This paper discusses questions related to the use of fragmentary qualitative data. In the first section, some methodological issues are raised in relation to such fragments. Some of these issues are general and relate to old and ongoing debates, and one is more specific and arises from a particular type of mixed method study. The ideas of Walter Benjamin are then introduced in the second section. Benjamin was a man who relied primarily on the exposition and exploration of fragments to develop extraordinarily rich, insightful and influential works on art, culture and history. The reasons behind the success of his method are explored. Benjamin's work then becomes the inspiration, at least in some respects, for the third section. In this, fragments of qualitative data from the Teleprism project, a mixed-method study investigating the links between pedagogy and student attitudes toward mathematics, are presented and discussed. In the concluding section, further links with Benjamin's work are then drawn, issues concerning the relationship of fragments to totality emerge, and the initial methodological issues are returned to and addressed.

Fragments and methodology

This paper is inspired by questions surrounding the use of fragments of qualitative data. Essentially, what are we entitled to do with them, how far can we take them, and how should one approach engaging with them? Some educational research papers seem to spin grand designs from the smallest threads of empirical reality. Whole books have been written based
on single, short excerpts of classroom dialogue. The richness and depth of meaning we get from such qualitative work do have a certain power but can become unconvincing if, as so often can happen, alternative explanations of the particular data are found. In the pursuit of ‘depth’, much research can narrow the focus so much that the wider context, of which it is a part, starts to fade. Yet, understanding any phenomenon arguably relies on this context and the inter-relations between it and the wider processes it is embedded in. Some theoretical traditions, such as postmodernism, can even make a virtue of this abandonment of the big picture and say that it is only the small details that matter. These varied issues, all in some way relating to generalisability, leave some uncomfortable still with qualitative approaches.

Quantitative work, in dealing with broader sources of information, seems to have the advantage in its generalisability. However, in exchange for this ability to generalise, it often provides us with what feels like quite blunt and narrow instruments. Participants’ ticking a box and choosing between limited options in a questionnaire just doesn’t provide the same qualitative richness of meaning as human observation and conversation can. A common solution aimed at overcoming these (crudely painted) difficulties is to use a combination of quantitative and qualitative approaches.

This mixed-method approach is the one taken by Teleprism, a large scale ESRC funded project (award ref: RES-061-25-0538 www.teleprism.com), as it investigates the relationship between pedagogy and the beliefs and attitudes of students in relation to mathematics. At the heart of the project is a large scale survey, involving over 13 000 secondary school mathematics students, and their teachers, from over 40 schools. Alongside this, the project includes qualitative work, primarily interviews and classroom observations, with a sample of those who have completed the main survey. The key impetus for this qualitative work is twofold. First, it aims to check the validity of the quantitative instrument. Do people do and think what they claim to do and think within the survey? Second, the qualitative methods are used to add layers of depth and meaning to the themes which emerge from the survey. It is these (hoped for) rich examples which will also be used to illustrate and communicate the findings of the project.

This process raises questions about a potential danger inherent in this particular methodological approach. If the quantitative instrument is seen as, in some sense, being relatively blunt or narrow, then both of the motivations described above may act to transfer this bluntness and narrowness into the qualitative part of the study, thus losing some of the benefits of qualitative work. To achieve validity and deeper exploration/illustration, the design of the qualitative phase has to reflect in some detail what has been asked in the main survey. It will shape what questions are asked in interviews, what is looked for in observations, which data is analysed, how it is analysed and how it is coded.

One way to try and overcome this potential pitfall is through being conscious of the problem and attempting to increase the openness of the design, for example, in asking more open questions in interviews. This is to be encouraged and was certainly done within the Teleprism project. However, there are limitations to this. The needs of validity and illustration are still essential and being too open in the approach could result in their absence. In practice therefore, these needs consistently act to reassert their influence.

A further option, and one which this paper explores, is to make a specific effort in the analysis stage to find elements which lie outside of this general structure and which
otherwise may fall by the wayside. This involves looking, for example, in interview data, for answers to questions which appear odd, which lie outside the usual or expected range of answers, or which seem, in some way, to be going beyond the question asked. By paying particular attention to these it is hoped that something additional and useful may emerge related to our particular questions, our design and methodology, or any wider questions.

In conducting this process, however, what we unearth will be, necessarily, isolated fragments of qualitative data. And this brings us back to the broad questions we began with regarding what we are entitled to do with such fragments. To gain some potential insights into this, we now turn to the life and work of Walter Benjamin, a man whose obsession with fragments may provide some illumination for our own methodological issues.

**Walter Benjamin**

Walter Benjamin is a huge intellectual figure, particularly in the fields of art, culture, modernism and history. His essay, *The Work of Art in the Age of Mechanical Reproduction* (2007: 217) is perhaps one of the most influential theoretical works of the 20th Century, and his *Theses on the Philosophy of History* (2007: 253), his final completed work, is regarded in comparable terms. Shortly after the completion of the 'Theses' in 1940 Benjamin committed suicide when his attempts to flee Nazi occupied France were seemingly frustrated. One short extract usefully conveys the style and power of his writing:

> A Klee painting named "Angelus Novus" shows an angel looking as though he is about to move away from something he is fixedly contemplating. His eyes are staring, his mouth is open, his wings are spread. This is how one pictures the angel of history. His face is turned toward the past. Where we perceive a chain of events, he sees one single catastrophe which keeps piling wreckage upon wreckage and hurls it in front of his feet. The angel would like to stay, awaken the dead, and make whole what has been smashed. But a storm is blowing from Paradise; it has got caught in his wings with such violence that the angel can no longer close them. This storm irresistibly propels him into the future to which his back is turned, while the pile of debris before him grows skyward. This storm is what we call progress.

Benjamin only published two works in his lifetime but left behind many manuscripts. Some remained unfinished, such as his 'Arcades Project' on 19th Century Paris (1999), the central focus of his final 13 years. One of the works that was published was his book *The Origins of German Tragic Drama* (1998). Essentially, this was the post-doctoral work that should have been his passport to an academic career. Unfortunately, his examiners found it incomprehensible and impenetrable and he was advised not to officially submit it. (Leslie 2007:67) This setback forced him to earn his living through journalistic output, and his opinion of academia remained low for the rest of his life.

> My book the Origin of German Tragic Drama was the test case for just how strict adherence to purely academic research methods leads a person away from the contemporary stance of the bourgeois and idealistic scholarly enterprise. This is borne out by the fact that not a single German academician has deigned to review it. This book, of course, was certainly not materialistic, even if it was dialectical. But what I did not know at the time I wrote it, soon
thereafter became increasingly clear to me: namely, there is a bridge to the way
dialectical materialism looks at things from the perspective of my particular
stance on the philosophy of language, however strained and problematical that
bridge may be. But there is no bridge to the complacency of bourgeois

His early intellectual life was influenced by Kant and Jewish theology, but the First World
War politicised him (Anderson 1979, 27), as it did many intellectuals of his generation.
Benjamin was first attracted by anarchism but his ideas soon developed towards Marxism.
This was partly through the influence of a romantic relationship with a Bolshevik actress and
theatre producer, partly as a joint development with his friend Ernst Bloch, (Benjamin 1979,
32) and partly influenced by Lukacs' then recent 'History and Class Consciousness'. He says,
in 1924, 'the book astonished me because these principles resonate for me or validate my
own thinking'. (Benjamin, 1995, 248). He is often seen as part of the 'Western Marxist'
tradition (Anderson 1979) through his relationship with the Frankfurt School. But despite
these strong intellectual relationships and friendships, particularly with Adorno, he never
succumbed to their pessimism. (Davidson 2009). His 'messianic' faith in working class
revolution remained strong throughout his life, as evidenced by sections of the 'Theses'
(Benjamin 2007, 253). A final, important marxist influence in his life was his friendship with
Bertholt Brecht, with whom he shared both a distaste for developments in Russia under
Stalin as well as a love for modernism in culture (Wizisla 2009).

Benjamin's early Jewish influences remain a motif through his later work. As he says in a
letter of 1931, 'I have never been able to do research and think in any sense other than, if
you will a theological one, namely in accord with the Talmudic teaching about the forty-nine
levels of meaning in every passage of the Torah'. (Benjamin 1995, 372). These influences
have led some to see Benjamin as primarily a religious thinker (see, for example, Jacobson
2003). However, this tends to ignore Benjamin's own, generally explicit concerns. For
example, the last quote continues, 'That is, in my experience, the most trite Communist
platitude possesses more hierarchies of meaning than does contemporary bourgeois
profundity, which has only one meaning, that of an apologetic'.

Despite Benjamin's 'grand narrative', others have seen in him a proto-post-modernism (see,
for example, Owens 1980). One of the reasons behind this is likely the embracing of
fragmentation in his writing. Yet, as will be seen as we turn to an exploration of his
relationship to fragments, the inspiration drawn from this aspect of his work may be based
on a misunderstanding.

Benjamin and Fragments

Opinions are to the vast apparatus of social existence what oil is to machine: one
does not go up to a turbine and pour machine oil over it; one applies a little to hidden
spindles and joints that one has to know. (Benjamin 1979, 45)

Benjamin's work has a recurring relationship with fragments at many different levels. To
give a flavour of this structural style, here is a list from the contents page of his 'Convolutes',
the major section of his sprawling (and unfinished) 'Arcades Project':
This categorisation of 19th Century Paris is at first glance reminiscent of Borges’ famous (and presumably fictional) Chinese encyclopedia, the ‘Celestial Empire of benevolent Knowledge’, in which animals are divided into:

(a) those that belong to the Emperor; (b) embalmed ones; (c) those that are trained; (d) sucking pigs; (e) mermaids; (f) fabulous ones; (g) stray dogs; (h) those that are included in this classification; (i) those that tremble as if they were mad; (j) innumerable ones; (k) those drawn with a very fine camel's hair brush; (l) et cetera; (m) those that have just broken the flower vase; (n) those that at a distance resemble flies. (Borges 1999, 231).

If we zoom a little further in to Benjamin’s writing a similar fragmentation is seen: In his work ‘One Way Street’ seemingly disconnected sections that vary in length from a few lines to a few pages sit next to each other on the page. Zoom in a little further even to the sentences on the page, and like the self-similarity of a fractal the same pattern emerges. In her introduction to ‘One Way Street’, Susan Sontag argues, ‘His sentences do not seem to be generated in the usual way; they do not entail. Each sentence is written as if it were the first, or the last. Then she quotes Benjamin from the Prologue to ‘The Origin of German Tragic Drama’, “A writer must stop and restart with every new sentence”. (Benjamin 1999, 29)
So Benjamin's work is imbued with a sense of fragmentation. The question which arises is 'why?'. What exactly is he trying to do? To answer this it seems appropriate to use his own words (particularly given the content of the first quotation that follows).

While writing his 'Origins of German Tragic Drama', in 1924, Benjamin becomes conscious of his emerging method and reports in a letter to a friend,

> What surprises me most of all this time is that what I have written consists, as it were, almost entirely of quotations. It is the craziest mosaic technique you can imagine…

(Benjamin 1994, 256)

In the 'Origins' itself, a year later, he expands on this metaphor of the mosaic and his methodology,

> Just as mosaics preserve their majesty despite their fragmentation into capricious particles, so philosophical contemplation is not lacking in momentum. Both are made up of the distinct and the disparate; and nothing could bear more powerful testimony to the transcendent force of the sacred image and the truth itself. The value of fragments of thought is all the greater the less direct their relationship to the underlying idea, and the brilliance of the representation depends as much on this value as the brilliance of the mosaic does on the quality of the glass paste. The relationship between the minute precision of the work and the proportions of the sculptural or intellectual whole demonstrates that truth-content is only to be grasped through immersion in the most minute details of the subject-matter. (Benjamin 1998, 28).

So again we see a mosaic made of fragments of thought, but these fragments are not just random scattered thoughts, they are part of an 'intellectual whole'. Later, in his 'Arcades Project', Benjamin expresses something similar,

> In what way is it possible to conjoin a heightened graphicness [Anschaulichkeit] to the realization of Marxist method? The first stage in this undertaking will be to carry over the principle of montage into history. That is, to assemble large-scale constructions out of the smallest and most precisely cut components. Indeed, to discover in the analysis of the small individual moments the crystal of the total event. (Benjamin 1999, 461).

This process of montage applied to fragments to form a sense of a particular totality is further described in a letter as he reformulates the structure of the 'Project' in 1935,

> Here as well the focus will be on the unfolding of a handed down concept. Whereas in the former it was the concept of Trauerspiel [German Tragic Drama], here it is likely to be the fetish character of commodities. (Benjamin 1995, 482)

The key to an understanding of the totality for Benjamin is a particular concept. In 1924, although still at the early stages of a development towards marxism, it is little wonder that, as seen earlier, Lukacs' sophisticated philosophical analysis resonated so much for him, with its particular emphasis on the concept of totality. By 1935, Benjamin follows Marx more explicitly in seeing the commodity as the key to understanding the 19th Century. Marx begins Capital with a discussion of the commodity, seeing in it the analytical germ-cell from which
one can unlock the totality of the economic system (1976). In an early section of the book, Marx discusses commodity fetishism, the particular form of alienation under capitalism, where,

The mysterious character of the commodity-form consists therefore simply in the fact that the commodity reflects the social characteristics of men's own labour as objective characteristics of the products of labour themselves (p164)... It is nothing but the definite social relation between men themselves which assumes here, for them, the fantastic form of a relation between things (p165)... they do not appear as direct social relations between persons in their work, but rather as material relations between persons and social relations between things (p166).

Grasping this fundamental process helps us understand many aspects of human relationships and culture. As Benjamin puts it,

Marx lays bare the causal connection between economy and culture. For us, what matters is the thread of expression. It is not the economic origins of culture that will be presented, but the expression of the economy in its culture. At issue, in other words, is the attempt to grasp an economic process as perceptible Ur-phenomenon, from out of which proceed all manifestations of life in the arcades (and, accordingly, in the nineteenth century). (Benjamin 1999, 460)

Such an approach to culture is often criticised as reductionist and mechanical, but this is based on a misunderstanding, as Benjamin explains,

At first it appears as if Marx only wanted to establish a causal relation between the superstructure and the base. But even the observation that ideologies of the superstructure mirror relations falsely and distortedly points beyond this. The question is this: if the base determines the superstructure, in what might be termed the material of thought and experience, and if this determination is not a simple mirroring, how – irrespective of the question of how it arises – should it then be characterized? As its expression. The superstructure is the expression of the base. The economic conditions, under which society exists, are expressed in the superstructure; just as an overfull stomach, although it causally conditions the sleeper's dream content, does not find therein its reflection but its expression. (Benjamin 1999: 392).

Taking Benjamin's advice that 'it is good to give materialist explorations a truncated ending (1999, 473), we now move on to explore some fragments of our own.

**Interview Fragments**

Although what follows is influenced by Benjamin's work as outlined in the previous section, that does not mean that it is intended to replicate (or parody) every aspect of his writing. That is to say, it is not claimed that either genius or poetry follows. As described previously, these fragments were extracted from interviews with secondary school mathematics students focussed on their experience of classroom pedagogy and their beliefs and attitudes towards mathematics.

* * *
Student (M, Year 7): …I've had long hair all my life.

The criteria for the initial selection of the fragments discussed here is simply that they stood out to us as odd, unusual or in some way not fitting within the range of answers we expected. There is a danger in such an approach that some of the fragments chosen become simply, 'funny things that kids say', We court that inherent danger openly by beginning with this example.

Our interviews tended to begin with open conversational questions such as these in an attempt to break down some of the communication barriers built in to the interview situation. The response here is to state a property of the self which is 'different' about the student. Unusualness of response seems built in to the question, but it was unusual to say something unusual. Many other students' responses were instead descriptions of things such as their family, where they lived, what they spend time doing. Such factors were of course very similar for the children in any particular school.

The process of formation of individuality is a long and complex one and can be quite painful for children. It is also, importantly, a social process. It is part of our culture to see ourselves as individuals, and we socialise children into this culture (questions such as 'tell me about yourself' do not just occur in interviews). This cultural notion of individuals is so strong it seems universal and eternal, yet in many ways it is a relatively recent historical product, rooted in the (successful) reductionism of the scientific revolution and processes inherent in the rise of capitalism (the ideology surrounding the need for 'free' labour for example) (see Meszaros 1970). Despite our complex uniqueness, the mundane similarity of our lives limits our societally-professed individuality and we are left with what Adorno (1941) called pseudo-individuation: 'mass-produced culture with the halo of free choice'. In such a world, consistency of hair length is as much as we can hope for.

Interviewer: Shall we start with just if you tell us a little bit about yourself....

Student (Female, Yr 11): ...I work well in a team.

'I work well in a team' is a phrase that almost everyone has used at one point or another, particularly, in the process of applying for jobs. It is as close to meaningless as a phrase can be due to its almost universal applicability. Of course you work well in a team, you are a human being. Human beings are social creatures. It is one of the key defining features of our species that we work well in teams.

The phrase is really saying something else within job applications. It is saying that we promise to make an effort, to contribute and not to be disruptive, or rather, we are the sort of person who can be relied upon to act in that sort of way. The reasons we have to offer such promises is that work is often unpleasant. We sell our time to someone else because we have little alternative, and the fact that we have alienated our labour power, is, well, alienating at times, and at work we will look for distractions. Even in jobs that feel useful and
fulfilling (and most people manage to find something within their own jobs to get some self-satisfaction from even if just to stop themselves going insane) the pace and intensity expected by the person above is unlikely to seem reasonable. To get a job, however, we need to convince the potential employer that we don't ever think that way.

So in order to sell our ability to work, we sell ourselves. We learn, although not necessarily consciously, that we are commodities, and we do with that commodity what is done with commodities. We advertise it and we sell it. In the process we reduce ourself to an object, and then subject ourselves to processes that are designed for objects. If a commodity such as a commemorative Royal wedding tea towel does not sell it is a shame for the seller but not particularly for the tea towel. But if a young person fails to get a job for many years, as is likely in the current economic climate, that failure is met with the complexities and emotions of a human being who was only in the disguise of an object.

That such a phrase as 'I work well in a team' can be expressed by someone still at school is, first, slightly depressing, and second, a clue as to the role school plays in the early stages of the commodification of the self.

* * *

Interviewer: Do you want to go to University?

Student (F Yr 8): Yeah.

I: And what would you do there?

S: I don't even know what you do at university.

* * *

I: So what do you want to do with your life after school, have you thought about that?

S (M, Yr7): Well I have always wanted to be a pioneer…

…because I don't want to be here for the rest of my life sat a desk, just sorting out files like asking someone to fax this to the next country, I don't want to do that…That is not my type of thing – sitting at a desk with coffee doing that all day and then coming home.

In Wes Anderson's 'Moonrise Kingdom' a young boy asks a girl, 'What do you want to do when you grow up'. And she replies, 'Go on adventures'. We naively hoped that all students would have dreams and ambitions such as this, yet this response was unusual to the point of unique. Either our school system has managed to crush such spirit from the majority by secondary school age, or they have at least learned to keep such dreams to themselves.

* * *

Interviewer: How did it change with the transition from that school then to this school, the secondary school?
Student (F, Yr 7): It changed because the lessons are shorter, you have to hurry up to do more work and produce what you can.

I: Can you give me an example?

S: Well in English we used to write the date, the title and the learning objective in a maximum of 2 minutes, whereas I used to write the date, then underline it, then write the title, then underline it. So now I just write it and do it and she moves on to the next slide, so it is just getting into that way of what to do.

This example shows how school can at times be almost direct training for future workplace experiences. The sense of the speeding up of the production line is familiar in most people’s employment experience in recent years. As in the workplace, what gets driven out first is the space for creativity or simply taking sufficient care. One can imagine her previously taking pleasure in the aesthetic craft of underlining (no doubt in a different colour pen), and perhaps even being praised for it. Now she is told that it doesn’t matter. She is remarkably stoic in the face of such treatment.

* * *

Interviewer: Are there any topics you like more than others?

Student (F, Yr 9): ... I don’t mind doing brackets.

With this question we were expecting, and received most often, something more generalised, like statistics or algebra, or something like, say, topics that involve drawing things. Although, it is a difficult question to answer and usually elicited something that had been done relatively recently. Here the answer is very specific and would be humorous to most mathematicians. The multiplying out of brackets is a very narrow process skill and isn’t really a topic. Of course, in the world of school mathematics where a beautiful complex world of interrelations is generally broken down into such narrow process skills this answer does becomes possible.

What has been done to mathematics parallels the division of labour in the workplace. The ‘Fordism’ of production lines where jobs are broken down into more and more mundane and repetitive tasks. The knowledge economy which we were so recently promised, which required massive further expansion of higher education and the training of the many to engage in complex creative tasks turned out to be a false dawn. In practice in most workplaces it is more ‘efficient’ to have one or two people to engage in such lofty pursuits, with the majority continuing the drudgery they have always known.

This process also parallels the atomisation and individualisation of society, and the effects on mathematics are similar to the effects on humans. We lose the sense of being part of a bigger whole. The humanity remains though in the students’ phrase ‘I don’t mind doing...’. She doesn’t love or like this pointless activity, she ‘doesn’t mind’ it, and she manages to keep a healthy psychological distance from it.

* * *
S (F, Yr 7): I get the ones like halves but I don't get the ones like it says 5/8 or something, the bigger ones.

One could perhaps write an entire paper on this fragment alone, but to even begin to do so may take us too far into the topic of mathematical concept formation. So, merely offering it as something to ponder, we instead finish by attempting to draw some conclusions.

Some conclusions

What has emerged from the analysis of our own qualitative fragments is something noticeably similar to what Benjamin found in looking at 19th century Paris, the expression within these students' comments of the particular economic organisation of our society and the influence of the commodity form on our thought. This was not our intention at the start of this process. However, we would anticipate suggestions of the inevitability of this result given the subjective stance of the researchers. In response to, this we would argue on one hand that both the 'oddness' of the selected fragments, and the attached interpretations have a reasonableness beyond our own narrow subjectivities. On the other, we would say that those 'subjectivities' are in fact a still progressive research program (in Lakatos’ (1978) sense, and as Feyerband (1976, 315) and Callinicos (1990, 83) argue in relation to classical Marxism). This embedding in wider theory is seen as an essential aspect of addressing fragments of data, of being able to integrate them into a totality, and, most importantly, to understand the nature of that totality.

Much of the above may be controversial to many so we would also like to offer some tamer methodological conclusions. Our initially described concern was that, in our current project, the requirements of validity checking and of deepening the findings of the large-scale quantitative instrument would act to impose some of the narrowness of such instruments onto our qualitative work. The process discussed above, of consciously seeking out what did not fit well with the general structure of this instrument and its findings proved to be a worthwhile and thus recommended experience. This process produced some interesting data that otherwise would have been lost, and engaging with it provided a useful stance for examining and critiquing our instruments, our project design and our wider methodology. Perhaps the most useful outcome, however, relates back to the previous paragraph. By focussing on data that we hadn't initially looked for we managed to embed our research in wider questions and for us this provided a deeper understanding of our primary data and potential developments for continuing research.
References


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I've done a few things in higher secondary school sort of like this, but I don't know how much it is really like it. Next Question.

Interviewer: It sounds like you've had interesting experiences; I appreciate your honesty. I've enjoyed our conversation today. Thank you for your answers and observations. We have several days of interviews scheduled for the position, so I will be in touch with you over the course of the next several weeks. Good-bye.

Recommended Answer: I've enjoyed the opportunity to learn more about the Customer Service Representative position. Do you agree or disagree with the following statement? All students should be required to study art and music in secondary school. Use reasons and specific examples to support your answer.

Nowadays, students have to study many subjects in secondary school. I don't know how much time you have but maybe you could express both points of view and then state your own point of view? Also, you generalise a bit too much. It teaches critical thinking, it expands the mind beyond what is learned in science and math, it has historical relevance, it teaches the mind about organization and pattern—these are some things you could mention as well. A great thing for all students to have the chance to study arts and music in secondary school.

Make eye contact and don't forget to thank the panel at the end of the interview and to shake hands. Remember that the panel will always ask a candidate if they have any questions at the end; if a candidate has nothing prepared, it is fine to use this opportunity simply to thank the school for the interview.