

Expressions of the commodity form: Alienation and mathematics education

1. Introduction

This article is a contribution to recent debates on alienation and education (see Lave & McDermott, 2002; Williams, 2011; Jones, 2011). Its aim is to refocus understandings of alienation in relation to education, and mathematics education in particular, around a unifying explanatory factor- the dominance of the commodity form of production within capitalism. It does this by first describing the wide range of influences that commodity production has on education, from the needs for a compliant workforce through to the atomisation of knowledge. For reasons of space, and to avoid repetition of points made more eloquently elsewhere in the discussion, these various paths from the commodity to the classroom are traced primarily in outline.

If the claim that commodity production overwhelmingly shapes education is to carry weight, then some evidence should be provided, but, also, such evidence should not be hard to find. Here, this is presented in the form of fragments of interviews conducted with secondary school students about their experience of mathematics. Given the complexity of mediations between the workings of the economy and the words of schoolchildren, the use of this as evidence requires some justification. Therefore, a detour is taken in the middle sections of the article; first, to describe the particular methodological question that led to the initial extraction of the data. And, second, to justify how it is used here by reference to the work of Walter Benjamin, a writer with a particular approach to fragments of data and a related interest in cultural expressions of the commodity form.

2. Commodities, alienation and education

At the heart of Marx's theory of alienation lies the commodity. In the 1844 manuscripts Marx (1992) famously discusses some of the implications of satisfying human needs through a system of generalised commodity production. Instead of a process of engaging in direct, conscious, collective activity to satisfy needs, as in, say, humanity's pre-historic hunter-gatherer past, the current form of social organisation of production mediates the link between activity and needs. Workers produce, but the product they produce is not theirs to use. The majority sell their ability to work to the minority who have the means to organise the production of commodities, in essence turning themselves, or their ability to work, into a commodity. In exchange workers get money, with which they can go and buy other commodities. Marx argues that this alienation from the product of labour also means alienation from the process of labour (through its disconnection from immediate needs, and the lack of control of the process), from what it is to be human (i.e. conscious social producers), and therefore from other humans (whether within production or between either side of the production consumption divide). Many of these aspects of alienation also apply in earlier

forms of class society where the product of labour is taken from the producer, for example, when a peasant works part of the year on the estate of their feudal lord. As Marx argues in *Capital* (1982), what differentiates capitalist society is that the social relations involved in production become hidden:

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).

This *commodity fetishism*, in a society dominated by commodity production, and where human beings are themselves objectified in the commodity labour power, has a profound effect on all aspects of human culture, including education. '[T]he problem of commodities must not be considered in isolation or even regarded as the central problem in economics, but as the central, structural problem of capitalist society in all its aspects' (Lukacs, 1971:83). A final factor relevant to education, that itself arises from the alienation of genuine social relations, and the competitive nature of capital, is the state, or what Marx calls the 'illusory community' (Marx, 1974: 83). The state gives the impression of standing over society and being neutral, of representing the common good, but in reality it represents the interests of capital against other classes, as well as mediating conflicts between capitals when necessary. It also performs, or attempts to perform tasks that are in the general interests of capital, the things that companies can't, or don't want to do individually, such as ensuring the general availability of the commodity labour power at sufficient levels.

Before capitalism, institutionalised education was very much a minority pursuit. In 1072, for example, even the king of England still had to sign documents with a cross (see Poplawski et al., 2008:15). The earliest schools were religious vocational schools attached to cathedrals and monasteries, when the church was a central part of the ruling class (Williams, 1961: 148), but from the 13th century independent schools such as Winchester and Eton are formed, and these become the schools of the rising capitalist class (p.151). The poor went largely uneducated. For example, even with a big increase in schooling through the industrial revolution, only around half of children attended some kind of school in 1816, and this generally only on one day a week, focussed on moral education and for a brief period (the average duration of schooling was one year even by 1835, see p. 157). There was rising pressure from industry to avoid the burden of training the minimally literate and numerate supply of labour power required to remain competitive, but this met resistance. For example, one failed attempt to increase the spread of schooling in 1807 met this response in the UK parliament:

However specious in theory the project might be of giving education to the labouring classes of the poor, it would, in effect, be found to be prejudicial to their morals and happiness; it would teach them to despise their lot in life, instead of making them good servants in agriculture and other

laborious employments to which their rank in society had destined them; instead of teaching them the virtue of subordination, it would render them factious and refractory, as is evident in the manufacturing counties; it would enable them to read seditious pamphlets, vicious books and publications against Christianity; it would render them insolent to their superiors; and, in a few years, the result would be that the legislature would find it necessary to direct the strong arm of power towards them. (Giddy, 1807)

This was not far from the truth as pressure also grew from below, from a radicalised working class developing its own educational practice, particularly following the rise of the Chartist movement. One small illustrative example is the Lord Street Working Men's Reading Room in Carlisle, where,

[F]ifty men, anxious to read about the European revolutions of 1848, clubbed together to buy newspapers. A year later, with 300 members and 500 books, it had far outgrown its premises, a borrowed schoolroom. A new Elizabethan-style building was constructed in 1851, with congratulatory messages from Charles Dickens and Thomas Carlyle. Governed by a committee of workingmen, it charged a subscription of only 1d. a week, and even that was waived for the unemployed (Rose, 2002, p. 65).

The needs of industry, combined with pressure from below (see Simon, 1974) led to the development of the mass compulsory education seen today, through various parliamentary acts from the 1870s onward. Schools were shaped by the needs of factories, and still reflect that influence today. The needs of companies and the profitable selling of commodities are still seen as the primary motivation for education, as can be seen in any speech on the subject by politicians. To give a flavour, here is UK Conservative Prime Minister David Cameron explaining the main reason for lowering truancy levels:

We want to want to create an education system based on real excellence, with a complete intolerance of failure. Yes, we're ambitious. But today, we've got to be. We've got to be ambitious if we want to compete in the world. When China is going through an educational renaissance, when India is churning out science graduate...any complacency now would be fatal for our prosperity (Cameron, 2011).

2.1 Purposes of education

In reality, for capitalism, education isn't just about the suitable development of the commodity labour power through the narrow learning of skills. The other main social functions of schooling, listed by Riemer (1971) during a previous wave of radical thought in education, are still valid. These are: custodial care, social-role selection and indoctrination. (p. 23). Each of these relates directly to commodity production.

First is the importance of custodial care, or, the effective babysitting of children so that their parents are in a position to go to work. This is one reason why strikes by teachers can be effective, as they have a generalised impact throughout the economy. The economic cost due to absenteeism of closing schools in

the UK for one week, for example, is estimated at £1 billion (Sadique, Adams & Edmunds 2008).

The second function, role selection, relates directly to adequate distribution and differentiation of the commodity labour power. With a societal division of labour comes the need to slot people in to different levels of job role. Schools are an efficient machine for taking people in at whatever class position they are at in society and throwing them out at roughly the same position, but with the illusion that the end result is based on individual merit, making people believe that they are the cause of their own failure (or success) rather than the system (see, particularly, Bourdieu & Passeron, 1990). Exams and streaming/differentiation are all essential to this task, with their impact on individual self-belief and teacher expectations (see, e.g., the experiments relating to rats, and children, by Rosenthal, 1968).

This 'learning your place' is also vital for capitalism in relation to the third function of schooling, indoctrination. The commodity labour power is very unusual. In purchasing any other commodity the price is fixed and money and commodity are exchanged. But purchase someone's ability to work for a period of time and there is an ongoing negotiation of how much work gets done, since human beings are not really objects even when they are treated as such (see e.g. Hamper, 1991 for some entertaining examples of this renegotiating). Learning your place in school is part of a general instilling of subordination which undermines the confidence to engage in individual and collective attempts at renegotiating when later in the workplace. The culture of sitting still, being quiet, learning to follow rather than create, learning to compete with others rather than co-operate, all help adjust children to their future life as a good worker/commodity. Although attempts at more explicit indoctrination, in the sense of consciously convincing individuals of the dominant ideology (Marx 1974, p. 64), do take place within schools, it is the shaping of expectations through lived experience that is more fundamental.

2.2 Education as commodity

Recent years have seen a relentless drive towards privatisation across all education sectors of the UK (for recent developments in Higher Education see McGettigan, 2013, and for the impact on schools, and beyond, see Ball, 2007). Even where education is not formally a business it is increasingly run as if it is. But in education, what is the product? What is the commodity? As both Williams (2011) and Jones (2011) point out, students themselves are not engaged in productive labour which generates surplus value and the grades and certificates they achieve are not commodities produced by them. However, instead, the certificate should be seen as the commodity which is being sold to them. In reality, they are sold the process of education and potential success in an exam, but this is no different to other commodities such as say film, where they do not give you your money back if you fail to pay attention when in the cinema. The fact that 'certificates belong to the student, not the teacher or school, and are not sold or exchanged' (Jones, 2011, p. 369) could also be said about many commodities, for example, haircuts, from this

perspective. Although, perhaps more than haircuts, certificates do potentially influence the future exchange rate of the commodity labour power for those holding them.

According to Jones (2011, p.369) teachers in the state sector are not productive in the marxist sense. However, it is certainly arguable that they are indirectly productive in that state education increases the potential productivity of the system as a whole (see Harman, 2009, p. 135) through reducing the socially necessary labour time required for production within the capitalist firms serviced by the particular state. Teachers within private education, on the other hand, are directly involved in the production of commodities. The impact of the neo-liberal era, with the development of transitional semi-public, semi-private forms in schools, colleges and universities alongside the pseudo-marketisation of publicly funded education, has been to transfer the realities of commodity production into the state sector. It is in this sense that it is meaningful to talk about the commodification of qualifications, such as in Warmington (2007). The logic of this process has led to exams increasingly shaping how education is delivered, an increase in managerialism and control in schools, fixed and atomised curricula, set lesson plans for teachers, and set ways to teach disciplined by inspection regimes. In the words of the radical slogan, the school is a factory. Even if teachers want to produce a different product, for example, well-rounded, critical thinking, self-confident, social human beings with a depth of understanding of their subject, there are increasing mechanisms to ensure they focus on exam results instead (see Paton, 2013).

2.3 Knowledge as object

The final point to make is that this commodification, the reification of a social process of learning into its outcome object, the qualification, is an example of a generalised feature of capitalism affecting wide areas of life (for an example see Badiou, 2012 on aspects of the commodification of love via dating websites). And this generalised process of reification extends even to how we think, and how we think we think. There are two key elements to this. First, 'ideas do not fall from heaven and nothing comes to us in a dream' (Labriola, 1966, p. 155): As in above, where the indoctrination element of schooling, the understanding and accepting of how the world is, rests primarily on the lived experience of schooling, ideas are fundamentally shaped by practice (Marx, 1974, p. 47). The generalisations made from experience are then intertwined with the dominant ideology (the generalisations from practice made from the perspective of those who dominate society, Marx, 1974, p. 65) to form what Gramsci (1971) calls 'common sense' (p. 419). Although the process is both complex and non-mechanical, it is far-reaching. The dominance of the commodity form of production and the resultant objectification, alienation and atomisation underpin modern conceptions of the individual and theories which take the individual as their starting point (Meszaros 1970, p. 254). They also underpin the rationalism and reductionism of the scientific revolution which accompanies the rise of capitalism (Lukacs 1971, p. 230). And finally, they help to reduce our understanding of knowledge, an active

relationship with the world, to that of an object, something that can be taken out of one person's head and slotted into another's.

Mathematics has played a central role in many of these developments:

It is anything but a mere chance that at the very beginning of modern philosophy the ideal of knowledge took the form of universal mathematics; it was an attempt to establish a rational system of relations which comprehends the totality of the formal possibilities, proportions and relations of a rationalised existence with the aid of which every phenomenon- independently of its real and material distinctiveness- could be subjected to an exact calculus. (Lukacs 1971, p. 129)

Mathematics education is therefore particularly shaped by this and the accumulated effects of all the processes and features of alienation described above, with many forces acting in a direction to encourage transmissionist pedagogy and limit the potential for more meaningful approaches to teaching. For example, the division of labour into mental and manual, and the further separation of knowledge into individual subjects discourage the use of meaningful problems and the relating of mathematics to everyday knowledge or physical and social experience. The needs of capital for a stratified and differentiated labour force, the reification and commodification of knowledge in certificates and a view of knowledge as object shapes an atomised curricula which divides mathematics into narrow process skills, and loses the systemic connections so central to understanding. The individualisation of the commodity labour power and the competitive demands of exams discourage emphasis on the social dialogue which is so fruitful in concept development. And the practicalities of custodial care, the time pressures of the 'production line', the training of submission and the idea of knowledge as transferable object encourage passive drill and memorisation rather than active and reflective thought.

These are just some examples of how the influence of commodity production works its way through to the classroom and pedagogy. To trace the complex mediations along each or any of these paths in sufficient detail would require more space than is available here. However, if the description of the multiple paths from the commodity form to the negative aspects of education is correct, it should be possible to find evidence within schooling of the various aspects of the analysis presented here. Data which represent such expressions of the commodity form is presented below, but first, the origins of the data and some justification for its usage is explored.

3. Methodological origins of the data

The source of the data used here is the Teleprism project, a large scale ESRC funded mixed-method project (award ref: RES-061-25-0538 www.teleprism.com) investigating 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 the survey, the project includes qualitative work, primarily interviews and classroom observations. The key impetus for the 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 data was used to add layers of depth and meaning to the themes which emerged from the survey. It is these (hoped for) rich examples which will also be used to illustrate and communicate in more relatable form the findings of the project.

This process, although not unusual for such projects, raises questions about a potential danger inherent in this methodological approach. If the quantitative instrument is seen, in some sense, as 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 suggested benefits of qualitative work. To achieve validity and deeper exploration or illustration, the design of the qualitative phase has to reflect in some detail what has been asked in the main survey. The survey will shape what questions are asked in interviews, what is looked for in observations, which data is analysed, how the data is analysed and how it is coded. One way to try and overcome this potential pitfall is of course to be conscious of the problem and attempt 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 from which the following data emerged, is to make a specific effort in the analysis stage to find elements which lie outside of the structure imposed by the qualitative instrument. Here, this meant looking in the interview data for answers to questions which appeared odd or which seemed, in some way, to be going beyond the questions asked. By paying particular attention to these it was hoped that something additional and useful would emerge related to the project's questions, design or methodology, or any wider questions. In conducting this process, however, what is unearthed will necessarily be isolated fragments of qualitative data. And some thought is required as to what it is researchers are entitled to do with such fragments. The work of Walter Benjamin, a writer whose work is permeated by fragmentation provides some potential insights into this question.

4. Walter Benjamin, fragments and the commodity

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, p. 45)

Benjamin's work has a recurring relationship with fragments at many different levels. To give a flavour of this structural style, a sample of the contents page of his sprawling (and unfinished) *Arcades project* (1999: 29) about Paris in the 19th century includes: A) Arcades, Magasins de Nouveautés, Sales Clerks; D) Boredom, Eternal Return; E) Haussmannization, Barricade Fighting; M) The Flaneur; N) On the Theory of Knowledge, Theory of Progress; and T) Modes of Lighting. This categorisation is reminiscent of the random disconnectedness of Borges' (1999) famous (and presumably fictional) Chinese encyclopedia, the 'Celestial Empire of benevolent Knowledge', in which animals are divided into categories such as, mermaids, stray dogs, those that tremble as if they were mad, and those that at a distance resemble flies (p. 231).

Zoom a little further in to Benjamin's writing and the fragmentation continues. In his work *One Way Street* (1979) seemingly disconnected sections that vary in length from a few lines to a few pages sit next to each other on the page. Zoom still further 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 says, '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".

It is while writing his *Origins of German Tragic Drama*, in 1924, that 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, for Benjamin, his fragments are not just random scattered thoughts, they are part of an 'intellectual whole'. Later, in his 'Arcades Project', he 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 [an earlier project] it was the concept of Trauerspiel [German Tragic Drama], here it is likely to be the fetish character of commodities. (Benjamin 1995, 482)

In 1924, although still at the early stages of a development towards marxism, Lukacs's sophisticated philosophical analysis with its emphasis on totality resonated greatly with Benjamin (1995, 248). By 1935, the key to unlocking that totality, shared by both Lukacs and Marx, also became central to Benjamin's attempts to describe and explain wider culture. As he 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)

Here is one small and (necessarily) random illustration of his theme from the Arcades Project (1999):

World exhibitions are places of pilgrimage to the commodity fetish. "Europe is off to view the merchandise," says Taine in 1935. The world exhibitions are preceded by national exhibitions of industry, the first of which takes place on the Champ de Mars in 1798. It arises from the wish "to entertain the working classes, and it becomes for them a festival of emancipation". The worker occupies the foreground as customer. (p. 7)

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, p. 392).

To return to the methodological narrative of the data presented below, Benjamin's work offered a useful approach to the extracted fragmentary data. But, also, much of the content of the oddities found within the interview data seemed to speak of the same central concern as that of his exploration of nineteenth century Paris: the commodity form. These fragments are now presented, and should be read with the themes of Section 2 in mind, that is, in relation to: alienation from product, process, self and others; the development of the individualised commodity labour power; education as commodity; school as factory; knowledge as object; and transmissionist pedagogy.

5. Interview Fragments

As a reminder, 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. It is presented in a spirit of human solidarity: no criticism or mockery of the students, their teachers (or their researchers) is intended. Commentary has been added to many of the quotes to draw out the connections with the themes of Section 2, although other connections (or completely different interpretations of the data) are of course possible. In what follows, R = a researcher, S = student, and a student’s year of schooling and gender are indicated in brackets (add four to the school year for an approximate age).

S (9F)	I've really enjoyed school like most people, like, they probably don't like school or they dislike it but I've never hated school because if we don't have it there's really nothing else for us to do.
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This quote expresses the essential custodial care aspect of schooling but also the ever present social nature of humanity which acts to contradict processes of atomisation.

R	Can you tell me a bit about yourself...
S (9m)	... I've had long hair all my life.

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). 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'. This often takes the form of identification with one of a limited choice of commodities: Blackberry or iPhone, Real Madrid or Barcelona etc. In such a world, consistency of hair length is maybe as much as we can hope for.

R	Tell us a little about yourself.
S (11f)	... I work well in a team.

The process of individualisation is intimately connected to the development of the competitive commodity labour power. This phrase, other than being a bland truism for humans – we are social creatures after all - is normally exclusively found in job applications. Its appearance in an interview with a school student is both depressing and telling.

R	Ok. So...do you think in general you're a good student?
S (8f)	Yeah, generally I always hand my homework in on time, present myself smartly and always try my hardest with my work.

Learning to be a good worker.

R	So what do you want to do with your life after school, have you thought about that?
S (7m)	Well I have always wanted to be a pioneer, but there is nowhere to pioneer any more is there? ... I don't know what else I can do apart from that, 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... Yes, because if you want to be a pioneer ... you set your mind to it and OK I have set my mind to it, I want to be a pioneer, you do your exams and then it is can I be a pioneer? 'No'. How do you be a pioneer, do you have to do this sort of exam, then you have to do that and that, and it is just like, I am only going to countries, just looking around.

Such imagined futures were disappointingly rare in the interviews. Perhaps, by age 11, schooling has successfully crushed the imagination of most children. However, the admirable resentment here expresses the potential contradictions which arise in this process.

S (10f)	I have been set on being a lawyer for about three quarters of a year now.
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The differential experience of time for adults and children here creates an air of unreality which hints at the lack of control in the process of role selection.

R	Does his work involve Maths?
S (9m)	No I don't think so.
R	What does he do?
S	Suitcases.

The reification of human activity in the commodity.

R	Do you want to go to University?
S (8m)	Yeah
R	And what would you do there?
S	I don't even know what you do at university.

Lack of control in the process of production of the self.

S (9f)	I don't think I'm going to get a job to be honest.
S (9m)	Why?
S (9f)	Because I'm getting low grades in everything.
S (9m)	You don't think you're going to get a job? You're still going to get a job just work in McDonalds.

R	Why don't you think you're going to get As?
S (9m)	It's just like mission impossible for me.
R	Why?

S	'Cause I'm not bright, I'm not intelligent.
R	Why do you say these things?
S	'Cause I'm not.
R	When did you start thinking of yourself like that?
S	Like if you get something wrong you think I knew that but I weren't thinking I weren't concentrating.

Learning your place and accepting it is due to merit.

R	Hmm how do you feel about GCSEs now?
S (9f)	I'm scared I'm so scared.
R	Yes but you are quite good really, you are progressing very well aren't you?
S	In that way I don't believe in myself, GCSEs, I am a lot more confident in maths but GCSEs I just don't believe in myself.
R	You have another two years you know before you, you know.
S	I know that's the scary thing.

S (10f)	Yeah I just panic before exams I'm going to fail.
R	Is there anything you don't like about it?
S	It can get a bit, I don't know some topics are a bit boring really you just think this is just ridiculous but not really there's nothing ...

R	So how do you think the next couple of years will be with all the exams you're going to have?
S (9m)	Well...now that I've started it I would probably get used to it and not go literally...stressful and that 'cause that then will always put you down, it will always...think about other things instead of what you think. Probably when I get...when I get a new experience put on me I can usually adapt to it and think about, you know, find a way out, something like that.
R	So you are ready for Year 10?
S	Don't ask me that question now, I'm in Year 9, ask me half way through the six weeks and I'll be alright, yeah.
R	When you...you mean three weeks into the...
S	Yeah, three weeks into the six weeks holiday.

The alienation and psychological damage of exams.

R	What's your level then in Maths?
S (8m)	6E.
R	6E ... that's pretty okay what's your target level?
S	6A.
R	6A yeah so you're below your target level?
S	I've not moved I've not moved up a level or a sub level since year seven. The end of year seven.
R	The end of year seven so you're still on 6E? And how you feel about that?
S	Not proud of it.
R	Yeah.
S	It's alright.

S (8f)	Maybe, it depends, depends how many people go 'cause I'd feel comfortable if there was more people than say if I was just the only person from set 2 and then I was mixed with lots of people from set 3 because I'd feel like I'd know everything that they didn't know.
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Learning your place with mathematical precision.

R	And do you think Mathematics will be useful in your future lives?
S (11m)	Yeah it's big GCSE isn't it.

The certificate has more meaning than the content.

S (7f)	I'm definitely going to college but I don't know about University because it's really expensive.
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An 11 year old feels the impact of the commodification of universities.

S (9f)	Some teachers the way they like speak to kids the way they approach them and they way they speak and you know shout the words I've never believed in
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	any of that like you shout at me I'll shout back you, speak to me calmly I'll give you a calm response, do you know what I mean?
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S (7f)	I've been told off a couple of times, but that was only because I've not understood it and I speak to people if I've not understood it, but now I know not to speak to people and ask the teacher.
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Learning to be subordinate.

S (7f)	I think I have had my ideal lesson, (it wasn't intentional) it was when our teacher, who has really bad asthma, so one day she came in and said she wanted everyone to be quiet. She explained it, because it was something she had done from the lesson and she gave us sheets on what to do; and everyone just quietly finished their work; it doesn't have to be anything fancy I can work with noise, but everyone was just quiet, so that was nice.
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The impact of the emergence of genuine social relations implies a contrast with regular experience.

R	...primary school, did you have any good memories or bad memories?
S (11f)	Yeah, I think I have good memories, but I can't remember.

R	And how did you find primary school?
S (7f)	It was alright. It's a lot different to high school but...
R	In what ways is it different?
S	Like people here called the teachers Miss and Sir but in primary school you've got to call them by their name, like Miss Clarke or something, so that's changed a lot.

R	So what about school, what can you remember from primary school, can you remember much?
S (7m)	when we were in Year 4 from Reception you would get 4 breaks, but when you go into juniors – above Year 4 you get 3 breaks, morning, dinner and end.

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

The school is a factory and sometimes the production line speeds up.

S (7f)	My worst subject...I like art but I don't like the lesson. I mean I like doing my own art, I don't like people telling me what to do in art.
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S (9m)	I decided to pick drama, science and French...I took drama for a lesson for me to get you know, you know a free lesson, 'cause I like drama...
R	So it's easy for you?
S	Yeah, 'cause with too much on...'cause I thought a lot of work to do on paper, I needed a break so...

S (9f)	In Citizenship they were saying, erm, some things you want to change and I said homework and I got the highest score out of the whole class saying you should ban homework and I did really good reasons and I got a 6A.
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Lack of control can breed resentment, resistance and attempts to renegotiate.

R	Okay can you describe to me the lesson a little bit?
S (9m)	She puts like an objective on the board and then like she reads it out and then she goes through examples what we've got to do and then she explains what we've got to do and then she asks us to try and work out the answer and at the end she like shouts one of us up and then we've got to write the answer up on the board and then if we get it wrong she like explains how we got it wrong and stuff.

S (10f)	My old teacher used to explain why something works, but my new teacher doesn't do that, I quite like to see how things work. Because now when we
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	are told something we just have to accept that it works.
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The dominant transmissionism in teaching.

R	Anything that's been particularly good about Maths this year?
S (9f)	Hmm don't know. I don't, I'd say everything's been good in Maths, like I'm not, we went outside a couple weeks ago we had to do angles and we had to like measure from the bottom of a certain, like we went over to the side and we had to measure from the floor and say what the angle was from the floor to the top of that.
R	I see, was that in Maths?
S	Yeah we all we did it in groups together.
R	Okay so how did you find that?
S	That was mental.

S (7f)	...on 'Fun Friday's' which is today, erm, Miss gets us like sheets where we've got to work out what we've been doing in class like practice on times tables or something else.
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R	So can you think of examples where you use this algebra in real life?
S (8m)	...like...I don't know actually, I think like...you can do it for sharing but I don't know how, if you add three pizzas...no actually I can't think of anything.

The extreme adjective in the first of these quotes expresses the rarity with which mathematics is related to the real world, or meaningfully engages students.

R	In an ideal world as we say, how would you like the lesson to be?
S (11m)	A lot more interactive.
R	Can you tell me an example?
S	Like...in the classrooms they've got that board, like...that...I don't even know what it's called, you know what I mean?
R	The interactive whiteboard, yes.
S	Teachers just sit there and they write on that and then you've got to copy, but it'd be better if like other people could come up and attempt stuff on it if you

	know what I mean.
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Perhaps a new name is needed for interactive whiteboards. The notion of knowledge as transferable object encourages monologue over dialogue.

S (7m)	The other thing I find hard is when you have to get like say minus seven add minus four I don't get it it's like you have to swap them around and like add it up and take it away and it's just a bit...
R	So do you know why you're doing swapping them around and adding them up and taking them away?
S	I kind of know it's like the method but it's just...
R	So you don't mean all the...
S	No.
R	Like the real?
S	Yeah

Although this dialogue can be unclear on first reading, the researcher and student clearly understand each other. The student is expressing the absence of meaning beyond the memorising of procedures in mathematics.

S (10f)	Yeah there's like different methods and things so that could be quite difficult to get used to.
R	So what was the difference between this teacher and before?
S	Um, well for factorising, use that as an example, I know the teacher I had in year seven used a different method than the one I use now.
R	Can you tell me what exactly was different?
S	Well when you have like the two brackets next to each other.
R	Yeah.
S	You like supposed to factorise it out and my teacher now uses eyebrows and smiley face and it's like it looks like that but the one in year seven used a crab claw and it looked like a crab claw.

A useful way to develop systemic connections in mathematics is to compare different methods. Such an approach may be less effective in this case.

S (7f)	I get the ones like halves but I don't get the ones like it says 5/8 or something, the bigger ones.
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5/8 is not much bigger than 4/8. To be fair to the student, bigger refers to the separate elements of the fraction, but more meaning and less procedure in fraction work would lead to expressing this differently.

R	Which is your favourite or best topic in mathematics?
S (8m)	Probably times.
R	And the most difficult one, the least?
S	Divide.

R	Are there any topics you like more than others?
S (8m)	... I don't mind doing brackets.

These last two quotes are indicative of the atomised curricula which result from the processes described in this article. That multiplication and division are seen as so distinct holds little hope for other connections in mathematics. And, multiplying out brackets, a narrow procedural skill, could only be seen as a topic of mathematics in such school curricula, where mathematics loses all meaning. The positive in this quote is the phrase, 'I don't mind doing'. The student doesn't love or like this pointless activity and she manages to keep, and express, a healthy psychological distance from it.

6. A positive ending

The aim of this article was to refocus on the commodity form as the unifying explanatory factor of alienation in education. Various paths were traced from commodities to the classroom: the needs of capital for the availability of adequately developed and sufficiently differentiated labour power; the need for that labour power to accept its differentiation as fair, to view itself as competitive, individual and subordinate; the need for custodial care of the children of workers, the increasing commodification of education itself; and the impact of cultural understandings of the individual, knowledge and learning which emerge in a society dominated by commodity production. Evidence for these influences of commodity production on schooling were then presented through their expression in students' discussions of the experience of mathematics education. Of course, other interpretations of the presented data are possible, but it is hoped

that the body of quotes and their relationship to the theme of alienation are sufficiently convincing. Other stories could also be told from the interview data and other fragments chosen to tell it. The evidential claims for the data lie first in the fact that *this story could* be told, but also in the explanatory power of the theory in relation to the data.

Discussing alienation in education can be depressing so ending on a positive note seems essential. It is argued here that the causes of alienation are societal, and thus that there is no real escape from alienation for individuals, or individual classrooms, while the commodity form continues to dominate. Contra Fraser (2012), it is important to understand that in one sense society can be commodities 'all the way down', in that processes such as education can be commodified, and that generalised commodity production can and does shape every aspect of human life including within the classroom. Fraser is, at the same time, correct however. The contradictions that arise from treating labour, land and money as commodities are particular forms of the more general contradiction fundamental to all commodities, that between object and the human relationships they mask. The contradictions within the commodity labour power (the potential to continually renegotiate the exchange, treating a thinking, feeling human being as an object, the collective and social reality of individuals) are the most important, as these can generate resistance. In the quotes above, alongside the expression of alienation there are also expressions of these contradictions and at times resentment and resistance. This means that there is space within education for the idea and practice of 'teaching as a subversive activity' (Postman & Weingartner, 1971). Introducing elements into education which oppose the dominant practice can lead to students and teachers *feeling* less alienated (something worthwhile in itself), and at the same time this can point towards a more generalised alternative form of education. To sustain that subversive activity requires organised networks of teachers and researchers, wherever they can be formed, whether focussed narrowly on pedagogical questions or extending towards wider social questions and linked to trade unions and social movements. It is in alliance with wider social movements that education has the potential to be reshaped. The evidence for this is in the spread of radical educational ideas and practice that followed the waves of social struggle in the 1960s and 1970s (including some of the literature referenced here). And, in the attempted educational reforms that followed the Russian revolution, the most serious attempt to end the domination of the commodity form seen so far. The brief period before the revolution unwound saw experiments in reuniting education with genuine social and practical activity, homework was prohibited and, for ten years, exams were banned across education (Karp, 2012). Such reforms give a small taste of the potential. Another education is possible.

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