "Harry was very critical of Sally. He seemed to have it in for her."

Mary "Harry certainly had it in for Sally on the day, but he criticised other people as well. He handles the team well in my view. I think it was just that Sally over-reacted while everybody else simply took the flak and said nothing. If Sally had said nothing, he probably would have moved on, but she was on for a fight."

Jane next interviews Harry. When asked, Harry denies that he was excessively aggressive. He acknowledges that he took a firm line and this may have ruffled a few feathers, but that is what he is paid to do. He considers that, while the meeting may have been "lively", it achieved its desired outcome in shaking people up. Harry does not think that he was disproportionately critical of Sally or her work. He feels that Sally is too touchy; if she cannot take the heat, she should get out of the kitchen.

Sally, naturally, tells quite a different story. She agrees that the data transfer project has had problems, but this is due to poor documentation in some of the legacy systems and the shortage of legacy system skills in the company. Neither of these is her fault. Harry had picked on her because, in her view, he is a weak character and he therefore attacked the only female team leader present (apart from Eleanor who he would not criticise in public). Even two months later, Sally is clearly still smarting from the events of April 6th. Relationships between herself and Harry continue to be fractious.

Unfortunately Ted had to leave the meeting early so he was not present for the full time and crucially was absent for the most of the *contretemps* between Harry and Sally. As a good consultant, Ted is diplomatic. The meeting was, in his view, "a little tense and not as productive as it might have been if a more measured approach had been taken" (which Jane reads as code for Harry should not have lost his temper). Ted comes across as a positive thinker and confrontation avoider. Jane gets the distinct impression that he disapproves of Harry's management style, but as a consultant does not feel it is his place to say so.

Eleanor is clearly uncomfortable during her interview. The problems are, in part, being blamed on the software and the quality of her company's technical support team. While she herself was not criticised, there was a undercurrent during the meeting that made her uneasy. She feels that Acme suffers from a 'not invented here' syndrome and this is a large part of the problem. With regard to the incident between Harry and Sally, Eleanor feels that it was unseemly. If Harry had a problem with Sally he should have taken it off-line and not brought up in front of the entire team. It was all a bit embarrassing. Eleanor feels that Sally was making some valid points that Harry was just not hearing. Despite her comments, Jane senses that Eleanor likes Harry and thinks that he is a capable project manager, if inclined to get a little over excited at times.

The above summary is, of course, only a tiny fraction of the information that Jane gathers. However it will serve for the purpose of discussing what, three years later, an aspiring Ph.D. in some university on the other side of the world reading Jane's paper: "*Problems in Major Package Software Implementation: Lessons from the field*" in a well known journal, understands of what happened at a meeting in Acme Industries on the 6th of April.

3. Determining reality

In reporting on and analysing this incident, Jane needs to understand, as fully as she can, two types of reality:

- The first is the external reality, which can be defined as what actually happened in the physical world. This

includes when and where the meeting took place, who was there, who said what and to whom and so on.

- The second is the internal reality, or to be precise, realities. These realities reside within the minds of those present at the meeting. These realities are not only volatile and subjective, they are conditioned by all sort of social, political and personal factors.

In a rough sense, these correspond to what Locke (1690) calls the primary and secondary qualities. Primary qualities (such as shape or mass) are out there, objective and exist independent of human sense. Secondary qualities (such as colour or smell) only exist where there is a subject present to perceive them. While it would not do to push this analogy too far, the same sort of issues that Locke's distinction raises in philosophy, arise here. Jane's objective is to tell a story that accurately reflects what happened. The first difficulty that she confronts is to establish these two realities and the challenges here are formidable.

In theory, some of the external reality can be established from a combination of documentation and/or records, interviews and observation. In practice some of these may not be available. Observation is only possible if the researcher is able to be present at the time (which not feasible in most case study research). Records may be poor, incomplete or inaccurate. While there may be many actors present at a given event, each has only a partial view. Consequently actors' perceptions and recollections may be different even where supposedly factual events are concerned. An actor's perception of what happened at a meeting can be influenced simply by their location in the room, a lapse in concentration or attention at a critical movement or by the fact that they were not there for the entire time (as in Ted's case). This idea is further developed below. If Jane is fortunate she may be able to at least establish a narrative of the external reality that is acceptable to all actors. If she is not, she will be obliged, like the viewer of *Rashomon*, to choose between incompatible accounts.

Internal realities are a great deal more problematic. Jane's research here is confused by a whole series of complicating factors including the various biases inherent in the actors or informants

themselves. These biases will be both conscious and unconscious. Conscious biases include political, cultural and other factors that distort the both the perception of events by actors and consequently the account that they give of those events to Jane. This will be particular the case for those that have an axe to grind, a position to defend or an action to justify. All of these are likely to be particular problems in a study of project failure, as here, where blame avoidance or self-exculpation may be paramount in people's minds. Even more problematic are the unconscious and cognitive biases at work in the way that people record and note information and in the inferences they make about what they observe. This subject will now be considered in more detail.

4. Filters

Jane's problem in interpreting what she has heard will be examined using the concept of a filter. Filters are here defined as mental processes through which facts and reality pass in moving from stage to stage in the research process. In a typical case study there are many different types of filters including:

- Perceptual;
- Contextual;
- Linguistic;
- Memory;
- Sequence;
- Personality;
- Agenda;
- Methodological;
- Selection;
- Temporal.

Throughout these run two common threads namely cognitive and cultural biases. To complicate matter further, a number of these filters will typically be found at more than one point in the process.

4.1 Perceptual

As already noted, in any social situation, each actor sees only a part or aspect of the picture and the perspective from which an informant views an event matters. To use an analogy from Magee (1997), a circle only looks like a circle if viewed from one specific direction. From every other aspect, it appears as an ellipse. The Acme project is a big one with over a hundred

people involved. Even assuming that Jane has the time to interview all actors and that all actors are available for interview, it is still unlikely that she will get anything approaching a comprehensive picture of what happened. Experience suggests that there will be contradictory views, even of seemingly objective external events, which are difficult to reconcile. Where contradictions in the storyline occur, Jane can, in theory, go back to try to resolve them. In practice, she may not have time and may therefore settle on which version she finds most convincing. In theory, it should be possible, with enough time and patience, for Jane to build, at least in her own mind, a reasonably accurate picture of what happened. In practice, Jane, with limited time, mental capacity and other resources, may settle for what she feels is a plausible account of events. In taking this pragmatic course she is vulnerable to excessive influence by the most persuasive informants.

4.2 Contextual

Jane is ineluctably biased by her own background. While Jane has a working knowledge of IT systems, her background is in business and organisation studies. Her limited knowledge of the practical day to day realities of managing a large IT project in general and an ERP implementation in particular, is going to be a constant source of potential misunderstandings. There is ample scope for misinterpretation arising from different backgrounds, different vocabularies, different *weltanschauung* and different mindsets on the part of Jane and her informants. Jane may have problems in communicating with some of the technical staff and they in turn may regard her as not being capable of fully grasping some of the issues that they are describing; for example failing to appreciate the complexities of a task. Consider the following exchange between Jane and Tony, a rather gruff production supervisor:

Jane: "What went wrong at this point?"

Tony: "Well, we ran into difficulties with the sharp end of the MRP system, didn't we? We use a modular BOM and superbill system to deal with the multiple options on the final product. The way we calculate ATP here is non

*standard because we use flexible time buckets and we wanted to modify the software to do this, but the ***** software couldn't handle it. We also had problems with the way the system converted the MPS superbill to the FAS. The package suppliers said this was straightforward, but the complexity in the product structure was greater than they anticipated."*

Here, Tony has thrown a mouthful of jargon at Jane. As Jane is not knowledgeable about production management, she will almost certainly not understand the implications of what Tony has said to her. She now has two options: either she can stop Tony and ask him to explain, or she can leave her tape recorder running and hope to work out his meaning later (possible with the help of a colleague). She may be reluctant to ask him for an explanation. Time may be short or she may not want to seem ignorant. In turn, Tony's response may be matter of fact; this is the way he always talks and he simply assumes that Jane will understand. Alternatively, he may be trying to blind her with technicalities either to impress her or to hide some other more serious problem from her. The fact that Jane is female, an outsider and not expert in ERP will predispose some actors at least to treat her in certain ways and (without necessarily malicious intent) be selective in the type of information that they give her.

4.3 Linguistic

The meaning and symbolism of language alone is the subject of much research. Under the broad umbrella of semiotics, approaches to understanding the role of language include content analysis (Krippendorff 1980), discourse analysis (Klein and Truex 1995) and conversation analysis (Wynn 1991). In layman's terms, the accounts of events given to Jane are given via words, supported in most cases by body language. Jane's understanding of what she is being told is influenced by how her informants use and understand words and phrases in English. Peter, in describing the meeting as 'tense', may be making an understatement. Mary uses the word 'fraught' to describe it. Paul says that the "*mood of the meeting was ugly*". Taken

together, these clearly indicate a difficult meeting. But how difficult? There is a considerable semantic distance between the words 'tense' and 'ugly'. Depending on the personalities of the actors, the seeming strength of these words could be reversed. For example, if Paul is known for his use of hyperbole, Jane might discount his description. But Jane may not (almost certainly does not) know whether or not Paul is given to overstatement. She is almost certainly meeting Paul for the first, and possibly the only, time in her life.

The second part of this process is Jane's own interpretation of words. She may consider 'fraught' to say, in effect, that the meeting was exceedingly difficult and confrontational. Conversely, she may think that the word 'fraught' suggests nothing more than that everybody was a bit on edge. What gets into Jane's head initially is her 'averaging out' of her understanding of what she believes her informants to mean and what emerges, or is embedded in her memory, is further coloured by her own grasp and usage of language.

Thirdly, when the research and analysis is complete, Jane has to write up her work. For the second time her use of language impacts on what will be conveyed. How she writes will convey different messages to different readers. Jane can choose to write in a clear, though rigorous, academic style, or she can dress up her material in high-flown language with a view to sounding more impressive. Writing of Sally's problems, Jane might (for example) say:

- "There were problems in transferring the data from the old to the new system" or
- "There were problems converting the legacy data because of non uniqueness in keys" or
- "Inherent integrity and referential anomalies in the existing data file structures gave rise to difficulties in re-architecting these data for transformation and upload into the Boyce-Codd normal form required by the new system"

each of which conveys the same key point, but transmits a subtly different message to the reader. Finally, the content of the article may be further influenced by editorial or reviewer requested changes. Some reviewers may seek particular

emphases or request that certain theories be integrated into the text. All of these can add further layers of distortion.

Finally there is the reader's interpretation of Jane's written text. Here there is much room for further misinterpretation as the reader reproduces in his own mental world what the meeting on the 6th of April must have been like. Language, therefore, acts as a filter, not just at one, but at several points in the process.

4.4 Memory

Memory is selective (Kransdorff 1996; von Zedtwitz 2002) and there are many well documented problems with humans' inability to recall events accurately as little as 24 hours after they occurred, never mind two months later as in the case of the April meeting. A particular problem with memory is availability bias. The human memory tends to recall dramatic events. This may mean, for example, that while memories of the argument between Harry and Sally remain vivid, other more important points raised at the meeting may be forgotten or at least do not come up in the interviews without prompting. Skilled interviewers will listen for off-the-cuff remarks or asides that may be signposts to significant information. But sometimes, if an issue is not asked about explicitly, the interviewee will not raise it voluntarily. Other memory problems include 20-20 hindsight, whereby actors retrofit reasons for their behaviour. A particular pernicious version of this is cognitive dissonance, a process whereby people seek to rationalise their behaviour, even where their explanation does not fit reality (Plous 1993).

For the researcher, memory problems can be particularly intractable as actors can genuinely believe what they are saying is true. Unless there are other reliable sources, the researcher can easily be misled.

4.5 Sequence

Jane's research will be influenced by the order in which she interviews actors. For example, Jane's attitude in subsequent interviews is coloured by her first detailed discussion of the April 6th meeting with Alan. In psychology, this is termed framing (Plous 1993; Bazerman 2002) – i.e. putting a context on subsequent actions or

events. Alan's colourful account of the meeting means that Jane will go into subsequent interviews with a different set of questions and a different mental picture than she would have if Alan had dismissed the meeting as bland or if she had interviewed, say, Ted or Sally, first. The fact that Jane is predisposed to look for certain types of problem in the April 6th meeting therefore affects the evidence she gathers and consequently the output of the research.

Framing, especially when done deliberately by an informant, can cause quite serious difficulties in research. It is important here to differentiate between explicit framing, i.e. where a researcher is given a brief to look at a particular aspect or to approach her research with a given theory or agenda in mind (see below), and subversive framing whereby an actor attempts to steer the research in a particular direction without making it obvious that this is being done. If, for example, Jane had interviewed Sally first and taken at face value Sally's assertion that Harry was a weak manager, Jane might be predisposed to seek evidence for this in subsequent interviews. This type of behaviour is known as confirmation bias.

It is also worth noting that, research has shown that when listening to multiple views on a subject, humans tend to be most influenced by those to whom they speak first and those to whom they speak last (Plous 1993). Consequently, those to whom Jane speaks in between may have less impact on her thinking.

4.6 Personality

Communication between informants and researcher will be affected by their personality types. Depending on her personality type, Jane will look for certain types of evidence. To illustrate this, suppose, using the Myers-Briggs (Myers 1962, Robey and Taggart 1981, Yeakley 1982, Sample 2004) terminology, it turns out that Jane is a ENTJ¹. As such Jane will tend to be focused on the real and the factual and be uninterested in anything she does not deem to be relevant. If she is a INFP² type she will look for the best in people, be more interested in nuance and will tend to be curious. Her personality

characteristics will thus influence how she goes about her research at both macro and micro levels. To complicate matters even further, each interviewee will have their own personality type. Communications problems between different personality types can lead to misunderstandings, failures of comprehension or, in some cases, mutual frustration. One researcher might consider he had given more than sufficient detail for his needs; another might find exactly the same information too vague.

At this level, mood, too, can play a role. How Jane feels on the day can affect personal receptivity (the same will be true of her informants of course). Her concentration may not be good and she may miss subtleties or subtexts in answers, failing to follow up. Fatigue will also affect her. If she undertakes several interviews in one day, she is simply not going to be as sharp in the later meetings and so on.

4.7 Agenda

In all organisations, conscious or unconscious agendas exist at several levels. The questions which Jane asks and the answers she hears will be influenced by various predispositions. For example Jane might be:

- trying to validate a new theory that she has already formulated or an existing theory that she has encountered;
- trying to generate new theory;
- planning to use this as a teaching case with no particular interest in abstracting the findings;
- influenced by the literature and previous theories.

In the first of the above there is a significant risk of the aforementioned confirmation bias, i.e. that she will seek evidence that supports the theory. This bias is a serious peril to the researcher. Even where a question is not loaded, the researcher may be primed to hear specific things in the answers³. If, say, Jane is trying to verify a theory that failure in such large projects is mainly due to breakdowns in communication, she may be predisposed to seek evidence for this both in the way that questions are framed and

¹ Extraverted iNtuitive Thinking Judging

² Introverted iNtuitive Feeling Perceiving

³ This problem will be greatly exacerbated if Jane is relying on her hand written notes instead of recording the interview.

in the answers that she gets. Indeed the whole nature of the information that she has received will depend on how well her interviews were structured, her questionnaires designed or her focus groups organised and run.

4.8 Methodological

Methodology affects outputs. Case study research tends to produce voluminous evidence – often on kilometres of recording tape. With such a large amounts of data, it is necessary to abstract and condense it in order to make some sort of sense of it. At one extreme, Jane could record everything, transcribing and coding each of the tapes and then use grounded theory to (supposedly at least) 'allow the data to speak for itself'. She could also use coding for various other types of analysis and/or process the data through a variety of analytic tools available for this purpose. She could summarise the tapes looking for themes or for evidence supporting or contradicting an existing theory she is trying to validate or disprove.

Each of these methods will almost inevitably give rise to at least a slightly different outcome. If all of the methodologies are valid, one would expect these outcomes to be close, but in practice this is unlikely.

4.9 Selection

Simple logistics dictate that Jane will have to be selective in her use of evidence. From maybe 50 hours or more of recorded material, only a highly distilled account can find its way into the 10,000 or so word limit of a journal. She may also have many pages of notes and dozens of documents which she has been permitted to copy. She has to make many choices about what to include and what to leave out. Even ignoring the factors listed above and assuming that Jane is impeccably unbiased in every other respect, it is inevitable the picture that results will be influenced by this process. The process of abstraction of reality into concepts and even multiple similar opinions into a seeming consensus risks misleading the reader. For example, if, in an attempt to avoid misleading the reader, Jane were to write:

"The meeting on April 6th was described in various ways by informants, but the general

picture that emerges is that it was a difficult one".

the reader is still left to infer what this means and there are many possible interpretations possible. This problem is discussed in the next section.

4.10 Temporal

Finally it is worth noting that time itself is a distorting factor. The impact of time on memory has already been discussed. Another impact of time is adaptation (Schwartz 2004), the process by which humans adjust to disturbances in their life's equilibrium. Thus the excitement of a win in the lottery or the trauma of the death of a parent tend, for most people, to fade with time (if they did not, life would be chaotic).

In an analogous way, the significance of events for actors and informants will change (usually mellow) with time. What seemed like a big deal in April, may, by September, come to be regarded as not particularly significant. This is not just because time lends perspective to events, it is because humans have evolved to adapt and to move on in order to cope with life. Occasionally one meets people who do not have this facility and who spend their whole life with a chip on their shoulder, smouldering over some never to be forgotten injustice. Many a fine novel has been written on this theme⁴. But for most people impact diminishes with time.

The relevance for the researcher is that the answer she gets to a question will therefore depend on the gap between the event under discussion and the time that the interview takes place. Jane is investigating a meeting that took place two months earlier. Depending on what has happened in between, memories of that meeting may be more or less raw. Factoring this into her own thinking is challenging.

4.11 Cognitive and Cultural Filters

Many of the sources of distortion discussed above fall into two categories: cognitive and cultural. Like everybody else on the planet, Jane has numerous cognitive biases. Several of these,

⁴ For example Dantes in Dumas's *The Count of Monte Cristo* or Miss Havesham in Dickens's *Great Expectations*.

availability, context dependency, framing, confirmation and so on. Not all will affect her research, but some will. Others include the halo effect whereby humans are influenced by the physical appearance of others. *Ceteris paribus*, a tall person will tend to carry more authority than a short person for example. There are many others. For a good account of these, the reader is referred to Kahneman *et al* (1982).

Likewise many of the factors in the above list are cultural. Additional cultural distortions can be caused by a variety of similar factors. Gender is a good example. The composition of the project team in Acme has a good gender balance, but if it was all male (or, less probably, all female),

then quite a different dynamic would exist and the response to an external female researcher would almost certainly be quite different. A conversation between a man and a woman will differ in many subtle ways from a conversation between two men or two women. What Jane hears will be affected by this. Race, age and even class may distort communication as may more subtle factors such as public and private sector values, ethos or simply attitudes to failure.

We can summarise these things diagrammatically. Figure 1 illustrates a number of key aspects of the process. Figure 2 is a simpler, but fuller abstraction of the same idea.

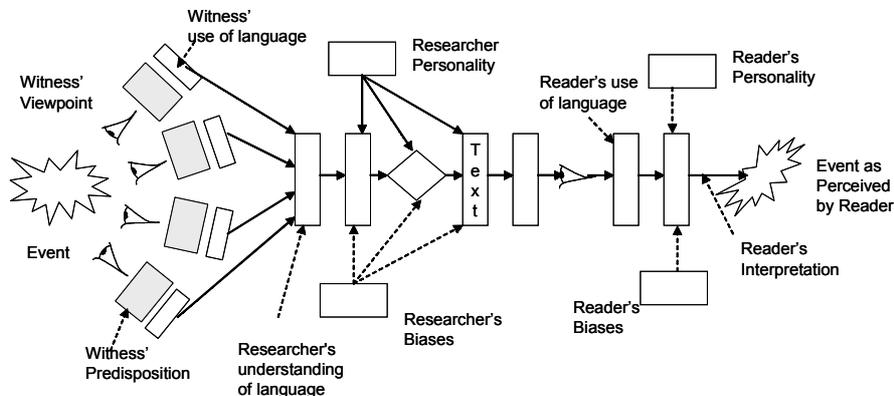


Figure 1: Schematic view of information transmission in research

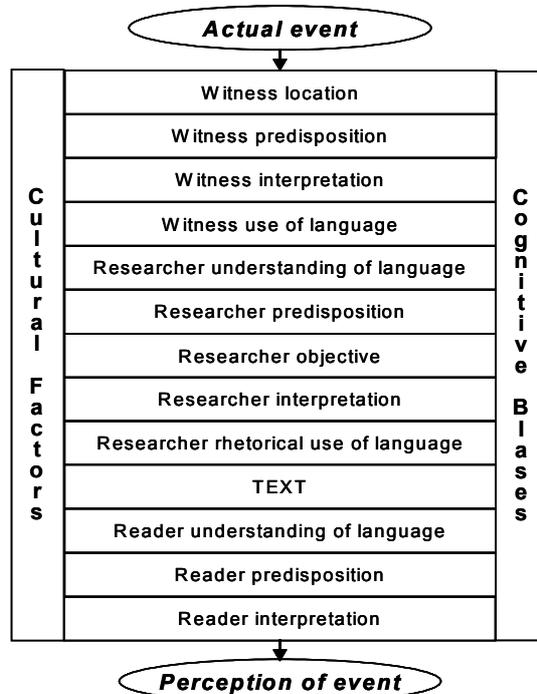


Figure 2: Abstracted view of information transmission in research.

5. Interpreting the findings

At this point it is worth a brief digression into the question of ontological stance. It is not the objective of this paper to delve into deep philosophical questions about the nature of knowledge, but given the collection of distorting lenses through which it must travel, it might well be asked at this stage, whether the eventual reader of Jane's research can ever hope to get close to an understanding of what happened in Acme. The argument briefly referenced in the opening section, that in effect there is no such thing as a fact, needs to be addressed. How might one refute the argument that Jane's final published article is pure interpretation and nothing else?

One of the most famous articulations of the sceptical line is Nietzsche's famous dictum "*There are no facts, only interpretations*" (Nietzsche 1965, p40) (probably more accurately translated as "*There is no truth, only interpretations*"). At one level, one should, perhaps, not take Nietzsche's aphorisms too seriously. Nietzsche was in the habit of making provocative statements⁵. Nietzsche also said that "*There is no truth, only perceptions*", "*There is no truth, only truths*" and "*There is no truth, only opinions*"⁶. Nonetheless the question of the researcher's assumptions about the nature of fact, or more broadly, reality not to say truth, is important

A simple riposte to Nietzsche is to ask 'interpretations of what?'. If Nietzsche is correct, the answer has to be other interpretations and we recess *ad infinitum* to a logical absurdity. In this instance, if we can never know anything with certainty, then Jane cannot be sure that the meeting ever took place which implies that there is some, non zero, probability that the meeting did not take place. Why then, would so many people say that it did? One possibility is that these is a case of mass, coordinated mistaken memory or, more plausibly, a conspiracy to pretend that the meeting had taken place. This begs the question, why should such a conspiracy be necessary? At this point this sequence of explanations is climbing a mountain of

improbability. While it is just possible that the entire team has got together to concoct an elaborate lie, the weight of evidence suggests that in this context, this is so unlikely as to be ludicrous. Scepticism, pushed to this extreme, while logically tenable, pushes credibility over the edge. In the real world, Jane can say with certainty that the meeting occurred. If one adopts the sceptical position, the only point of research is to present another viewpoint. This quickly degenerates into the view that all readings of a text are equally valid, so beloved of some schools of postmodernism. This may make for an interesting intellectual game, but does not serve any other purpose as far as the research is concerned. Nonetheless, an appropriate degree of scepticism serves an important purpose in interpretivist research. The researcher must always question the evidence and the version of reality with which she is being presented. This is what Klein and Myers (1999) call the 'principle of suspicion'.

In practice, many researchers do not concern themselves with such nuances and many of those that do will adopt the pragmatic view that there is a real world out there and that we can know something about it. This world-view has a long litany of defenders in modern times and it is not necessary to justify it yet again here. If the researcher can, therefore, leave aside such abstruse conjectures and take the position that facts do exist, attention can be focus on a rather different question namely the nature of fact itself. As it stands, the 'fact' that a meeting took place is remarkably bare. It is a statement that an event took place – nothing else. What is more, Jane only knows in outline what happened at the meeting. She may imagine, on the basis of descriptions by the participants, what it was like, but her imagination will at best bear only a tenuous relationship to the reality. This does not make the fact, or the recreation of it in Jane's imagination, unimportant. Many facts are remarkably thin. The statement that Napoleon invaded Russia in 1912 is an extremely bald statement when contrasted against the enormous events it implies. Fortunately, in most research, if not in some historical research, there is a little more than a small collection of bare facts on which to rely.

⁵ Such as the Conan-esque "Anything that does not kill me, makes me stronger"

⁶ Depending on the translator. A web search for these phrases will throw up even more variations.

Despite their parsimonious nature, facts are the essential framework and bedrock of almost all research. Contrary to Nietzsche's position, without facts there is nothing in which we can ground the greater part of research⁷. Consequently:

- while a framework of facts is not the essential objective of the research,
- a sufficient and accurate framework of fact is necessary to the research.

For example, a key fact that it is important to establish is that the project is late and over budget. This may be done in many ways including by reviewing internal documentation on deadlines and looking at financial reports. There has to be a reasonable degree of consensus on this factual underpinning, otherwise Jane will get nowhere⁸. Furthermore, it is important that these facts are correct. The reader may forgive Jane the occasional lapse, even Homer nods, but a persistent pattern of minor inaccuracies in her account of the external reality will undermine confidence in her account of the much more difficult internal reality (see below).

6. A taxonomy of fact

Given the foundational nature of fact in research, it is useful to classify the factual information that Jane has gathered into a number of categories. The following is one classification of facts, derived from the case study, into five types:

- The first type might be called fundamental fact. Examples of fundamental facts are that the project is over budget and that a review meeting of the project team took place on the 6th of April. Fundamental facts have two key characteristics. First, and most important, there is undisputed documentary or artifactual evidence to support them. Secondly, the veracity of the fact is accepted by all parties who are in a position to know whether the fact is true or not. Somebody who knows nothing about the meeting may choose to deny that it ever took place, but their evidence/opinion is irrelevant and of no value in the research. Fundamental facts are the bedrock on which the research is built. In Jane's case, if the Acme project is actually on

time and budget, the whole rationale for her investigation of Acme collapses.

- Secondly there are consensual facts. These are facts for which there is no hard evidence in the sense of documents, recordings, etc., but which are agreed upon by all parties in a position to know whether or not they are true. In the Acme case, everybody who recalls Harry's exact words to Sally at the meeting might agree that at one point Harry said to Sally: "*I hold you responsible for the problems in the data transfer project*". A consensual fact need not be absolute in the sense that it is not necessary that all agree that these were Harry's precise words, provided that all agree that this was what he meant and a sufficient number agree that this was what he said.

Consequently, consensual facts may have various degrees of strength. For example, if nobody disputes the above wording and several people agree that this is exactly what was said, this may be considered a *strong* consensual fact. More likely, as in the example, everybody may agree that either Harry used those words or if not, something very like them. This is a *firm* consensual fact. For the purposes of the research, the exact wording is unimportant if the message and the sentiment are clear. A *weak* consensual fact might occur where nobody (or possibly only one person) can remember exactly what was said, but there is a consensus on the sentiment, i.e. Harry was blaming Sally for the problems with the data conversion project.

- Thirdly there are probable facts. These are facts are again based on evidence, but on a single piece of credible evidence with little or no corroboration or triangulation. Credible here means that the fact conforms, or at least does not conflict with, what else is known. Probable facts may occur when there is a single witness to an event or where other witnesses are not able to recall sufficient detail to confirm or deny one witness's account of events. The researcher may be called on to make a judgement about the reliability of the witness or may seek confirmation from other sources about the reliability of such a witness. An example in the case study is Alan's comment that Sally is

⁷ One can, of course, do purely theoretical research which might not need any facts at all to proceed.

⁸ Many experienced researchers will have come across cases where it is impossible to reconcile accounts of an event.

not well organised. Sally might, of course, deny this (she almost certainly would), but other evidence suggested by events may provide support for Alan's assertion and it may even be possible to obtain visual or other documented support for this fact if time and resources permit.

- Fourthly there are possible facts. These are things for which there is some evidence, but insufficient evidence to be conclusive; much now depends on the researcher's judgement. Possible facts are in some ways the most problematic, not to say frustrating, for the researcher. In the Acme case, there is at least a suggestion that Harry had decided, prior to the meeting on April 6th, to make a scapegoat out of one of the team leaders. The only evidence Jane has for this is Alan and Sally's opinions. But Sally's opinion is hardly objective and is countered by Harry's denial and to some extent by Mary's comment that Sally was the only person who fought back. Consequently, while there is some circumstantial evidence in support of this fact, and while Jane may strongly suspect that it is the case, it would be impossible to prove in a court of law and must be therefore treated with caution. How much weight should Jane place on Alan's opinion? This is the type of fact that either needs to be presented honestly to the reader for him or her to make their own judgment or to be omitted from the narrative entirely.
- Finally there are disputed facts. These are facts on which there is no agreement or where there are different versions of reality. Disputed facts are common in case study research (they would be less common in, say, ethnographic studies). There is a subtle distinction here between fact and opinion. A disputed fact might be where, say, Tony asserts that the software was not able to cope with the way Acme planned their production. Eleanor might counterclaim that he software could handle it, but that Acme were not using the package facilities

properly. In this instance, were there enough time and expertise, it should be possible to resolve this question one way or the other. On the other hand, disputed facts can blur into opinion. An example here is whether Harry's criticism of Sally's performance was justified. Some actors say yes, others no. Ted might provide a detached view, but he is too politic to comment. This problem is compounded by the seeming presence of pro- and anti-Harry factions in the team. Was Sally's performance poor? Some would argue that this is a matter of opinion; others that her performance can be objectively measured. This is one boundary at which interpretivism and positivism clash, but that is a discussion for another day. The best that an interpretivist researcher can do with this type of evidence is report the varying perspectives and invite the reader to make up his or her own mind.

In this simple taxonomy of facts, each level plays a different purpose. Whilst it is not essential that there be some fundamental facts in order to undertake research, in practice, these normally form the framework within which the research is carried out and against which the consultations, models and explanations of the research must be measured. A research project without fundamental facts is akin to, if not actually, a piece of theoretical research.

Each level of facts is layered upon the preceding one in the researcher's analysis. Any interpretation must account for the fundamental facts and, unless there is strong contradictory evidence from a fundamental fact, the consensual facts. The researcher then has to use her judgment on the degree to which her interpretation of events incorporates the other three classes of fact. As one goes down the list, the room for interpretation increases until at level five, the researcher may have to make a choice between several possibilities (or she may, of course, elect not to choose at all). This is shown conceptually in figure 3. The point at which she chooses to do this might be called the interpretation boundary.

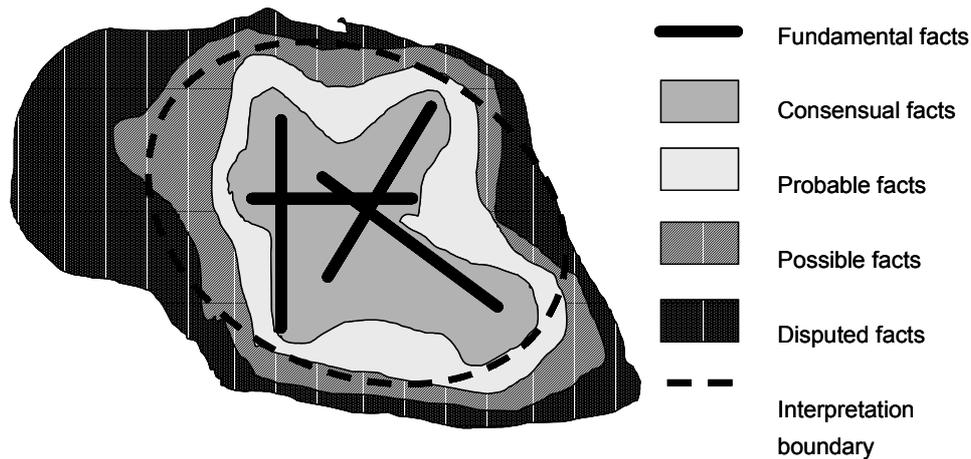


Figure 3: Fitting the interpretation to the facts

It is in the handling of the latter three and particularly the latter two categories of fact that the nub of good interpretative research lies. The researcher's narrative must make clear to the reader to which classification facts belong and in part when (s)he is making informed judgments as to which of a number of conflicting accounts of reality is the correct one. Facts, as has been noted, can be remarkably thin. However facts form the bedrock on which interpretation rests and need to be clearly understood. Facts may never give us the whole truth of a situation, but anything that claims to be an account of those events must fit the facts.

7. Conclusion

In the social sciences, the process by which an event or series of events in one small corner of the real world are conveyed via retrospective research to a readership in the wider world is a complex one, involving many layers of potential distortion. Faced with the prospect of looking through so many imperfect lenses, it is tempting to wonder whether the only path to true knowledge is the positivist road (or the ethnographic approach of being there oneself). Unfortunately both of these methods have their own drawbacks. Indeed the analytical approach here might be applied to methods of research other than the multiple case study.

It is important not to be unduly pessimistic. In interpreting data and evidence and putting that interpretation in written form, the professional researcher is trained to use detachment and language to depict with accuracy. A good researcher will achieve something at least close to this.

After all, one of the primary methods of conveying knowledge is by stories. The importance of stories in the form of, for example, myth, has long been recognised in other fields (McConkie and Boss 1986). Recognition of the value of story telling in business and social knowledge management is more recent (an example contribution being Seely Brown *et al* 2005). In telling the story of her five case studies, Jane may put a particular gloss on events in order to verify a theory or hypothesis that she had before she started her research. Without knowing Jane or her reputation, the reader cannot be sure that she has not done just that. However if she is doing her job professionally, Jane will present the all of the factual evidence as objectively as she can and, while putting her own interpretation on it, invite the reader to read something different into the text if he or she can do so credibly⁹. While the reader will never have access to all of the data, (s)he will have his or her own experience on which to draw and may well have access to other data from other events or other cases, not to mention other researchers which, when combined with what is in Jane's specific text, may possibly provide another and even deeper interpretation of what Jane has found.

Facts play a critical role in this process. A critical methodological practice of good research is that facts and their provenance should survive the multiple layers of distortion between the real world of event and action and the mental world of the eventual reader. Opinions can be useful,

⁹ This is reminiscent of Joyce's comment that he had put enough into Ulysses to keep the professors guessing for years.

but opinion unsupported by, or inconsistent with, fact is at best suspect and at worst vacuous. In interpretative research, facts have always been, and remain, precious.

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