

A study into identity formation:
Troubling stories of adults taming
mathematics

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Abstract

This thesis investigates how adult learners continuously negotiate their relationship with schoolroom mathematics through discourses akin to being ‘more’ or ‘less’ able to ‘do’ and ‘be’ mathematical. It argues that mathematical identities are politically and socially constructed, and that available forms of knowledge inscribe particular mathematical practices on the individual in the classroom. By paying attention to the precarious and contradictory productions of the self, and investigating the allure of undergoing a transformation of the self, I contribute to critical understandings of the psychic costs of re-engaging with learning mathematics as an adult learner.

This analysis is a critical narrative inquiry of stories of adults (not)taming mathematics. As an iterative study into identity formation it puts theory to work in unusual ways. In bringing together internal and external processes (and the intersection of biography, aspiration and discursive practice), I unmask how participants underwent what Mendick (2005) calls “identity work”. Working with a Lacanian psychoanalytical through a Foucauldian tradition, I navigate the construction of selfhood during processes of reinvention as (non)mathematical subjects, experiencing ‘success’(and alienation) through models of collaborative learning, in the contemporary mathematical classroom.

The study examines the lived experiences of 11 adult learners using a range of qualitative methods. I actively seek the complexities within various types of provision (including adult education, further education, work-based learning, and community outreach programs) and the multiple forms of knowledge available (or not) through authoritarian discourses of education.

Engaging a mobile epistemology, this thesis connects subject positions, techniques of power, psychic costs of reinventing the self, and how the processes of visceral embodiment of mathematics affects learning in the classroom. It argues that mathematical identities are discursively constructed, and the relationship between selfhood and ‘being’ and ‘doing’ mathematical-ness is told as much through narratives characterised by affection as by fear. Rather than provide answers or ‘best practice’

for the collaborative classroom, I conclude with an explanation of why I question common sense assumptions, such as that adult learners want to be placed in a hierarchical positions and judged as independent mathematical thinkers in class, and the practical implications for this in the classroom.

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Glossary of terms

Adult Basic Skills	Generic term used to describe basic mathematics and English for adults.
Adult Numeracy	Numeracy curriculum designed for adults mapped against primary and secondary schooling outcomes.
Community learning	Community learning includes a range of community-based and outreach learning programmes. These are primarily funded by local authorities and further education colleges. They typically offer entry-level qualifications.
Discrete mathematics	A mode of studying mathematics where mathematics is the only qualification output.
Embedded mathematics	A mode of study where learning mathematics is one element of a wider, usually vocationally-based qualification.
Functional mathematics	Functional mathematics is a set of standards with the criteria guided by standards for assessment.
Skills for Life	The skills-set defined by the curricula for Adult Numeracy, Adult Literacy and English for Speakers of Other Languages.
Work-based Learning	Work-based learning comes in many forms and includes internships, mentoring, and apprenticeships. The costs are typically met by the employer and the programme specific to the needs of the employment. The classes typically take place in the workplace.

List of acronyms

AE	Adult Education
ALLN	Adult Literacy, Language and Numeracy
CPD	Continual Professional Development
DBIS	Department for Business Innovation and Skills
DfES	Department for Education and Skills
DIUS	Department for Innovation, Universities and Skills
ESOL	English as a Second or Other Language
FE College	Further Education College
GCSE	Examinations typically taken at the age of 16
IFL	Institute for Learning (now defunct)
M4L	Maths for Life
NCETM	National Centre for Excellence in the Teaching of Mathematics
NIACE	National Institute of Adult Continuing Education
NRDC	National Research and Development Centre
QCA	Qualifications and Curriculum Authority
SFA	Skills Funding Agency
SfL	Skills for Life
TLRP	Teaching and Learning Research Programme
TTM	Thinking Through Mathematics
UCU	University and College Union

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Introduction

Thesis outline

This thesis is divided into ten chapters. The introduction sets out my positioning as an insider to the field, the aims of the research and a chapter-by-chapter outline of the thesis. Through setting a context of the field of study, Chapter One maps the policy context, discursive constructions of collaborative learning, and explains the mathematical spaces on offer within the sector. Through a review of relevant literature, Chapter Two draws particular attention to the studies that have informed and shaped this research. Chapter Three engages with discussions of putting multiple theoretical perspectives to work, but also provides a critical account of Bourdieu (habitus, capitals and field), Foucault (technologies of power and subject positioning) and Lacan (the mirror stage, fantasy/desire and lacking, and the imaginary, symbolic and real domains) to map the analytical tools, which I have used to illustrate how mathematical relationships are fraught with emotion, tension, silences and antagonism.

Chapter Four is separated into six parts. In the first I situate myself as a researcher. I pay attention to the ways in which my identity fragmented, as I removed the markers of professionalism that I was once privileged to as a teacher. Section two offers a largely descriptive account of the research design and process. In the meantime, parts three, four and five provide a reflective account of the ethical decisions that I wrestled with, and in-depth debate of the data collection and analytical methodological considerations that have informed the findings of this study. Part six returns to a largely descriptive account of how I ‘tamed’ and organised the unruly life history interviews and lesson observations into manageable chunks for analysis through Chapters Six to Nine.

Chapter Five involves a critical deconstruction of government policy discourses to illuminate the history of the present construction of mathematics, numeracy (and the numerate citizen), and the production of ‘employable’ subjects. Through problematising official policy texts, I expose the ways in which the adult ‘numeracy’ learner has been constructed, and to what effect. Chapters Six, Seven, Eight and Nine

draw directly from the primary data gathered. Chapter Six ‘stories’ four ‘larger than life’ participants to establish (and maintain) a sense of the human that lies behind identity work. I put the theories to work, to deconstruct the conditions that have created the possibilities of truths about (not)learning, as understood by each of these four individuals. Having reached conclusions of the structural account, I then add to the discussion by interrogating the effects of positioning and identity work within the classroom.

Chapter Seven is concerned with the ways in which the learner participants wrestled with different social constructions of ‘being’ mathematical; notably through attention to the political and social locatedness of the subjectivities on offer to them as adult learners, particularly within discourses of collaborative learning. Chapter Eight takes the discursive construction of ‘best practice’, professionalism and standards as its focus. I look to the primary sample of teachers to explore their various productions of the self and of performative discourses of ‘best practice’. I achieve this by drawing upon the ways in which they reject, negotiate and reconcile ideal constructions of the ethical teacher through the (mis)alignment of historical and contemporary encounters of education and mathematics.

Chapter Nine considers the participants’ locations within, and their contributions to, a complex and contradictory discursive landscape of ‘being mathematical’. By attending to gendered, classed and raced constructions of mathematics I reveal, how on being confronted with ‘success’, the adult learner looks to stereotypes to reconcile their sense of selfhood as they undergo transformation into (non)mathematical subjects. In particular I unmasked how, through techniques of splitting mathematics into do-able and un-do-able forms, the participants recount stories of ‘taming’ the body of knowledge and/or the gremlins lurking within. Finally, Chapter Ten offers a brief synthesis of the main thrust of my argument, an overview of the main findings and a consideration of the implications of this study for future research and professional practice.

Positioning myself as an insider to the field

Until 2010 I had, for fifteen years, been a teacher (and latterly a teacher trainer) of mathematics for adults returning to the classroom to learn numeracy. I have chosen to study the field of identity/discursive formation, because I realise that during this time I had almost exclusively focused my pedagogic gaze on ways to develop mathematical thinking. I had neglected the complexities of social positioning, and particularly the social construction of what it means to be mathematical. I had not recognised the importance of theorising the inherent instability and disunity within the site of the ‘self’, the effects of power and/or the compulsion to continuously undergo identity work; particularly as learners are confronted by new (and often unrecognisable) configurations of ‘success’ in the mathematical classroom.

During the six years that it has taken to complete this study there have been three different governments, each of which have reworked the ways in which the learning of mathematics is organised within the sector. In undertaking this thesis, I have interrogated the peculiarities of the production of ‘doing’ mathematics, of ‘being’ numerate and of the ‘responsible’ citizen, in particular in relation to the policy discourses that were pertinent at the time that the data was collected (December 2010 – April 2011). However, in revealing the history of the present, and the complexities behind the compulsion to undergo identity work, I have unmasked how the subjectivities of the adult learner (once judged as not having the ability to ‘do’ mathematical thinking, now positioned as agentic ‘mathematical’ creators in the classroom) are inherent within, and through, the disruptions of the policy cycles and the changes to the curricula.

I achieve this by interrogating narratives of learner participants, as they recall stories of how they have come to ‘tame’ (or bypass) the unruly mathematics that they once encountered. In doing so, I reveal the ways in which these participants have challenged, resisted, and/or taken up public discourses that construct the sector. I have taken particular interest in aspects of mathematical knowledge that have been valorised and/or devalued, within and through these empirical collections of (not) learning mathematics.

The aims of this research are:

- to consider how public discourses position adult learners returning to the classroom, to learn numeracy, functional skills mathematics, and/or GCSE mathematics;
- to examine the compulsion to undergo identity work as the learners negotiate their mathematical practices through the classed, gendered and 'raced' trajectories of their identities;
- to interrogate gendered narratives of the constructions of 'doing' mathematics and 'being' mathematical;
- to unmask how learners use the technique of 'splitting' mathematics, as they draw on discourses to position themselves as more or less 'able' to do mathematics.

Chapter 1: Introducing the field of study

This chapter is formed of three parts. In section one I provide an overview of the sector, and in the second section I outline the historical, political and economic contexts for policy, with particular attention paid to the Skills for Life (SfL) Strategy that was pertinent at the time the data were collected. In section three I briefly consider the discourses of ‘choice’ for adults returning to the sector to learn mathematics, before outlining the pedagogic assumptions that have constructed spaces for learning mathematics.

1.1 The Further Education sector

Hillier (2015) describes Further Education (FE) as comprising the voluntary, public and private sectors, funded through agencies, governments, employers and individuals and catering for approximately six million students. The FE sector primarily offers vocational training at foundation and intermediate¹ levels, to learners over the age of 16, although the provision caters for students from the age of 14 as an alternative to the traditional models of schooling. The FE sector also caters for individuals who are highly technically skilled, and who study academic courses at undergraduate and postgraduate levels². This, according to Crawley (2013), makes the FE sector one of the most complex and difficult areas of the educational landscape to define.

Huddleston and Unwin (2013), offer a description of the FE sector as constructed from a richness, diversity, and range of qualifications that is unlike any other, producing a population heterogeneity that is simply different to schools and universities. Ursula Howard (2009), of the National Institute of Adult Continuing Education (NIACE), suggests that FE is most accurately reflected through an understanding of the diversity of the material, social, affective, and cognitive characteristics of those individuals returning to the classroom as adult learners. In

¹ An intermediate qualification is considered to be equivalent to the threshold qualifications taken at the age of 16 by the majority of the population in England.

² Refer to Appendix 1 for a visual explanation of the national qualification framework calibrated against the qualifications offered through the compulsory and the Higher Education sectors.

trying to frame this diversity, Howard (2009: 4) has compiled a “fact sheet”, to which I have added the final two points.

- In 2006, 67% of those in receipt of Education Maintenance Allowances were studying in the sector.
- In 1996, 80% of the adult learners studying within the sector were over 19 years old. By 2007, the figure had dropped to 62% of the learner population (NIACE, 2012).

In 2009:

- 90% of all adult language, literacy and numeracy (ALLN) courses that were offered in the UK were delivered within the sector.
- The sector provided 48% of entrants to Higher Education.
- 59% of all HNDs and 86% of HNCs that were undertaken by learners in England were delivered in the sector.
- Over 80% of all ESOL learners were studying English in the sector.
- 18% of learners were from ethnic minorities, compared to 11% of the general population.
- However, with the increase in apprenticeships available to adults, the proportion by 2013 had increased to 76% of the student population (SFA, 2014).
- In 2013, the Further Education sector catered for over 6 million students and employed over 1.3 million members of staff (Crawley, 2013).

By far the largest provision (and therefore the one that tends to dominate policy discussions) is the Further Education (FE) College (Foster, 2005), followed by Adult Education (AE) and the prisons system, although since 2006 there has been an increasing number of private training institutes (NIACE, 2012). Training institutes fall within the sector, but tend to be privately owned and hold the specific instruction to meet the employment-based learning needs of young adults in transition from compulsory schooling to employment (NIACE, 2012). Alongside, but funded through separate channels, are the smaller ‘non-formal’ community-based provisions that tend

towards non-qualification learning outcomes. Such courses include family learning, community outreach, Trade Union, as well as other work-based learning programmes (Colley, Hodkinson & Malcolm, 2002). The implication of the experiences of learning mathematics through one form of provision, as opposed to another, is central to the discussion threads and the findings of this thesis.

1.2 An historical overview of the sector

1.2.1 Volunteerism and philanthropy

Adult Education as a concept emerged prior to the establishment of a state-funded educational system. Rooted primarily through the social critique that arose within and through the turmoil of the industrial revolution (Hillier, 2006), the primary providers were the Mechanics Institutes (MI) who drew from the Enlightenment philosophies to inform the shape of provision. In a bid to wrestle power away from religious institutions, MIs looked to the rationality of the sciences to secularise education and to establish a body of “really useful knowledge” (Johnson, 1993: 17) to be learnt through “an atmosphere of open enquiry” (Benn, 1997: 67). But as can be seen from the quote below, in taking a classical liberal approach, the protagonists intended to separate adults perceived to be capable of engaging with esoteric forms of knowledge from the wider population, who were offered technical forms of instruction:

It is incumbent upon us to take care that our managers, our foremen, and our workmen, should, in the degree compatible with their circumstances, combine theoretical instruction with their acknowledged practical skill (Samuelson *et al.*, 1884: 508).

Born of these classed trajectories, Working Men’s Associations (WMA) began to emerge offering an alternative curriculum comprised of “general literacy through cultural, and political education” (Hyland & Merrill, 2003: 6). Watson and Maddison (1908) suggests that the architects of the late nineteenth century adult education provision discursively constructed education as a liberatory tool for social change, and through a comparison of the quotes below, can be seen as remaining surprisingly similar to the contemporary (albeit diminishing) discourses of the community outreach settings.

Thomas Burt, first Labour MP, 1870:

We say educate a man, not simply because he has got political power, and simply to make them a good workman; but educate him because he is a man (quoted in Watson & Maddison, 1908: 104).

University and College Union (UCU) Congress 2012:

Congress believes education is a right not a privilege, and all members of society should be able to access appropriate programmes (Congress, 2012: 6).

1.2.2 Emergence of a national policy

At the first Great Exhibition of 1851, held in London, British exhibits won most of the prizes. But in 1867, when Napoleon hosted the second International Exposition in Paris, the British exhibits failed to make an impression, and were simply reported in the national press as a “poor showing” (Hillier, 2006: 21). In the political aftermath of this embarrassment, the British government established a select committee and two royal commissions to inquire into the state of technical instruction in the UK. As a result, the City and Guilds of London Institute was formed in 1877, instructed to devise accreditation for vocational training (Leathwood & Francis, 2006). The *Technical Instruction Act 1889* brought, according to Hillier (2006), new powers for boroughs to “devote a penny per person” (Hillier, 2006: 22), from rates raised from a tax on alcohol spirits, “... to technical and manual instruction” (Hillier, 2006: 22). Although adult educational opportunities tended to remain in the form of training, and principally the responsibility of employers (Field, 1996), a range of technical colleges began to emerge (Hurt, 1971).

Hillier (2006) cites this Act as an historic marker for the sector, because the particular nature of this funding stream (principally raised from taxes on the buying and selling of whisky) changed public discourses on the purpose of the sector. Where the philanthropic and voluntaristic movements had once held discussions over the ethics of poverty, the *Technical Instruction Act* justified political involvement in adult education through discursively constructing the effects of the underperforming British economy, paralysed by a skills shortage (Hyland and Merrill, 2003), and the “... terrors of foreign competition” (Wolf, 2009: 58). Although the distaste for practical instruction is not as apparent as in *The Taunton Report* (Schools Inquiry Commission, 1868/ London: HMSO), in relation to the teaching of mathematics, the shape - and the subjectivities on offer - continue to be bound within this complex taxonomy, which in

the contemporary setting still separates the academic adult from the technical adult, who is separated again from the non-academic adult (Pring *et al.*, 2012).

The *Education Act 1902* laid the foundations for a locally co-ordinated, national system and provided the framework for policy construction until the *Education Act 1988* (Hyland & Merrill, 2003). In what Ball (1990) refers to as the post-war consensus, the *Education Act 1944* reasserted the responsibility of local authorities to secure a provision with a focus on apprenticeships (Field, 1996). Benn (1997) and Schuller and Watson (2009) each point to the establishment of Local Education Authorities, and the normalisation of day-release learning programmes, as an historical pointer for when the concept of ‘educational opportunities for all’ began to emerge as an imaginable ‘right’ within the psyche of the nation.

The Crowther Report (1959) brought about a new era for vocational training, citing FE as the “next battleground for English education” (Crowther, 1959/ London: HMSO: chapter 30). Crucial to this thesis, the concept of numeracy was discursively constructed as a social and political means to address inequality, at the point at which schoolboys made the transition between school and employment (Hillier, 2006). However, whilst the *Industrial Training Act 1964* brought about a new political ascendency for FE, the shape of mathematics education was primarily informed by the discursive link that justified the cost of FE through a promise of economic growth and social stability. The (lack of) impact of Crowther’s numeracy (as an alternative curriculum space) will be explored in Chapter five, but the epistemological consistencies between the mathematics on offer in the 1870s, and Crowther (1959) and the introduction of functional skills (QCA, 2007) are interesting to note, and can be seen from the following quotes:

The Devonshire Report on the Advancement of Science, 1874:

... but the true teaching of Science consists, not merely in parting facts ... but in habituating the pupil to observe for himself, to reason for himself on what he observes, and to check the conclusions at which he arrives (Devonshire Association, 1874: 12).

The Crowther Report into changing nature of social and industrial needs, 1959:

On the one hand is an understanding of the scientific approach to the study of phenomena – observation, hypothesis, experiment, verification. On the other

hand is a need in the modern world to think quantitatively, to realise how far our problems are problems of degree, even when they appear as problems of kind (Crowther, 1959/ London: HMSO: para. 401).

Qualifications and Curriculum Authority (QCA) definition of functional skills, 2007:

Functional mathematics requires learners to use mathematics in ways that make them effective and involved as citizens, operate confidently and to convey their ideas and opinions clearly in a wide range of contexts (QCA, 2007: 1)

1.2.3 A recent history of the FE sector

By tying technical education, work-based training and adult provision together through one single funding stream (Jarvis, 2005), the *Education Reform Act 1988* reasserted the purpose of Further Education. The classical liberal roots of the ethics, morality and the transformative opportunities brought about by education, turned to neo-liberal and performative discourses of individualisation, economic competitiveness, governing bodies, financial accountability and managerial control (Ball, 1990):

There shall be established a body ... shall consist of fifteen members ... Not less than six and not more than nine of the members shall be persons appearing to the Secretary of State ... to have experience of the provision of higher education... and in appointing the remaining members to have experience of, and to have shown capacity in, industrial, commercial or financial matters or the practice of any profession (Education Reform Act, 1988: 135).

By the early 1990s the FE sector was an “industrial relations battlefield” (Shain & Gleeson, 1999), but it was the *Further and Higher Education Act* (1992), which irreversibly transformed provision (Coffield, 2007). In the immediate aftermath of the Act institutions were thrust into a new marketplace where “any college could sell any learning opportunity to anybody” (Hillier, 2006: 28). Overnight colleges became independent corporations where the principals, suddenly in charge of multi-million pound corporations, assumed the responsibilities of a CEO (Smith, 2007). Where the Local Educational Authority had once overseen the organisation of provision, it became the role of non-elected governing bodies to oversee change at a local level (Gleeson & Shain, 1999), with the Further Education Funding Council (FEFC), created in 1993, to implement the new funding mechanisms and to ‘claw back’ from provisions perceived to be failing to professionalise the workforce (Hamilton & Hillier, 2007):

In exercising those functions a council (Further Education Funding Council) ... shall have regard (so far as they think it appropriate to do so in the light of any other relevant considerations) to the desirability of maintaining what appears to them to be an appropriate balance in the support given by them as between institutions of a denominational character and other institutions (DES, 1992: 5).

The effects of the Act were profound, with key actors simply referring to working conditions as pre- or post-incorporation (Burchill, 1998). From 1997, the New Labour government reworked aspects of the post-incorporation reform agenda, but the discursive configuration remained built around professionalism, managerial accountability, and expanding the skills-base of the adult population. In 1999, Sir Claus Moser undertook a review of literacy and numeracy provision to make recommendations which, through programmes assumed to promote integration into the labour market and more broadly into civil society, would 'encourage' the greatest number of 'disadvantaged' adults to return to the classroom. In his report, Moser estimated that about 20 per cent of the adult population, almost seven million people, "suffered" (Moser, 1999: 1) from the effects of literacy skills below those expected of an 11 year old, with the figure for numeracy as high as around 40 per cent (Moser, 1999). It was through an uneasy alliance between the twin pillars of social inclusion and economic competitiveness (Schuller & Watson, 2009) that Moser constructed a policy landscape for what he termed Adult Literacy, Language and Numeracy (ALLN) provision:

Roughly 20 per cent of adults - that is perhaps as many as seven million people - have more or less severe problems with basic skills, in particular with what is generally called 'functional literacy' and 'functional Numeracy'... Poor skills are not only damaging to an individual's chances of progression in their work, but also have an impact on performance at work with a cost to the employer. It is estimated that poor literacy and numeracy skills costs UK industry £4.8 billion each year in inefficiencies and lost orders (Moser, 1999: 20).

Moser's recommendations (detailed in Chapter five, but for the purpose of this context included new curricula, examinations and a teacher training framework) were taken up wholesale by the New Labour government and, in 2001, the Skills for Life (SfL) Strategy (DfEE, 2001) was launched. An extensive media campaign, 'Get On', reached public consciousness by highlighting the personal and national 'cost' of poor basic skills (Barton, 2007). The injuries caused will be discussed in more detail from Chapter five, but Raffo and Gunter (2008) comment that although the 2003 review of

the SfL strategy acknowledged that the ALLN targets had been surpassed, the reform agenda began to rapidly unfold through a market-led attention to human capital theory:

Inspection found that colleges and schools with sixth forms in particular had failed to respond to the requirements of the new 16 to 19 study programmes quickly enough. ... English and mathematics teaching and learning are still not good enough ... FE and skills providers were not adapting their provision well enough to enhance learners' chances of future sustained employment (Ofsted, 2014: 4).

As the SfL strategy travelled through the numerous sites of delivery, Moser's concerns for the twin pillars of inclusion and competitiveness began to lose sight of concerns for the effects of structural inequality (Schuller and Watson, 2009). In 2005, the Foster Review implemented new administrative technologies to refocus delivery around one key policy area; fostering skills in the workplace. This was immediately followed by *The Leitch Report* (2006), which with a focus on targets reinforced the link between LLN skills and employment and the ability for all adults to usefully participate in, and contribute to, the prosperity of the country. The findings of the two reports were combined by the 2006 white paper *Further Education: Raising Skills, Improving Life Chances* (DfES, 2006). Wolf *et al.* (2010) deconstruct how, from this point, policy production shifted from an understanding of 'achievement' based on the ability to attain benchmarked levels of qualification, to the 'ability' of the institution to foster a culture of business excellence amongst the workforce. Despite the policy claim that a "strong focus on economic impact does not have to come at the expense of social inclusion and equality of opportunity" (DfES, 2006: 29), by privileging skills acquisition, policy discourse changed from the opportunities of "fostering of an enquiring mind and the love of learning" in *The Learning Age: A renaissance for a new Britain* (DfEE, 1998) to the sector being condemned as lacking; "not achieving its full potential as the powerhouse of a high skills economy" (DfES, 2006, foreword).

The Conservative-led coalition government, elected in May 2010, continued to reflect Labour's focus on ALLN, and in publishing their White Paper, *Skills for Sustainable Growth*, maintained the discursive construction of the ALLN learner through emphasis on employability, social mobility, citizenry and economic competitiveness:

Skills have the potential to transform lives by transforming life chances and driving social mobility. Having higher skills also enables people to play a fuller part in society, making it more cohesive, more environmentally friendly, more tolerant and more engaged (DBIS, 2010: 5).

Since *The Foster Report* (2005) and *The Leitch Review* (2006), policy rhetoric has lost the structural concerns that were characteristics of Moser (1999), and with the 2011 report from DBIS (Review of Informal Adult and Community Learning) the technologies of power have continued to shift towards a model of risk-taking ‘entrepreneurial’ education, prioritising young adults who lack English and maths skills, and those adults not in employment, and re-establish the terms ‘English’ and ‘maths’ for adults:

Our (BIS) priorities are to ... Take strong action to drive up standards and quality, including withdrawing funding from providers that do not meet the high standards that learners and employers demand and ensuring that providers support apprentices to achieve Level 2 in English and Maths (DBIS, 2011: 9).

However, the funding streams that had been established in 2001 (and sustained by the Learning Skills Council (LSC)) were split between 14-19 provision and post-19. The newly constructed Young People’s Learning Agency (YPLA) attracted most of the budget, although the Skills Funding Agency (SFA) maintained the remit for apprenticeships. The allocation of funds for apprenticeships favoured 16-19 provision, funding for post-19 provision was ring-fenced, although enforced through an ever-tightening link with employability and citizenry (Hodgson, Spours & Waring, 2011). The technologies of the funding administrations once reworked by *Further Education: Raising Skills, Improving Life Chances* (DfES, 2006) as employer-led, were transformed by *New Challenges, New Chances* (DBIS, 2011: 5) into a requirement for colleges to collaborate with, and meet the specific demands of, local authority and employer forums. At the time of writing, the Skills funding letter of 2015 (DBIS, 2015) reflects the responsibility of funding as shared between the employer, the sector and, through the introduction of loans, the individual.

1.3 The mathematical spaces created by policy discourse

In the UK, learning mathematics is compulsory until the age of 16. For learners who achieve the threshold qualification (GCSE / level 2 mathematics), the individual is

then generally presented with the ‘choice’ as to whether to continue with learning mathematics. If, at age 16, the individual is unsuccessful in achieving this threshold qualification, or increasingly if they opt for a vocational pathway, they are then compelled to continue studying mathematics. At the time that I was framing the PhD research questions (October 2009), the spaces occupied by mathematics were organised through the Skills for Life strategy (DfEE, 2001), but the sector stood accused of failing to reorganise provision to meet the needs of employers (DfES, 2006). At the time that I collected the empirical data (December 2010 – April 2011), *The Wolf Report* (2011) had criticised the SfL strategy, dismissing functional skills as “conceptually incoherent” (Wolf, 2011: 172). GCSE was centre stage in the report, which stated it was the only widely valued mathematics qualification and the recommendation was that all adults engaged in post-16 education should repeat this qualification, rather than engage with the alternative options such as functional skills (Wolf, 2011).

Consequently, at the time of the field work (2011), key actors were acclimatising to the policy shifts set out by the Conservative-led coalition. At this time, provision remained consistent with SfL, and *New Challenges, New Chances* (DBIS, 2011) continued the focus on the supply of employable subjects by offering Moser’s numeracy and functional skills, with the occasional option of studying GCSE mathematics. Since May 2015, and the installation of the Conservative government, whilst the epistemological balance has been reworked in favour of the ‘rigorous’ content of GCSE mathematics, ‘useful’ knowledge remains constructed around discourses of fluency, reasoning and problem solving (ETF, 2015). In addition, the policy shift towards the delivery of ‘new’ mathematics GCSE qualifications (DBIS, 2014: 9) remains an aspiration³, with the majority of providers offering the functional skills over GCSE mathematics (ETF, 2015).

In relation to adults’ motivations to return to the classroom, it is too complex to assume homogeneity of ‘choice’. For example, according to NIACE (2011), many adult learners are compelled to return to the classroom by employers, workplace

³ In August 2015, raw figures from 2013 suggested that 110,811 learners took a GCSE mathematics exam in the FE sector (Porter, 2015), whereas just over one million learners took functional skills mathematics exams at this time (ETF, 2015)

training schemes, and on the advice of professionals such as General Practitioners, etc. In this way, ‘choice’ does exist, but the conditions are inscribed through the routes by which the individual finds themselves returning to education. It is these subjectivities that are central to the findings of this thesis, and it is for this reason that I include the use of ‘choice’ but do so with extreme caution. To return to the mathematical spaces on offer at the time of the fieldwork, the most prominent space of ‘choice’ fell between the option of studying mathematics as a discrete course (where mathematics is the only course of study), or as part of a wider vocational programme, where the mathematical element is embedded within the qualification.

On entering a mathematical programme, the level of the examination is determined by the results of an initial assessment (Hodgson *et al.*, 2011). A discrete course (where the learning of mathematics is the only learning outcome) is usually organised around mathematical content of the curriculum, with classes typically lasting two to three hours. Where mathematics is delivered as part of a wider vocational learning programme, classes tend to be about an hour in length, with the mathematical content geared towards the relevance of the particular vocation of the student group (Hodgson *et al.*, 2011). In this instance, the level of the mathematical qualification is determined by the wider level of the vocational course (Wolf, 2011). For example, where a learner is studying on a level 2 vocational course, she is expected to achieve a level 2 qualification in English, and at least a level 1 qualification in mathematics. A learner on a level 1 qualification, is expected to achieve a level 1 qualification in English, and at least an upper entry level qualification in mathematics (Wolf, 2011).

At the time of the field work (December 2010 – May 2011), there were four forms on offer within the sector; adult numeracy (ALLN); functional skills mathematics; GCSE mathematics and non-accredited mathematics. It is the nuances, the (dis)continuities and tensions brought about by the experiences of learning through one curriculum, as opposed to another, that are central to the discussion threads of this thesis. For the purpose of this brief context, the teaching and learning practices of the GCSE mathematics classroom tend towards a traditional focus on learning mathematical rules and procedures (Ernest, 1998). In contrast, the alternative spaces on offer through SfL have been reorganised (detailed in Chapter five) around a new curriculum

to emphasise the processes of 'agentic' mathematical thinking, rather than the traditional reliance on the algorithmic product.

The gap between the adult learners' memory of classroom mathematics and the experience of mathematics in the contemporary problem-solving classroom will be detailed from Chapter six. But in terms of this context, Bernstein's (1971, 1999) analysis of pedagogic practice can provide a theoretical understanding to support the upcoming conversations. Bernstein (1999) initially makes a distinction between vertical and horizontal discourses of knowledge. Vertical discourses consist of coherent, explicit, and systematically principled knowledge (Fitzsimons, 2002), and within this traditional pedagogic model the epistemic focus tends to centre on abstract 'why' principles (Coben, 2000). In contrast, horizontal discourses are comprised of segmented localised knowledge, which focus on practical questions that concern the 'how' of mathematical reasoning (Coben, 2000). Within this model, mathematical spaces tend to be pedagogically articulated to the adult learner, through drawing from existing funds of knowledge (Street, Baker & Tomlin, 2008). Pedagogies that bring about horizontal discourses tend to involve the affective domain, demand a repertoire of strategies from the learner, with an epistemic enquiry that tends to be directed towards individually planned for, relevant, contextualised, and time-bound goals (Fitzsimons, 2002).

Bernstein (1999) then uses the conceptual tools of classification and framing to theorise the effects of the primary technologies of power (mathematical language and codes) on the structuring processes of learning in the classroom (Fitzsimons, 2002). With its own unique identity and specialised language, mathematics is often cited as a discourse that is both strongly classified and framed. Strongly classified because there is a clear linear system for acquiring knowledge, and strongly framed because only a small proportion of the population are awarded the opportunity to progress to higher levels of mathematics and, of those, only a privileged few achieve the status of mathematician (Walkerdine, 1998). The strong classification and framing of traditional classroom mathematics (for example GCSE) demands learners use specialised symbolic structures (and codes), to expand their mathematical thinking. Learning is often informed by the learners' ability and willingness to follow prescribed routes of

enquiry. This pedagogic approach demands the teacher to be visible, situating the learner as a passive recipient of an external body of mathematical rules and procedures (Fitzsimons, 2002). The teaching, learning and assessment practices of the GCSE mathematics classroom tends towards this more traditional focus on mastering mathematical rules and prescribed procedures (Ernest, 1998).

In polar contrast, the mathematics on offer through SfL is both flexibly framed and classified (Coben, 2000). SfL mathematics is positioned as a problem-solving tool that is constructed by the individual, and which is communicable through language and symbols malleable enough to embrace everyday situations (Wolf, 2011). Within this model, learners are required to take control of their own mathematics and to make sense of their own mathematical world. Teachers become less visible and more instructional (Fitzsimons, 2002). General mathematical principles tend to become contextualised into localised settings, in ways that require the learning community to construct their own mathematics for a particular purpose (Coben, 2000). With ALLN Numeracy (DfES, 2001) and Functional Skills mathematics (QCA, 2007), SfL shifted the assessment criterion towards an inspection of the mathematical procedure, with the justification of the choice of strategy privileged over the algorithmic product.

According to authors (Baxter *et al.*, 2006; Coben, 2006; Swain & Swan, 2007; Swain *et al.*, 2005) writing within the constructivist paradigm, the advantage is that learning through horizontal discourses tends to invite intuitive meaning for the individual. The learner is assumed to hold a greater degree of agency over the direction and purpose of their learning. In ways similar to traditional models, learning remains organised around building the ‘basic blocks’, in that the approach maintains the assumption that the adult learner should be able to master adding digits before they can multiply. They must measure with a ruler, before they can construct a graph etc. However, in a departure from traditional pedagogic models, the adult learner is required to engage with peer to peer co-construction of mathematical knowledge. This demands the learner values what Usher (2002) refers to as the soft skills of the knowledge economy; namely team work, problem solving and leadership. The consequences for learning mathematics through this perspective can be dramatic. Learners are expected to undergo transformation; to learn to value their own and their peers’ constructions of

mathematics; to articulate their own ideas; to explain their mathematical schemata and to take on particular subject positions, not only in relation to the forms of mathematical knowledge, but also to the shape of delivery and as subjects of employment.

1.4 Summary

The intention of this opening chapter has not been to trouble the assumptions behind the ways in which adult learners are being asked to learn mathematics (such discussions will take place from Chapter five), instead the aim has been to provide a context to frame the arguments put forward in this thesis. This study is principally concerned with interrogating narratives to reach alternative understandings of what encounters of mathematics, and indeed mathematical spaces, look and feel like from the perspective of adults returning to the classroom to learn mathematics in the FE sector. In this thesis I explore the ways in which resistance is performed, and to discuss whether it is possible to confront uncompromising discourses and continue to learn within the sector. In the next chapter, I map the existing body of knowledge (regarding the sector) and in a critical response; I look to the academic theories and discussions that have informed how I have gone about interrogating the data. I conclude with a critical analysis that puts forward the arguments for using a broadly post-structuralist approach in analysing the empirical data.

Chapter 2: The literature review

This chapter maps an existing body of knowledge, starting with an overview of the research that is specific to adults learning mathematics within the FE sector. In the second section, I map the academic debates that have informed my interrogation of the narratives of this sample of learner participants (and to an extent their teachers) to reveal how they have come to negotiate, rework and reconfigure their (non)mathematical identities in and between the subjectivities on offer through the dominant discourses of the sector. Then in critical response, I outline my arguments for the rejection of the Humanist model of the unitary individual, and justify a move towards a broadly post-structuralist analysis of the empirical data.

2.1 Situating this PhD within the existing body of research

The SfL Strategy encouraged teacher participation in research, and between 2004 and 2007 the Department for Innovation, Universities and Skills (DIUS) and the National Research and Development Centre (NRDC) established a large-scale research consortium Maths4Life (M4L), “to develop non-specialist mathematics teaching and learning for everyday life and work” (Hudson, Colley, Griffiths & McClure, 2006: 5). M4L commissioned 90 research projects, the most significant of which was *Thinking Through Mathematics* (TTM). Although the opportunities to conduct research during this time were extensive, the funding streams were tied to the interests of the primary funding agents, the Department for Education and Skills (DfES) and the Department for Innovation, Universities and Skills (DIUS). A glance through the titles of the funded research (NRDC, 2013) during this period shows that in line with the findings made by Coben *et al.* (2003), almost two thirds employed a design-based research methodology, which more often than not culminated in pedagogic guides and practitioner tool kits.

The pedagogic guides and tool kits from the research commissioned by Maths4life, and to a lesser extent the Teaching and Learning Research Programme (TLRP), fundamentally changed the landscape for teaching in the sector. The findings of TTM in particular informed the criteria that construct the common inspection framework

(NCETM, 2008, 2011). As such, the teacher participants have, to varying degrees, attended the professional development events brought about by the findings, and whilst I intend to critically analyse the discourses of best practice, professionalism and standards, I feel it important to initially outline the influential research from which the discussions of collaborative learning and numeracy have occurred.

2.2 Constructivist conversations of power and social justice

In 2006, the Maths4Life consortium commissioned an extensive research project *Thinking Through Mathematics* (TTM), which informed the Maths4Life policy discussion paper, which in turn reworked the criterion of best practice for the common inspection framework (NCETM, 2008, 2011). On completion of TTM, the professional development aids and learning materials were rolled out, made freely accessible to all practitioners working within the field. TTM was a design-based research project, framed by the unproblematised assumption that the individual adult learner can (and should) be taught how to construct, organise and articulate their own mathematical knowledge. The research captured data from ‘attitudinal’ surveys and from observations of classroom and CPD events to capture ‘typical’ teaching and learning behaviours within the classroom. Particular attention was paid to occurrences of practices “that resist change” (Swain & Swan, 2007: 7). In the findings, learner resistance was understood in terms of ‘normal’ reactions to change, and analysed in terms of persistent behavioural patterns in need of reform:

Some learners come to classes with clear expectations of the teacher, the mathematics, and the ways in which they would be expected to learn. Some found it harder, and took longer than others, to adapt to working in new ways (Swan & Swain, 2010: 170).

Although the stated desires to “challenge the status quo” (Swain & Swan, 2007: 7) and to “enhance the quality of learning” (p. 14) placed the notion of social justice at the heart of this project, TTM aimed to provide a tool kit for teaching with findings expressed in terms of clear outputs that indicated ‘correct’ learning procedures. In opting to express the findings in terms of a recipe for ‘best practice’, the findings demand that the ‘expert’ learner should be facilitated by the teacher, and be shown how to organise, value and articulate their own mathematical constructions. The authors were untroubled to articulate learning as a cognitive process that is

complicated, and disrupted, by the chaos of the affective domain. TTM, in seeking to establish an account of ‘normal’ (whether of learner behaviour, best practice or professionalism) sustained the hegemonic illusion that there are pedagogic ‘truths’ that make learning accessible to all. As a practitioner and teacher trainer, I acknowledge that I benefited from the practical suggestions offered to me for the classroom; but simultaneously the authors, in failing to allocate the analytical spaces to interrogate the forms of resistance, sustained the status quo. Discourses of best practice, standards and professionalism have become the means by which to render a teacher or a learner ineffective because of their ‘old ways of thinking’. Simultaneously, the requirement to change is organised and monitored through new regimes of standards, which essentialise modes of learning as effective or ineffective, often positioning the individual as obstructive or resistant to change. I argue that it is vital to uncover some of the trajectories of the subjective ways in which individuals are required to be a ‘successful’ learner (or teacher).

The intention of this thesis is to provide a different theoretical account of resistance. By problematising the homogeneity inherent within Swain and Swan’s (2007) discursive production of concepts such as “rich collaborative tasks” (Swain & Swan, 2007: 38), “teachers’ knowledge” (p. iii), “shared goals” (p. 15) and “changes in practice” (p. 52), I turn towards discussions of the production of discourses, the representation of cultural and ideological practices, to reveal certain subjectivities and a compulsion to undergo identity work. I challenge the assumption of ‘natural’ truths about learning and, as such, I turn to TTM to reveal how adult learners have come to be inscribed as particular kinds of mathematical subject.

2.3 A turn towards Lacan

In the previous section, I illustrated how authors working within the Humanist tradition seek to understand how an agentic individual makes sense of their experiences of mathematics. Instead of theorising learning as primarily within the cognitive domain, in using a Lacanian lens participation becomes “a risky business since the threat of failure is ever present” (Black, Mendick & Solomon, 2009: 6). I mobilise Brown (1991, 2008b), Brown *et al.* (1991, 2001, 2006), Walshaw (2004,

2007, 2010) and Bibby's (2010, 2011) application of the Lacanian perspective, to ask questions of the empirical narratives to reveal psychic costs of the investment in desires, fantasies and fears, brought about by returning to the classroom to learn mathematics.

Brown (2008) utilises Žižek's (1998, 2006) applications of Lacan's (1977) psychoanalytical account to show how regulatory discourses silently "nudge individuals towards conventional, that is, state sanctioned modes of behaviour" (Brown, 2008c: 253). Brown tends to be critical of what he refers to as the "hardcore" (2008b: 28) constructivist approach, a location from which I situate the design-based research TTM:

I concur with those who suggest that radical constructivism provides an inadequate account of how the social web of discourses intervenes in the process of individuals declaring how they see things (Brown, 1991: 19).

Brown and McNamara (1991, 2001) conducted two inter-related studies to explore the theoretical landscape of identity positioning within and around the discourses of mathematics. The initial study was based on a cohort of 20 trainee teachers and included participants from each phase of the four-year training cycle of a Bachelor of Education (B.Ed.) course. The second followed a smaller sample of 10 newly qualified teachers as they transitioned from teacher training to their first year of teaching in a primary school (Brown, McNamara, Basit & Roberts, 2001). These studies collected narratives of previous and contemporary encounters of teaching and learning mathematics and included lesson observations as well as reflexive journals, to act as 'an aide memoire' to facilitate the interview process. Although the methodological tools were similar to the studies conducted by Swan and Swain (2007), on analysing the narratives Brown and McNamara asked very different questions of the texts. They interrogated the processes of teaching and learning as a social phenomenon, and in doing so, explored the ways in which newly qualified teachers (NQTs) "as subjects of an emerging professionalism ... navigated the opaque and often contradictory demands of policy" (Brown *et al.*, 2001: 6). The report did not intend to provide a tool kit for ITT, but to problematise the ways in which the NQTs were compelled to act and become "enmeshed in the performance of symbolic acts ... (as they were) inducted into school norms and classroom practices" (Brown *et al.*,

2001: 8).

Whilst their observations were in line with Swan and Swain's account, these findings were interpreted as constitutive (and constructed) to persuade Newly Qualified Teachers (NQTs) "to opt to 'fit in' with school norms and practices" (Brown *et al.*, 2001: 6). In a stark contrast to TTM's list of normal classroom behaviours, Brown *et al.*'s (2006: 154) concluding comments pointed to the complexities of professional identity, and to the tensions hidden within the hegemonic discourses of best practice, which currently surround the teaching and learning of mathematics in the classroom:

The compliance this activated was generally seen as supporting the common good, namely the basic need for mathematics as a social project to be taught such that all pupils could engage as fully as possible ... such happy resolutions ... can provide effective masks to the continuing anxieties.

Walshaw (2001, 2007, 2010), like Brown, underwrites her Lacanian framework with a Foucauldian understanding of the regulatory practices that normalise how actors discuss and implement practice. Walshaw mobilises Foucault to theorise how "politics weaves itself into the very fibre of our concepts, constructs, processes and practices" (Walshaw, 2001: 484), to understand the ways in which teaching and learning are determined within, and through, the powerful and dense web of educational discourses which position learners as particular kinds of mathematical subjects. However, in ways that juxtapose Brown's works, Walshaw reveals the effects of the binaries of logic that are at play in the classroom. Through a particular emphasis on Foucault's latter works on the technologies of the self, she argues that despite being caught in power contestations, it is possible to talk of spaces of agency within the classroom (Walshaw, 2010). This debate will be detailed in the next chapter, but in summary Walshaw argues that the discourses of learning should be viewed as particular forms of knowledge, which produce an effect of power that then reproduces discourses through which the individual experiences their learning.

2.4 Gendering mathematics

Although Brown considers the gendered trajectories of discourses, he does not contemplate the particular ways in which the dominant productions, such as binary

gender and natural ability, discursively sustain normalised perceptions of ‘truths’ about particular ways of knowing and doing mathematics. Bibby (2010, 2011), using a Lacanian framework, focuses on the gendered trajectories of mathematical discourses, but her work is grounded within a Freudian perspective (as opposed to Foucauldian) that draws from the oedipal family and the Oedipus complex to unpack individual relationships with mathematics. Whilst I will draw from Bibby’s work to consider Jalal, Philly and Karigalinas’ relationship with mathematics in Chapter nine, it is Walkerdine’s (1984, 1998) and Walkerdine *et al.* (2001) pivotal works that will be central to theorising the discourses of masculinity that will be discussed from Chapters seven through nine.

In the 1980s, Walkerdine (1984, 1986, 1988, 1989) shook what traditionally had been held as objective truth claims about the ‘problem’ of girls’ underachievement in mathematics. She revealed that this discursive construction was as much the product, as productive, of the discursive spaces available to girls within the academic discipline of mathematics. Walkerdine - by putting the narratives of girls doing mathematics, their mothers and their teachers to work - posed new questions of pedagogic instruction. In taking this approach, she revealed how the discursive construction of ‘underperformance’ was more a case of the social construction of the subject ‘girl’, than a product of any statistical analysis of performance. Walkerdine revealed how analysis of student attainment at this time, was less about statistical analysis and more about the stories that key actors told about ‘girls’ and ‘boys’ behaviour in the classroom.

Walkerdine moved the axis of research interrogation towards discussions of how discourse inscribes positions within the classroom, in order to unravel how classroom (and mathematical) practice leads teachers (and researchers) to (mis)recognise discursive constructions of binary truths (such as ‘naturally gifted’ boys and ‘hard working’ girls) as natural ‘truths’ about teaching and learning. She concluded that, contrary to popularised beliefs of the period, there is in fact no identifiable period where boys outperform girls in schoolroom mathematics:

... The question then is whether girls and women are lacking or different. Most of the arguments about their performance relative to men take difference as

indicative as something real. High performance indicating something present, low that something is missing. The idea that girls lack spatial ability or mastery orientation or holistic thinking, or whatever the deficient model or whatever the next incapacity turns out to be, is not best served by trying to prove either that they really have it or by trying to find the cause of their deficit ... such approaches tend to fall into the trap of treating these differences as caused by something real and true (Walkerdine, 1989: 29).

2.5 Critical rejection of the unitary individual

I use the term the ‘socio-cultural account’ to maintain a sense of the broadness of the perspectives that centre on the Humanist understanding of the rational, agentic and unitary individual. Individual learners are understood to hold a natural freedom, although autonomy within the classroom is often recognised to be productive of “historically and culturally constituted reality according to her interpretations and personal meanings” (Radford, 2008: 453). Whilst it can be acknowledged that authors working within a Humanist framework wrestle with questions of social justice, learning tends to be theorised as a natural behaviour, with questions concerned with the socio, political and cultural locations of knowledge. Secondly, whilst spaces of uncertainty are considered, questions tend to be formed around the (un)certainty of mathematical knowledge. As Radford (2006: 54) posits:

... On one side, meaning is a subjective construct: ... Meaning here is linked to the individual’s most intimate personal history and experience; it conveys that which makes the individual unique and singular. On the other side and at the same time, meaning is also a cultural construct in that, prior to the subjective experience, the intended object of the individual’s intention (*l’object visé*) has been endowed with cultural values and theoretical content ... It is in the realm of meaning that the essential union of person and culture, and of knowing and knowledge are realized.

Within the socio-cultural account, the individual learner is framed by the conditions of possibility that enable the self to make, and sustain, autonomous and rational choices. Mathematics is seen as a protean body of knowledge, malleable in the hands of the individual (Pais & Valero, 2014). Perhaps the most alluring promise is that pedagogic truths *will* enable all individuals to overcome the injuries of their past (Brown, 2008c). Where a ‘problem’ with learner agency is revealed, such concerns tend to be with protecting the safety of the learning environment, often regarded as temporary, resolvable by neatening the “clash between individual agency and social demand”

(Pais & Valero, 2014: 242). Certainly, there is a comfort in the hegemonic account that with the ‘correct’ approach, and with an infinite number of contexts available, it is only a matter of time before the expert teacher will engage the learner.

Pais and Valero (2012) deconstructs how, within the socio-cultural account, measurement and progress can only be understood in terms of the individual’s ability to repeat the exacting nature of the prescribed procedure. At this brief and fleeting moment, demonstration of the mastery of the procedural knowledge is all that counts. It is only at this time, during the crisis brought about by summative⁴ assessments, that the teacher is confronted by the hidden tensions between creating a safe and nurturing learning experience, and the need to perform in an examination. It is useful here to turn to Brown (2011) to reveal the two discursive constructions of ‘success’ offered in this account. The first, Brown (2011: 24) argues, is the pedagogic view, with the second providing the policy construction of ‘success’:

Mathematics 1 … places emphasis on … exploring mathematics, making connections, seeing structure and pattern and the teacher’s task is understood more in terms of facilitating learning … such an approach is often seen as being more “learner centred” or “discovery” orientated, emphasises process and the using and applying mathematics … Assessment is often targeted at the student’s attempt of articulating their perspective;

Mathematics 2 … mathematical achievement is understood more in terms of performances of prescribed mathematical procedures. This is quantifiable through diagnostic testing, and broader understanding is anchored around test indicators in a statistically defined environment. Mathematics itself is understood as being describable as a list of mathematical content topics, and thus a transmission approach may be favoured as there is a precise content to be delivered.

Whilst interesting critiques of the social, cultural, and historical manifestations of knowledge occur, according to Walshaw authors writing within this paradigm “share a commitment to the characteristic orientation of Humanist thought – to the fundamental importance of rational thinking and to the rational conscious thinker” (Walshaw, 2004: 126). The conditions for learning are set with the assumption that, when skilfully managed, the possibilities of producing the self as an autonomously learning subject will come to the surface and this is a perspective that prevents authors

⁴ Summative assessment is the name given to the final examination.

from wrestling with the histories and/or conventions of reason (Walkerdine, 1998).

Walkerdine argues that this translates into a research paradigm that privileges design-based models that reveal ‘facts’ about the individual’s capacity to learn, whereby primacy is given to the cognitive processes that are assumed to govern meaning and the means of communication. Statistical analysis, in particular, tends not to be problematised which, as in the case of TTM, can normalise the discursive construction of best practice, professionalism and standards as the product of evidence-based findings. As Rose (1996: 358) comments:

We have entered, it appears, an age of the calculable person, the person whose individuality is no longer effable, unique and beyond knowledge, but can be known, mapped, calibrated, evaluated, quantified, predicted and managed.

The allure of the socio-cultural model cannot be disregarded. Nor in the age of performativity, should the fantasy of being able to plan for a cognising agentic individual be under-estimated. Material and affective barriers to learning are assumed to be surmountable with time, patience and expertise, because of the inherent assumption that the psycho-social costs of repeated failures are but a product of the realities of the past (Walshaw, 2007). Such framings give limited room to listening to counter-narratives and resistance. Where resistance is met within the classroom, it is regarded as an obstacle and the learner is positioned as in need of reforming their learning habits. To make sense of resistance, I need to work in line with authors who look beyond cognition and the affective domains, and turn towards discursive production of policy. I need to interrogate how individuals take on, negotiate and resist the subjectivities on offer to them and explore the representations of cultural and ideological practices of classroom mathematics.

2.5.1 Identity positioning and discursive construction

Mendick (2006) extends Walkerdine’s arguments to interrogate how hegemonic discourses continue to construct gender within and through a matrix that relies on oppositional binaries of ‘masculine’ (for example rational, logical, objective) at the expense of the ‘feminine’ (for example collaboration, team work and negotiation). Solomon (2012) and Mendick (2005, 2006), like Coben (2000) - who theorises within a field specific to adults returning to the classroom to learn mathematics through the SfL intervention - focus on ‘invisibility’ within the mathematical domain. In contrast

to Coben's socio-cultural theorising on the invisible and gendered nature of mathematics within the everyday domain, these authors interrogate the manifestations of gendered dialects of mathematics. They argue that it is only through interrogating the ways in which the social world directly causes gendered behaviours that it becomes possible to deconstruct how women (Solomon, 2007, 2010, 2012; Mendick, 2005; Mendick *et al.*, 2000, 2008, 2010) and men (Mendick, 2006) become compelled "to 'do' identity work ... [to] belong" in the world of mathematics" (Solomon, 2012: 175).

Mendick, Epstein & Hollingworth (2000) and Mendick, Epstein, & Moreau (2008) investigated the gendered imbalances of participation rates, and used an imaginative and provocative montage of theoretical lenses to collect data and theorise the impact of media discourses on learners' relationships with mathematics. The Mathematical Images and Gender Identities project (Mendick *et al.*, 2008), compared and contrasted stories from 14 and 15 year olds (Years 10 and 11 in the UK) to stories of learning mathematics from second and third year university undergraduate students. The research was extensive and developed a stratified sample; by educational achievement, class, gender and race. The findings of this project were used to inform the final report to the UK Resource Centre for Women in Science Engineering and Technology (Epstein, Mendick & Moreau, 2010), which investigated the gendering of representations of mathematics and mathematicians in popular culture, and the influences of these discourses on young/adult learners.

The data collection included a survey, a textual archive, focus groups and semi-structured individual interviews. The incorporation of a textual archive was integral to the data collection methodology, and this marked a departure from the previously mentioned studies (Swan & Swain, 2007; Brown *et al.*, 1999, 2001, 2006), which focused on mathematical practices within the classroom. The authors of the Mathematical Images and Gender Identities research project (Mendick *et al.*, 2000, 2008) asked participants to arrange a series of images of people and mathematics in order of likeability, and then to arrange a second series of images of mathematical artefacts in terms of math-ness'. The use of different images allowed the authors to cross ontological (who is a mathematician) and epistemic (what is mathematics)

boundaries within the interview spaces, and the responses they achieved hinted at the complexities and contradictions of social constructions of mathematics and mathematicians. Whilst the sampling methods mirrored the design-based paradigm of TTM in ways refreshingly similar to Brown and McNamara, the authors foregrounded their analysis on the productive power of discourses and the ambiguities, contestations and complexities inherent within the messiness of identities, participation and relationships with mathematics:

Our main focus here is on the discourses about mathematics and mathematicians that prevail in popular culture and the ways in which young people deploy them and negotiate their way through them in making their choices and producing themselves as (non)mathematicians. We see these discourses operating as regimes of truth, not because of their power to describe reality but because of their power to produce it (Moreau, Mendick & Epstein, 2010: 45).

The authors found that the complexities, divisions, and contradictions of the participants' narratives hinted at a general critical awareness of the clichéd nature of mathematical representations in popular culture. But, simultaneously, their stories also revealed how these participants readily drew on what they knew to be clichéd accounts to sustain their sense of mathematics and their mathematical identities (Mendick *et al.*, 2008). Interestingly for this thesis, for participants categorised as holding "poor relationships with the subject" (Mendick *et al.*, 2008: 25), the discussions of mathematics tended to be restricted to number calculations and set in a binary comparison against more 'creative' subjects such as language and art. As these participants organised the pictures, they tended to use a discursive ranking of 'otherness' and references to mathematics within the esoteric domain. Stories about 'mathematicians' tended to be positioned as simply different to 'normal' people and for those with a poor relationship with the subject. For those participants who did not identify as 'good' at mathematics, this research revealed how 'doing' mathematical thinking required considerable "identity work" (Mendick, 2006) in order that they could acknowledge their achievements.

The participants studying mathematics at a higher level tended to use similar identity markers. However, in contrast, they tended to identify with the 'commitment' to and/or what they assumed to be the devotion required, to grapple with (and overcome) demanding mathematical knowledge (Mendick *et al.*, 2000, 2008). These stories

tended to centre on personal uses of mathematics in ways that were suggestive of an identity of being a mathematician. Participants with a stronger relationship with mathematics were less frightened by the connotations of mathematical brilliance and of being perceived as socially inept or living with mental illness (Mendick *et al.*, 2008). The authors concluded that whilst “those not choosing mathematics tended to “dis-identify” with identity markers of mathematicians and mobilised language such as ‘weird’ ... the participants displaying more “positive” relationships ... tended to present a different account of ‘the mathematical’ within popular culture” (Mendick & Moreau, 2014: 24). Mendick *et al.* mobilised a Foucauldian approach to reveal the ways in which power was intrinsic to the production of a discursive network and interrogated the ways in which gendered trajectories of doing mathematics and being a mathematician ran through the fabric of the wider social milieu. For the authors, to come to new understandings about the processes of subjectivity and subjectification, it was important to make the distinction between reasons given for particular choices and the ways in which these choices were articulated.

Through the use of storytelling, this research revealed how individuals who identified as (non)mathematicians invested in not being a mathematician. In ways similar to Brown *et al.* (1991, 2001) - and polarising Swan and Swains' (2007, 2010) discourses of pedagogic practice - the authors concluded by problematising the contemporary assumption of a ‘natural’ desirability associated with acquiring mathematical status amongst peers including in the workplace. In summary, this research found that participants’ relationships with mathematics were gendered, classed, and raced and consistently found that relationships with mathematics were indicative of the ways in which social differences are re-produced. They concluded that incorporating references to popular culture could discursively produce spaces for the discussions of social justice in the classroom. Central to the discussion threads of this thesis, these authors put forward the argument that discussions should not be restricted to affect and meta-cognition. They demonstrated how research needed to be widened to reveal the hidden gendered, classed and raced practices of mathematics.

Black *et al.* (2009) and Mendick *et al* (2009) continue to demonstrate that the ‘problem’ of girls is more a question of participation rates than of performance in the

classroom. Walkerdine created a space for researchers to theorise the effects of power, discursive formation and the psychic investments in (non)mathematical identities.

This has sustained a methodological pathway that enables me to engage with the academic debate that focuses on gendered discourses that subject learners to particular kinds of schooling practices. As Walkerdine (1998: 16) wrote:

Our research becomes a process of disentangling, of pulling ourselves free of the web. It is like unpicking knitting, the wool still bearing the imprint of the knots that formed into a garment. The garment often seemed to fit us well and even keep us warm on winter nights. Taking it apart is painful and does not reveal the easy certainty of answers.... But there have been so many easy answers which told us what was wrong ... and how to put it right. ... We want to tell a different story of fact, fiction and fantasy.

2.6 Summary

At the start of this PhD journey, I was motivated by the idea of listening to the learners describe, and teachers discuss, good practice. To do so would rely on a Humanist assumption that disconnects the known from the knower. With this realisation, I moved towards a critical analysis of the ways in which key actors consume the dominant neo-liberal discourses of professionalism, standards and good practice, and the ways in which this particular sample of learner participants took up, negotiated, and resisted these discourses within and through the stories of their encounters with mathematics. This is an original research trajectory for the sector, but falls within a well-established wider body of work that examines the post-structuralist ‘turn’ in mathematics education. By venturing into the post-structuralist domain, I create a discursive space that seeks to unsettle the taken-for-granted assumptions about the coherence of the learner as a rational and autonomous agent on which current practices are based. By acknowledging research, mathematics and mathematics education to be uncertain, ambiguous, fragile processes that are at best “jerky, episodic and as beset with loss as much as gain” (Bibby, 2011: 58), I have troubled my previous understandings of ‘performance’ in the classroom.

In conclusion, this thesis intends to reveal the ways in which the participants constructed mathematics as unyielding, exacting and hard, and to come to new understandings of why it is these very qualities that many of the participants fought

the hardest to protect. Whilst starting from different positions, in mobilising Foucault's "politics of refusal" (Gedalof, 2003: 94) alongside Lacan's understanding of demand within the symbolic realm, it becomes possible to extend the debate in new and exciting ways. I intend to weave threads from this body of literature to support my own theoretical arguments, to gain new understandings of the multiple contexts in which the participants (both learners and teachers) negotiated and reworked their (non)mathematical identities in and between the dominant public discourses of numeracy, the numerate citizen and of mathematics. The next chapter provides an outline for mobilising the principle theoretical tools mobilised within this thesis, ending with justification for a post structural turn in analysis.

Chapter 3: The theoretical framework (introduction change)

In Chapter Two, I outlined the rationale for my decision to follow a different research path from the established model for the sector, which traditionally has focused on evidence-based ‘truths’ about teaching and learning, and deriving ‘tool kits’ for practitioners in the classroom. I also outlined the reasons for my rejection of Humanist frameworks that conduct academic discussions on the basis of an agentic individual, through an assumption of the coherence and unity of the self. In this chapter I frame my decision to opt for narrative-based analysis, which intends to put multiple theories to work. I outline the thoughts that I navigated as I made the decision to turn to an unusual mixture of Bourdieu, Lacan and Foucault, to generate a critical theory that is not imposed on, but rather is shaped by the empirical data. I start justification of this methodological approach by drawing attention to Ball’s (quoted in Mainardes & Marcondes, 2009: 316) comment:

The point is that all theory is inadequate by definition ... limited by the positions that it takes up, the preconceptions within which it operates. Theory often claims to explain the whole world to us, but fails inevitably, and most theories tell us some useful things about some bits of the world, so ... if you want to develop a more coherent and joined-up analysis of the world you actually need different kinds of theories.

The motivations that led me to embark on a ‘doctorate journey’ started with a concern to reach alternative understandings of what encounters of mathematics (and mathematical spaces within the site of the self) look and feel like to subjects of mathematics in the FE sector. It is the richness of the life history account that attracts complex narrative layers, which then provide insights into the tensions, silences and antagonisms that arise through the telling of tales of familial tensions, of revealing fantasies and fears of returning to discourses of mathematics as an adult, and of resistance to the subjectivities on offer in the classroom. It is this kind of critical narrative inquiry that, I argue, develops the substantive themes that arise from the data. However, this approach seeks to challenge the limitations of theoretical frameworks (as explored in Appendix Ten) and thus invites analysis from different perspectives. This is helpful because, despite the inconsistencies, in utilising a mobile epistemology it is the data (and not the theoretical perspective) that drives analysis.

Whilst it is unusual to find a thesis that seeks to place Bourdieuan analysis alongside Foucauldian traditions and Lacanian psychoanalytical account, Archer and Francis (2006) write that post-structuralist and socio-cultural accounts work in different ways, but each seek to challenge hegemony and the reproduction of inequality. Each deploy theories to problematise the neo-liberal turn of international politics, the economy and government funding and implementation of policy (Callewaert, 2006: 74). In conclusion, in taking the decision to ‘listen’ to the narratives, I employ a mobile epistemology and turn to a compilation of theoretical tools to interrogate the points at which the individual indicates that some sort of ‘taming’ or transformation has taken place.

In starting with a Bourdieuan analysis, I consider how four participants have internalised particular lived experiences of mathematics in ways that are suggestive that people ‘like them’ should not grapple with the mysterious, and complex, language of mathematics. In initially taking this broadly case-study approach, I encourage the reader to travel beyond Foucault’s concerns for discourse and maintain a sense of the individual, as they engage with wider discussions of the classed, raced and gendered subjectivities, and the compulsion to undergo identity work, particularly when confronted by alternative forms of mathematics and configurations of success. The Bourdieuan tools that I have used are habitus, capitals and field.

3.1 Bourdieu's theory of practice

The purpose of sociological research is to uncover the most deeply buried structures of the different social worlds that make up the social universe, as well as the ‘mechanisms’ that tend to ensure their reproduction or transformation (Bourdieu, 1996: 1).

By relating the structuring processes of the social world to the ways in which the body regularises the self, questions of autonomy, hierarchy and inequality lie at the centre of Bourdieu’s intellectual endeavours. In putting forward an analysis that transcends dualisms, such as agency versus structure and objectivity versus subjectivity, Bourdieu (1993) argues that his practice avoids being trapped (like many structural accounts) into a static framing of the self. In theorising identity outside of biological concerns,

Bourdieu is able to travel beyond concerns of identifying core or ‘true’ characteristics (Archer & Francis, 2006), and in dynamic ways his tools can explore how the body transfers social memory from one encounter to the next, and the ways in which the “social world is in the body” (Bourdieu & Wacquant, 1992: 20).

They (1992) frame the individual as a player, who on entering a new game (what he refers to as the field), uses past experiences (habitus) to make sense of the rules of social encounters in which she finds herself. On theorising the ways in which we encounter the social world (familial, at work or at study etc.,) Bourdieu posits that the individual consciously, and subconsciously, internalises what she takes to be her ‘natural’ place within the social geographies of the field. In doing so she judges what can be won and lost, internally categorising what she values, weighing up what she perceives to be the worth of her continued participation. She then develops strategies (dispositions) to gain advantage over others in the field. These categories (and the attributed values) are not fixed, but continuously shift as the individual consciously, and subconsciously, attributes value to the prizes she perceives to be on offer, through her continued participation in the game.

Bourdieu and Wacquant (1992: 127) write that “when habitus encounters a social world of which it is the product, it finds itself ‘as a fish in water’, it does not feel the weight of the world and takes the world about it for granted”. The notion of symbolic violence is concerned with how the arbitrary cultural norms (of the dominant group) come to be misrecognised not as arbitrary, but as legitimate. Individuals, do not by necessity, ‘choose’ to perpetuate socially produced inequalities, but misrecognise the arbitrary culture of the dominant actors (whether that be ‘useful’ mathematical knowledge, or pedagogic action such as collaborative learning), "under the guise of neutrality ... (sustained by) the groups, classes whose cultural arbitrary it reproduces" (Bourdieu & Passeron, 1990: 67). The “fundamental principles of the arbitrary culture ... (are inscribed in) the apparently insignificant details of dress, bearing, physical and verbal manners ... (and in treating the) body as a memory ... nothing becomes more communicable, more inimitable, and, therefore, more precious, than the values given body” (Bourdieu & Passeron, 1990: 94). In other words, if an individual's social behaviours are compatible with the style and customs of the other participants within

the field, she is more likely to be accepted as a member of the community and, from this position of acceptance, she re-aligns her identity.

3.1.1 Habitus

... systems of durable, transposable *dispositions*, structured structures predisposed to function as structuring structures, that is, principles of the generation and structuring practices and representations which can be objectively ‘regulated’ and ‘regular’ without in any way being the product of obedience to rules, objectively adapted to their goals without presupposing a conscious aiming at ends of an express mastery of the operations necessary to attain them and, being all this, collectively orchestrated without being the product of the orchestrating action of a conductor (Bourdieu, 1977: 72).

Habitus is a theoretical construct that seeks to understand the mechanisms by which traditions (familial and wider social milieu) come to be reproduced across history. One of the crucial features is that it is theorised within an embodied state, formed over time, strengthened by the belief in the natural logic of social structures. By interpreting participants’ bodily expressions, mental attitudes and perceptions in relation to wider social traditions of the field, the concept of the embodied state enables analysis to travel beyond a separation between the material and the cost to the individual. This will be a particularly useful tool for exploring Steve and Philly’s narratives in Chapter six.

Habitus can be analysed by looking at the ways in which the individual subjectively holds the objective social structures within her bodily actions; what she wears, the way she speaks, the ways in which she holds her body. Habitus becomes visible at the point at which the individual recognises the practical logic that structures the field, and articulates the prizes that she prioritises, and the worth of her participation in the game. However Bourdieu, in likening the act of making a choice to “the art of inventing” (1996, p15), inscribes limits on the possibilities for an individual to experience ‘choice’. The limits that he places on habitus are revealed through the quote below:

The habitus is necessity internalized and converted into a disposition that generates meaningful practices and meaning-giving perceptions; it is a general, transposable disposition which carries out a systematic, universal application – beyond the limits of what has been directly learnt – of the necessity inherent in the learning conditions (Bourdieu, 1984: 170).

According to Jenkins (2002), Bourdieu looks to the objective logical structures of the social world, to negotiate the conditions of possibility for the individual to exercise agency. In the following quote, Bourdieu demonstrates that whilst there is a sense in which the actor is free to decide how they act, this cannot be theorised as the same as agentic choice as assumed within the Humanist tradition. This assumed homogeneity (in and between the classed groups) means that differences in practices are at risk of being dismissed as improbable, rejected as unthinkable, and it is for this reason that Butler (1998) argues it difficult for the researcher to theorise the particular locations of agency. Reay (2004: 433) puts Bourdieu's tools to work in the context of education and reveals how habitus, whilst constructed through durable social memories, incorporates restricted spaces for agentic choice:

... a wide repertoire of possible actions, simultaneously enabling the individual to draw on transformative and constraining courses of action ... the addendum in Bourdieu's work is always an emphasis on the constraints and demands that impose themselves on people.

Reay (1998) in framing 'choice' in terms of a range of possible decisions, draws on the points at which objective structures set the conditions for identity positioning. This means the relationship between the individual and the social is never theorised in isolation. At the same time that the social is within the body, social structures are understood to be dynamic; recreated, reproduced and redefined by the continual and shifting interpretations and modifications of the dispositions that construct the individual's habitus (Jenkins, 2002). It is the interconnections, between habitus and field, the "latent determinism" (Reay, 2004: 432), which makes the concept of habitus the most critiqued of Bourdieu's concepts.

3.1.2 Capitals

... *economic capital*, which is immediately and directly convertible into money and may be institutionalized in the forms of property rights; as *cultural capital*, which is convertible, on certain conditions, into economic capital and may be institutionalized in the forms of educational qualifications; and as *social capital*, made up of social obligations ("connections"), which is convertible, in certain conditions, into economic capital and may be institutionalized in the form of a title of nobility (Bourdieu, 1997: 47).

Bourdieu's (1986, 1997; Bourdieu & Passeron, 1990) notion of capitals is highly classed. It embeds the assumption that groups that constitute each category of 'class' share similar lived experiences. This homogeneity, Bourdieu and Passeron (1990) argue, means that although the individual's composition of various forms of capital is understood to be unique, the locations of 'class' incorporate shared characteristics that can be broadly considered the classed trajectories of the dispositions, habits and practices of the individuals that construct the social class (Jenkins, 2002). It is this shared form that can be mapped to facilitate academic discussions of how advantage and disadvantage come to be reproduced through the practising structures of schooling. It is through this framing that it becomes clear that the notion of capital includes variables other than economic purchasing power; the most influential of which includes the cultural, and social / symbolic forms. The different forms of capital will be discussed in more detail, within empirical context, in Chapter six.

In summary, an individual's capital is theorised primarily through membership within a particular social class, and is composed of different volumes and composites of the various forms on offer within the social interaction. Whilst identity formation is considered in terms of the internal processes of sense making, positioning within social spaces also demands external validation and this is particularly poignant for reading Jalal's stories in Chapter six. The notion of capital is relational and is constructed as transformable, but ultimately, all capitals are potentially converted into economic capital and therefore, '...economic capital is at the root of all the other types of capital" (Bourdieu, 1997: 54). For example, the volume of cultural capital may enable one individual to join a social network, in ways that may be closed to another. In joining this particular network, an opportunity for employment may occur and it is within this context, say for example in the form of a salary, that cultural capital can be envisaged as transformable into economic capital.

3.1.3 Field

The struggles which take place within the field are about the monopoly of the legitimate violence (specific authority) which is characteristic of the field in question, which means, ultimately, the conservation or subversion of the structure of the distribution of the specific capital (Bourdieu, 1993: 73).

The field can be seen as operating in two different ways. On the one hand, it holds the objective rules of the game that structures the individual, and collective, habitus. The rules of the game are simultaneously produced (and are productive of) the shared characteristics of the participants involved in the game. Where the field can be seen as bringing the objective structuring practices of logic, or the rules of the game, the habitus is conceived as bringing the subjective elements of making sense of the rules. It is the network of dispositions (especially collective habitus), which Bourdieu argues can lead to very different practices at the level of the individual, and is dependent on the state of the field. However, in relying on the generative capacity of habitus to inform and change practice within the field, it is unclear how social change and/or resistance is performed in the classroom.

3.1.4 Bourdieu and discussions of power, hierarchies and social spaces

In taking his theoretical inspirations from Marx and Weber, Bourdieu is interested in hierarchical properties, social spaces, patterns of reproduction, and the ways in which power struggles take place within the field (Jenkins, 2002). In the case of learning, Bourdieu stresses that habitus is neither mechanical, nor leads to inevitable learning behaviours, but instead offers a tool to develop a relational account of social positioning. Whilst habitus holds both durable and stable characteristics, transformation is possible, albeit relational to the “repressions and pressures asserted by the macro, meso and micro practices of the field” (Hillier & Rooksby, 2002: 15). Bourdieu's work looks to the similarities within groups of people and the ways in which the formative capacity of habitus inclines people to act (Jenkins, 2002). Those with the greatest volume of what is valued (capitals), are most likely to feel like a ‘fish in water’, and are more likely to participate in ways that will perpetuate the rules that promotes social positioning. Essential to the pedagogic demands of collaborative learning, those individuals who feel more like a fish out of water, are likely to have limited volumes and composites of capitals. They are likely to position themselves (and be positioned by others) less favourably, are less likely to value their participation, and are more likely to devalue their mathematical contributions.

Society positions the individual within social spaces in complex and contradictory ways. In the preceding paragraphs, I have shown how participation is an indicator of

subjective perceptions of positioning, as well as a means of being positioned by society. Many of the generative structures of habitus remain unconscious processes and it is only through analysing the ways in which the individual interacts in the field, that the durable characteristics are revealed in its dynamic form. Bourdieu (1984) posits that it is through these multiple (and evolving) lenses that we as individuals, come to know and position ourselves and through which others come to know and position us. In this way, the networks of dispositions that construct the habitus, can be analysed to reveal the structuring forces of the social, cultural and physical locations of experience.

Skeggs (1997, 2004a, 2004c, 2015), Reay (1997, 1998, 2000, 2004) and Ingram (2009, 2011) each put Bourdieu to work in the context of education to reveal the points at which objective structures set the conditions for identity positioning. The tools of habitus, capitals and field are significant for this study, because they reveal the effects of classed locations and uncover the deeply buried mechanisms that enable (or prevent) the individual from accruing and transforming capital, for advantage, in the classroom. This perspective allows me to gain insights into the classed trajectories of inequality, and to reveal how key actors (without their explicit intention) reproduce inequality within and through the wider social milieu of society. However, I find Butler's (1998) concern that Bourdieu assumes power to be with the hegemonic collective is also useful to consider in relation to narrative accounts offered in my study. In this perspective, it is "the fish in water" (Bourdieu & Wacquant, 1992: 127) that are most likely to bring about the conditions of social reality. Identity formation is therefore primarily understood through the hierarchical organisations of the people who dominate, and inform, the normative understandings of the field. Whilst framing Steve and Philly's accounts of identity formation through attention to the structuring processes of school, Bourdieu offers little scope to explore Steve or Jalal's narratives of bravado, or the politics of Fatima's (not) belonging, or her angry narratives of resistance of being positioned as 'hard to reach' by the head teacher of her son's school.

In this section, I have endeavoured to show how Bourdieu's interest in hierarchical properties, patterns of reproduction signal the ways in which this can limit the range of activities that are considered possible. However, whilst useful, the conceptual

framework offered by Bourdieu needs to be extended to adequately reveal the intersections between classed, raced and cultural trajectories and interrogate the identity work of the participants. The intention of the next section is to outline the discursive construction of identity formation, and put forward the reasons for making use of Foucault, I can provide more textured understandings of the differences in, and between, the subjectivities on offer within the field.

3.2 Foucault's theory of discourse

Foucault writes primarily from a philosophical perspective, and is concerned with theories of power, discourse and subjectivity. Foucault's (1977) notion of governmentality relies on apparatus of social structures, but in ways that are very different to Bourdieu's understanding of the dominant power of the 'fish in water', who subconsciously reproduce what is essentially arbitrary knowledge as neutral and objective truths. Where Bourdieu places limits on agentic choice, Foucault, especially in his earliest works, does not seek exploration of spaces of agency (Butler, 2005). He is instead concerned with interrogating how individuals perform acts of self-crafting. Foucault (1977) does not seek fixed structures to analyse acts of self positioning but looks to discursive constructions of the 'regimes of truth', which claim to be accounts of the real, and inscribe conditions more likely to produce certain behaviours. Occurrences that are then read back, by subjects of discourse, as 'true' or 'normal' indicators of 'typical' learning behaviours (Walshaw, 2007).

If power were never anything but repressive, if it never did anything but to say no, do you really think one would be brought to obey it? What makes power hold good? What makes it accepted, is simply the fact that it doesn't only weigh on us as a force that says no, but that it traverses and produces things, it induces pleasure, forms knowledge, produces discourse. It needs to be considered as a productive network which runs through the whole social body, much more than as a negative instance whose function is repression. (Foucault, 1980: 119).

Where Bourdieu maps the field of power to the structuring practices of class, with an understanding of power that is based on the domination of one group over another (Swartz, 2012), the intention of working within a Foucauldian tradition is to interrogate what kind of subjects are created and how the discursive constructions of teaching, learning and learners come to be configured (Brown, 2011). Subjectivity is produced socially, but it is through language, in relations of power, that subjects are

positioned by discourse. In Chapters seven through nine I interrogate the formation of norms and codes of behaviour and look to Foucault (1988) to reveal the truth effects on the ways in which the participants take up, negotiate and reject the subjectivities on offer by discourses of mathematics and the numerate and responsible citizen.

3.2.1 Technologies of power

Within traditional, mainly judicial-based framings of power such as Bourdieu's, the concept of power (for example social or economic power) tends to be theorised as stable, transferrable in predictable ways, most often asserted from one person over the next. Foucault's (1972) understanding of power is more complex. It is not understood in terms of a commodity that can be possessed and transferred, but as constituted by (and through) the multiple and constantly shifting discourses that we as individuals (or as Foucault posits subjects) seek to perform to reconcile the expectations of what is assumed to be 'normal' or acceptable modes of behaviour. Foucault's focus is not the notion of power per se or indeed the individual, the collective or even the institution. Within a Foucauldian tradition, it is the techniques of administration and the apparatus of power that holds interest. It is through questioning what Foucault (1977) refers to as "the regimes of truth" that it becomes possible to gain insights into how power comes to be inscribed on the body. Foucault (1988: 18) sets out three domains (truths, power and ethics), which are then split into four further distinct technologies of power:

- (1) technologies of production (of truth), which permit us to produce, transform, or manipulate things; (2) technologies of sign systems, which permit us to use signs, meanings, symbols, or signification; (3) technologies of power, which determine the conduct of the individuals and submit them to certain ends or domination, an objectivising of the subject; (4) technologies of the self, which permit individuals to affect their own means or with the help of others a certain number of operations on their own bodies and souls, thoughts, conduct, and ways of being, so as to transform themselves.

Tamboukou and Ball (2003) explain that the subject is constructed through these technologies as an object in need of work, where the technologies set out the specificities of the measures of reform. The domain of power includes the disciplinary mechanisms (put in place by the reform agenda) to "determine the conduct of individuals and submit them to certain ends or domination" (Foucault, 1988: 18). Within the context of this thesis, this domain includes measures such as the

curriculum, staff development, examinations and pedagogic models such as collaborative learning. Hall (2001: 85) explains:

Neo-liberal democracies produce a particular type of subject, one that is constituted with a will to act, and the political and economic participation of these subjects are necessary for the production of these societies ... of particular conceptions of human nature ... formations of subjectivities, and ... ideologies lie at the centre of Foucault's thinking.

The technologies of discipline set out the terms of conditions that regulate the boundaries of acceptable conduct, and thereby determines the parameters of what 'should' be accepted as normal. Foucault's (1988: 18) final domain is that of ethics where the technologies of the self:

... permit individuals to effect, by her own means or with the help of others, a certain number of operations on her own bodies and souls, thoughts, conducts and ways of being.

It is through the ethical domain that the subject is invited to reconfigure her identity by regulating the "abnormal or dysfunctional elements" (Owen, 2014: 86) of her character. The disciplinary mechanisms (for example, staff training and collaborative learning) distil the grander technologies of production through the field, which are then interpreted by the self, to reconfigure as a subject in need of reform. It is only from within this framework that the subject can then 'choose' to "re-align their faults" (Owen, 2014), and conform to acceptable modes of 'normal' behaviours, through their participation within the field (Tamboukou & Ball, 2003).

3.2.2 The subject, subjectification and subjectivities

Lawler (2008) puts forward the 'traditional' view of the site of the self that is constructed through Humanist traditions which, since the Enlightenment, have dominated 'Western' thought. The individual is understood as unique, in charge of its actions and the author of its circumstances. Lawler lays out how people come to be comforted by the idea that, whilst the social world produces aspects of identity, it is possible to transform one's life. It is the assumption of the autonomous and enterprising individual, which means that 'uniqueness' is seen as qualities that belong to the individual. It is this view, where aspects of the self are seen to lie outside of the influences of the social, which brings about conversations of the 'true' or 'deep' self.

In viewing self as unitary, and/or power as a stable commodity, authors writing within a Foucauldian tradition (Walshaw , 2007; Ball, 2013; Brown, 2011) argue that traditional research paradigms ignore the subtleties of the ways in which power operates, and the ways in which subjects resist. Researchers, writing within Humanist traditions, run the risk of homogenising and essentialising subjects by analysing the individual as though she has universal or monolithic characteristics (Archer & Francis, 2006).

For both Foucault and Bourdieu, the site of the self is understood to be unstable, disjointed, conflicted, and produced within power relations. However, in an interview with Dreyfus and Rabinow (1982), Foucault theorises the subject as produced by subjugating powers. In reconfiguring the site of the self in this way, the individual is not constituted in relation to others, historical experiences or material conditions, but through an ongoing process of ‘becoming’, in ways that demand the subject to continuously take up, negotiate and resist subject positions, sustained by hegemonic discourses.

This form of power applies itself to immediate everyday life which categorizes the individual, marks him by his own individuality, attaches him to his own identity, imposes a law of truth on him which he must recognize and which others have to recognize in him. It is a form of power which makes individuals subjects. (Foucault, 1983: 212).

Walls (2009), writing in a mathematical context, sees the Foucauldian explanation of subjectivity as the act of self upon self; a process and a position in motion. The analyses offered in this study draws upon this view of self, as subject, whose subjectivity is something felt and lived and continuously reconfigured. It is through the subjectification of power that Ball (1995) sees the subject as becoming trapped by the comparison of normal against abnormal, and in doing so, is configured as a particular kind of subject within a community of practice. However, whilst Ball (1995) theorises the processes of discourses being inscribed on the body, Brah (1996) working from a post-colonial framework, suggests the processes of subjectification are not necessarily unpleasant to experience. On the contrary, she argues, a world regulated by “unquestioning acceptance of the normative codes of the social milieu, and the structures of legitimation that underpin these norms” (Brah, 1996: 202) creates

illusions of safety, even when trapped within the raced, gendered, and classed discourse of neo-liberalism. The injuries caused by subjectification will be discussed from Chapters six through nine, but Walshaw (2007), writing within a Foucauldian tradition, like Brah, emphasises that subjectification can often incorporate positive lived experiences. The processes of being judged mathematical may include precarious and contradictory productions of the self. It may include continual identity work to make sense of the ways in which the self is constantly being configured, but as will be seen in Chapter seven, and includes willing development and transformation. This identity work usually includes multiple forms of disciplinary powers, surveillance and judgements of normalcy. This view of subjectivity will be touched on again, when I consider the Lacanian perspective in the final section of this chapter.

3.2.3 Bourdieu, Foucault and visceral embodiment

Although the body is theorised as being subject to the inscriptions of hegemonic forces, Foucault's understandings of subjectivities lie outside of structural reliance of the 'real' domain. This means that Foucault's early thoughts also require further explanations for the ways in which "discipline produced subjected bodies, 'docile' bodies" (1972: 138) that simply yield to discourse. Archer and Francis (2006) and Walshaw (2007) map how, particularly in his later works, Foucault shifts from a focus of the technologies of production, towards technologies of the self, and the ways in which the self acts upon itself. It is within this understanding that individuals can be seen as learning to manage their identity work, by employing particular regimes of self-surveillance. This is an important theoretical shift for this thesis, as the intention is to explore the complexities of 'doing' mathematics and of 'being' a (non)mathematician in a highly classed, raced, gendered and devalued sector of education.

In comparing the conceptual tools offered by Bourdieu and Foucault, both looked to the margins, were "more concerned about epistemology and its pitfalls" (Ball, 2006: 68) than in generating theory, arguing that their primary concerns were with practice. Whilst Bourdieu has by no means declared that 'governmentality' has replaced class rule, both were influenced by Marxism, and concerned with the contemporary liberal

understandings of the individual and of society (Callewaert, 2006). Each took a stance against the Humanist traditions that make the social world appear real, orderly and predictable. Both were concerned with the possibilities of paradox. Bourdieu was pragmatic, a critical realist, fighting against being constrained and trapped by dichotomies to make false choices. Foucault worked outside and against intellectual conventions, with attention to discourse and the “cultural complex of signs and practices that regulates how we live socially” (Duranti & Goodwin, 1992: 30). Although tensions about the ‘real’ often prevent researchers from engaging with both authors, Foucault’s ‘discourse’ and Bourdieu’s ‘habitus’ hold many similarities (Duranti & Goodwin, 1992) and the intent of this chapter is to establish grounds for a theoretical tool box, through which to rummage, to examine aspects of the empirical data.

In having deployed Bourdieurian concepts to reveal the power struggles brought about by the classed locations, of Steve, Philly, and Jalal habitus and Philly’s visceral embodiment of mathematics in Chapter six; in Chapters seven through nine, I move to a Foucauldian frame to locate how these individuals (to which I include the full sample of learners) are constructed as subjects of mathematics, employment and citizenry. I draw upon Foucauldian tools at the points at which participants challenge ‘common sense’ understandings about learning, such as the installation of the numeracy core curriculum (DfES, 2001), constructions of best practice, and the ‘benefits’ of collaborative learning.

However, working solely within a Foucauldian framework also places limitations on the ways in which I can converse with the empirical data. I want to talk about mathematics, and collaborative learning, as things that are tangible and which exist in some kind of dimension, and this requires that I travel beyond discursive production. In using Bourdieu’s theory of practice, by undertaking a socio-analysis of the participants’ narratives (Bourdieu & Wacquant, 1992), I have already required the audience (temporarily at least) to engage with discussions of the ‘real’. By combining Foucault’s tradition of focusing on discourse, with a Lacanian psychoanalytical model, I can converse with the empirical data about tangible ‘things’ (whether that is collaborative learning, mathematics, or the learning environment). I can avoid

essentialising what it means to be human and simultaneously challenge the ‘common sense’ assumptions about learning that can bring about “profound material consequences” on identity formation (Archer & Francis, 2006: 23).

3.4 Lacan’s psychoanalysis

Bourdieu’s habitus presupposes that the field is composed of durable rituals, framed by the structuring forces of the social world. This notion is based on an assumption that the individual will adapt her actions to fall in line with normalising expectations, but this framework provides restricted analytical space to think about resistance. The focus of this final section is to lay the foundations for theorising the discursive production of meaning. In ways similar to Foucault, Lacan’s psychoanalytical model is discourse based, but through a Lacanian perspective the individual negotiates identity through navigating multiple, complex and contradictory linguistic filters within symbolic networks. Lacan (1977) also looks to discourse to understand the site of the fractured subject, however in a crucial split from Foucault, it is the movement between the signifier and the signified that triggers differences, complexities and contradictions in ways of thinking. It is thus sounds and images that are attached to the signifier (whether mathematics or collaborative learning) which hold significance for identity formation. Influenced by Freud’s exploration of the unconscious, but moved by the impossibility of the task that tries to capture the material world, Lacan turned to discourse (with primacy given to the symbolic order) to gain understandings about the site of the self. Whilst Lacan (1977) kept Saussure’s epistemic focus on linguistics, he transposed Saussure’s formula ($\text{sign} = \text{signified}/\text{signifier}$) to focus inquiry on the objects of desire, the construction of the big Other, and with it, its subjects (Walkerdine, 1988).

In taking a psychoanalytical approach, interest is not so much concerned with how the individual takes up, negotiates and resists subjectivities, but with how she makes sense of what she perceives to be the demands made of her. Psychoanalysis is concerned with unmasking the psychic costs of meeting the demands of how she perceives she is supposed to fit in. In this way her actions are not inscribed on her through yielding to the demands of the discourse, but because she desires to please the image that she

holds of herself within the symbolic domain. This is a particularly useful analytical tool for revealing the narrative processes by which the participants talk of ‘taming’ mathematics.

3.4.1 The mirror stage

We have only to understand the mirror stage as an identification, in the full sense that analysis gives to the term: namely, the transformation that takes place in the subject when he assumes an image - whose predestination to this phase-effect is sufficiently indicated by the use, in analytic theory, of the ancient term *imago*.
(Lacan, 1977: 2).

Lacan (1977) starts by tracing the relationship between desire and subjectivity. He uses the analogy of a child looking in a mirror to identify the first point at which the ‘inside self’ (the embodied self that has always existed) is understood to be different, and separate from, the outside self. The mirror phase is not conceived to be the beginning of something, but as a stage of identification where the child is confronted by a fragmentation and interruption of the self (Hall, 2000). The child is confronted by a sense of autonomy (to engage with the embodied ‘I’, or the external ‘I’), to succeed in completing mundane tasks such as tying a shoelace, or looking over a shoulder etc. In making the ‘choice’ to engage with the image in the mirror the child then acquires an illusory sense of mastery, of having tamed the external ‘I’.

However, the mirror phase is not theorised as a safe boundary that cleanly delineates the inside self, from external constructions of the self. It is a metaphor for the slipperiness and murkiness of external encounters, which bring about an end to the sense of unity of the embodied ‘I’. It is an interruption that is confusing; that lacks control, and brings about feelings of loss, as the child simultaneously experiences the division between what she sees of herself, and what she desires to be seen of her (Brown, 2008a). It is the start from which the child conjures up an image of an external sense of the self, which invites an awareness that there is an ‘other’. In the initial stages, the child is able to sustain the illusion of a complete and whole self. But the continuing encounters begin to demand new (often idealised) forms of language to articulate the differences, the losses, the desires brought about by engaging with the self in the mirror (Žižek, 2006).

3.4.1 Fantasy, desire and loss

The shaping of the individual through inherited or imposed artefacts, tools or words, Lacan would argue, can begin to misrepresent the human's sense of self. This demands or supposes compliance with a false caricature. This results in the individual being spoken about through the filter of particular ideologies, which serve some people better than others. (Brown, 2011: 118).

Desire is an important aspect of Lacan's theory. In line with Foucault's inscription of meaning upon the body, there is a gap between the individual's sense-making processes and the discursive tools that establish and maintain particular regimes of truths, but it is in the detail of this gap that I hold interest. Within this psychoanalytic model, stories of learning involve individuals mediating complex and diverse demands, or "antagonisms" (Žižek, 2006: 75), productive of the differences between the judgement of the life that has been lived, and the ideal model of how things could have been. The failure to find a fit between the imagined and the real does not, by necessity, have to dissolve into a narrative of disaffection, but can lead to a 'balance' to achieve a life that may be (Brown & England, 2004). As Brown explains,

The desire is brought about by a promise of perfection, or new exciting territories. The desire, however, often mistakes its object ... We may well have fantasies of who we are and fantasies of the world that we occupy, fantasies emanating from different aspects of our fragmented selves. But for Lacan, there is something beyond these fantasies and this supplement interferes with the operation of our fantasies. The fantasies structure our account of reality but never fully account for this reality. (Brown, 2011: 119).

The fantasy of the potential self is, according to Brown and England (2008b, 2011), processed through what Lacan (1977) refers to as the imaginary domain. It is in this realm that the individual fantasises about her positioning within the world, whilst simultaneously negotiating with the external productions of herself. The productive fantasies interact with each other, shifting and trying to establish a sense of meaning through the conflicting discursive constructions of subjectivities (Brown, 2011).

3.4.3 The imaginary, the symbolic and the real domains

The fantasy of the individual's potential self is, according to Lacan (1977), processed through the imaginary domain, and the behavioural codes that the individual understands to be 'normal' are constructed through the discourses of the big Other (for example policy, exams, and curriculum etc.) within the symbolic domain. It is at the

points at which the individual is reflecting on the inequalities of lived experiences, that she is primarily engaging through the symbolic realm. Žižek (1989, 1998, 2006) establishes how it is possible to talk of a subject's awareness of herself, under the gaze of the big Other, but given there are no subjects from whom she can compare how effective she is, there are no tangible markers of normalcy. The big Other is the ideology that shapes how we perceive we can be, and determines how we feel we should act. It is always with us, and it is through the different discourses of the big Other (take for example the differences between the pedagogic and the policy configurations of success) and the inevitably conflicting demands, that fantasies of what and should be on offer frame the sense of the self.

Whilst it is through the imaginary domain that the individual positions herself, these configurations can only take place in relation to what she perceives to be on offer. It is only through the imaginary domain that the individual can make sense of what she desires, but it is only through reflecting on disjointed past experiences that she can make a judgement on how she is positioned. It is only through the symbolic that the fantasies can be constituted, and it is only through engaging with these fantasies that it becomes possible to make sense of the external world (Black *et al.*, 2009). It is these competing demands that construct different subjectivities which require different forms of language, and it is within these gaps that a sense of alienation and loss is sustained. The individual is caught in perpetual negotiations, to try to balance the discursive construction of normal and natural, and to make sense of her own purpose in the world (Brown *et al.*, 2006). In returning to the mirror phase, it is through this sense of the ideal, the coherence of the outside, that the "I" becomes separated from the "other." And it is through this lack of control that the "human subject fixes upon himself an image that alienates him from himself" (Lacan, 1977: 19).

This alienation creates a tension that makes her desire what she imagines the other, the ideal ego, desires. This is the beginning of a kind of aggression, wanting what I think the other wants, jealousy, competitiveness, and resentment. (Brown *et al.*, 2006: 224)

The 'thing' (in this instance doing mathematics, being a mathematician, learning in collaborative ways) may exist within the real domain, but more important than its name is the production of fantasies, desires and fears through the perceived demands

made within the symbolic domain. Brown (2011) comments that reality is structured through the fantasies of the subject. From within this perspective there are multiple, complex and contradictory trajectories, and neither the teacher nor the learner can ever hope to reconcile their fantasies and desires of the ways that learning should take place within the classroom. The desires and/or wishes of the learners, the teachers, the institutions, and policy makers are, by necessity, created through spaces of loss and ambiguity. Accounts of learning are understood to be wrapped around the negotiations to resolve these inherent tensions, which are interwoven through the expectations of the symbolic domain, which then shape how we interact with the form of the mathematics on offer within these particular spaces. It is, according to Lacan (1997), this sense of loss, excitement and drive that is then enacted as performances of the self within the domain of the real, in this instance the mathematics classroom. It is through this attention to the psychic costs, of engaging with symbolic domain, that the injuries caused by resistance can be analysed in Chapters seven through nine.

3.4.4 Lacan and the illusion of choice

The ‘real’ of the classroom, collaborative learning and being a mathematician are, according to Archer and Francis (2006), but fictions produced through the relations of power, and I mobilise a Lacanian framework to examine the:

... crisscrossing between present perceptions of mathematics and the self, memories of mathematics and the self, and how together these feed into and help fashion future constructions of the self as learners of mathematics. (Brown & England, 2004: 72).

However, I only take this step through a Foucauldian understanding that “such subjection is a kind of power that not only unilaterally acts on a given individual as a form of domination, but also activates or forms the subject” (Butler, 2014: 230). Power is a fluid notion and difficult to reveal, although the effects remain very visible in the narratives of the individual. In Chapter five, I demonstrate the range of techniques that subjugate the individual as subjects of mathematics, employment and citizenry and compare the forms of administrative technologies of power to the conduct of the self, which through the hegemonic discourses, position teachers and learners so that they come to recognise the spaces available to them “as deficient, passive, childlike and ‘other’” (Oughton, 2007: 259). In pursuing the symbolic domain

in these ways, it is necessary to think beyond the pedagogic device of collaborative learning, beyond how the adult learner encounters the social, and explore the multi-positional relations of power, with attention to the very real psychic effects of the decision to return to the classroom.

In working with Lacan's notion of 'the real', it is only through understanding that the real can never be captured or fully understood that I can interrogate the locatedness and effects of subjectivities, but even then, only in terms of a relational account with the sense-making processes of the participant. By also drawing from post-structuralist theories of discursive formation, I place tensions at the heart of this thesis, but more importantly, in focusing on similarities as well as on differences, I can understand more about the compulsion to undergo identity work, and the negotiations needed to be judged as having a 'normal' ability to perform number calculations. I also want to be able to reveal things about the psyche of the individual. By deploying Lacan's psychoanalytical framework alongside Foucauldian conceptual tools I am enabled to search for the history of the present, and trace regimes of truths and consider how fantasies, fears and desires impact upon identity formation. In using a Lacanian approach, I explore the complexities of the relationship between the "culture and the psyche in the production of subjectivity and identity" (Henriques, 1984: x).

3.5 Summary: Rationale for looking to post-structuralism for this study

Although extensive research by NIACE (2011, 2012) has revealed the ways in which SfL brought about benefits to the sector, as Youdell (2006; 514) suggests:

... for some time researchers have been looking for tools for understanding, and strategies for interrupting material inequality through an engagement with language; a de-centred subject; and an unstable truth.

In situating myself as an insider to the field, I am also influenced by Brown and Jones' (2001) advice on how practitioners have a tendency to expect the research task to tell them 'how it is', so that they can then plan new strategies for the creation of new outcomes. Walkerdine (1998) also highlights the assumption that there is an easy relationship between research and practice. As she observes, practitioners often feel

guilty because they cannot simply produce the magic formula, and identify what to do to solve problems.

Within this thesis, I look to the ways in which the key actors (including myself) have been 'fed' discursive truths about a 'crisis in skills', the importance of the sector and the need for the precise nature of its reform (Osgood, 2010). Integral to this approach has been a rejection of Cartesian dualisms that seek to separate the body from the mind and, move towards a framework that can unmask how the psychic, the discursive and the social are intertwined (Archer and Francis, 2006). In Chapter 6, I then change the analytical path by turning attention to the locations of the structuring processes of lived experiences. The notion of habitus, according to Reay, is "a deep, interior, epicentre containing many matrices" (1995: 354), which can generate comments at the level of society, and layered at the site of the individual. In first analysing the narratives using Bourdieurian analytic tools, I appreciate how inequalities in education have come to be perpetuated, but crucially I can also understand how the processes by which the participants' visceral embodiment of the learning of mathematics affects learning in the classroom. These understandings are then mobilised to facilitate further examination of the cultural and symbolic landscapes of mathematics on offer within the FE sector.

In Chapters Seven and Eight I considered the notion of identity work and mobilise Lacan through a Foucauldian tradition, to reveal the ways in which the learner and teachers took up, negotiated with and resisted particular aspects of the discourses of best practice, professionalism and standards. Then in Chapter Nine, I maintain the Lacanian psychoanalytical framework to finally consider the forms of knowledge that are privileged by the participants. I look to the narratives to reveal what it is about returning to the learning of mathematics that is appealing to the adult learner, and to understand why stories of 'taming' mathematics are framed by anxiety and fear of a sudden return to loss of understanding and feelings of humiliation in the classroom.

Chapter 4: Methodology

This chapter sets out the rationale for the choice of methodological tools to obtain new insights into the ways in which the participants negotiated and reworked their (non)mathematical identities. This chapter is divided into five parts. The first reflects my own positioning as an insider within the field. The second concerns selection, recruitment and access to the participants. The third involves discussions of maintaining ethical practice, and the fourth the justification of the data collection tools. Finally, the fifth section is concerned with building a robust diverse framework from which to interrogate the data. A detailed reflection of the data collection process is given in Appendix Two.

Table 1: Timescale of study

Year 1 December 2009 – November 2010	Reading: compiling a bibliography Outline research design Refine research questions Train in qualitative techniques Gain ethics approval Plan for data collection
November 2010	Group discussion with initial sample of practitioners and negotiate site access to participant learners
Year 2 December 2010 – November 2011	Reading: compiling a bibliography Collect and transcribe data Present papers on methodological issues at conferences Conduct initial documentary policy analysis
December 2010 – April 2011	Life history interviews (learner participants) n=11
January – March 2011	Non-participatory classroom observations n= 7
February – July 2011	Semi-structured interviews (learner participants) n = 8
Year 3 December 2011 – November 2012	Organise, code and analyse data Present analysis of data at conferences Write peer and non-peer reviewed conference papers Change supervision team Re-negotiate research aims to interrogate identity formation as (non)mathematicians
Year 4 December 2013 – November 2014	Further analysis and recoding Complete documentary policy analysis Draft chapters Attend BSA and other specific study groups
Year 5 December 2014 – December 2015	6-month interruption to recover from surgery Submit thesis

4.1 Situating the self as a researcher

Having established the field of study, reviewed the relevant literature and set out the theoretical framework that will be put to use to examine the empirical data, this chapter begins by exploring the fragmentation of my once secure professional base, as I transitioned from teacher to doctoral researcher. I started teaching in FE soon after incorporation (in 1995), when morale was low and strikes common place. Teacher training was generic to the sector, with no particular attention paid to the specific

subject area. I trained to teach ‘basic skills’ to students with learning difficulties and disabilities. Support for ‘new’ and in-service teachers was virtually non-existent at this time. The limited teaching resources available were designed for children and ‘adapted’ by the individual teacher to meet the perceived needs of the adult learner. As SfL began to unravel from 2001, I was at the front of the queue for more information. I attended CPD events where possible, got involved in the consultation process for the new Numeracy Curriculum. I began to deliver professional training modules on behalf of CfBT, volunteered as a teacher participant on the *Thinking Through Mathematics* (TTM) project, and was invited to act as an advisory trustee for Adults Learning Mathematics (ALM) – an international research forum – and served two (non-consecutive) terms. In this capacity (as a representative of ALM), I was invited to attend two steering meetings for Maths4Life. This led me to co-author the ‘numbers’ booklet (Newmarch & Part, 2007) of the Maths4life collection, from where I was also commissioned to write a ‘critical’ reflection on the use of ‘learning styles’ in the classroom for the BBC’s Skillswise ‘expert’ teacher column (Teacher, 2011).

By 2003, I was a subject specialist teacher of mathematics (and teacher trainer designing and delivering the subject specialist qualification) and an advocate for SfL. I had taken on the pedagogic spaces, and negotiated my own practices through the socio-political discourses that appeared to be on offer. However, I began to resist the Strategy as talk amongst my peers became fixated with preparing Individual Learning Plans (ILPs) for inspection. I shuddered as learners were described and categorised as ‘low-hanging fruit’ and ‘hard to reach’ and as the culture of performativity tightened, I became increasingly critical. I resisted as sharing practice began to turn into a requirement to demonstrate ‘good practice’, and then finally being compelled to position myself as demonstrating ‘best practice’. I enjoyed teaching and teacher training, but by 2009 a combination of failing health, poor working conditions and redundancies led me to leave the sector. As I formalised my research proposal, I realised I did not seek ways to persuade the learner to engage with the mathematics on offer to them, but I wanted to understand more about the ‘resistance’ that I had continuously encountered in the classroom. In conducting the literature review, I realised that I would need to challenge not only my assumptions about the ways in which adult learners ‘should’ be encouraged to learn, but more importantly, how

without noticing I had come to form these assumptions as 'real' indicators of learning behaviour.

Fragmentation, according to Brown (2011), is a powerful defence that enables the individual to maintain the illusion of fulfilling a fantasy (in my case of having been a 'successful' teacher), and in confronting my practices through a broadly post-structuralist framework, I am fascinated by my discursive positioning of the 'ideal' teacher. I am increasingly interested by the ways in which my own identity as a teacher has begun to fragment as I have removed markers of professionalism that I once privileged. In exploring the narratives of the participants of this thesis, I have also come to understand the ways in which my own perceptions (as an insider) have continued to attract confusing, complex and interesting academic and practised-based conversations; not only of taming mathematics, but also neo-liberal discourses of performativity. On revealing the technologies of power that kept me working within the dominant pedagogic discourses, I still cannot, in full, subscribe to Foucault's earliest conclusions that, as a human subject, I simply yielded to discourses of policy. I maintain that many of the recommendations made by Moser (1999), implemented by technologies of control for the purposes of surveillance (for example CPD, peer observations and the curricula), 'worked' in the classroom. In recognising the limitations, I argue that through mobilising a broadly post-structuralist approach, I can glance at how (in meeting the perceived demands of the culture of performativity) the ambiguities of the once rich tapestry of mathematics and of learning (Hillier, 2006) have been lost.

The purpose of this research is not to seek a unified understanding of a 'good' teacher, a 'good' learner or 'good' practice, but to interrogate identity work as individuals and collectives speak to the different demands that they perceive as being asked of them, by the big Other. I interrogate public discourses to seek new understandings of subjectivity and deconstruct identity work as the participants negotiate expectations brought about by a culture of performativity. I combine theoretical frameworks to interrogate how learner participants (and to an extent their teachers) negotiate and rework their (non)mathematical identities in and between the dominant public discourses, disruptions of policy cycles, changes in curricula, and reduction of

educational spaces that remain available to adult learners. I also maintain Bourdieu's framework to think about the ways in which individuals embody what it means to 'be' a mathematician and/or 'do' mathematics in a classroom setting. In taking this approach, I have endeavoured to maintain a sense of the messiness of the processes of learning.

4.2 Selection, recruitment and access to the learner participants

The participant sample was non-probability based and purposively constructed to capture the breadth of learning contexts within the sector. The sample of learners was drawn from a pool of eight participant teachers (three men, five women), four of whom were in full-time employment, with the remainder employed on a part-time / fractional basis, all of whom, to a varying degree, interwove mathematical discussions (as a pedagogic approach) into the learning of mathematics. The pool of teachers was selected from five different forms of provision and included discrete and embedded mathematical programmes. The sample consisted of:

- discrete numeracy settings, including an adult education college, a residential women's college, community out-reach family learning provision within a primary school, and work-based learning (classroom assistance);
- embedded numeracy provision, including foundation tier (business), ESOL learners (IT) and an access to HE programme (nurses and teachers).

Table 2: Details of the sample of participant teachers

Pseudonym	Type of provision	Gender	Ethnicity	Class origin	Type of contract	Years of teaching experience	Highest mathematical qualification	Highest qualification
Jane	Head of Basic Skills Adult Education (AE)	F	White British	Working class	Full time	30+	Degree	MA modules in education
Sarah	Advanced Practitioner Further Education (FE)	F	White British	Working class	Part time	8	'O' level	PGCE adult education
Simon	Practitioner Outreach Family numeracy	M	White British	Working class	Hourly paid	2	'A' level	Certificate in Adult Education
Phil	Advanced Practitioner Adult Education (residential)	M	Asian British	Middle class	Full time	30+	Degree	Masters (education)
Caroline	Advanced practitioner Work Based Learning	F	Asian British	Middle class	Full time	13	Degree	PGCE adult education
Ayo	Practitioner AE	M	Black African Nigerian	Working class	Hourly paid	1 (UK) 10 (Nigeria)	Form 6	Certificate in Adult Education
Elizabeth	Teacher trainer FE	F	Black African British	Middle class	Full time	22	'O' level	Masters (education)
Kate	Head of faculty FE	F	White British	Middle class	Full time	26	Degree	Masters (education)

In total, a sample of 11 adult learners (aged 19 and over) included:

- five learner participants returning to the classroom to study discrete mathematics, six studying mathematics embedded within a full-time, vocationally based learning programme;
- a range of learning outcomes (from **Entry Level to Level 2**);
- a range of qualification aims that includes **paper-based GCSE mathematics**, Adult Literacy, Language and Numeracy (**ALLN**) **online testing**, **paper based Functional Skills (FS) mathematics**, Open College Network (**OCN**) **portfolio assessment**, and a **non-accredited course**.

Table 3: Details of the sample of participant learners

Pseudonym	Research start date	Type of provision	Curricula and qualification outcome	Curriculum level	Type of study	Age	Gender	Ethnicity	Class origin ⁵
Alexandru	Dec 2010	Further Education	Embedded functional skills mathematics	Level 1	Full time	22	M	White Romanian	Working class (rural)
Jalal	Dec 2010	Further Education	Embedded functional skills mathematics	Level 1	Full time	29	M	Moroccan Asian	Working class (rural)
Fatima	Dec 2010	Outreach Family numeracy	Discrete numeracy non accredited	Entry level	Part time	23	F	British Asian (first generation)	Working class (urban)
Philly	Dec 2010	Residential Adult Education	Discrete numeracy non accredited	Entry level	Part time	63	F	White British	Upper Middle class
Karigaliana	Feb 2011	Work Based Learning	Discrete GCSE mathematics	Level 2	Part time	49	F	White Lithuanian	Working class
Steve	Feb 2011 (joined with Abul)	Further Education	Embedded OCN portfolio	Level 2	Full time	24	M	White British	Working class
Abul	Feb 2011 (joined with Steve)	Further Education	Embedded OCN portfolio	Level 2	Full time	23	M	British Asian Bangladesh (first generation)	Middle class
Sandra	Feb 2011	Further Education	Embedded OCN portfolio	Level 2	Full time	43	F	Black British	Working class
Tony	March 2011	Adult Education	Discrete ALLN Numeracy	Level 2	Part time	50	M	Black British (first generation)	Working class
Susan	April 2011	Further Education	Embedded Functional skills mathematics	Level 1	Full time	19	F	Black British	Working class
Kath	June 2011	Work based Learning	Discrete GCSE mathematics	Level 2	Part time	35	F	White British	Working class

⁵ The participants were asked to describe their demographics

4.2.1 Recruitment

Heterogeneity, multiplicity and difference are central tenets of the post-structuralist framework, but it is in catering for diversity that sampling becomes a fragile process. Theorising positioning requires conversations about the negotiations of the subjectivities on offer through demands from the constellation of discursive practices that constitute the individual's sense of self, for example the responsible citizen, adult learner, carer, woman, worker etc. Each perception of the subject position signifies aspects of the self, and each carries ambiguities that invite conflicting meanings that shift in relation to the context from which the individual seeks to make meaning; for example, the interview, the classroom, the mathematical problem etc.

As explored in Chapter three, positioning is theorised as something that is fluid and partial. It is always in construction and is never complete. I have critically rejected research methodologies that talk of a unified and rational being, of 'capturing' the essence of the person and/or the loci of identity formation (Clegg, 1989). Critical 'realists' in education (such as those following Marxist / Freirean frameworks) in looking for generalised theories, require a highly systematic sampling process that "seeks to reduce complexity by selecting out what is most important on grounds predetermined by the theory ... that guides the interpretation of the data" (Hammersley, 2008: 41).

However, in searching for diversity, I am not pursuing the Modernist goal of neatness brought about by careful synthesis of evidence. Nor am I searching for the unity of practitioner 'tool kits' that has characterised the evidenced-based research that I encountered as a practitioner. In staying within a Foucauldian tradition, I seek the complexities and the multiplicity of the forms of knowledges that are (and are not) on offer through the discursive practices. I kept the criterion for inclusion flexible, but have paid significant attention to the variation within the types of provision, and the mathematical curricula. Through engaging with multiple spaces of mathematics, I have, as Fine (2003) suggests, provided the strongest measure of confidence that my findings will not be unique to the particularities of this sample group.

4.2.2 Access to participants

Access to the learners was surprisingly straightforward to navigate. In line with academic discussions of concern about the morale of the sector, all of the participant tutors made informal arrangements, rather than request formal permission from their place of work. This included a practitioner who was also a head of faculty, two senior practitioners (who as part of a new contract needed to defend their role through recording and measuring the impact of their work on the quality of teaching within their institutions), and another senior manager who managed the basic skills provision within their organisation.

Table 3: Schedule of data collection per provision November 2010 – June 2011

Schedule of data collection	Data collection sites	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Group discussion (practitioners)	University								
Life history (learners)	Further Education College								
Classroom observation	Functional Skills (ESOL) Embedded								
Semi-structured interview									
Life history (learners)	Further Education College								
Semi-structured interview	OCN portfolio Embedded								
Life history (learners)	Further Education College								
Classroom observation	Functional Skills Embedded								
Semi-structured interview									
Life history (learners)	Work-based learning								
Classroom observation	GCSE mathematics Discrete								
Semi-structured interview									
Life history (learners)	Residential Women's College								
Semi-structured interview	Non-accredited Discrete								
Life history (learners)	Adult Education College								
	ALLN numeracy Discrete								
Life history (learners)	Community out-reach								
Classroom observation	Non-accredited Discrete								
Semi-structured interview									

4.3 Ethics and anonymity and collecting data

Knowledge is power and, as Andrews (2000) reminds us, by employing a life history method participants are asked to divulge details about (potentially) the most intimate aspects of themselves. In choosing to start the research process with a life history

interview, I brought issues of ethics to the forefront of the interview space. In planning to avoid causing harm to the participants, I conducted a literature review to trouble what I thought I knew about being an ethical researcher. I agreed with Nespor (2000) in that, whilst most academic discussions and research guides drew attention to ethical dilemmas, most gave unproblematised accounts of anonymity and confidentiality, simply universally situating the practice as common place. I agreed that the discussions of anonymisation that I read were:

... no longer questioned, examined, or viewed as problematic, but . . . taken for granted. The problem with such tools, useful though they may be, is that they conceal all sorts of assumptions that need to be scrutinised, and fit together representational genres that make certain kinds of accounts easier and others harder to articulate (Nespor, 2000: 546).

However, I found the processes of anonymity and confidentiality far more complex to navigate than I had anticipated. As a qualitative researcher, I needed to provide an ‘open and honest’ account of the data collection method, but in committing to the ethical practice of anonymity, particularly with regards to protecting the sites of the provision, I have found it increasingly difficult to provide insight into learner choice. Ironically, in calling attention to this particular ethical debate, I have raised the probability of identifying the workplace and therefore the possibility of identifying the teacher participant. There are few adult education, female only residential colleges in England, but this data is vital to the analysis, especially in Chapter six. In addition, at the time of the research, there were few institutions that provided GCSE curriculum for candidates involved in work-based learning, as most followed the policy directive and offered ALLN Numeracy or Functional Skills mathematics. Therefore, to talk of GCSE work-based learning is also to risk identifying the institution. However, it is these nuances, the (dis)continuities and tensions that are brought about by the experience of learning in one type of institution, or curricula, as opposed to another that are central to the discussion threads of this thesis. In having agreed to confidentiality and anonymity amongst the tutor participants, and in personally agreeing with the underlying philosophical need to protect the identities of research participants, I find myself with the very ‘real’ risk of unintentionally identifying a tutor. This may expose them to potential risk of embarrassment and/or professional harm, especially to those who hold less powerful (albeit privileged) positions within

their institution. It is for this reason that I am not providing the dates of the courses and/or the location within England.

A second ethical dilemma concerned one of the learner participants. In taking a life history approach, I elicited multiple layers of rich data that would enable me to disrupt the stories and reveal hidden components in ways that would glance at the silenced lives of the participants (Osgood, 2010). Philly expressed a strong desire to maintain her real name. On being asked why, she stated she wanted to provide 'hope' for other adults facing similar difficulties to those that she faced (and continues to face), in her every day and 'learning' life. I had been convinced by Nespor's (2000) argument that identification of a participant may not necessarily lead to an assumption of injury on public recognition, and agreed at the time to maintain her name. In engaging more deeply with her narratives, I became concerned by my decision. I had invited the participants to construct stories, but in making the decision to 'story' Philly's narratives, I 'colonised' (Du Gay & Hall, 1996) her narratives by selecting partial components to interrogate the location of power within the specific social, cultural, political contexts of her decision to return to learning. On speaking with my new supervision team, I realised that I would need to impose a pseudonym on her identity, to protect her from the analytical path I had chosen. These are just two instances where I have had to confront the paradoxes inherent within adhering to the philosophical ideal to protect the research participants from the possible implications of participating in the project.

Having highlighted the troublesome subjectivities of configuring an identity as an 'ethical researcher', I have endeavoured to balance my responsibilities through using strategies (as in Chapter eight) such as not allocating a gender to the teacher label and/or associating the tutor with a particular institution. Importantly, given the length of time that has lapsed between the field work, and when the analysis will be made public, the inherent risk of identification has decreased, which merits the continued effort to anonymise the data without compromising the integrity of the analysis.

4.4 Justification of the data collection tools

Qualitative inquiries tend to be analysed through the nuances of the data collection tools, and I wanted the scope to be able to use ‘open’ story telling techniques to glance at the multiple and shifting understandings of ‘being’ a (non)mathematician, and to analyse concrete practices of the participants ‘doing’ mathematics in the classroom. What I offer is an understanding of a decentred subject through a research paradigm that positions stories as constant constructions, but in ways that are also constitutive of the social encounter (Stentoft & Valero, 2010). Mathematical trajectories are understood, through a Lacanian lens, to be fed as much from the lived experiences of returning to the classroom, as fantasies of ‘doing’ mathematics or ‘being’ a mathematician (Brown *et al.*, 2006). Interrogation of the learners’ narratives will not be conducted through a linear account that is characteristic of the socio-cultural paradigm between what is assumed to be the signifier (the teacher), and the signified (the learner), but with how signifiers become subjects of another signifier, with particular attention to the discourses of best practice, professionalism and standards (Stentoft & Valero, 2010).

Herbert (1989) argues that the best way to seek diversity whilst maintaining richness of data, is to include multiple processes of data collection. In planning to vary interaction, the intent was to increase the conditions of possibilities to narrate stories in unusual ways. Consequently, my approach included two different forms of interviewing, non-participatory observations, and was supplemented by documentary policy analysis. The study involved working with eight tutors, all of whom held privileged positions within their organisation, and 11 adult learners. In total 26 hours of interview data were recorded and transcribed verbatim. In addition, 5 hours of classroom observations were recorded and then summarised using a table format. Where narratives from the classroom were put to work in the study, the extract was transcribed verbatim.

The main methods for data collection included:

1. documentary policy analysis to deconstruct the dominant public discourses of mathematics, numeracy, and the numeracy learner

2. an informal group discussion to gain insights into how the initial sample of teachers negotiated, resisted, and took up the discourses of best practice, professionalism, and standards
3. life history interviews to listen to which aspects of their mathematical encounters they privileged, and which remained hidden/silenced
4. non-participatory classroom observation of learners ‘doing’ mathematics in the classroom
5. semi-structured interviews to gain insight into how the learners undertook identity work to make sense of being judged as (non)mathematical.

4.4.1 Document analysis

Gleeson *et al.* (2005) claim that sociological interest in the field has in the past focused on FE practitioners as either the subjects of market and managerial reform or as creative agents operating within the contradictions of audit and inspection cultures. In this thesis I do not intend to analyse ‘practice’ (Du Gay & Hall, 1996: 2). Instead, I ask different questions of the histories of the present forms of practice and have sought new methods to interrogate the ways in which lived experiences have come to shape how we think about ‘practice.’ In line with Foucault’s (1966: xiv) remarks, “the purpose of discourse analysis is not of knowing the subject, but rather a theory of their discursive practice”. Foucault frames discourse as both organised and regulated in ways that sustain the illusion of the Humanist assumption of the autonomous individual.

Discourse is not simply that which translates struggles or systems of domination, but is the thing for which and by which there is struggle, discourse is the power which is to be seized (Foucault, 1981: 52).

Foucault (1980) highlights the importance of interrogating not only the dominant public discourses but also the discourses of the key actors as they arise within the specific field of interest. This requires a tool kit that will allow me to reveal the technologies of power that operate within and through the public discourses and identify the kinds of practices and knowledges that are on offer to the actors within the field. According to Walshaw, it is possible to interrogate the “taken for granted rules that specify what it is possible to speak do and even think at particular times” (2007:

19). The intention of this part of the research is to expose technologies of power that have come to objectify the positions available to adults returning to the classroom (refer to Appendix Two for details of the sampling process for the documents analysis). By interrogating the production of policy discourses and the accompanying media campaign, I reveal the discursive construction of numeracy, the numerate citizen, the numeracy learner, the numeracy teacher and the normalised criterion of best practice (Brown *et al.*, 2006).

4.4.2 Teachers group discussion

Hall (2000) argues that methods of data collection require discussions of a particular object, in this case best practice. It is only once the object has been attributed with values and situated within an historical and geo-political context that individuals, and collectives, can grapple with tensions created by different discursive constructions, in this instance of best practice and success. Inviting practitioners with a professional reputation of engaging in ‘best practice’ does not come from a personal belief of innate or natural qualities of gifted teachers. The criterion was set because of the particularities of the tensions and complexities of the subjectivities constituted by the notion of best practice. In conducting a group discussion, I stimulate a synthesis of ideas that unveil (and conceal) things about teaching and learning in the sector. I treat the text as a product of a discussion that has been collectively constructed through stories that involve ideals of belonging to the notion of best practice. I argue this approach will unveil some of the unproblematised assumptions that these subjects of best practice hold about notions such as learner agency, individualised planning and learning ‘choices.’

4.4.3 Life history interview

Andrews (2000b) writes that individuals use the act of story-telling as a means to make sense of the social worlds in which they operate. This research is motivated by the notion that it is possible to interrogate the discursive practices of the individual, to gain insights into the ways in which they operate in (and are operated on) by the social world. Within a broadly post-structuralist paradigm, Hall (2000) suggests that through the telling and the retelling of unfolding stories, subjects provide the texts through which it becomes possible to theorise how people come to think, live and speak in

ways that will help me to give an account of unfolding mathematical selves. I was attracted to the idea of a richness in narratives that would enable an interrogation of how stories about encounters with mathematics are structured, produced and consumed within and through the disciplinary, pedagogic and policy discourses that produce the field for the adult returning to the classroom (Pheonix, 2008).

Life history interviews are productive of stories; they are not discrete accounts of past encounters with mathematics. Through the narrative processes that the participants construct their stories it becomes possible to reveal the layers of ambiguity of the types of mathematical spaces available to them. The complexities, tensions and contradictions that lie within the life history provide insights into the effects of power of the social, geographical and historical manifestations of mathematics in ways that illuminate how subjectivities are shaped. Through paying attention to the types of 'noise' that accompany learning I can, as Kohler Riessman (1992) suggests, make sense of the ways in which hidden stories come to be revealed in and through participation in the classroom.

Ritchie & Lewis (1994: 115) suggest that the researcher return to the purpose of their study (in this case the research question) to re-imagine the troubling thoughts that motivated the research.

As an aide-memoire, the topic guide offers a tool to enhance the consistency of data collection ... It helps to ensure that relevant issues are covered systematically and with some uniformity, while still allowing flexibility to pursue the detail that is salient to each individual participant. ... (It) should be seen as a mechanism for steering the discussion in an interview or focus group but not as an exact prescription of coverage.

In returning to my research questions, I devised four key areas; biography and influence of influential others; doing mathematics; being a mathematician; and the purpose of (re)learning 'mathematics' as an adult (refer to Appendix Four for a copy of the guide). I was mindful to avoid creating a deficit model and wanted participants to be able to identify their own personal as well as mathematical strengths, however I now realise that this approach stemmed from my own assumptions that barriers to learning can always be uncovered and ultimately overcome. I realised that some participants may simply not create stories and may prefer to respond to questions, so I

planned for a transition into a more structured interview if the need arose. I constructed a table that enabled me to ask purposeful questions, but without changing the format of the interview into a semi-structured space (see Appendix Five).

4.4.4 Non-participatory observations

Asking a participant to relay (with examples) what mathematics has come to mean to them, and to describe the sort of mathematician they aspire to be, is abstract and almost impossible to visualise, let alone answer. So being able to ask these valuable but abstracted questions needed to be planned in meaningful ways and I was taken by West's rationale for using observations in his research.

To investigate how the learners, the teachers, the researcher, and the audience may consciously or tacitly attempt to construct an objective learning environment of normal learning habits and behaviours through the discursive production of meaning (West, 1996: 89).

The second phase of data collection focused on ‘naturally’ occurring data, the observations of which would form a platform to plan the questions for the final interview. Observations provide contextual information that can be recalled to encourage discussions, and the language produced within and through the classroom provides insights into power structures. This will combine with the other forms of text, to generate new insights into the processes by which these participants have taken on, negotiated and resisted the subjectivities they perceive to be on offer to them, within the sector.

4.4.5 Semi-structured interview

Bryman (2008) suggests that semi-structured interviews allow the researcher to move the research process away from agenda ‘setting’, towards agenda ‘testing’, and I wanted to be able to discuss what (re)learning mathematics meant to the individual. In preparing for this final phase of the research cycle, I returned to my original topic guide. I re-read and initially coded the life history interviews for each of the participants, and then in relation to the topic guide headings, devised individual questions for each participant to ‘fill in’ the gaps from their life history interview. Once I had a ‘feeling’ for the content and the gaps of the life history material, I returned to the research questions and devised the semi-structured interview.

Appendix Five outlines the topic guide and the preparation for the semi-structured interview.

4.5 Analysing the data and organising the data

4.5.1 Critical discourse analysis in a Foucauldian tradition

Tamboukou (2008) uses Foucault to reveal how practice is negotiated and/or defined as ‘legitimate’ through the subjectivities produced within discourse. This enables an interrogation of the particular ways in which voice is authorised, contested and/or silenced. This is an approach that challenges assumptions about agentic choice, and interrogates the diminishing spaces of ways to know, which for this thesis involves questioning what it means to the individual to be judge (and to be judged) as (non)mathematical. Mendick (2005) and Mendick *et al.* (2008, 2009) reveal how discourses provide the range of positions from within which, individuals can then mark themselves as being (un)able to ‘do’ mathematics or ‘be’ a mathematician.

By starting with a critical discourse analysis, I was enabled to identify the ways in which discourses produce particular ways of thinking, by paying attention to aspects of written texts (curriculum, teacher training frameworks, policy etc.). In Chapters six through nine, I then draw upon discourse analysis of research data to seek new understandings of the ways in which the actors perpetuate the conventional myths of ‘normal’. In adding to Foucault’s discourse analysis, I then apply a Lacanian reading of the ‘big Other’ to conceptualise certain practices as ‘real’, to reveal what the learning of mathematics feels and looks like to the participants in this research. This will enable me to come to a new understanding of how norms come to be so entrenched that it makes particular forms of practice possible/impossible, often in distressing ways (Walshaw, 2007). However, before offering an analysis of the stories of ‘taming’ mathematics, I first want to provide a structured account to maintain a sense of the ‘people’ behind these complicated and paradoxical narratives of (not) ‘taming’ mathematics.

4.5.2 Storying the participant

In starting the analysis of the storied empirical data through Bourdieu's tools of habitus, field and capitals, the intention is to establish a sense of the human that lies behind the identity work. I deconstruct and theorise the historical conditions that have created the possibilities of truths, as they have come to be understood by the individuals. Having reached an understanding of the structural account, I then move towards a Foucauldian tradition of psychoanalysis, to deconstruct why ambiguity and uncertainty is resisted in the mathematical classroom and why seemingly 'successful' encounters of mathematics can be met with resistance, dissatisfaction and challenge.

Lawler (2008) suggests that the 'truths' people produce through stories are not 'truths' as conventionally understood in positivist social science. In the post-structuralist condition, stories are always contested, and where reality is constituted it is viewed with caution and is, at best, an unstable approximation of the dominant discourses, or what Foucault (1972) coined as "truth games". In broadly adapting a case study approach for Chapter six, the analytical task is not to replicate the 'truths' about these participants, nor to determine aspects of their 'core' learning selves. By opening up and 'storying' the individuals, I establish new connections between theory and practice. I draw attention to the particular ways in which this sample of learners has structured stories of their mathematical selves; as subjects of the academic discipline of mathematics, of numeracy, and of being judged against discourses of the enterprising and responsible citizen. I make use of the 'truth effect' (Walkerdine, 1984), but in doing so I am also in conversation with the emotional content of the stories. As Brown (2011: 97) posits:

The personalities that we are seeking to learn about can only be read against certain backdrops where we as researchers and they themselves seek to understand how personalities and research perspectives and backdrops and discourses and external demands and aspirations, and more come out in the wash.

Brown *et al.* (2006), working within a context of teacher training, also turn to the stories of the individual to demonstrate how language alone fails to reveal the complicities of making sense of lived experiences. Through mobilising a Lacanian framework, they problematise the assumed cohesiveness of the hermeneutic process and tease out the ways in which discussions are productive of the symbolisations of

what is judged as best practitioner. They demonstrate how, by idealising discourses of standards, fantasies and fears of (not) being judged to deliver ‘best’ practice structure practice.

Although this discourse contains much that can be valued ... as a series of conceptualisations of teaching it lies some distance from and tends to obscure a more fundamental series of psychic and social processes ...a series of conscious actions, unconscious processes, interactions, and conversations, impulses and responses, planned activities, disruptions (Brown *et al.*, 2006: 62).

Walls (2009), working within a primary school context of learning mathematics, also draws on Lacan through a Foucauldian tradition, to interrogate how stories include fantasies and fears, which feed into practices that construct individual and collective actions within the classroom. Walls (2010) works through how, when a person hears, does, sees, and/or speaks of mathematics, they become entangled in mathematical constructions of the self. She interrogates how, when an individual asks for help with calculating a cost, or on encountering a (non)mathematical character on television, discusses an encounter of mathematics, they do so both as a human with fantasies and fears, and as a mathematical subject. In ‘storying’ the participant, my intention is to establish a sense of the “history of the different modes by which, in our culture, human beings are made subjects” (Rabinow, 2002: 326) in relation to discourses of numeracy, employment, and of the numerate citizen.

Walls (2009, 2010) is not the only author working within a post-structuralist tradition, to ‘story’ the individual. Black *et al.* (2009) also put the thoughts of Walkerdine (1998) to work, to investigate the complexities of the connections “rather than the separations into discrete persons acting on and as subjects” (Black *et al.*, 2009: 73). They illuminate how material structures create a sense of the mathematical, and interrogate the spaces within the discourses that the ‘storied’ individuals occupy:

... we do not ask ‘is x true?’, but rather ‘what makes x possible?’ And ‘what are its effects?’ ... This is a switch of focus which foregrounds not the individual and their choices and abilities, but the ways that people are assembled.

4.6 Organising the data

Initially, I used NVivo to organise the data, however due to health concerns related to the number of hours looking at a computer screen, I moved towards traditional paper-based methods, which I found to be a surprisingly useful turn in my analytical approach. On initially using NVivo, I had to remind myself to move away from reading the narratives and return to listening to the interviews. With the physical movement away from a small computer desk to a large table, I simultaneously listened to and read the scripts, whilst continuously dipping into my journal notes to remind myself of the details of the interview space. This was time consuming, but it ensured I was deeply immersed in the data. At the beginning of the analysis, I examined the stories line-by-line, and annotated on the interview script which of the four topic guide categories the narrator was in conversation with. This kind of close examination ensured that I maintained a reliable coding frame, however as I reduced the data into more manageable chunks (Mason, 2002), I found that I was left with fragmented abstractions that had become separated out from the context of the individual. On Rapley's (2007) advice of ways to maintain a connection with the narrators, I drew up a participant table, and copied the main quotes that had spoken most clearly to the topic guide. Appendix Six gives an example of a participant table.

I organised the data from the non-participatory observation in the following ways. First, I described the classroom setting, including the mathematical topics, and materials used. I then transcribed the points at which there were specific interactions between the teacher and research participant. I also transcribed the extended conversations between the participant and their peers. Second, I brought in the details from the semi-structured interview. I focused on the participants' recollections of the learning experience, and matched this with my observations in class. Finally, I constructed a table to thematically compare experiences of 'being' a mathematician - working alone or in collaboration - and 'doing' mathematics. Although I had already decided not to focus an analysis through the lens of institutional habitus, for the ethical reasons outlined in section 4.3, I decided to compile a table to thematically organise the data as this would help to formulate interpretations. For each institution, I used a table to facilitate a comparative analysis, compiled from observation notes,

transcriptions from the mathematical discussion, and data from the semi-structured interview.

The second phase of analysis was to reorganise the data for retrieval (Mason, 2002). In Chapter six, I opened the theoretical lens to maintain a holistic view of the individual. I returned to Mason (2002), Clough (2002), Rapley (2007), and Hollway and Jefferson (2013) to critique and problematise the site of the individual and decided on a mind map to track, in a holistic way, the accounts that had given the most detailed life history. I achieved this by returning to the topic guide and organising the data in ways that would visually contrast the narrative trajectories of each of these participants. In order that I could ‘retrieve’ quotes, I then produced a further participant table to thematically organise and ‘store’ the quotes. These tables were primarily reconstructed from stories arising from the life history interview, but where appropriate, quotes from the lesson observation and the semi-structured interview were included. For Chapters seven through nine, I turned to a thematic analysis. I took a psychoanalytical approach and mobilised a Lacanian account of the psyche and, in a Foucauldian tradition, returned the focus to the regulatory gaze, the processes of subjectivities and the effects of subjectification.

4.7 Summary

In taking this unorthodox analytical approach, I argue that I can give an account of the lived tensions as narrated by the participants. But I can also draw attention to the possibilities that lie outside of immediate accounts. From Chapters seven through nine, I make use of the full sample of participants, and put their texts to work by moving towards a theme-based interrogation of the range of subject positionings and performances of the assumed demands made by hegemonic discourses of the sector.

In the next chapter, Chapter five, I undertake a critical discourse analysis of policy to reveal the technologies of surveillance and discipline, and in doing so, I develop analytical space to ask questions about the manner of the production of policy discourse, and the processes that objectify ‘Numeracy’, the ‘Numeracy learner’ and the ‘Numeracy teacher’. Personal constructions of mathematics reveal insights into how these participants have positioned their (non)mathematical selves within social

space, and through discursive configurations of the self. Then in Chapters seven through nine, I return to Foucault's theoretical tool kit of power / knowledge relations and the technologies of power, in combination with a Lacanian understanding of the 'big Other', to unmask how participants, as subjects, continuously slide across different subject positions (Brown, 2011) and perform particular configurations of success.

Chapter 5: Historical locations

Neo-liberalism connects political, social and institutional discourses through a web of discrete, but interrelated, technologies of power that sustains what is deemed, by the most powerful groups, to be ‘common sense’ practices of the self. Within neo-liberal culture, discourses of mathematics and psychology are particularly deployed to construct what Walkerdine (1998: 214) refers to as “reason’s dream, an idealised and calculable universe”, obliging the individual to not only exercise but demonstrate their ‘freedoms’. The opening chapter sets out the chronology of the transition of policy from its ‘classical’ liberal roots, to the contemporary ‘neo-liberalism’ framings that form the boundaries from which policy and strategies can be debated. I touched on the consistency of political discourses that since the 1860s have divided the adult population into categories of perceived levels of (in)competence in ‘basic’ literacy and mathematical skills.

In this chapter I start with a Foucauldian framework and examine how public discourses position learners as particular kinds of subjects, from which power relations and forms of mathematics are inscribed. I mobilise Walkerdine (1988) to think about the effects of these power relations through paying attention to ‘common sense’ understandings of ‘truths’ about people and mathematics. Whilst Foucault (1977) is concerned with interrogating how individuals perform acts of self-crafting, he does not seek understandings of social relations. To converse with the empirical data and further understandings about processes of otheringness, I supplement the Foucauldian analysis through turning to Baker (2010) and Ahmed (1998) to deconstruct how the subjectivities of ‘otherness’ rely on discourses of the moral economy, where individuals are judged in terms of holding a capacity to engage in a project of the self. In taking the approach of mixing the theoretical frameworks I can then, in Chapters Six through Nine, reveal the ways in which the participants undergo identity work to negotiate being judged as (non)mathematical and reveal things about the expectations, and demands, brought about by the transformation of the self.

5.1.1 Numeracy linked to productivity

I start by framing the ways in which adults, assumed to be in need of basic education,

occupied crucial spaces (albeit at the fringes) within key policy texts, during codification of compulsory schooling in England. In this chapter, I turn to Cohen (1982, 1999, 2001), writing in an American and British context, to establish how educational discourses that sought to secularise knowledge have inextricably conflated basic skills acquisition, with the Humanist production of the autonomous, self-regulating, and enterprising citizen.

Numeracy spread in the early nineteenth century under the influence of two powerful attitudinal changes: the extension of the commercial, or marketplace, frame of mind and the growing dominance of certain ideas associated with the fostering of democracy, especially the notion that rationality in the greatest possible number of people was desirable (Cohen, 1982: 148)

Rose (1996) and Walkerdine (1998) extend Cohen's works by interrogating the processes by which regimes of truth, about cognitive development, the production of evidence, and the desire of certainty, become established. The development of statistical analysis, to compare and analyse the individual against a norm, formed a new regulatory gaze to monitor logic, reasoning and civility, to activate (and monitor) those assumed to possess the 'right' characteristics for enterprise. Walkerdine (1998), in particular, points to the spate of enquiries into the state of technical education in the UK, in the political aftermath of Britain's poor performance in the 1867 Paris Exhibition. In doing so, Walkerdine contrasts Hillier's (2006) account of the birth of schooling, surmising the purpose as the production of an elite class who could reason, and the proletariat who could be made "reasonable in order to be governed" (Walkerdine, 1998: 214). She foregrounds the spate of reports (Samuelson *et al.*, 1884) that sustained the *Technical Instruction Act 1889*, as the emergence of statistical modelling, from which dominant discourses of 'normal' citizenry became established. The proof from this the government could then use to divide the population into different 'types' of citizen.

5.1.2 Markings of difference

Constructing educational needs through discourses of social class, *The Taunton Report* (Schools Inquiry Commission, 1868/ London: HMSO)⁶ remains significant to this day.

⁶ The last of three policies, that Gillard (2011) categorises as class divisions – *The Clarendon Commission* (1864), *The Newcastle Report* (UK, 1861), *The Taunton Report* (UK, 1868)

The organisation of schooling, according to the social class of the parents, was aligned to “patterns of curriculum differentiation” (Goodson, 2001: 23) and configured in three particular ways. Goodson (2001: 22) deconstructs how:

The ‘first’ curricula, the academic tradition of the grammar schools, destined its pupils for the learned professions and higher administrative and business posts. The more utilitarian curriculum in the technical schools was for the pupil destined to work in ‘applied science or applied art’. Whilst for the future manual worker ... the emphasis was on utilitarian and pedagogic curricula; those studies were to make ‘a direct appeal to interests which it would awaken by practical touch with affairs.

Smelser (1991) suggests that the report did not only reveal the classed barriers put into place by the political organisation of schooling, but also configured parents as choosing the mode of attendance (of their children’s’ schooling) based on classed grounds. The highly skilled artisans of the middle class were constructed as enterprising, who realised the importance of education, and who had the means to educate his child beyond the age of 18. These parents were assumed to privilege the learning of ‘classics’ over technical instruction. The ‘second’ configuration was the ‘lower middle class’, the parents of whom were discursively framed as having limited financial means, but wanting their child to receive education until the age of 16. Crucially this curriculum comprised both classical forms of knowledge and practical instruction. The ‘third’ and final production consisted of the ‘masses’, able to sustain the child in education until the age of 14, but through a curriculum that excluded classical forms of education, in favour of practical instruction and reading, writing, and arithmetic, which was assumed to “improve morality” (Smelser, 1991: 67). In consequence, the Taunton Commission relied on discourses of the ‘goodness’ of education. Through classed trajectories that constructed ‘really useful knowledge’ for the few, as ‘useless’ for the masses, who were judged to be lacking the necessary characteristics to develop rational thought (Johnson, 1993). The following quote from *The Taunton Report* (Report of the Royal Commission [The Taunton Report], 1868, quoted in MacLure 1986: 94), reveals how the social situation of the parent was relied upon to prescribe the length of time the boy would spend in education:

These parents consist of two classes. On the one hand many of them can afford to keep their children in school ... the special preparation of which should start at 16; as for instance the army, the highest branches of the medical and legal

professions, civil engineering and some others. On the other hand, there are some parents whose position in life makes them require their boys to begin at 16 ... to find their own living.

The first would no doubt accept Latin as an important element of their education... but the great mass of the other class seem disposed to barely tolerate Latin ... I have been assured by several men of business that few things would please them better than an attack upon classical studies ... but some of them are not insensible to the value of culture in itself, nor to the advantage of sharing the education of the cultivated classes.

Within this script, the first category of parents were imagined as devoid of gendered, classed or raced markings of difference, and as such in reworking the thoughts of Ahmed (1998: 52) can be seen as abstracted from “the contingencies of the social, including the bodily realm, in order to fulfil the criteria of universality.” This subject was constructed as the ‘ideal observer’; masculine, rational and in control of their own success. In reworking the thoughts of Walkerdine (1988), those falling within Taunton’s configuration of ‘lower middle class’ can be understood as subjects of a new regulatory gaze, designed to monitor continued desire for self-improvement and the combination pathologised ‘the masses’ as lacking, inevitably holding poor expectations for themselves and their children. Forster (1870), author of the *Elementary Education Act*, through the following excerpt can be seen to reinforce Taunton’s social construction of education by leaving no doubt about the necessity to create more stringent technologies of power to control the “dangerous classes” (Walkerdine, 1984: 166):

I cannot leave this point without just alluding to the reasons why we have this difficulty at all, which is almost a disgrace to this country. We are behind almost every other country, whether in America, or on the continent of Europe ... and this draw back meets us not only in connection with education, but with many other aspects of social questions affecting the people come before us ... in this country people prefer to them politics, station, business, money-making, pleasure and many things; and till we cease to prefer these things, a law which gives instruction the power to interfere with them through a sudden impulse may make us establish it, cannot be relied upon to hold its ground and to work effectively (Speech by W. E. Forster, 1870, quoted in MacLure, 1986: 102).

5.1.3 Invited subjects

There have been two changes to government since I conducted the field work. However, whilst policy levers have changed, this chapter will reveal that it is the discourses of performativity that drive policy instruction, and market-driven models of

competitive education which fabricate learners as agentic and rational consumers of choice (Brown *et al.*, 2006). In investigating the range of subjectivities on offer by discourse, it is important to place the discussions of Chapters six through nine in relation to the prominent discourses at the time the data was collected. Appleby and Bathmaker (2006) initially point to *The Learning Age: A renaissance for a new Britain* (DfEE, 1998/ London: HMSO) to identify the construction of two distinct ‘types’ of adult learners; the first ‘type’ consists of high-level learners, studying vocational courses at level 3 or above. In line with Taunton’s configuration of ‘lower middle class’ parenting, I suggest this category of enterprising and aspirational working-class subject is constructed as possessing the ‘right’ kind of characteristics, who on completion of appropriate training would be invited to share in the wealth of the nation. This ‘type’ of learner is representative of the knowledge economy; academically able, enterprising and financially stable and is highly visible within the following text:

In the Learning Age, we will need a workforce with imagination and confidence, and the skills required will be diverse: teachers and trainers to help us acquire these skills; carpenters and bricklayers to build the homes we need; designers and engineers who can create the products of the future, craftsmen and women to manufacture them, and people with the confidence to sell them right across the globe (DfEE, 1998, Introduction).

The second category of adult learner, individuals assumed to have poor ‘basic skills’ was by contrast, left lurking within the margins and discursively assigned to the knowledge society. By the time of the SfL strategy in 2001, discourses of opportunity were reworked as a duty for citizens to reskill, and to participate in civil society and employment. In this script, the masses were once again pathologised, framed within a deficit model, “by a relationship of dependency” (Appleby & Bathmaker, 2006: 5). Deemed to be suffering from a personality pathology, trapped by a lack of aspiration, I suggest that, in ways similar to the Taunton Report (1868), SfL failed to allocate an account for the progression of this kind of subject, to transfer to higher-level courses and subsequent inclusion into the knowledge economy. The quote below demonstrates the movement from the presence of a rights-based discourse, which can be traced in the above quote from *The Learning Age: A renaissance for a new Britain* (DfEE,

1998/ London: HMSO), to neo-liberal configurations of the responsible citizen that was characteristic of the 2001 SfL strategy:

A great deal of information is available about the social characteristics of people with poor basic skills levels. These have significant consequences for the capacity of local communities to regenerate, for democratic participation, for the criminal justice system, the public health agenda and for issues of social cost and social welfare (DfES, 2001, 3.9).

It is generally agreed that, if we are to achieve a world-class economy, we need a world-class workforce. To achieve this, employees and job applicants need good basic skills, not just for the current job, but for changing demands of employment. Many adults will need help to improve their skills, in order to reach a level where they can not only attain employment, but are also well placed to adapt and improve their skills as the demands of the economy change (DfES, 2001, 3.20).

Whilst similarities remain between the ‘classical liberal’ and ‘neo-liberal’ trajectories of citizenry and employment, Olssen (2003: 193) determines the “distinctive nature of the neo-liberal revolution as it has impacted on OECD countries over the last 30 years”. He suggests key to the neo-liberal turn is the departure from the ‘negative’ role of the State, where the individual was constructed as freed from the threat of state intervention to enjoy ‘natural’ freedoms to develop the self. A popular justification for state funding of adult learning in classical Liberalism (particularly in the post-war era but present within *The Learning Age: A renaissance for a new Britain* (DfEE, 1998/ London: HMSO)) fell within a rights-based discourse of entitlement to education. The stated aim was to ‘empower’ the autonomous individual but this was set within a normalising discourse that expected civilised behaviours (Ball, 2008; Olssen, 2003).

5.1.4 Contemporary configurations of the ‘dangerous classes’

Juxtaposing classical Liberalism, in the 1997 white paper *Excellence in Schools* (DfES, 1997) New Labour discursively constructed policy on a continuum, where it was envisaged that by 2002 emphasis would be placed on “standards not structures” (DfES, 1997: 2). By 2001 and the SfL strategy, policy was framed by individualism and measurable outputs through targets of accountability, marketisation and individual productivity. The New Labour government increasingly sought to transform the underperforming learner into an employable subject, now motivated to fulfil economic, social and political duties to the state (Ball, 2008), but still viewed, and

controlled, as an object of study (Walkerdine, 1988). Through embedding notions of social responsibility at the heart of policy, discourses of empowerment had established subjectivity as a project of ‘belonging’ to the state (Gedalof, 2003), thereby reconfiguring basic skills provision as a cost-effective strategy for the nation. This is a particularly relevant policy construction for understanding Fatima’s stories in the next chapter, and captured in this extract:

We must improve our productivity, and our ability to support sustainable development, if we are to compete successfully in today’s global market ... Government cannot do this alone. We need to build a new Skills Alliance, where every employer, every employee and every citizen plays their part. No business should be left behind because it lacks the opportunity to improve the knowledge and skills of its staff. No individual should be denied the chance to realise their potential for want of opportunities to invest in their own skills (LSDA, 2003: 13.a).

Within this text, ‘normal’ individuals, those aspiring to join the knowledge economy, are required to demonstrate flexibility, innovation and creativity, and central to this project of the self, is the discursive construction of the personalisation of learning. Learning becomes strongly associated with ‘choice’, with individuals framed as choosing futures to accomplish new forms of personhood, and in doing so distinguishing themselves from the pathology of underperforming adults. In this way, ‘choice’ is viewed as a powerful signifier, with responsible parents and learners framed as consumers within the educational marketplace. To achieve this normalised positioning learners are required to demonstrate autonomy in the classroom. Consequently this form of choice also becomes a mode of subjectification, with key actors not only subject to (and subjects of) the discourse filters of employable subjects, but also particular forms of citizenry. Although Osgood (2006: 291) is working with practitioners in the field of Early Childhood and Educational Settings, her thoughts, I argue, are also applicable to the subjectivities of adult numeracy learners:

The rhetoric implies that those who adhere to the normative middle class notion of individualisation will succeed in becoming middle class ... and with the right measure of effort and talent success is possible. But for practitioners that lack either effort or talent, or both, then they rightly ‘deserve’ to occupy positions with less status.

Throughout the lifespan of the SfL strategy, the agenda for reform remained tied to the economic domain, but increasingly, emphasis was placed on the political and social duties of the individual citizen. With these expectations came silent and ever-menacing demands for the ‘normal’ individual (Ball, 2008) to fabricate their personhood as strong, successful, and to understand their responsibilities to the state. By the time that the 2006 *Leitch Report* was published, individuals judged as *still* having poor numeracy skills were constructed within policy texts as having ‘failed’ to take advantage of previous ‘freedoms’ to become numerate. They were no longer subjects constructed as suffering from “sad reflection on past decades of schooling” (Moser, 1999, introduction), but instead according to Jarvis (2007), produced as subjects failing to understand their responsibility to the state, and as a ‘natural’ risk to the political, social and economic fabric of British society. This repositioning can be traced through a comparison of the following quotes from 2001, 2006 and 2011:

As well as losing out financially, people with literacy, language and numeracy skills deficiencies may have low self-confidence and low motivation. Their children are more likely to struggle at school. And they are more prone to health problems and to suffer social exclusion (DfEE, 2001: 4).

In the 21st Century, our natural resource is our people – and their potential is both untapped and vast. Skills will unlock that potential. The prize for our country will be enormous ... The alternative? Without increased skills, we would condemn ourselves to a lingering decline in competitiveness, diminishing economic growth and a bleaker future for all (Leitch, 2006/ London: HMSO: 1).

Skills play an important role in creating a fairer society by promoting social inclusion and social mobility ... The Government cannot tackle the skills challenge on its own. Employers and citizens must take greater responsibility for ensuring their own skills needs are met (DBIS, 2010, executive summary).

A critical discourse analysis of these quotes demonstrate how basic skills learners are framed as self-fashioned, active and self-regulating. Consequently, the subjectivities on offer to ‘normal’ citizens are produced through discourses of maximising one’s self, one’s productivity and understanding one’s responsibility to the nation. The concerns of such universalising normative mechanisms are expressed by Ahmed (1998: 108):

The absence of a referent to secure the regime of the subject does not lead to a mere ‘flotation’ of the law regulating difference. The law may not be a referent,

but its stabilisation is pragmatically and normatively regulated through the very structures of identification whereby subjects are constituted as such.

As has been explored in Chapter three, the mirror phase of the Lacanian model of identification reveals the self-other relationship to always be marked by difference. The hegemonic constitution of the ‘normal’ adult learner as unmarked and abstracted from the bodily realm, conceals the discourses of privilege that sustains pathologisation of the adult learner within the sector. Linguistic indicators of what Appleby & Bathmaker (2006) classify as the “second type” of learner – and perhaps even Taunton’s configuration of the masses – as more than the dispossessed are apparent with *The Learning Age: A renaissance for a new Britain* (DfEE, 1998/London: HMSO) In turning to Ahmed (1998) it is possible to see how these learners are radically Othered, as someone who cannot ‘belong’ but who stalks within the text, un-representable, yet ever present, someone to which the ‘normal’ I, is forever obligated to include in moral discourses. This problematic will be teased out in the media representation section of this discourse analysis, and then put to work through the empirical stories narrated by Fatima in Chapter six. I feel it is useful to end this section with Walkerdine’s (1984: 90) understandings of the death of the subject within the neo-liberal text:

The central issue to these debates is the place of the ‘man’ in social and political change, that is to say, it concerns the question of how initiatives and responsibilities are to be divided up between the individual, the party, and the class. The humanist position tends to see the individual as the agent of all social phenomena and productions, including knowledge. The specific notion of the individual ... is one of a unitary, essentially non-contradictory and above all rational entity. It is the Cartesian subject in modern form; a notion of the subject which has been central to the whole Western philosophy founded on the principle of cogito.

5.2 Structures of identification; subjects constructed by numeracy

5.2.1 *The 1959 Crowther Report*

In the above section I revealed how, at the heart of the production of numeracy is the pathologisation of “hard to reach” adult numeracy learners (DfEE, 2001: 52) deemed unpredictable and potentially a risk to social and political security. Such leaners are

often positioned as dependent on the state and unable (in the present form) to contribute to national wellbeing. In returning attention to the production of numeracy and the structures of identification that constitute subjects as (in)numerate and (un)responsible citizens, starting with the public discourses of the nineteenth century, it is important to note that the architects did not seek to separate ‘calculations with numbers’ from the mathematics of the esoteric domain. It was not until *The Crowther Report* of 1959 that a particular term, numeracy, was coined to develop policy spaces that set about to equip the ‘at risk’ or ‘excluded’ young men, leaving school at 15, with skills needed to successfully enter the labour market.

The Crowther Report, according to authors writing mainly within the socio-cultural domains (for example, Hillier, 2006; Colley, Wahlberg & Gleeson, 2005), is generally credited with being the first educational policy to pay particular attention to the classed trajectories of ‘success’ and the risks of transitioning into the workplace. Although the terms of reference were concerned with 15 to 18 year olds, and not adult learners, the report holds significance for this thesis in two ways. The first, it was the fear of failure that sustained policy discussion. Whilst it can be argued that the ‘problem’ concerned the young (principally working-class men), the structures of identification (politicians, media discourses and public imagination) constructed subjects of a technical numeracy curriculum, through discourses of waste; of not having realised their own potential. This construction pathologised youth leaving school at 15 (and by implications their parents), as skills deficient, disrupting the social and economic fabric of society:

There are two main forces which decide that a boy or girl should have a longer education than is enforceable by law. One is the expectation that this will give him better prospects in life than he would otherwise have; the other is that it would be unthinkable within the social group to which his parents belong to cut short his education before whatever age is the norm for that particular section of the community. The two forces are not entirely independent of one another. The children of the better-off on the whole enter, or are expected to enter, careers for which education at least beyond the age of 15 is a necessity. But, even if that expectation is not realised, the educational battle is won. Once a family has established itself inside a group with a conventionally high school-leaving age, its children, almost irrespective of ability, will be given that full secondary education at least until 16 (*Crowther, 1959 / London, HMSO: para. 118*).

The second significance for this thesis lies with Cohen’s (1999) and Walshaw’s (2004)

critical analysis that contrasts Hillier's pointers of social justice (and in particular the effects of poverty on educational achievement) through interrogating Crowther's sophisticated understanding of 'being numerate' and 'literate'. By doing so, Cohen and Walshaw reveal the silent technologies of administration that they argue was suggestive not of a social intent, but a political desire to maintain 'normal' by stemming the growing split between the "illiterate scientists with innumerate humanists ... (who were) diverging into two cultures, each unable to comprehend the other" (Cohen, 1999: 5). In continuing from Crowther's quote above, Cohen (1982) argues that it becomes possible to see whose interests were being served by proposing an alternative form of mathematics, even though discursively positioned as accessible to all:

... On the one hand an understanding of the scientific approach to the study of phenomena - observation, hypothesis, experiment, verification. ... On the other hand ... the need ... to think quantitatively, to realise how far our problems are problems of degree even when they appear as problems of kind. Statistical ignorance and statistical fallacies are quite as widespread and quite as dangerous as the logical fallacies which come under the heading of illiteracy (Crowther, 1959/ London: HMSO: para. 11).

Cohen (1999) is more critical than Walshaw, arguing that Crowther's intent included discursively marking a percentage of the population (principally white, working-class boys) as lacking the characteristics deemed necessary to achieve in academia and therefore in need of reform:

(the) attention to the needs of the minority of abler pupils should not be allowed to lead to neglect of the interests of the many boys and girls for whom preparation for external exams would be inappropriate ... a third should be given the chance to take external examinations below the level of the GCE (Crowther, 1959/ London: HMSO: para. 451).

Written in a policy era outside of contemporary concerns with performativity, Crowther constructed numeracy within a Modernist tradition that remains recognisable today. He constructed numeracy as a measure of individual capacities for learning below the 'normal' standard and allocated a mathematical space to the everyday domain. -Without contemplation of the mathematical form, he irreversibly brought a social narrative of cohesion and mobility that changed the purpose of the mathematics on offer. Walkerdine's (1984: 154) concern about processes of creating

new “regimes of truth … that made possible what can be said and what can be done” appear relevant when considering how Crowther initiated a policy space that enabled Moser (1999) to pathologise seven million people as lacking the skills to manipulate everyday numbers.

5.2.2 *The 1982 Cockcroft Report*

Stanton and Bailey (2004: 13) look to the 1980s as a “watershed moment” with individual learners increasingly viewed as an untapped resource. It was with *The Cockcroft Report* (1982) that an epistemic focus was brought to the notion of numeracy, where it was recalibrated as common sense mathematics; the application of everyday numbers, in everyday situations:

Indeed, we are in no doubt that the words, as commonly used, have changed their meaning considerably in the last twenty years. The association with science is no longer present and the level of mathematical understanding to which the words refer is much lower. … We would wish the word 'numerate' to imply the possession of two attributes. The first of these is an 'at-homeness' with numbers and an ability to make use of mathematical skills which enables an individual to cope with the practical mathematical demands of his everyday life. The second is an ability to have some appreciation and understanding of information which is presented in mathematical terms, for instance in graphs, charts or tables or by reference to percentage increase or decrease (Cockcroft, 1982/ London: HMSO: 39).

Rose (1991, 1999) illustrates how the epistemic re-invention of ‘numeracy’, shaped by discourses of Utilitarianism, reconfigured the acquisition of ‘numeracy’ as an essential marker of being judged as a 'responsible citizen'. By the 1980s, Rose (1996: 65) suggests, statistical analysis was common place within the workforce, and was understood by the general public as a useful tool to describe and compare individuals: for example, by income bracket, intellect, health needs and so on:

… the person has opened up, in diverse ways, to interventions conducted in the name of subjectivity: the calculable subject, equipped with relatively stable, definable, quantifiable, linear, normally distributed characteristics – the domains of intelligence, personality, aptitude and the like; the motivated subject, equipped with an internal dynamic orientation to the world, with needs to be shaped and satisfied; the social subject; seeking solidarity, security and a sense of worth; the cognitive subject in search of meaning; steered through the world by beliefs and attitudes; the psychodynamic subject, driven by unconscious forces and conflicts; the creative subject striving for autonomy through fulfilment and choice, according meaning to its existence through the exercise of freedom.

With the increase in planning through statistical analysis normalised it became possible to imagine the sorts of 'reasonable' levels of mathematics expected of a functioning 'normal' citizen. The adult learner, by needing to return to the classroom, was judged as lacking the basic tools to "cope" with active citizenry or productivity in the workplace:

... tempting though the approach might seem, we should not set out to try to define the mathematical needs of adult life solely in terms of some kind of 'shopping list' of necessary or desirable skills but should also investigate attitudes towards mathematics and the strategies used by those whose mathematical abilities are limited in their efforts to cope with the mathematics needed in everyday life (Cockcroft, 1982/ London: HMSO: 14).

In the opening paragraph of this chapter, I referred to Cohen (1982, 1999, 2001) to frame how, since the early 1900s, the notion of numeracy has been legitimised, not by its adherence to traditional epistemological canons of mathematical knowledge (Ernest, 2002), but by its capacity to enhance the efficiency of (socio)economic systems (Cohen, 1982). Stanton & Bailey (2004: 132) starkly point out their conclusions; "whilst high-status courses and the creation of knowledge are located in more prestigious institutions, the FE curriculum reflects the production of obedience and conformity in the 'lower orders' that is also a significant tradition in English education". It is through returning to the works of Lyotard (1984: 6), and paying attention to the processes of identification as not being able to 'cope', that the effects of Cockcroft's subjectivities can be understood as only 'useful', to those in need of reform:

It is not hard to visualise learning circulating along the same lines as money ... the pertinent distinction would no longer be between knowledge and ignorance, but rather, as is the case with money, between "payment knowledge" and "investment knowledge" – in other words, between units of knowledge exchanged in a daily maintenance framework (the reconstitution of the work force, "survival") versus funds of knowledge dedicated to optimising the performance of a project.

5.2.3 *The 1999 Moser Report*

Having been awarded the financial means to conduct the UK's largest audit of basic skills, Moser was in an unprecedented position to be able to establish 'normalcy'. Not only did he take the authority of statistical analysis, the survey, as means to estimate

the extent of the skills gap, but he also extrapolated this information to determine the cost of poor skills to the individual, by measuring the social and economic effects of the reform (Hamilton & Hillier, 2007). By taking the authority of assumed scientific precision, he set out to objectively define the exacting nature of economic, political and social costs caused by those lacking the propensity for survival, Moser (1999: 1) reconfigured the sector as the “Cinderella service” which, once pulled out of the margins, would be able to focus on skills and secure its future by being key to the nation’s future prosperity. The implications of *The Moser Report*, in relation to the construction of the numeracy teacher, will be explored in the following section, but for now, the attention remains with the pathologisation of the numeracy learner:

At least three million adults in England with Entry Level 3 or below literacy skills are in employment. Poor numeracy skills in the workplace are even more prevalent. Poor skills are not only damaging to an individual’s chances of progression in their work, but also have an impact on performance at work with a cost to the employer. It is estimated that poor literacy and numeracy skills costs UK industry £4.8 billion each year in inefficiencies and lost orders (Moser, 1999: 20).

By the time the SfL Strategy was formally implemented in 2002 (only three years after Moser had divided the learners by categories of innumeracy), the SfL learner was constructed almost exclusively through the subject of a paid worker, with unpaid work, for example familial caring, rendered invisible. ‘Normal’ was exclusively framed on inclusion in the workplace, and the implications of this will be explored in relation to empirical stories narrated by Fatima in the next chapter. However, the effects of identification are revealed not only through policy discourses, but through unproblematised statements expressed by Beer (2007: 12), (NIACE London Regional Development Officer) which is full of hidden assumptions and glances over the uneasy relationship between the ‘worth’ of a human being and the need for skills to participate in a thriving British economy:

A learning society would combine excellence with equity and would equip all its citizens with the knowledge, understanding and skills to ensure national economic prosperity and much more besides. The attraction of the term ‘learning society’ lies in the implicit promise not only of economic development but also the regeneration of our whole public sphere. Citizens of a learning society would, by means of their continuing education and training, be able to engage in critical dialogue and action to improve the quality of life for the whole community and to ensure social integration as well as economic success.

5.3 Structures of identification; teachers constructed by discourses

5.3.1 The production of the ‘ethical’ teacher

In addition to reconfigurations of the ‘numeracy learner’, subjectivities awarded to ‘numeracy teachers’ have also been reworked through policy. The ‘ethical teacher’ was constructed during an era when questions of agency tended not to arise. At this time, ‘teacher’ was constructed as docile, and asked “to deliver centrally determined syllabi by means of didactic lectures and demonstrations” (Colley, Wahlberg & Gleeson, 2005: 6), in effect separated from discussions of structural inequality. In starting this section, I cite Crowther’s (1959, para. 401) concerns of the “... heavy demands on really good teachers”. According to Ozga (2000), it was Callaghan (1976), with the *Great Education Debate*, who brought about a permanent disruption to the unproblematised unitary configuration of the ‘ethical teacher’. Without overt use of disciplinary technologies (such as legislation or inspectorate), Ball (2013) also points to Callaghan’s repositioning of parents, alongside industry, as major stakeholders, to reveal how the object ‘teacher’ was reconfigured as an individual, accountable for ‘satisfying’ government and non-governmental actors alike. By comparing the two excerpts below, it is possible to see how the “saviour narratives” (Osgood, 2010) of the 1950s compare against the 1970s, to not only define the ways that teachers “should act, but changed the ways that they are” (Foucault, 1972):

Education can only function within the broad directives of right and wrong which society gives. Teachers and youth leaders are, however, well placed to bring to attention the personal bewilderment and disaster to which this public indecision over moral issues often leads the young (Crowther, 1959/ London: HMSO: para. 201)

To the teachers I would say that you must satisfy the parents and industry that what you are doing meets their requirements and the needs of our children. For if the public is not convinced then the profession will be laying up trouble for itself in the future (Callaghan, 1976).

Callaghan, in questioning the educators’ “legitimacy as authoritative allocators of resource and opportunity” (Ozga, 2000: 225) immediately created public spaces where the expertise of the professional teacher was at once imagined and open to scrutiny.

This laid the grounds for new public expectations that profoundly impacted on the inner life of the teacher, now socially constructed as holding the responsibility to “convince” the general public of their economic and social value to societal wellbeing, and for assuming the responsibility to support individual development of each student (Bathmaker, 2007). The following quote from Callaghan shows how, in mapping, and ultimately rationalising, an intended space for multiple stakeholders to contribute to policy texts secured new spaces for policy intervention:

This responsibility is more than a responsibility for the quality of teaching ... (this) is a responsibility for the subjectivity of the student, for that which allows the student to be a unique, singular being. Taking responsibility... is not something that has to do with calculation. It rather belongs to the very structure of responsibility that we do not know what we take responsibility for, if taking is the right word in the first place (Callaghan, 1976).

Ball (2013) explains that the technologies of ‘neo-liberalism’ work to disrupt the flow of collective authority, particularly amongst groups who traditionally have claimed to be professional by virtue of their shared job description. Whilst teachers remain constructed as ethical subjects, their subjectivities are constructed through complex value-laden discussions of pedagogic mastery, policy apparatus and examination results. The complexities of the classroom, as a site of struggle, will be explored in Chapter eight, but Rabinow (2002) asserts that power manifests through the production of truths about the world, appearing as self-evident, obvious and necessary. Dismissed in 2006, as a sector having failed to meet the standards set out by the reform agenda, Ball (2013: 94) points to the ever aggressive administrative technologies, which sought to “lead the providers by the hand” as the emergence of a new performative culture:

... performativity is a culture or a system of ‘terror’. It is a regime of accountability that employs judgments, comparisons, and displays as means of control, attrition and change. The performances of the individual subjects or organizations serve as measures of productivity or output ... These performances stand for, encapsulate or represent the worth of the individual or organisation within a field of judgment.

In the previous section, I located the discursive construction of the adult learner founded on the principles of cogito, “I think therefore I am” (Ahmed, 1998: 57), and positioned as incapable of the production of formal logic (Walkerdine, 1998). This

discursive construction has reinforced the discourses of responsibility on the ‘ethical’ teacher, reconfiguring ‘value’ in the classroom towards therapeutic expertise, rather than her epistemic mastery. In making use of Rose (1999: 90), the responsibility of the teacher can be read as to:

... disseminate new procedures for understanding oneself and acting upon oneself to overcome dissatisfactions, realise one's potential, gain happiness and achieve autonomy.

5.3.2. Skills for Life and the technologies of administration

This section explores how constructions of the numeracy teacher exist less in relation to developing epistemic foundations, but within wider discourses that are particularly concerned with solving the ‘problem’ of underperforming citizens (Ball, 2003).

Having investigated the technologies of the production of numeracy, I now interrogate how, through the art of government, New Labour imposed a regime of truth so embedded that, by 2002, discourses of good practice, standards and professionalism had all but denied legitimacy to practitioners engaging in public deliberation over the purpose of teaching mathematics (Avis, 2005).

Moser, in naturalising the ‘need’ to standardise ALLN provision, through new teacher training standards, new adult ALLN curricula, and a “battery of uniform assessments” (Hamilton, 2011: 72), sought what Ross (2000: 11) refers to as a “new social order” to reform the adult population. Moser (1999) established an imperative for provisions to mobilise statistical analysis to categorise learners into neatly divided populations, so that much learning became increasingly predictable, incremental and measurable.

With learning being read as linear, it became natural to adhere to a ‘logical’ development (Hamilton, 2011), thereby legitimising the need for assessment pathways. This discursively constructed the learners as free to measure their own progress. However, it is not only the processes of learning that have come to form the subjectivities on offer to learners through the intervention. The discursive construction of best practice became reshaped around demonstrating mathematical competencies based on Moser’s organisation of numeracy.

Through this reorganisation, new and precise technologies of control were required by institutions to police cost, quality and productivity. This demanded that the sector

implements various forms of technologies of surveillance,⁷ to promote technologies of the self that, through a desire to be perceived as professional, cajoled teachers into monitoring and controlling their professional selves. Not only did teachers come to expect to be observed in the classroom, they were also expected to undertake peer observations and self-assessments, which through prescribed routes of reflective practice could demonstrate their capacity for professionalism. In thinking about Brown's (2008d: 6) assertion that "mathematics is situated amidst a multitude of alternative versions of what people claim it to be", ALLN Numeracy was constructed to restrict expectations of learning subjects.

Alongside reworking technologies to police the progress of teachers and learners alike, Moser (1999) also silently set about reorganising and fixing pedagogic understandings of mathematical thinking. By re-organising numeracy into three bundles of skills (number, measure and statistics), numeracy was contextually bound within a logical sequence of computational skills, which like the mathematics of the esoteric domain, when mastered correctly, would inevitably produce logical reasoning and encourage articulation of mathematical ideas. Within this model, numeracy (like literacy) was assumed to be technically orientated, which unlike theories of language development naturalised metaphors such as 'deep' and 'individualised' learning, which could not be effectively delivered through pedagogic techniques such as rote learning (Hamilton, 2012). Walkerdine (1998: 42), although theorising within the context of children learning, provides insight into the tensions between silenced power/knowledge relations, and the 'illusion' of choice in the classroom:

The child is so positioned within the practice as to have not 'seen' power, and sees itself as the originator, controller of its actions, its choice. It is a powerful illusion, an illusion of choice and control over one's destiny taken to be centrally implicated in producing the possibility of 'rational argument' ... there is no mastery outside of the form of the discourse itself ... the teacher's power, then, is invested in that mastery. It is a denial of hierarchy, of policing, of government, except through mastery.

In 2007, a new curriculum of Functional Skills mathematics was introduced, but in this instance, there was no illusion that it was a product of consensus, and 'take up'

⁷ For example, external monitoring by Ofsted, and the now defunct ALI and FEFC inspectorate as well as peer-to-peer observations and audits of qualification outputs

was markedly slower (Taylor, 2008). Since the Conservative-led white paper *Skills for Sustainable Growth* (DBIS, 2010), despite Wolf's (2011: 172) concerns, summarised in the quote below, and as outlined in Chapter one, functional skills remain endorsed as the 'normal' curriculum for adults within the sector. The regime of testing remains a calibrated measurement not only to the demonstration of mathematical thinking, but to the (potential) productivity of the person:

If Functional Skills are to have any currency, they have to involve some form of external, standardised assessment. And if they do that, then they cannot be true to the original concept. They become a set of qualifications with a centrally set syllabus, like any other, to be judged as good or bad on the basis of coverage, and the quality and credibility of assessments. This is not a circle which can be squared.

In the contemporary mathematics classroom, not only is it assumed by powerful actors that the prescribed assessment tools can cut across structural restraint, and thereby provide a true account to measure individual competence, the contemporary spaces for numerical knowledge have been forced to reside solely within the everyday, vocational and workplace domains. This emplacement ignores the:

situated practices that enjoin, inscribe, and incite certain relations to the self; they ignore the inscription devices from storybooks to graphs and charts ... cultural technologies that serve as ways of encoding, stabilising, and enjoining being human (Rose, 1996: 171).

In this section, I have deconstructed how a culture of performativity has focused on efficiency, effectiveness and quality in ways that now demand key actors to be responsive to 'consumer' need. I have interrogated the effects of such measures of competencies, and have revealed the learner to be a subject of employment and citizenry as well as a fabrication of the assessment process. I have endeavoured to unmask how the technologies of administration (from individual learning programmes, to discourses of best practice, curriculum content and systems of surveillance) have inscribed new meanings of the self, on the self, perpetuating the construction of numeracy learner as 'Other' than the self-regulated and responsible citizen, thereby sustaining the positioning of the 'ethical teacher' within the affective domain.

5.4 Media discourses of numeracy, mathematics and mathematicians

5.4.1 Discourses of numerate employees and citizens

There are many stories that we as a nation have repeatedly told ourselves about the basic skills problem, numeracy and productivity. I have shown how these discourses have shifted, and revealed the prevalent themes that continuously intersect through policy locations of employable subjects and responsible citizenry. Earlier in this chapter I deconstructed one specific policy moment, when Moser and the New Labour government mobilised new technologies of power (based on the assumption of rational and objective scientific truths) to objectify and divide the population. In one historic moment, through the very act of publishing the SfL Strategy, some seven million unknown people were made visible by the criteria of ‘suffering’ from a problem with basic skills. Archer and Leathwood (2003: 228), although writing in a context of lifelong learning in the Higher Education sector, provide insight into how such an enormous and diverse ‘underclass’ could be revealed, with such complicity, on the release of one key report:

... historically, and within contemporary New Labour policy discourses in the UK, the working classes have been pathologised and constructed as educational problems and failures. There is some acknowledgement within government policy that working-class groups may experience histories of systematic disadvantage, and yet the working classes are still overwhelmingly constructed in terms of ‘lack’ and ‘deficit’. That is, low rates of achievement and/or educational progression among working-class groups are represented as resulting from their lack of appropriate attitudes, aspirations, motivations, or abilities.

Policy documents are only one form amongst a plethora of texts produced by (and for) the state, to ‘normalise’ and fix individuals in a “web of objective codifications” (Olssen & Peters, 2005: 159). This final section, through mobilising Osgood’s (2006: 6) writing within an Early Child Education and Care setting, looks to the media to unveil the discursive intent behind the overhaul of adult LLN provision:

This model of social engineering is characterized by regulation and control through a standards agenda and represents adherence to a mechanistic reductionist project, wherein those who represent the power elite (government departments and agencies) act as regulators of the behaviours of the subordinate

...The need to regulate and control stems from the discursive construct of a ‘crisis in education’.

5.4.2 The crisis, ‘Get On’ and the gremlin within

‘Get On’ was an extensive, multi-pronged, and striking media campaign that was launched after *The Moser Report*, just prior to the release of the SfL Strategy (Hamilton, 2012). The campaign attracted a budget of £4 million and ran across six years, and in various forms “taunted adults about their poor literacy and numeracy skills and inability to ‘get on’” (Hudson, Colley, Griffiths & MacLure, 2006). The initial campaign featured actors going about their everyday lives. At the moments at which these individuals were perceived to be not ‘coping’, a gremlin would appear, and make visible the cost of their skills deficit, revealing their desires and fears:

A child’s voice calls to her father from another room asking ‘can you help me with my maths?’ ‘Ask your mother’ the father replies from the sofa where he is sitting. He is joined on the sofa by an ugly grey figure with large pointed ears and a low weaseling voice that taunts him with his difficulties ... ‘Bad dad’ says the gremlin, ‘Very bad Dad!’ (Taylor, 2008: 134).

This example demonstrates how positioning can be used as a powerful conceptual tool for policy production, where there are “multiple significations, connecting, weaving in and out of different discursive practices” (Walkerdine, 1998: 207). In looking through a Lacanian mirror, the norms associated with ‘I’ are those of the more confident embodied self, with the image of the mirror associated with the ‘Other’. In Chapter three, I associated the mirror image with the big Other. I revealed normative discourses residing in the symbolic realm and described how by engaging with the mirror image, the abnormal, or the ‘Other’, comes to be constructed. In associating the numeracy learner with a gremlin, the embodied I is assumed to be the ideal observer, associating the ‘Other’, the numeracy learner, within a graduated scale of differences, allocating individuals to positions of subnormal or unnatural adults. In working through the thoughts of Baker (2010), it is possible to deconstruct the ‘Get On’ campaign text. Stories of learner success (a qualification gained) followed in the narrative formation of a fairy tale, where adverts tended to feature a grotesque figure, a gremlin, a magical transformation of the heroine, and the inevitable slaying of the monster.

However, those that remained ‘unmotivated’, as in the dad in the vignette above, were left hanging - not in an expanse of boredom or repression, but in a menacing loathsome space, with an open ending as yet to be judged - where those who ‘succeeded’ were valorised by the narrative closure, they were awarded by a predictably violent execution of the gremlin. In contrast, the individual that has yet failed to choose the project of the self is left drowning in inertia, radically distinguished as subnormal, against the responsible individual, who is now empowered by progression and changes within their personhood. In looking once again to Walkerdine (1998: 198), this time in the context of children learning mathematics through ‘play shopping’, it is possible to see how the adult numeracy learners have become inscribed as:

... subjects within everyday practices, is not, therefore, produced by rationality in which formal decisions can be made but is cross-cut ... by desire. Absence, lack, loss, prohibition are present. And the subject’s experiences of that practice, and therefore the practices in which ‘numeracy’ is produced, must be relations of desire. They are not formal systems, but lived relations of power and powerlessness, of wanting, having, being; they are continually opening and shifting, not closed axiomatic systems like mathematics.

5.4.3 The jettisoned abject ‘Other’ and an-other

Through this critical discourse analysis, the narrative cliché of a gremlin (Baker, 2010), was not chosen to only illuminate the monster that mathematics can be, but to provide a relational account to situate ‘those individuals’ targeted by Moser as lacking and in need of professional ‘help’. In looking to Kristeva (1982: 1), the purpose of positioning the abject as a gremlin-within is revealed:

There looms, within abjection, one of those violent, dark revolts of being, directed against a threat that seems to emanate from an exorbitant outside or inside, ejected beyond the scope of the possible, the tolerable, the thinkable. It lies there, quite close, but it cannot be assimilated. It beseeches, worries, and fascinates desire, which, nevertheless, does not let itself be seduced. Apprehensive, desire turns aside; sickened, it rejects.

Whilst the use of the gremlin clearly articulates how the abject should be viewed, and the campaign showed how “movements into abjection – can be purified or managed” (Baker, 2010: 89), by framing the gremlin as within, which must be destroyed for “dominant systems to come into meaning, to find purpose, to have a sense of itself and

its boundaries” (Baker, 2010, 93), the ‘hard to reach’ numeracy learner is positioned as in need of reform and control. In returning to Kristeva (1982: 2), the importance of the relation of the self/other becomes clear:

The abject is not an object facing me, which I name or imagine. Nor is it an ... otherness ceaselessly fleeing in a systematic quest of desire. What is abject is not my ... support, (which) would allow me to be more or less detached and autonomous. The abject has only one quality of the object—that of being opposed to I. ... (It is) the jettisoned object, radically excluded and draws me toward the place where meaning collapses.

The antagonist, in this case the gremlin, is depicted as a figure. It is restricted to negative and threatening disengagement, however the individual actor is a character, not a figure, who through interaction with multiple discourses, draws attention to the fragility of the fabric of the nation. In fashioning the fabrication of the learner through a potential positioning of holding a grotesque monster within, the campaign intentionally drew on the imagination of risk to the nation. In looking back to Baker (2010), those left hanging as the ‘Other’ reveal the existence of multiple subjectivities, including transgression of normative assumptions of ‘responsible’, and resistance to change; someone who “pales, blurs and corrupts boundaries” (Baker, 2010: 94). I suggest that it is through the ambiguity created by the use of gremlins that the movement in ‘common sense’ from Cockcroft’s (1982) numerical form of the everyday use of numbers was reconfigured into the contemporary social project that demands the transformation of selfhood, through demonstrating autonomy as a responsible citizen and an effective employee. This movement is revealed in the following excerpt from the Moser Report (1999, the introduction):

As is clear from research ... though many people who perceive themselves as having problems do come to classes, the great majority do not. ... Motivation - and how to encourage it - is all.

In 1999 the concept of the hard to reach was produced through a projection of a fantasy of self-fulfilment. Presented as someone who wants to develop, but who as yet, because of the pathology within their character, is denied the possibility of being included in the wealth of the nation. In reading Walkerdine (1998: 196), it is possible to see that this “world in fantasy is held out as a resolution of dreams – of being in control of one’s destiny, by having the material wealth of one’s dream”. In

understanding policy discursive construction through a Lacanian tradition, this gap is unmasked as full of the fantasy of fulfilling one's potential, but by entering into mathematical spaces this fantasy becomes releasable within the imaginary domain. Numeracy is not a free-flowing mathematical domain, it is produced in relation to the symbolic, which by being inserted into a vast array of political and social practices, provokes multiple, complex, contradictory and shifting fantasies, desires and fears. In other words, the individual may 'take on' the fantasy of wish fulfilment, but the potential satisfaction is as illusionary as its attainment (Walkerdine, 1988). The discursive construction of unobtainable desires will be put to work through the stories of the participants in Chapter seven.

Becoming a subject of numeracy requires the individual to engage with mathematical practices, and relations, which by being reformed are constructed as significant. In choosing a gremlin to signify the sliding scale that occupies the 'Other' positions presented to the adult, who is assumed to 'suffer' from poor basic skills, the power of lacking is embedded at the centre of the relation of this significance. The fantasy is full of the promise of joining in the share of the nation's wealth, meantime the adult is simultaneously positioned as not being able to master the basic necessities of 'getting on' in life. The act of re-entering the classroom is contained within spaces that can only signify powerlessness: within the academic discipline of mathematics; on the perceived spectrum of employability; and of (in)effective and (ir)responsible citizenry. This reading is particularly relevant for Jalal's stories of not learning mathematics that will be unveiled in the following chapter.

New Labour, in extensively using metaphors such as 'inclusion' and 'diversity', discursively sought to create social norms that compelled the individual to want to be included. Gedalof (2013: 120) explains that neo-liberal discourses tend to achieve this effect, through discursively valuing sameness over difference:

It does this in its talking of the autonomous, undifferentiated and universal individual as the basic unit of analysis, stripping away particularistic ties of kinship, sub-national community or 'culture', personal belief and tradition to reveal an essential sameness that we can all share as moral, economic or political actors.

However, as has been discussed in this chapter, the privileging of sameness does not produce universal values across the population, but what it does is effectively normalise the particular interests and perspectives of the dominant groups. In doing so, it is only through discourses of individualised choice and opportunity that structural inequalities can be recognised as constraints; both at the level of the individual and collective. In pathologising difference, deficit is always imagined on the individual, and never located in the universal ‘We’. This means that in Liberal accounts difference is always constructed in terms of a problem which needs to be ironed out, thereby accommodating only limited gradations from the norm. This makes it necessary to theorise the ways in which it is possible to engage with discussions of the unrepresentable ‘other’, which through the works of Kristeva (1982) I used to frame the possibility of the ‘impossible to reach’ adult, who is unwilling to shake off the gremlin-within.

In returning to Ahmed (1998), it is possible to see how, in creating a discursive construction through a campaign based on face-to-face encounters with different forms of the ‘Other’, that the intended audience becomes evident. The ‘ideal observer’, the enterprising and self-regulating individual – and by implication, those not inflicted with the problem of poor basic skills – is invited by this campaign to fabricate the jettisoned ‘Other’, as the unreachable other. In this one instance, through the proximity of the encounter that is marked by the threat of an impossibility of finding a resolution, the ideal observer expels the abjected ‘Other’ into the “mystery of the future” (Ahmed, 1998: 60).

The severance of the relationship, and the expulsion of the ‘Other’ from the site of the embodied self, constructs a being that is so incomprehensible that it cannot be represented as existing in the now. This abjected ‘Other’, in being so radically othered, is denied the right to exist and it is because of the recognition of the asymmetry of the power relation (the marginality, desperation and destitution) that the ideal observer is called upon as an ethical subject, to commit “endless obligation within the ethical domain” (Ahmed, 1998: 205). It is the paradox of this very location, the abjected ‘Other’, which retains a belief that there is another form, an-other, who is reachable, represented by the affable dad in the vignette. However, in leaving the dad hanging at

the end of the advert, I suggest that the value to the ideal observer is in the relief that there is a space for reform, which in itself then perpetuates the moral obligation to encourage the ‘hard to reach’ learner to become an-other; an embodied individual who can be persuaded to reform, and to join the moral, social and financial fabric of the nation.

It is precisely, according to Ahmed (1998: 61), because it is only “through being rendered irreducible to the concrete particularity of an-other” that I suggest funding mechanisms for basic skills becomes visible, “through the figures that stalk his (the ideal observers) text” (Ahmed, 1998: 61). By 2015, the abjected Other has become so removed from the present, that a new wave of expectations has created a new category of learners, which I argue sees a return to Taunton’s construction of the third ‘type’ of learner. I suggest that contemporary policy divides the second category of learner, as identified by Appleby and Bathmaker (2006), into those that deserve ‘free’ skills development and those that do not. In ways I suggest, which are not too dissimilar from the notion of the deserving poor in the 1830s, a critical reading of the quote (below) from the 2015-16 grant letter⁸, should be read "as an instance of violence to ensure conformity" (Foucault, 1980: 128) to monitor and control ‘deserving’ adult learners, who with the ‘help’ of their employers recognise their need to reform:

For learners who are not yet able to undertake a rigorous apprenticeship programme, you should continue to prioritise traineeships which contain high quality work experience, English and maths and development of the basic attributes employers value (DBISa, 2015: 1).

With this framing, performativity is unmasked as not only productive of target setting, performance indicators and accountability (Brown, 2011), but hegemonic discourses construct abject ‘Others’, who remain unrepresentable within a discourse of employability. These ‘Others’ remain a disembodied and obscured category othered from privileged forms of ‘othering’; forms available to some ‘deserving’ adults but even they will be expected to engage in a deferred project of selfhood. However, ‘gremlins’ are only one of a plethora of powerful media representations of ‘doing’ mathematics and ‘being’ a mathematician. Increasingly, global pressure has been

⁸ Written at the time of the Conservative-led coalition

placed on the importance of talking about and measuring the value of human capital in the workplace. This, argues Mendick *et al.* (2008), has led to an increasingly complex 'popular' engagement with mathematics through culture.

5.4.4 Gendered discourses of 'being' mathematical

Meaning is theorised, within the post-structuralist framework, as being inscribed through signifiers of power and the values that are attached to the discourse; in this case, the claim by the individual to fulfil criteria of normal. Having deconstructed how numeracy is a production of a particular source of fantasy; a fantasy of wish fulfilment, an identification by the big Other as a powerful, respected and responsible adult, what can be said of the fantasies produced through judgement as mathematical? In contrast to numeracy, Walkerdine (1998) argues that being judged as a mathematician evokes more powerful fantasies than being numerate not only of wish fulfilment, but of the mastery of reason itself. Crucially this form of pleasure, according to Walkerdine, is perceived to derive from being in (and able to) control. Rather than remaining entrapped in an entanglement of desire (most aspects of which remain unobtainable) of wish fulfilment, individuals who have mastered mathematics are signified as in control. This section now focuses on the subjectivities of numeracy, in relation to the mastery of reason:

Numeracy is not mathematics skills applied – here mathematics becomes relations in which numeracy practices are produced and suppressed. Where the imposition of universal truths are read as normative, the creation of 'other positions', or differences, are positioned as a pathology where class, gender and race are central questions that need to be interrogated (Walkerdine, 1998: 198).

Walkerdine (1998) writing about mathematics as reason works through how the category of woman is produced. Drawing on Walkerdine (*op cit*) my intention is to place the production of the category 'numeracy learner' within the mobile and shifting practices of mathematics. Numeracy learners are not "exchanged but produced in the exchange" (Walkerdine, 1998: 192) for the symbolic representation of the adult learner as in need of reform. Thus the relations are constituted in the practices themselves. It is not the individual numeracy learner that is distorted, but the symbol that is created through the practices. It is therefore my intention to avoid locating how numeracy learners are constructed, but demonstrate how it is the symbolic

representation that is constructed within and through discourse. This, I argue, provides a theoretical framework that will allow me to put the empirical narratives to work, in Chapters six through nine, to deconstruct the identity work that takes place, as the individual participants try and locate meaning as they transform into individuals who are judged to be (non)mathematical.

As outlined in the literature review in Chapter two, Mendick (2005) and Mendick *et al.* (2008, 2010, 2014) have conducted extensive research into the discursive constructions of mathematics, and mathematicians, within popular cultural texts. They argue that discourses of mathematics attract gendered and socio-cultural binaries, which make it difficult to identify as ‘good at maths’. Mendick explores how, in using oppositional binaries, the individual is both worked by and performs their own identity work, through “related oppositions that parallel the discursive binary of masculine/feminine” (Mendick, 2005: 205). They found that the assumption that people seek to identify themselves as mathematical is problematic, in that the associations made tended to be “imbued with unequal value judgements” (Mendick, 2005: 205). This reinforced what was recognised by the participants to be clichéd identifications of mathematicians and found that all their participants, “saw mathematicians as White, male, middle class and old, these are simultaneously positions of power and ones that draw on some common popular culture tropes of obsessiveness, geekiness, madness and social awkwardness” (Mendick *et al.*, 2008: 27):

The assumed embodiment of mathematics illustrates how much doing mathematics is seen as a powerful identity marker. Mathematicians’ bodies, as mathematicians’ minds and lifestyles, are perceived as being ‘marked’, through physical inadequacies and mental health issues, as well as through their exceptional abilities (Mendick *et al.*, 2010: 30).

Despite the perceived costs of allowing mathematics to “colonise their selves” (Mendick *et al.*, 2007: 18), being judged as a mathematician tended to attract higher value characteristics, which were associated with masculinity, for example problem solvers, active, independent thinkers, often at the expense of femininity. Participants suggested that mathematicians found different ways to relate to the world, inferring a ‘mathematical personality’ as innate. As highlighted in Chapter two, Mendick *et al.*

(2007: 21) focus their analysis on the ways in which “those not choosing mathematics tended to dis-identify with these attributes and find them ‘weird’; however, those choosing mathematics (at A-level or degree) were more likely to frame this obsession as ‘skill’ ‘commitment’ or ‘devotion’ and less likely to be frightened by connotations of mental illness.”

In this chapter, I have demonstrated how being positioned as mathematical sustains deeply-held stereotypes of “masculinity … whiteness, middle-classness and heterosexuality” (Mendick *et al.*, 2008: 6). However, whilst this positioning carries considerable power, the costs have also been highlighted, which has problematic implications for assuming a natural desire by the individual to be repositioned as mathematical. Those framed as ‘natural’ mathematicians are simultaneously constructed as brilliant yet fragile, lacking in social skills, and often in need of protection, and following a Lacanian argument, the complexities of power are revealed:

It involves the manipulation of a universally applicable symbolic system – a fantasy of playing God … the fantasy inscribed in the Cogito … if desire is controlled it is not fulfilled, or satisfied. Its Other, therefore, the loss, the object desired, exists waiting in the wings … suppressed in the discourse. The Other of mathematics is uncertainty, irrationality, out of control, … and so on (Walkerdine, 1998: 198).

With the power of mass media to perpetuate recurrent themes that use binary logic to conjure mathematics, the subjectivities on offer are allocated to the flawed geniuses against the parent failing to help their child, with the threat of the abject other lurking in the margins of the text. In the following chapters, I put the theories to work through the empirical data, to reveal the tensions as the learner participants employ binary logic as they undergo identity work to reconfigure their sense of selves as “average” at mathematics.

5.5 Summary

In this chapter I have revealed how the spaces of numeracy have sustained powerful myths about the stability of the social, political, and economic patterns of behaviour through discourses in which power and relations are inscribed (Walkerdine, 1998). I

have endeavored to uncover the ‘how’ of policy production, and reveal the particularities of the administrative technologies of discipline and surveillance in ways that privilege the positioning of cognitive development and psychology, within the production of the numerate citizen and, in particular, subjects of employability. I have posed questions about the normative production of the universal ‘We’ (as in control of desire) and, in doing so, have interrogated how differences are always formed as pathological (Walkerdine, 1988). I have framed how the imposition of universal ‘truths’, and expectations, form projects of the self, at once both produced and productive of the gendered, classed and raced technologies of surveillance and control, and in doing so, revealed issues such as pleasure, desire and anxiety as central to identification. In this way, I have unmasked how particular productions of the sign ‘numeracy learner’, have distorted the subjectivities on offer to the individual adult returning to the FE sector to (re)learn mathematics.

By concluding with critical analysis of media representations of being (non)mathematical, I have highlighted the ways in which Cartesian models of dualism rely on gendered differences in two particular ways. The first is that of a white male, middle class autonomous (if fragile) individual, who is able to use logic and rational thought to control the self. The second is a moral production of the “unreachable underclass, who are by turn to be regarded as dangerous and who are to be pitied” (Hamilton, 2012: 2). It is through deconstructing the taxonomy of subjectivities of ‘otherness’, which rely on the hegemonic discourses of the moral economy, that individuals are judged in terms of holding a capacity to engage in a project of the self. I have brought attention to the power relations between fantasies of control as compared to wish fulfilment, and it is through these natural understandings of ‘truths’ about people that, in Chapters six through nine, I explore the seductive powers and dangers of ‘being’ judged as mathematical; of adhering to normalised and normalising constructions of the self; and the ‘best’ way to learn mathematics. I reveal the ways in which the participants undergo identity work to negotiate being judged as (non)mathematical, through paying attention to the counter narratives that reveal things about the expectations, brought about by demands, of the transformation of the self.

Chapter 6: ‘Private’ discourses of mathematics

The processes by which individuals come to negotiate, mediate, and ultimately reject their identity as a 'mathematician' are integral to the findings of this thesis. In undertaking this study, I am not looking to sustain a theory of 'true' and identifiable learning behaviours as in the Swain and Swan (2007) *TTM Report*. I hold no interest in attempting to identify and/or compare aspects of the core learner or learning self. Having, in the previous chapter, grappled with some of the ways in which the public narratives of numeracy and mathematics have arisen, this chapter now intends to make enquiries into the particularities of the subject positions taken by a small sample of learners. In 'storying' four participants, I look not to the characteristics of the learner (or of the processes of learning), but to the mechanisms of power to reveal the "differences, and the similarities, the interconnections and the dissonance" (Stentoft & Valero, 2010: 89) within their stories and to interrogate how the lived contradictions (Walshaw, 2010) and "markings of difference" (Walkerdine, 1998) have come to be constructed and performed through the policies and practices of mathematics.

Whilst a life history told by one person cannot be taken as a means to tell us how she (or another) will approach learning mathematics, Stentoft and Valero (2010) propose that through the interrogation of shared stories it is possible to look to the margins to reveal some of the noises that can accompany learning. In borrowing from Reay (2002: 1), these particular stories that have been told by the participants, are rich not "only in an enormous amount of academic labour but also an intolerable burden of psychic reparative work". The aim of this chapter is twofold. The first is to analyse the key aspects that each of the individuals have most forcefully expressed in their stories, and the second is to glance at the identity work that they were compelled to undergo (Mendick, 2005), as they narrated their encounters with mathematics.

In this chapter I bring together a number of Bourdieurian concepts with those of subjectification and performativity (an approach taken by others, e.g. Butler, 1999; McLeod, 2000, 2006; McNay, 1999, 2004, 2010). In returning to Chapter three, I mobilise Bourdieu's theory of habitus, field and capitals to explore the ways in which biographical, social and structural processes interact with dominant discourses to

shape the processes of identification. However, I mobilise Bourdieu alongside an interrogation of the discourses that fashion subjectivity, and performative understandings of positioning. In line with Skeggs (2004a: 501), I argue I can bring together the “internal and external processes to analyse the interactions between individual biographies and the aspirations and discursive practices” to gain insight into discursive identity formations. Although these frameworks share alliances in terms of a wider epistemic shift, from the centre to the ignored and/or excluded (Stentoft and Valero, 2010), I encounter epistemological tensions within this chapter.

Theorists working within the psychic domain look to fantasies and desires to interrogate how ‘choices’ are framed, but in troubling language, I challenge the ‘structuralist’ focus on social order. Where Bourdieu works to break down the Cartesian dualisms of logic, for example agency and structure, and objective and subjective, Foucault looks to how subjects come to be constrained, how they negotiate and resist the positions inscribed on them, by particular discourses. Indeed, it is through these very tensions I retain a sense of the messiness that Tamboukou (2008: 94) refers to as a “matrix of subject positions” and that, I argue is available to this sample of learners through mathematical practices and discourses of the classroom.

6.1.1 Introduction to Steve: “Becoming academical”

Steve participated in two interviews and whilst the first was joint with Abul (refer to Appendix Two), the second was a one-to-one interview on the penultimate day of his course. From the ways in which Steve spoke, it was evident that he invested heavily in his identity as a future university student, but with his frequent slippage into the third person, he also revealed the fragilities and fabrications of the constructions of his self-hood, inherent within what Mendick (2006) describes as the processes of ‘becoming’, in Steve’s case, of “becoming academical” in his quest to become a teacher:

... then the teaching thing kind of happened and you need to have a degree to do what you love, and what you are passionate about. That's the only reason why I'm back in education, because I would be a lot better off, a lot richer for starters. So now I'm looking at it as taking the plunge: be broke, but you'll be way better off in the long term.

In looking to the works of Quinn *et al.* (2006), and specifically discourses of disengagement amongst young working-class men, Steve's jovial manner can be unmasked through narratives of bravado that frequently entered his script. As the interview progressed, it became increasingly clear that he was, again in borrowing from Quinn *et al.* (2006: 738), "hyper-aware of the stigmatising effects" of his 'choice' to return to education, and frequently openly wrestled with the subjectivities on offer to him. In doing so, he revealed the extent of the psychic costs of his desire to return to education, citing irreconcilable conflict with his mother, and his (half) brother:

Yeah, that was our personal clash, because I'm her boy... she has called me a snob and all sorts ... she wants me to be successful and do well, but at the same time she doesn't want to lose me ... like my mum's kind of like, not treated me equal, but given me a lot of say ... whereas with Bert and Judith, they were above me. Like miles. And maybe, it's that as well. It's complicated.

In line with Skeggs' (2004a) work on social class, Steve's stories were often characteristic of a particular image of working classness, namely a heroic individual working class man; a problematic construct that could no longer sustain the differences within his own complicated familial class structures. Consequently, stories of his desire to escape the mundane lifestyles, which he perceived of his mother and brother, were evenly matched by a neo-liberal discourse of fear that he would waste his own opportunities to enter academia. He frequently realised the contradictions within his stories, and the consequential identity work that he was compelled to undertake was both complex and revealing. In looking to Mendick (2005), working within a context of identity formation in relation to mathematics, Steve can be seen to be openly struggling to negotiate a sense of his emerging self, in ways that he perceived would not be interpreted as arrogance. Chapter eight will investigate the processes of his subjectification (along with the full sample of learners and teachers), but in this chapter I intend to primarily keep close to the interests of Steve and use the works of Skeggs (1997, 2004a, 2004c), Reay (1997, 2000, 2004) and Ingram (2009, 2011), to explore his sense-making processes as he struggled to tame social structures more aligned to his paternal aunt's 'middle-classness'.

6.1.2 Introduction to Jalal: “It doesn’t help me … destroy me little bit”

At the time of the research, Jalal was in his early 30s and participated in two interviews. The first was one-on-one, in which he generally told amusing tales of his university experiences and career in Morocco, through anecdotes characteristic of what Osgood (2010) would describe as neo-liberal discourses of an empowered, privileged and agentic protagonist. Whilst he and his wife both held ‘good’ undergraduate degrees from Morocco, it was evident that in contrast to his wife, through his contemporary positioning as a migrant subject (learning basic skills) in the UK, he occupied a devalued circuit of resources (Ingram, 2011) to those he had celebrated in Morocco. During the second interview Jalal became increasingly despondent as he desperately sought mechanisms he perceived would enable him to convert the value of cultural capital accrued in Morocco and so announce his capacity to be included as an autonomous and enterprising individual:

I feel pressure. I don’t think any more about luxury, or to do what I want to do … we have, you know, expectations … I wrote an article in the magazine about politics … but in English, I wish I had the skills to do this.

The relationship between knowledge and power often surfaced during Jalal’s stories, and the ways in which he perceived subject positions on offer emerged as he negotiated with, and then ultimately rejected, the powerlessness of numeracy and the pedagogic device of collaborative learning. I argue that in ‘storying’ Jalal, I catch glimpses of what Quinn (2010: 18) refers to as “the perpetual process of flux”, which as a migrant subject in the UK has shaped his contemporary experiences of learning numeracy. In ‘storying Jalal’, I can also interrogate the discursive effects of being categorised as in need of numeracy (rather than mathematics) to tease out the ways in which the hidden processes of ‘talking’ mathematics has, in ways that are different to Steve, marginalised and ‘othered’ Jalal:

I am not teacher … but I am smart. I think and I can work it out. Yesterday, I was with this man. He was not happy, but he understood everything … he doesn’t want to stop … I think that he should get a naughty, to understand … you shouldn’t do it this, because … he humiliate him … (about 20 minutes later talking about the curriculum) … I find it a very bad way to learn. You are going to end with disabilities in your mind … It doesn’t help me, he (the curriculum) destroy me little bit.

6.1.3 Introduction to Philly: “There’s a lot of people like me, out there”

Philly participated in two one-to-one interviews and her stories were indicative of a different discursive construction of resistance. She indicated that a professional health worker had advised her to return to education, but borrowing from Bourdieu her narrative account framed her a privileged fish, waiting for her sort of water. In this way her return to the mathematics classroom hinted at a quest to belong. As a means to finally acquire the language of logic and reasoning, to enable her to hold influence, and persuade those in her familial setting (particularly her sons) to take her opinions seriously. Although her demographics made her unusual to the sector (white British female in her 60s and from a privileged upper-middle-class background), it is interesting to reveal how she mobilised cultural capital, to simultaneously include and exclude the other, less privileged 'Others', within her class.

In ways that differed from Steve and Jalal, I use Quinn (2010: 21) to understand how Philly’s project of the self has become entangled with what could be seen as ‘confessions’ of a fragile self, seeking the “therapeutic intervention of education”, to prop up her sense of self. Through this reading, Philly’s stories provide insight into the ways in which her multiple experiences of failure have manifested, bringing forward emotions of feeling a burden to society, and of guilt for having failed, despite her privilege, to take up the position of an agentic and enterprising citizen. Through interrogating Philly’s recollections, I argue it is possible to gain insight into some of the spaces that she occupies in her daily life, particularly in relation to her decision to return to learning mathematics, which in line with Brown’s (2011) interpretations of the mirror phase, I argue are intricately linked to the architecture of her intellectual and emotional sense of self-worth.

Although she rambled, the events Philly spoke of were not simply random affairs. In drawing from Lawler’s (2008) use of Ricoeurian analyses, Philly can be understood to have brought her disjointed stories together to inform an overall plot, in ways that were indicative of the complicated processes that she draws upon, to make sense of the world. In the following quote, Philly shows the ways in which she is unable to place herself within spaces which are occupied by mathematics. Talking about mathematics, for Philly, was to talk about assessment and logic, and there was little

room for her to make a distinction between those that she categorised as being able to do mathematics. Equally, in ways similar to Jalal, there were few gradations from which she could describe how she ‘cannot’ do mathematics:

Tracy: And do you see maths as being up here. Like formal maths, and maths that you use in everyday life?

Philly: Yes, that’s down there. I mean I get round it ... I haven’t made any terrific mistakes ... well it’s a case of survival isn’t it?

Tracy: Is that maths?

Philly: Well, my way is just a means to an end. Maths is something that you stick down and you couldn’t stand ... but there are people ... who are actually into that, obviously that’s maths.

6.1.4 Introduction to Fatima: “The silliness of education”

Fatima was in her early twenties and participated in two one-to-one interviews, and her stories can be most effectively read by working through the taxonomies of ‘Otherness’, that I introduced in the previous chapter. Fatima who on developing (an earlier than expected) mastery of the English language, in the early stages of her narratives, could have been read as on the margins of an-other adult learner, in need of numeracy training. But as discussed in Chapter three, cultural capital is used as a mechanism to filter individuals into particular positions in society, and after the loss of her father, at the age of eleven, Fatima (and her family) lived under the continual gaze of professional bodies. As her life story unfolded she was jettisoned away from Jalal’s narratives of desire⁹ and silenced by her interpellation into discourses of hard to reach:

After my dad died, it was quite a lot of stressful things that happened. ... my mum ended up in, erm ... mental hospital. ... well we would have been taken by the social services but ...we had a long distance relative ... the social worker ... said if you actually stayed, then the children won’t be separated ... but he was told that he was never allowed to leave our sights, and even though I was there.

Fatima’s stories offer insights into the subjectivities on offer to a Bengali woman, who with a limiting educational history, despite her fluency in English, remains positioned

⁹ To activate his capitals and integrate into British Society as an active, enterprising and critical citizen

as a subject of ESOL. A subject positioning, which in her perception, has reproduced her within a discourse of 'hard to reach'; both in terms of parenting and learning and which, I suggest, evokes Spivak's (2003) question as to whether the Subaltern can speak. In following on from the above quote, Fatima can be seen to haveing internalised the structuring processes of her schooling, in ways that were different from Steve, Philly or Jalal. Fatima's stories demanded careful identity work to enable her to negotiate a sense of her selfhood, within the classed, raced and gendered subject positions that she perceived had been inscribed on her body:

... I had to miss school one or two days a week because my mum wasn't very well. She's an epileptic and ... she could have had a fit anywhere anytime ... and a couple of times she went next to the cooker and her clothes got into fire ... and they thought the reason why I wasn't learning was because my attendance was not good ... but they never, I mean I don't understand why they didn't give me the help ... my form teacher said, "well your attendance is not very good, and normally children who do not attend to school are not as good as the others. You can't just have a magic wand to say you want to fix it." Yeah, I know these phrases, and she asked "well, what other phrases have you come across" ... (and was) quite shocked like, you know, has the cat got your tongue? ... and that's how it is.

In the last section of this chapter, I use Fatima's narratives to empirically put Brah (1991, 1996), Ahmed (1998, 2000) and Gedalof (2009, 2013) to work, to explore how neo-liberal discourses ignore the politics of belonging and the complexities of the discourses of citizenry and employability. Through exposing the supressed and repressed silences within Fatima's narration of her self-worth I glance at the complicated and competing messages of (not)belonging; in her familial house, at school and in the wider social milieu of 'society'. In storying her narratives I reveal that, unlike Philly, Fatima is not returning to education to seek what Ahmed (2007) refers to as the "happiness turn". Instead, I map how she has come to be interpellated as a raced subject into discourses of numeracy, citizenry and employment, and discuss how the patterns are different (but also familiar) to the narratives of Jalal. I argue that in mobilising Fatima's stories I can ask critical questions about the processes of

belonging and manifestations of power, through stories from a woman who perceives her voice to be rational but rarely heard.

6.2 “Storying” Steve

At the time of the interview Steve was approaching 30 years old and was studying at an urban FE college attending an Access to Higher Diploma (Education), with the eventual aim of teaching Computers, Design, and Technology (CDT), in an inner city secondary school. Prior to enrolling on this course, on his fourth attempt, Steve had just gained a C grade in GCSE mathematics. Steve described his familial setting as coming from a “single parent family, like typical working class [city where he lived], working mum.” During the initial phase of the first interview, he ‘fixed’ his socio-economic background by telling a story of his mother leaving school at 14, and working at the same biscuit factory for 45 years:

Erm, she (his mother) is really intelligent but she just didn’t fit the schooling or just didn’t manage to survive the school ... I mean maybe her parents didn’t push her to get educated, but I was lucky, because later on I met some people who were all about education and completely like get to school, you need to go. And how did this go? And how did that go?

As the interview progressed, he revealed that the “some people” referred to were his paternal aunt and her husband, and from this point he began to paint a complicated picture of the tensions brought about by the socio-economic fields occupied by his familial roots. The physicality and endurance of his brother and the mundane life style of his mother, were situated as ‘Other’ to his own emerging sense of cleverness and self-governance:

My dad’s side are really switched on, they are really clever people and, well, one’s a uni lecturer and she was the one who put me onto wanting to be a teacher ... and my mum’s side is kind of completely different. My mum’s clever, but her sisters ... it’s like God, I can’t believe we’re related. I mean they’re nice, but they are simple, straightforward people ... education’s valued, but only as much as you do what you can, ... but people don’t really look up to academical achievement.

In putting Skeggs (1997, 2004c) to work it becomes clear how Steve primarily constructed his selfhood through his working-class roots, but simultaneously viewed the dispositions acquired through his early life experiences (in other words his sense

of working-classness), as characteristics that he would have to bury to ‘become’ the teacher-self to which he aspired. Steve constantly underwent extensive identity work, to legitimately judge his ‘natural’ worth to enter university; trying to find a balance between the structuring practices of his habitus and his desire to gain the respect of those that he held in esteem: his paternal aunt (Judith) and her husband (Bert). In line with what Ingram (2011: 292) coins as habitus tug, where the individual “is being pulled in multiple directions by different fields … (and where) conflicting dispositions struggle for supremacy”, Steve’s stories, whilst humorous, pointed to complex internal divisions and intense feelings of shame. To recall and extend the quote I used from the opening section to introduce Steve:

… she [Steve’s mother] has called me a snob and all sorts … she wants me to be successful and do well, but at the same time she doesn’t want to lose me … there was a time with the Bert and Judith thing [paternal aunt and husband], and she was a bit jealous and they were totally successful and I was totally looking up to them and thought they were brilliant. … There’s one end of the scale where mum lets life happen to her, and these guys are like totally, get out there and get in life’s face.

Caught within a complicated habitus tug, Steve struggled to maintain a discursive configuration of himself as a teacher, and was unable to paint an embodied form of his imagined teacher-self. To understand this discursive gap, it is useful to refer back to Skeggs (2004), who suggests that the processes of ‘becoming’ are reproduced through the lived experiences of the hierarchical relations which occupy a particular social field, in this instance secondary school. Steve struggled to discursively negotiate his own ‘fit’ as a potential secondary school teacher, and his narrative began to fragment as he tried to position his emerging middle-classed self through the structuring practices of his schoolboy experiences. Consequently, through emotionally-loaded binary logic, he called upon what he perceived to be the core characteristics of a once-favoured school teacher, to hint at his image of an ideal teacher-self:

There was a cockney Lovejoy … and I said, “Wow, you come from where I come from … just brilliant.” Unorthodox, I mean break all the rules, just to get it in your head, and to see what is going on. So, you can still be part of them. If you work it well and do it properly, you can be one of them and make it work.

In coming to an understanding of how Steve positioned himself as a maverick academic (and as will be seen later in this section, existing in the shadows of esoteric

mathematical spaces), it is useful to turn to how he constructed his stories of learning mathematics. In secondary school, on the surface, Steve's memories appeared monotonous; more a story of missed potential than a struggle to repeat prescribed mathematical procedures. He described himself as "a C/D kind of a person", where he discursively constructed himself as a schoolboy "ducking and diving and dodging" the teachers, achieving a sense of invisibility from the professional gaze. In simultaneously blaming and excusing himself, his peers and his teachers, Steve's recollections can be read through the works of Osgood (2010), as a quest to prove his merit in a classless, raceless, and genderless meritocracy; 'able' to resist external influences, including the material constraints of poverty:

Maths; it was all too floaty ... but as for teachers, well - some were really passionate and really, really enjoyed it and really love it, but there were some ... I don't know they either didn't like us or had had enough of us and our stinky attitude, or maybe it was that they didn't believe in what they were teaching with this national curriculum ... I mean, I know it is easy to blame the teachers, but some of them weren't what you call connected ... we were getting far too carried away with them, and having way too much fun.

The next, and most detailed, description of learning mathematics was storied as though an inevitable progression¹⁰, where Steve 'the professional' narrated his final and successful story of gaining GCSE mathematics. Here, Steve constructed his selfhood through a fantasy of a single entity, an enterprising learning support assistant (LSA), voluntarily 'upskilling' to meet the demands of his job, and to progress to University to gain a teaching qualification. In drawing from the ways in which Boaler (2002) puts Bourdieu to work, Steve's narratives of 'ducking and diving' in the following excerpt can be understood as symbolic of his emerging sense of middle-classed self. However, through also examining the critical works of Lawler (2008), working through female experiences of social mobility, it becomes possible to see how, by continually weaving middle-class cultural capital into his sense of self, Steve was working hard to continually reconfigure his self as agentic, authoritative and strategic. In this way, instead of relying on narratives of an 'agentic' learner, the ways in which Steve used anecdotes steeped in neo-liberal discourses of 'opportunity' and metaphors of 'social mobility', his stories are productive of having been framed by the

¹⁰ Steve spoke about his second attempt to get GCSE as "a lesson in total embarrassment" and his third as simply exhausting.

subjectivities of Appleby and Bathmaker's (2006) first kind of learner in *The Learning Age: A renaissance for a new Britain* (DfEE, 1998/ London: HMSO) i.e. capable of entering the knowledge economy which required him to recognise himself as a project in need of work:

I just forced myself, I mean forced myself ... it was like 6:30 to 9:30 after work, and I was like a zombie. So we would all eat lots of chocolate, get really hyper and then crash about 8 o'clock ... I skipped a couple of classes, didn't do any homework, the bare minimum to get through. ... Once I did practice some past papers, and fortunately they had the answers so you could see ... Like err, there are ways they want to see and I wasn't doing that. And then once I realised that they like it that way, I was not losing marks ... At the last minute I said 'Oh give me the foundation paper' ... (it was) ridiculously easy and I was thinking what was I doing? Seriously, and erm, I got a C ... total top marks for the lower foundation paper.

In foregrounding his own "stinky attitude", whilst carefully weaving stories of working hard, particularly in terms of exam technique through a more generalised discourse of "skipping classes" and "not doing the homework", Steve's pattern of language repeatedly fell into gendered performances of the 'effortless achievement' of the 'naturally able', as explored in the previous chapter, through the findings of Mendick (2005) and Mendick *et al.* (2000, 2008, 2014). Juxtaposing the focus of this analysis, by mobilising Žižek's (2006) readings of Lacan, another account is also available. Steve, the fragmented subject, is unmasked as undergoing identity work within the symbolic domain, to reconcile his relationship with mathematics, to authorise him to externally voice his internal fantasies of being a powerful 'professional'; a "subject supposed to know" (Žižek, 2006: 29). As has been explored in Chapter one, through 'traditional' understandings of schoolroom mathematics, knowledge tended to be expressed through horizontal discourses where learners were universally positioned as "subjects supposed to believe". In this model, learners expected to be baffled in the mathematical classroom, looking to the teacher to be led by the hand, to be shown their mistakes, and given prescribed and coherent strategies to follow, and derive the correct answer. Trust and learning to control the self reside at the centre of 'success' in this model. Steve, in his role as LSA, is looking to externally authorise trust in a fantasy in which, when it matters, he can overcome the complexities of solving mathematical problems.

Through this lens, Steve can be seen as caught within one of the silencing paradoxes that play out in the constructivist classroom. Steve, in his role as a LSA, is looked upon as a trusted and privileged member of the learning community, patiently working with his learners; listening to them, guiding them through the maze of what Street *et al.* (2008: 31) refers to as ‘their existing funds of knowledge’. He is facilitating the learning process to enable his learners to find unique ways to locate their own mathematical schemata and to articulate their own ideas. The facilitating teacher/mentor is, in the constructivist classroom, located within trajectories of trust, able to empower the learner to find their own solution. In a critical reading, the facilitator is caught within a paradox of knowing they have the ‘correct’ answer for the assessment but also required to understand that the ‘right’ solution must lie within the learner.

Steve is caught within this fabrication. As a learner of mathematics, he locates himself within the esoteric domain, ‘knowing’ that with ‘real’ mathematics there is only one true way to solve a mathematical problem. Yet he can also be seen as positioning himself as a professional, someone who *knows* that the most effective way for people struggling to learn the prescribed roots is through being encouraged to articulate (and therefore authorise) their own mathematical thinking. It is Steve the professional, and not Steve the mathematics learner, who is able to negotiate between the symbolic demands and the ideal fantasies of self-control. As a learner, he is able to locate an agentic projection, but only once could he demonstrate his ability to overcome his irrational emotions, and reconcile his understanding that he could only control mathematical reasoning through adherence to logical sequences:

I mean ... it was just where do you get it from? What is n ? And they would go no, there is $2n$ there. I would go two n what? And I just couldn't click, and ... I just had to take it literally and say yes, there are $2n$ there. Get over it. Get on with it.

Whilst Steve appeared confident (albeit wary) that he could reproduce mathematics on demand, there was little to suggest that he valued the content of the mathematical knowledge that he perceived to be on offer:

... there's one more maths-related hurdle ... to be a teacher ... you have to do some kind of test ... and I think, is purely mental maths ... I mean just to see if

you're average. So I know that's coming and I am really not looking forward to it at all. The plan ... is to knuckle down the weeks before this test, and make sure that I have got my times table in my head back to front.

In the second interview Steve recounted that during the second semester he had developed “a feel for the game” (Bourdieu & Waquant, 1992) and rather than defer to the expectations of the institution he had devised a way to circumnavigate the mathematical unit, framed as essential, but still complete the portfolio of evidence. Through his comments, once again, his views of mathematical knowledge polarised socio-cultural accounts of mathematics; that is of a useful, living, and protean body of knowledge:

I kinda dropped out of the maths ... it's needed and what not ... to be honest ... half of that stuff I had forgotten (laughs) “my God, it's so long since I've done this” ... Erm, I didn't do amazing on the first ... test ... I passed ... but from the way I was behaving, I should have destroyed the papers, but I didn't so, erm, ... I appreciated the sort of level it was aimed at, but er, (laughs) it was too low.

By mobilising Quinn's (2010) ‘imagined social capital’, Steve's stories of studying in the further education sector indicate how his are more than stories of ‘just’ trying to ‘belong’. His narratives reveal that returning to learning mathematics was too painful and too risky for the conclusions of the project of his self. In ultimately designing his own mathematical component of the course, using a previous GCSE grade C to demonstrate competency, Steve was laying claim to “owning” his space within the institution. The relevance of the narratives of bravado that frequently entered his script remain beyond the theoretical analysis of Bourdieu, but will be recalled in Chapter nine. Steve worked hard to discursively configure his sense of self as a learner, potential teacher and as a mathematician through the specific historical, cultural, gendered, and geographical context of what he termed a “white working-class lad”, and it is only through mobilising a post-structuralist account that I can offer interesting lines of enquiry into the patterns of his use of reactionary language. In consequence, I will revisit his narratives (both later in this chapter and throughout Chapters seven through nine) to interrogate how he navigated intricate identity work to simultaneously claim his mathematical space (his C grade GCSE), whilst distancing himself from being a mathematical genius.

Nevertheless, from analysing Steve's stories, learning mathematics has served as little more than a critical filter to enable him to enter other occupational and educational fields. His stories were unusual in that his tales fell somewhere between what Boaler (2009) demarks as the traditional gap between being good or bad at mathematics. Skeggs (1997) moved the concept of habitus towards a relational understanding of class struggle which allows new insights into why Steve simultaneously felt compelled to defend his identity as a "typical working-class, (East) London lad", but through a classed discourse of the 'goodness' of education, he fantasised framing himself alongside his paternal aunt. It is only through recognising the psychic costs of his habitus tug, that it is possible to reveal that by re-engaging with mathematics he felt compelled to distance himself from his working-class roots (and particularly his mother). It is these insights that reveal the complexities of his resistance.

Steve was prepared to battle with what he perceived to be a difficult body of knowledge and in doing so he was willing to take the risk of further alienating his mother, but only for the high stakes of taking an examination. He was prepared to "knuckle down" before his mathematics test to enter the teaching profession and re-master the relevant mathematical procedures. But he was not willing to confront his familial settings by participating in a field that required him to enter powerlessness discourses of talking about "simple" topics in the everyday domain. It is in listening to Steve's stories that the enormity of assumptions embedded within the Humanist framework, which positions participation as simply a matter of choice, is revealed. The bland explanation of the 'numeracy problem' as set out by NIACE (2011: 3) silences and denies the psychic risks and turmoil that accompanied Steve's decision to return to learning mathematics:

We have a numeracy problem in this country – we are a nation quite happy to admit to being 'bad at maths', we see people almost wearing it as a badge of honour, in a way that they would never admit to not being able to read and write.

6.3 “Storying” Jalal

Given that Jalal has only lived in England for three years, he has developed an exceptional grasp of the English language. Unfortunately, whilst his responses were thoughtful and thought provoking, his oratory style, combined with my lack of

experience as an interviewer, made it difficult at times to grasp the particularities of his stories. Consequently, some of the questions that I would now like to ask of his texts sadly remain unopen to this inquiry. Jalal spoke about his experiences of learning mathematics for over ninety minutes, needing few prompts. Yet when asked about his immediate family the spaces allocated to his wife were stilted. Throughout the interview he tended to project onto her a state of stability and a sense of a completion of the project of the self. Consequently, his wife does not enter the text as a character so much as a fantasy that frames his losses at having migrated to the UK. In looking to Bhabha (1994, 2000) it is possible to glimpse at how Jalal's desire for a Masters qualification has taken on visible characteristics of a signifier offering integration into British society, or more specifically the knowledge economy. The sense of 'home' that he infers from his wife, who has achieved a Masters qualification in the UK, and the anger and frustration of having to continuously reclaim his own space of agency were markers of being trapped within a web of dislocation, constantly compelling him to undergo identity work, to maintain a sense of what he tried to recall of his authentic identity - as a scholar and an enterprising citizen.

It is difficult to map his narratives of migration but it is possible to identify what Skeggs (2004b) refers to as a process of re-invention. It is possible to interrogate the points at which he articulates and rejects the moral and social discourses that configure him as a 'non' academic learner in the UK and it is for these reasons that I suggest Jalal's stories provide insightful accounts of his encounters with mathematics education, the further education sector, and his responses evoke interesting, critical and troubling lines of inquiry. In ways similar to Steve, Jalal was frustrated that he could not just 'step into' the mathematical spaces that seemed to appear available to his peers. However, unlike Steve, he was scathing of the pedagogic expectations that demanded him to learn from others, and to 'discover' his own mathematics, restricting access to knowledge to the everyday domain. Confronted by the cultural and symbolic tensions of the 'worth' of his academic identity, but not engaged in an internal struggle to prove his 'intellectual worth', Jalal confronted, and ultimately rejected the mathematics on offer, and the pedagogic approach. Through his counter narratives, I borrow from the thoughts of Bhabha (1994) to interrogate how his 'identity' as a learner has come to be politically and institutionally placed, thereby providing

glimpses of the restricted subjectivities on offer through hegemonic discourses, discussed in the previous chapter, that have pathologised Jalal as intellectually lacking. From his stories, it was clear he considered the worth of his social, cultural, and symbolic capitals to have been diminished by returning to the classroom.

Unlike his Somali wife, Jalal remained trapped as a migrant subject bound within discourses of the knowledge society, concerned with political stability and cultural assimilation, and his stories were consumed by his desire to be able to communicate in what Bourdieu (1984) refers to as the “legitimate language”, to be valued for his “Moroccan” volume and composition of cultural, symbolic and linguistic capital. However, as Rose (2008: 120) explains:

Transfer (of capital) from one individual to another is a long, indefinite process; unquantifiable in economic terms. The objectified state is materialistic and media-orientated. It can be legally transferred to another person but, if that person does not have the embodied state, i.e. the knowledge of how to view, use, hear or interpret the physical goods transferred, they are unable to fully utilise their cultural capital. The experience will be outside their *field* with no *habitus* on which to draw, making the acquisition of the embodied state an almost impossible task.

In being unable to mobilise cultural capital to inform the audience about his intellectual worth, in using the works of Lawler (2008) it is possible to reveal how Jalal turned to code (in the form of story-telling) to indicate the potential worth of his social status. For example, instead of framing his birth place as a rural town, he described it as “... for the army or the police to be sent there as a punishment, you know a punishment area”. Despite his humour, his discursive account of his childhood was frequently activated through spaces of anger, and in ways different to Steve’s troubled relations with his mother, Jalal narrated a complex and troubled memory of his late father, whom he described as a “serious and dry” and a “humble” man who was revered in his local community for withstanding corruption to improve the infrastructure of his local city:

My father he was working with the engineer ... The roads, foundation you know all the things that you need in the city ... but the problem is corruption everywhere. I have one letter for him. I read it after he died ... ‘things could be better than this you know’ ... but not how he wanted (mimes with his body refusing the money). ... I was respected because of him ... And I loved it, you know ... they tell me this bridge here, is this your pappie? ... I feel very, very

proud about it. But you know my sisters, everybody is struggling with stuff, doing this stuff, women's stuff, you know with stuff, but that's OK.¹¹

Having foregrounded the fragility of Jalal's sense of belonging in the UK, I start 'storying' his discourses of (not) learning mathematics. However, first I need to make a distinction between the classed analysis within Steve's stories, and that which is relevant for Jalal. Whilst I used a more traditional lens that focused primarily on familial occupation for Steve, Jalal requires a more fragile construction of class identity, as constituted through the impact of social, cultural and economic manifestations of relations of power on his identity formation (Archer and Francis, 2006). Bourdieu (1997) tells us that the strongest elements of habitus are developed during early childhood, where the logic of practice comes to be structured through the ways in which differences are negotiated, in relation to a particular social field. It is thus useful to turn to Jalal's stories of his early education, to gain insights into the structuring processes of the network of dispositions that he now recalls, for learning mathematics in the contemporary classroom:

I can remember the teachers most of the time having tea and cigarettes outside ... I mean, I feel hurt because I know I didn't get the help from the teachers ... I can remember the faces ... of the people in the class with me and sometimes it is very sad. ... you know, I may be passing and they have no job, or some job like sweeping the road. This is not a bad thing, but these people can do better than this, you know, if they have a good experience at the start ... The system is not, the system is very, you know it can't just work on what you go with to the school.

At secondary level Jalal was eventually allowed by his father to travel to the city school, and whilst he quickly excelled in his academic studies, his performances of mathematics can be broadly described as experiences of "non-learning". The injuries caused by repeatedly failing to acquire the language, symbols and prescribed procedures on offer to him in Morocco have come to lower what Wedege (1999) coined the resolution of his mathematical gaze. So in ways similar to Philly, Jalal

¹¹ About 10 minutes later, unprompted he went on to provide an example of 'stuff'; "It was a small city you know, and you couldn't give a job to his wife you know, because she has ... one of the first degrees (high school diploma) in Morocco ... she can write, speak French and write and read and do maths."

found it difficult in the interview to imagine how the different spaces within him could ever come to be filled by mathematics. Whilst his (non)identity with mathematics was primarily informed by what Boaler (2009: 232) refers to as the effects of the “repetitive reification of his high school grades”, it was striking just how few gradients Jalal could construct to describe his school friends beyond ‘being brilliant’. Nevertheless, despite the low resolution of his gaze, the ways in which he narrated his ‘Otherness’ to mathematicians remained complex, primarily constituted by a rights-based discourse concerning the material constraints of poverty. With comments that were surprisingly comparable to the findings of Hodgen and Marks (2009), Jalal separated the ‘lucky’ few who, because of their financial capital, were able to achieve in mathematics:

If you are good ... you are lucky enough to do other important stuff, to get better jobs. And these jobs are like this (shakes hand and makes a sound as though too hot to touch), you know the Moroccan people say to the kids ... ‘what do you want to be’, ‘a pilot’. And ... they are asking me, and I say engineer, and then after a few years, it is getting down and it’s just teacher or something like that, with no maths! ... In Arabic, you know I was 16 (out of 20 international baccalaureate score), very good you know ... and I knew the (maths) exam was coming, so I tried to organise myself to get smart. ... I went to prepare ... and you know I was lost ... and the teacher, they look at you like this and they don’t help you. ... If you want to know these things very well ... then you have to pay a good amount of money ... and when it came to the exams they (his friends) have 20 in the maths and they was looking you know, they are like Gods ... without paying they are good ... but with this, they are Gods!

To return briefly to the stories narrated by Steve, it is interesting to note the similarities in the ways in which each discursively configured valuable mathematical knowledge through rhetoric characteristic of Humanistic language of masculinity, rationality, rigour, order, and absolute ‘truths’. Whilst Steve sought to negotiate his averageness by using the GCSE examination as a benchmark, Jalal’s discourses were not indicative of the cultural connotations that I discussed in Chapter five. Whilst it was true that Jalal constructed those who could do mathematics as exceptional, non-human, “like Gods” and the symbols as a kind of magical language, “... it was just like for me signs you know. It was like some kind of magic you know”, Jalal did not hint at the connotations of his friends being afflicted with fragile mental health. Whilst Jalal, like Steve in the previous section, internalised his perceived inability to transfer his expertise into the mathematical space, the last line of the following quote is

another instance of Jalal calling on his knowledge of normative codes, to claim his space within the academy:

I think to myself this is crazy you know. I think to myself you can forget these things so easily. The other day I had to do the three numbers times and I couldn't remember how to do it ... it becomes very, very difficult. It is true I forget them and this is what makes the human lives very, very interesting.

Although in ways very different from Steve's 'habitus tug', Jalal also carried out his identity work through stories "tempered by the damage of his childhood experiences of mathematical classrooms" (Boylan & Povey, 2009: 49). However, Jalal (like Steve) also defied Boaler's (2009) demarcation of a gap between being good or bad at mathematics, and both resisted numeracy discourses of powerlessness and by positioning themselves within the esoteric domain, were staking a claim as 'intellectual'. For Jalal, 'academia' was framed as a somewhat guilty pleasure in ways that were distinctive of the cultural, historical, and geographical locatedness of the nostalgia of his memories of his father. An obsessive activity that was to be indulged alone; an activity of the privileged that comes with hidden costs, often at the expense of Ahmed's (1998) indicators of an-other:

... My dad used to read a lot in French and in Arabic and some kind of subscription for a journal from BBC Arabic and I read it, after I have grown up ... I was spending some holidays and I just read it. I closed the door and I was reading. I think for around 400 magazines from the BBC.

In contrast, for Steve 'academia' was a fixed notion at the end of his journey of self-development. Through recollecting a story of chatting with Bert (his paternal uncle), Steve situated doing homework as the kind of 'normal' that he aspired towards. He knew that he had to prove his intellectual 'worth' (the hardest element of which was mathematical), which meant that knowledge in itself held little intrinsic worth, and was not an activity that he could be expected to enjoy:

We were walking through the forest and they're saying look you've just got to do this ... they were talking about how they would come home and sit in their tiny room ... and just work, work away, work away in the evenings and just doing lots of homework. So erm, I mean, I knew about homework ... but never considered it that my whole life would be homework ... So I was thinking oh, I have been having it easy... you're supposed to suffer basically [laughs].

Steve narrated the spaces of mathematics that he occupied through classed and familial trajectories. To re-balance his internal division and resolve his feelings of shame, he configured his sense of self on a continuum from the past to the present and then onto an inevitable, but imagined, future. Jenkins (2002) reminds us that habitus is a social construct theorised through the context of the power relations that result from the individual's struggle to preserve, or improve, positioning within the field. In contrast to Steve, Jalal's responses were located within the diaspora, caught between the memories of his past in an attempt to re-negotiate his self-worth by recalling his past successes. Jalal's stories revealed the extent of the injury of his loss, brought about by the dislocation of being unable to recall a unified and cohesive memory of his 'authentic' Moroccan self.

Problematically for Jalal habitus can only become active through social interactions within the field. In this way, Jenkins argues that whilst habitus is conceived as within a state of flux, construction is maintained through the constant renewal of repertoire of dispositions. Skeggs (1997, 2004a) juxtaposes this analysis, by paying particular attention to how the composite of capitals is valued, through the relations of power which determines how symbolic recognition is legitimised. Skeggs' interest lies in the processes of validation (rather than form of capital) and this perspective is particularly relevant for analysing Jalal's stories. Jalal continuously constructed his identity within the esoteric domain, and was frustrated by its meaninglessness within the context of the knowledge on offer within the spaces of SfL. Ross (2000: 104), in investigating the structuring processes of knowledge, provides insight into how to read Jalal's determination to remain within the esoteric domain:

Knowledge is a distinct way in which the individual's experiences become structured, and this structure is formed around the use of publicly accepted symbols.

Jalal was caught in and between the spaces of his memories. He looked to his past, to sustain the legitimacy to reinvent his present as intellectually able, but became frustrated at the points that he was unable to recall a unified sense of his 'Moroccan' self. It was not that his memories were lost, but that the memories were fabrications of the positioning that he sought to prove. He perpetually underwent identity work to rectify loss of the sense of his worth, "I'm smart. I learn quickly. I have a lot of ideas

and creativity”, but he could not, with any degree of authenticity, identify a continuum to safely lead him towards a completion of his project of the self. The complexities in and between the contingencies that fabricated his sense of belonging meant that a continuum was simply not available, and he became angered at the points at which his stories (and particularly of learning mathematics) collided through the multiple locations (the psychic, geographical and cultural domains) of what Brah (1996) has described as the cartographies of a diasporic struggle. As Du Gay and Hall (1996: 56) explain:

The inscription of the minority subject somewhere between the too visible and the not visible enough returns us to ... (a) sense of cultural difference ... the discriminated subject, even in the process of its reconstitution, be located in the present moment that is temporarily disjunctive and effectively ambivalent ... the discriminated subject ... occupies a contemporary moment that is historically untimely, forever belated.... .By contrast the liberal dialect of recognition is at first sight right on time. The subject of recognition stands in a synchronous space ... surveying the level playing field that Charles Taylor defines as the quintessential liberal territory: ‘the presumption of equal respect’ for cultural diversity.

Whilst Steve sought a ‘feel for the game’, Jalal was compelled to attend his course, despite feeling deeply ‘othered’, precariously having to mimic a sense of self through a neo-liberal discourse of the “worthy citizen”; demonstrating the attributes that he perceived would potentially identify him as being able to contribute to the economy. It was through these moments, when he articulated his experiences of cultural differences, that he revealed some of the gendered, cultured and racialised practices of classroom mathematics.

As was highlighted in the introductory section, Jalal was scathing of the assumed theoretical foundation of the constructivist paradigm that a democracy existed within the collaborative classroom. He was clearly frustrated that he, once again, could not simply ‘step into’ the mathematical spaces available to his peers, and was angered by the processes of subjectification that, against his will, demanded that he legitimated mathematical knowledge constructed through the everyday domain. In this way, Jalal’s resistance to accepting the body of knowledge on offer to him is an example of the limits of the Foucauldian framework. Jalal was compelled to continually draw from the composite of his various forms of capital, to produce counter narratives with

hidden cultural codes, which would allow him to resist the homogenised subject positionings produced for him as a migrant ‘basic skills’ learner. It is only through drawing on the notion of habitus that it is possible to reveal the extent of the loss of his self and of his former identity as a successful academic. Chapter eight will look in particular at the construction of best practice and collaborative learning, where I will revisit both Jalal and Steve’s comments in combination with the full sample of learner and teacher participants.

To conclude, Jalal and Steve each placed mathematics within the starker of Dowling’s (1996) esoteric domain; framed as a body of knowledge external to the self. Both took comfort in the fact that mathematical answers could only be authorised as either right or wrong and were angered by the demands that it should be created (and owned) by the individual. The following quotes¹² demonstrate how both consider that legitimate and worthwhile mathematical knowledge could only be gained through vigorous teaching and learning to reproduce the symbolic and prescribed procedures. Mathematics acted a gatekeeper to academic opportunity and socio-economic security and, in a discourse terrain that polarises the principles of collaborative learning, mathematical knowledge was not viewed as a ‘tool’ to enhance performances in life. Being numerate was perceived to be a necessary skill, as laid out by the public discourses examined in Chapter five, but neither associated themselves with needing to learn this kind of mathematics:

Jalal: It’s not the maths that I imagine as maths … when we go to real maths and x and beta and p and all this stuff … you know, it was just like for me signs you know. It was like some kind of magic you know.

Steve: I wouldn’t go to teach maths, like if I really committed myself and got into maths, because it was like enjoyable, erm I would probably … try and be at the front messing around and trying to get it to work.

6.4 “Storying” Philly

Immediately on starting the interview Philly foregrounded her lived experiences of neglect, fear and of fragile mental health, and although her rambling stories were at

¹² These quotes will be revisited again in Chapter nine where the gendered locations of the mathematics will be discussed in more detail

times very difficult to navigate, it was clear that she had undergone intensive therapy and, as such, frequently positioned herself as a subject under the gaze of a ‘professional’. Philly continuously scrutinised her ‘character’, framing herself as the stigmatised ‘Other’ (Quinn, 2010), and by frequently threading stories of altercations with authority figures (such as headmasters, health visitors, and doctors), she authorised a ‘natural’ authority for such professionals, to judge her actions. In reading through the works of Lawler (2008), it is possible to see how the product of such relentless self-scrutiny has produced how she has come to pathologise her sense of self, as living and having to make do with critical character flaws which lurk within.

Philly’s stories reveal the complexities between the individual and class trajectories, and in particular the centrality of discourses of “mothering”, particularly in relation to the reproduction of privilege. In using Reay’s (2004) development of the concept of emotional capital, Philly’s tales of resistance can be read through a Lacanian framework as defended desires, who having judged herself (and been judged by others) as failed to effectively manage her family’s emotional life, has failed to pass on privileging resources to her sons:

School certainly isn’t fearless. It’s full of fear. Everyone is in there, full of fear ... I thought so strongly about it my last son didn’t go to school (until he was eleven) ... I just really wanted him to enjoy. Mind you he couldn’t ... because I was depressed but erm, so, it wasn’t really an ideal situation ... He lives up in Suffolk with his father now. And his father, you know, managed to get him this job and he seems to be enjoying it from what I can make out ... It’s a restaurant, up near his father, and you know he’s doing bar work and he’s doing a bit of cooking, a bit of waiting. So he’s doing lots of things, and he quite likes that.

Philly, in not having met or passed on the expected value of her classed trajectories, at times appeared overwhelmed by not having “climbed up the steps” and of ending up “where I am now”. She internalised the product of her school experiences as a single veil of shame, and the ‘truth’ about her intellectual (in)abilities. In acknowledging the structuring role of capital, it is first interesting to return to the works of Walkerdine (1986, 1988) and Walkerdine *et al.* (2001) to gain insights into how Philly perceives the gendered production of ‘truths’ about rationality. Walkerdine traces the ways in which the Humanist philosophy of the Enlightenment turned its ‘scientific gaze’ on the body, producing generalised ‘truths’ about women’s nature, as qualities that by

necessity lie outside of normalising concepts of rationality. The logical structures that are perceived to sustain mathematical truths are also presumed to sustain the foundations of rational thought. Whilst Bourdieu's framework contains the three functions of symbolic violence, I argue that his tool kit is limited in its capacity to theorise the gendered production of Philly's binary metaphors which enabled her to split the rational (male) mind, over (feminine) matter:

It's almost like, hands off ... I think I've been brought up in that sort of environment ... the untold thing, that you know, men are better at that ... I don't necessarily feel it now, but it's still sort of in there, ... and then there's the internal voice ... you shouldn't know this. This is too hard for you. You don't need to know this. It's too difficult for you.

The use of gendered binaries of logic will be explored in Chapter nine, but to return to a Bourdieurian analysis, in another story Philly told of how at the age of about 13 she was, with her brother, taken by their father ("mother didn't agree, but went along with it") to have their IQ tested. On 'failing' to demonstrate a 'natural' intelligence both were immediately removed from their private school and transferred to a secondary modern school. The previous chapter has examined the role of examinations in terms of the schooling ritual but the significance of this injury; the pain and the discomfort of being publically constructed by those in authority as intellectually inadequate for private tuition, remains within her and sustains her continued struggle to reconfigure her sense of worth:

I know my father was getting a bit fed up with paying out and not getting any return, basically ... actually I'm putting that, I'm saying that. Erm, I just think he just thought they might as well go to state schools, but he took us off to have an IQ test. So I don't think that helped with my feelings about different things.

Consequently, whilst Philly's references to mathematics could at best be called fleeting and stilted, as has been discussed, she looked to the discourses of rational thinking and logical reasoning as the tool that she needed to be able to control, to unveil and share her hidden self-worth.:

It comes from something there (points to her heart). That's the first thing. Once I get it there, I think well, wait a minute I've got to get this backed up. You know because otherwise, I am in the know, but ... I haven't got the backing up ... and no I don't want that ... I tend to sit back like this (sits back and raises an

eyebrow) and it's all going in ... and I'm thinking well, this doesn't make sense, that doesn't make sense, well where's that coming from?

According to Stentoft and Valero (2010) the non-authorisation to legitimately talk in public spaces about mathematics tends to take on embodied forms and shows in the individual's mode of moving, standing, sitting and walking. In their expressions and gestures, and this was particularly poignant in relation to Philly. She was only able to talk about mathematics when she used her body as a canvas to share her experiences of 'doing' mathematics. She talked of being sick, feeling sick, smelling the classroom, and even equated her memories of being forced to repeat times table with eating blotting paper. In polarisation to Jalal's quest for the tools to convert his capitals, Philly's volume, composite and the trajectories of her classed lived experiences were inscribed in her sense of self. Skeggs' (2004c) conceptualisations of class can be usefully applied to make sense of Philly's repeated signification of her privilege through her accent, her dialect, her sense of taste and, in particular, stories of picking at food.

Whilst she worked hard to carefully maintain discourses of an ethical obligation to the 'abject Other', as set out in the previous chapter, Philly fantasised more about belonging than about wish fulfilment. Drawing upon Lawler (2008) rather than narratives of empathy Philly can be seen to fall into a trap of misrepresentation, losing track of her own pain by continually appropriating the pain of 'Others'. Whilst she hinted that her struggle to maintain her mental health took her into the realm of the 'extraordinary', unlike Jalal, she was able to continually call upon her memories to make connections between her past and her present, and in ways that were suggestive of possible futures. Through processes I found to be surprisingly similar to Steve, Philly was able to locate a positioning within a continuum with a policed point from where she assumed she would finally be able to learn how to reveal her knowledge, to gain authority to speak (particularly within familial spaces):

Well I suppose years ago I could have done something about it, but I didn't choose to because of the block. Well I suppose that I didn't know very much. I mean even now I still sort of think that, and yet sometimes when I go to (name of college) I can almost hear them say "well what on earth is she doing here?" ... but there again, a lot of them are foreign and then I realise there are a lot of people like me out there.

Despite her significant sense of lacking Philly's narratives remained tightly bound within her spaces of privilege. She continuously called upon her various forms of capital to sustain a powerful position within her learning institution, and as such her stories provide insights into what Lawler (2008: 21) refers to as the "pitfalls" of identification through an 'Other'. Philly, through continuously seeking avenues to project her shared experiences with 'Others', was staking a claim to speak as a subject of pain. Her repeated use of the phrase "people just like me" can be understood as biding her time as a privileged fish, appropriating the pain of 'Others', to finally be able to locate her particular sort of water. As Lawler (2008: 23) explains:

Those who are privileged often deal with their privilege through an identification with the trauma of the dominated and the disposed. But of course this trauma can only be imaginary: those who are socially privileged, are by definition, *not* sharing in the misery of lacking privilege.

In conclusion, putting Bourdieu to work allows the complex and layered understandings of processes of embodiment to be explored in ways that deconstruct the effects of the bodily hexes on learning (Youdell, 2006a). Despite her self-positioning as a subject of pain Philly underwent complex negotiations to maintain her 'natural' sense of privilege, and this understanding of her 'self' lay at the heart of her identity work. Each of her stilted stories of mathematics were described through an embodied sense of fear yet she 'chose' to return to learning in a close-knit, intensive residential learning environment that lasted for a weekend. Whilst her 'choice' is understandable in relation to the learning outcomes of the course (there were no examinations), this analysis is only skin-deep. Philly had worked hard to find a learning environment where she could transmit her material and cultural privilege through a projection of her symbolic capital and social authority, and yet maintain a sense of her shared experience of a subject of pain and suffering:

Philly: When I'm sitting in a maths class, I feel like running out the door! Well sometimes. Not when I am at [name of college] but I wouldn't enter half ... I can just spot, I can hear it coming and I think oh no.

Tracy: Can you tell me what it is?

Philly: It is impatience, a level of erm, ... Now how can I explain this to her. I mean that's OK, that's fine ... but sometimes there's a second bit ... how can I explain that to someone like you? I mean I pick it up, and I

switch off. I think, OK if you're gonna do that to me, then I can't go there.

Taking up Bourdieuan concepts here it is possible to reveal the ways in which Philly activated (and more specifically deployed) the relevant aspects of her capital to gain positioning within the field. Having internalised the worth of mastering the skills of logical and rational thought, Philly can be seen to draw from her lived experiences (her habitus) to deploy complex and layered strategies to compete and enhance her sense of self. In continually drawing upon normalising discourses of the middle-class to sustain the strong indicators of her symbolic capital Philly maintains her privileged social authority within the wider social milieu of the residential Adult Education Centre. Her decision to return to, in her words, a "big rambly house" holds cultural codes that signify to others her particular classed kind of existence. It was in this way she was able to simultaneously include and exclude her peers within her localised learning community, but in analysing her stories, the power that Bourdieu (1998: 28) places on the doing of mathematics become poignant for reading Philly's scripts:

Often with a psychological brutality that nothing can attenuate, the school institution lays down its final judgements and its verdicts, from which there is no appeal, ranking all students in a unique hierarchy of all forms of excellence, nowadays dominated by a single discipline, mathematics.

6.5 “Storying” Fatima

Fatima had an interestingly complex relationship with mathematics, and her stories reveal how she has come to negotiate, and ultimately reject, learning through a collaborative model of peer to peer interaction:

Fatima: I can't keep things inside me, I say things when the teachers are supposed to say things. But I start explaining things in my way, when I am not supposed to ... but if a person doesn't understand when I already understood it, so let me explain.

Tracy: But do teachers stop you when you do that?

Fatima: No, really no. Really they say “no, that's good” because I don't explain the same way as the teacher did, so I take information in me and then I use my own way of explaining.

Tracy: Do you think this is useful?

Fatima: It is disappointing for me that I can help somebody else, but when it comes to me, a student can't come and help and so I would prefer the teacher to explain it to me than to ask somebody else. And the teachers says to me ask somebody next to you ... I mean before I even asked them I said to myself I don't want to that's why I asked the teachers.

Whilst she talked in excess of three hours (over two interviews) with few prompts, she only spoke for about ten minutes about her feelings towards the academic discipline of mathematics. She was definite about being “not good at it at all”, but also spoke about finding mathematics interesting, of enjoyment and recalled fond memories of doing homework with her son. She concluded with “yeah, I enjoy maths with everything, but it’s just when it comes from the top of your head [recalling times tables], that’s when I don’t like it”. However, whilst we did not speak any further about her feelings towards mathematics, discourses akin to those of the ‘Get On’ campaign crept into her narratives. She talked of the cost of not being “at home” with numbers, framing these stories through narratives of loss, hinting at a gap, a deficit, which lay within her:

I would rather take it to a shop. ... They just say don’t worry, we will do the calculations ... and I just rely on them. But sometimes if they cheat on me, it would have been helpful for me if I knew it. Then I can say “no ... I don’t need the whole metre.”

She also spoke of the embarrassment of having to cope with day-to-day interactions:

I avoid writing cheques and things. But now it’s more easier with the internet. And I’ve got the credit card, but erm, to know the pin numbers and it’s difficult for me.

Whilst it is interesting to reveal how public discourses of being innumerate crept into her narratives, Fatima had an interesting story to tell which through the works of Lyotard (1984) can be viewed as a grand narrative. Fatima’s stories were put together to give insight into what she perceived to be the development of her social positioning within the structures of schooling. Instead of giving examples of isolated learning experiences, Fatima revealed how she made sense of her educational history. Where Steve spoke of limited educational opportunities for his mother, and Philly narrated as a woman constructed as irrational, Fatima’s stories were a product of identity

formation within the imaginary realm, referenced in particular through homogenising discourses of hard to reach Bengali mothers. I argue that in taking a Lacanian interest in the concept of the big Other, I can reveal the raced trajectories of the range of neo-liberal discourses, and the subject positions on offer to Fatima - socially constructed as a Muslim woman; with limiting educational experiences; positioned as hard to reach; as a particular kind of employable subject; with implications on forms of citizenry.

Having leaned on the works of Spivak (2003) to introduce Fatima in the opening section I now take a post-Modernist turn and specifically draw upon the language of crises to interpret the processes of her otheringness. The following excerpt reveals how Fatima constructed her narratives to separate her from other ‘Others’. By using a discourse of difference, she can be understood as undergoing identity work, imagined within the ideal domain, as belonging within the margins. She momentarily reworked powerful and politicised discourses from within the symbolic domain to, unmask how schooling practices that use discourses of common sense led to a denial of difference, which in this instance stripped Fatima of her material embodiment. This jettisoned her into discourses of the un-representable ‘Other’, and thereby temporarily framed her as a ‘being’ without rights:

... there was a lot of Indian and Pakistani people and so I used to go to school with people who didn't have any erm, language connected with me ... They [the teachers] thought I understood them because I looked the same ... one day I vomited and they asked me if I could call my parents ... and I told them there was no one home, but it just didn't come in a proper sentence and ... they got this girl ... and she was asking me in her language, cos erm, she said she knew two or three languages, and she asked in all the languages. I think one of the words meant something else ...and I thought, oh erm, that's like, quite shocking ... and the head teacher just looked at me and said no it's not really working. So, I just sat in the classroom for the whole day until it was time to go home.

Before further revealing aspects of Fatima’s grand narrative, it is useful to recall the rights-based discourses of democracy Jalal used to frame the gendered narratives of resistance. In returning to Ahmed (2000: 59), it is possible to see how by situating her opening story of schooling, through an embodied example of otheringness, Fatima did not seek either “supremacy or sovereignty” through her narrative. Instead, she mobilised a powerful and politicalised discourse of raced practices to initiate a counter narrative to what she later characterised as the “silliness of schools”. In line with the

findings of Hall (1991), outside of her social construct as a Muslim woman, with poor basic skills, Fatima perceived herself to be rendered invisible by discourses of individualism, particularly in terms of catering for her learning needs, understanding her caring duties, etc. However, she simultaneously indicated she felt acutely visible under the gaze of professionals, and in doing so, indicated to the audience that she had been unfairly pathologised as unpredictable and problematic. Consequently, she took the opportunity of the interview space to point out why she was incorrectly labelled 'hard to reach'. In the following account Fatima positioned the educational establishment (on a micro level) as irresponsible, through an account of how a past teacher washed their hands clean of their duty of care:

The care people used to come. ... and erm, nothing was really organised and so I thought ... what would I achieve (if I stayed on at school)? I did ... two exams... I had two papers left ...and erm, I actually dropped out. I said no, I would rather look after my mum ... I used to ... pop into the class, just to see the girls and ... just after the final two exams the teacher said "oh – well, I suppose you do come now and then. I could have actually put you into the exam". I said "so why didn't you then?" (he said) "I didn't think you'd" ... I said "why didn't you ask me?" ... well that's just me, that's my luck.

In looking to Fatima's presentation of herself, her identity has been shaped by the particular kind of schooling that she has encountered. She simultaneously positioned herself within the imaginary domain as an agentic hero, but also as a subject of fate. In the following story, in line with the findings of Crozier and Davies (2007), Fatima exposes how as a Bengali parent she has been identified as "hard to reach" by her son's school. Once again, Fatima felt compelled to undergo complex identity work in the interview, to mark herself as different to what Brackertz (2007: 1) refers to as the "hidden population ... the underserved, namely minority groups, those slipping through the net". Fatima worked hard to reposition herself in opposition to the hidden population, assumed to be resistant to engaging with services, and frequently framed within policy discourses as families that "have multiple problems and complex needs" (Osgood *et al.*, 2012: 24). In the following quote, Fatima put forward a counter narrative that was in conversation with findings from feminist scholars Walkerdine and Lucey (2001), Lawler (2008), and Osgood (2010: 88) who focus on mother-daughter relationships to expose the contemporary constructions of "sensitive" mothering ... as being highly classed and 'raced' so that 'good/sensitive' mothering is

understood as a white, middle-class model characterised by liberalism and self-regulation”.

In Chapter five I traced through the history of the present, to gain understandings of the conditions that had distanced both Fatima and Philly from discourses of the “sad reflection of past decades of schooling” (Moser, 1999: introduction). Analysis of their narratives, revealed how the architecture of their intellectual worth tended to be valued (both internally and externally) through the powerlessness that constructs discourses of numeracy, but Fatima’s story (in contrast to Philly’s) reveals the classed and raced discourses of good parenting:

I’m not really a friendly person to the school because I keep on poking into their business and I don’t want them to feel wrong … I just want to know what my son is up to. What is his weak point? I’d like to be able to help him at home … and they say, “No, he doesn’t need it”. I said “How can he not need it? He’s still learning” … so I end up in their bad books, and then I had to end up seeing the head teacher, because apparently it became a complaint … and they brought other things up like he was late twice in the year. He was absent two days without any reason, and I didn’t attend one of the parents meeting … and I said “I don’t know why you are trying to accuse me, and why it is relevant?” … you’re accusing me of what sort of a parent I am … I said “what about the government when they said the parents and the teachers should have the good bonding? That’s not happening.” You know, they say “we have less parents like you”. I said “no wonder you have less parents like me. They wouldn’t speak up”. Most parents I’ve spoken to, and they agree with me, and I said “why don’t you come and say something”, and they say “no” they won’t listen.

In analysing Fatima’s stories, it is possible to glance beneath the surface of the neo-liberal practices outlined in Chapter five, and expose the problematics within the current policy drive that demands schools to engage, in homogenised ways, with community groups perceived ‘hard to reach’. Whilst in the above section Philly can be seen as having jettisoned herself into spaces devoid of mathematics, Fatima felt the effects of the inscription of ‘hard to reach’ discourses and described feelings of being jettisoned by her son’s school into spaces that can be theorised as occupied, by the abject Other. Fatima had been encouraged to join the family learning programme by a liaison officer working within her son’s school, who had been commissioned with the remit to engage ‘hard to reach’ parents and encourage them to interact with the school. According to Crozier and Davies (2007: 295):

The term ‘hard to reach parents’ is a phrase usually used in relation to parents who are deemed to inhabit the fringes of school, or society as a whole—who are socially excluded and who, seemingly, need to be ‘brought in’ and re-engaged as stakeholders.

This is particularly relevant because discourses of ‘hard to reach’ are not conceptually conceived as existing on an individual level. This renders encounters such as Fatima’s problematic, not because of disengagement but because of the hidden discourses of compliance that have been imposed on particular groups (Crozier & Davies, 2007). In policy terms the intention was for schools to intervene, “to assist those families deemed by policy makers to be socially deprived … to access social, cultural, and economic capital which will lift them out of deprivation” (Osgood *et al.*, 2012: 24) and this policy imperative directly addresses citizenry discourses. However, whilst public imagination demands ‘success’ of each individual Ross (2008: 492) has unmasked how the construction of different ‘types’ of citizenry have imposed identity markers that distinguish individuals perceived to be destined for “exceptional accomplishment”. In the excerpt below, Ross (2008: 494) explains the social construct of the enterprising citizen:

Enterprising citizenship, an essentially individualistic model of citizenship action, in which the individual engages in self-regulating activities such as achieving financial independence … [of] being a problem solver and developing entrepreneurial ideas.

Ross is particularly concerned that the structuring powers behind this discourse deny the possibility of ‘failure’, and impose silences on individuals that have not been identified as destined for active citizenry. Once again, I find it useful to call upon the narratives of Jalal to put theories of citizenship to work, to understand the implications for Fatima’s identity formation. In looking to the works of Brah (1991), Ahmed (1998, 2000) and Gedalof (2003, 2009) I also interrogate the ‘relationship’ between the state and the individual, thereby unmasking the gendered, classed and raced politics of belonging. Jalal, in using a discourse of human rights was positioning his selfhood as a protagonist, as masculine, and frequently used the notion of a collective ‘we’. This discursive construction was suggestive that Jalal took on and aspired to the promise of the betterment of society. As has already been explored, he yearned to belong to a community of active and enterprising citizens, and to be discursively linked to the

knowledge economy. Within this conceptualisation of ‘belonging’, difference is positioned as offering an interesting intellectual space from which to bond through a multi-cultural discourse of active citizenry. In a striking difference, Fatima frequently spoke in the first person, usually expressed through embodied anecdotes and expressions. Each instance that Fatima mobilised the concept of a cohesive ‘we’ she indicated falling in spaces of not belonging. Where she called on a collective ‘we’ it was primarily located within a familial setting (particularly in allegiance with her son and her mother) and occasionally in relation to her school friendships.

As glimpsed at in Chapter five, public discourses of ‘basic skills’ are correlated with aspirations and achievement. Deviations from this perception are interpreted as abnormal (or sometimes subnormal) differences, thereby (re)inscribing a pathology of difference onto the adult subject. Despite her counter narratives, Fatima was not only silenced by her challenges to the schooling system (both as a teenager and in the contemporary setting as a mother), but through the works of Brah (1991, 1996) can be seen as interpolated as a racialised, gendered subject within the sector. Despite speaking English fluently, she was filtered through ESOL-based learning programmes. In working through Ross’ (2000) concept of the curriculum as a cultural practice, ESOL programmes can be understood as framed by a utilitarian model designed to produce, control and maintain the objective positioning of the docile, passive and useful citizen. Having been positioned as an adult in need of lessons in citizenry Fatima would be expected to demonstrate and articulate a personal belief in what is framed as key British values and to have formed a network of dispositions recognisable as British (Archer & Francis, 2006).

Gedalof (2013: 252) refers to the kind of conceptual framing of this form of ‘belonging’ as “new Britain”, constructed through an ideology of community cohesion with the promise to “deliver modes of ‘being together’ and ‘having together’ that are grounded in sameness, reciprocity, mutual responsibility and a form of mutual connectedness and attachment”. In the following quote Fatima was responding to having been placed on a course that incorporated training to pass the UK citizenship test:

I said I didn't ask ... for three different qualifications in the one class ... You got the English ... the one about the national recognise. I mean, I don't want that, I don't need that ... she said, "well some people ... need to have a British passport, and they need this qualification". And I said ... I don't think anyone in this class needs this. ... I mean, there are two different types of ESOL.

The socio-economic practices of neo-liberal drivers as set out in the previous chapter have, according to Ahmed and Fortier (2003: 18), fundamentally reconfigured the social construction of what they term "appropriate personhood". To come to new understandings about the politics of Fatima's sense of belonging, it is useful to turn to Brah (1996: 130) who explains that culture cannot be understood as a fixed array of customs, values and traditions. Instead, concepts of belonging need to be explored as:

a process, a nexus of intersecting significations: a terrain on which social meanings are produced, appropriated, disrupted and contested ... constructed within a multiplicity of sites, structures and relations of power.

As can be seen by the above quote, the emphasis of the curriculum is on stability and homogeneity. The purpose is to learn how to repeat a static way of displaying Britishness, primarily for the purpose of passing the UK citizenship test. It is useful here to turn to Maylor (2007: 32), who writes that the concept of a 'nation' state arose in response to a call from powerful actors, to primarily manage the economic and social behaviours of the masses in "increasingly complex industrialised world regions". The now neo-liberal construction of national identity, or nationhood, is premised on a desire to develop collective 'solidarity'. This, she argues, holds implications for understanding 'culture' in terms of a common and shared language and goals; a position which enforces a sense of similarity and informs the basis of a so-called 'national' identity. Authors working within a post-modernist tradition (Hall, 1997; Brah, 1991; Ahmed, 1998; Gedalof, 2009) oppose this Modernist view. Human identities within the post-modern, according to Maylor (2007: 33), are understood to be the product of social construction, in themselves reproducing:

categories of ideas and phenomena in order to understand the world, which then gain legitimacy and general acceptance by appearing as 'natural' rather than socially constructed.

Whilst Rose (1990) points to how neo-liberalism requires individuals to continuously demonstrate their project of becoming, and in doing so places emphasis on how

people judge themselves, and others, by how they seek to belong. In joining a community, questions of choice and self-identification are inevitably raised. But choice through post-structuralism is analysed through the language of how it is expressed and is sustained by how the self comes to guide itself and make new allegiances to maximise success. In responding to Spivak's (2003) question as to whether the subaltern can speak, the 'storying' of Fatima requires a post-modernist interpretation of how she positions herself, particularly in relation to other 'others'. Fatima is framed as a subject who has failed to understand the society that she inhabits. She is not only understood in relation to rejecting aspects of Britishness, but is recognised by external bodies as dangerous and lacking in the desire to assimilate.

As outlined in Chapter five educational policy discourses, serve to organise, monitor and control groups of individuals. Although these qualities are positioned as precise, they are, according to Ross (2008), extremely general concepts (for example upholding human rights, social responsibility, work ethic etc.), which hold specific meanings that are particular to cultural settings. Whilst Fatima's 'failures' are perceived along multiple lines of fault, thereby making it essential for her to perpetually undergo complex identity work, it is all but impossible for her to filter anecdotal examples of Britishness into conversation. In the following quote, it is possible to theorise Fatima trying to dislocate her assumed 'natural' positioning within policy discourses concerned with low parental aspirations and children's low educational achievement. Her narratives are primarily shaped within the symbolic domain. The 'I' that she imagines, as touched on previously, is as an aspirational mother wanting to protect her son. In this way, the stories that she told were for the consumption of the audience. Fatima wanted to persuade that she should not be a subject constructed as in need of a professional gaze. She perpetually found ways to demonstrate her personal qualities, to reveal herself to be autonomous, as holding aspirations in ways that she hoped would distinguish her personhood from the extremity of the othered positioning, the othered parents at her son's school:

... for some reason, my son was saying "did you know mum, that elephants can smell water at a 100 kilo" and I said "is it a 100 km" and so it was weird, ending up talking about what is cm, meters and km . . . If I don't know about it, I would say "Oh, Okay" and the conversation would have just ended there . . . I mean one of the reasons why I do this . . . it is to help myself, but also to help my son,

because when children don't educate they end up on the wrong track. You know as parents that is the least thing that you want your children to go off and do.

Ultimately Fatima desired freedom from discourses that sought to reform her as an employable subject, and that also controlled her as a certain type of citizen. In returning to the context of the ESOL curriculum, the following excerpt was recorded during an observed mathematics class, and is testament to the strength of the normalising discourses of citizenship. The students were engaged in an activity about budgeting. Each student was given five cards that gave them an instruction. The learners were invited to read the details to the class, and discuss the impact on their budget. After the discussion, the students were then asked to re-balance their budget, thereby practising addition and subtraction in a contextualised format:

Learner 1: Found £20 on the floor. I think I can't take it.

Teacher: You can today.

Learner 1: No, I think I give it to the temple.

Learner 2: No, I would just ignore it and walk on. I've done it a few times.

Learner 3: I heard that if you pick it up then they (the temple) double the money. No, we donate it.

Teacher: Would everyone do that?

Discussion with everyone talking. Fatima working hard to get her voice heard

Teacher: Hang on. Let's hear Fatima's story.

Fatima: There are some good people. My brother had like £200 in his wallet and he was on the bus and ... the guy went there and asked for the address ... and he came a week later, and my brother was going mad and he brought it round and said he didn't want to hand it into the bus station. But he was just amazing. You know he [her brother] offered him some but he said no ... he was 17 or 18 or something, and he just said it was a lot of money.

In using this text, I outline the important positioning of engaging with a moral community, and within this context of family learning, one categorised hard to reach. In contrast, whilst Jalal was certainly disengaged he underwent complex identity work

to mimic participating in democratic ways, but he used a different construction of himself to engage in the moral production of his selfhood. Ross (2006: 2) provides insight into how highly moralised hierarchies discretely mobilise curriculum to organise subjects into categories of active and passive citizenry:

Learning about a meta society at the meta-level requires more than simply re-learning behavioural patterns to deal with new kinds of difference. It involves the development of abstract concepts ... the ability to question critically ... skills of ... interpretation and judgement of social interaction.

This chapter has sought to put empirical narratives to work to demonstrate how policy constructs objects of learning as explored in Chapter five. Whilst it is clear that both Jalal and Fatima have come to internalise aspects of their resistance and in ways reminiscent of Ball *et al's* (2011) findings, each through the frustration of external constraints came to look to the site of their personhood, and blamed themselves for their exclusion. However, whilst both participants were clearly disillusioned, I want to conclude this section by highlighting the spaces of resistance within each of their narratives. In ways not present in the findings of Archer and Francis (2006) whose research uncovered a tendency for minority subjects (particularly women) to internalise discourses of individualism and subscribe to the views of meritocracy, both Jalal and Fatima resisted the normalising demand to comply, and frequently pointed to instances of institutional racism, discrimination and structural restrictions:

Jalal: For me it's just open and another way to avoid stuff. I don't see it as useful, as more destructive. I am not negative, but from what my experiments from what I see, I find it a very bad way to learn. You are going to end with disabilities in your mind. If you don't know how to do something, but if even the curriculum help you to avoid ... if it doesn't make me learn these things ... It doesn't help me, he destroy me a little bit.

Fatima: I was good you know if I'm not good at something then I say you know I'm not good at doing it. I went to do childcare and I said I'm not going to continue because I have a weakness. I can push the weakness and go around it, it's not getting over and then I don't want to go around. I know there are people there that are worse off than me. They are cheating and getting the certificate. They're being supported by the teacher to get the certificate, not to get the qualification and I don't want the certificate, I want the qualification.

6.6 Summary

Steve, in his desire to enter Higher Education, underwent complex identity work to sustain a sense of averageness, in a bid to simultaneously defend his place within the academy and negotiate psychic costs; the product of his habitus tug. Unlike Steve, Jalal has not had to engage in an internal struggle to prove his ‘intellectual worth’. But his narratives point to the diasporic space, where much of his identity work was consumed with the desire to mend the fragmentation of his sense of ‘authentic’ self. He worked hard to deploy cultural codes to locate himself, as an active citizen and to free himself from the subjectivities that he perceived to be on offer to him as a migrant subject under the regulatory gaze of the ESOL curriculum.

Whilst Steve used amusing anecdotes in an attempt to bury his sense of shame (of downplaying his working class roots), he also revealed the cost of returning to the classroom to learn mathematics. Jalal also used anecdotes that were characteristic of an agentic protagonist and the differences between the discursive construction of the enterprising individual, and the resulting identity work was both complex and revealing in its implications for the classroom. The severity of Jalal’s feelings of the loss of the worth of his capitals prevented him from engaging in an inner struggle to release his intellectual worth, but translated into a discourse that desperately sought his audience to separate him from the other ‘Others’ in his class, and to release his intellectual worth.

In this understanding, Jalal’s use of cultural codes (such as describing his home town as “known as a punishment area”) tried to hide the injuries of being judged as non-mathematical in the past, but what was also interesting in terms of his approach to learning was that ‘being’ mathematical held very different cultural connotations. The result of which was most dramatically revealed at the points at which the resolution of his mathematical gaze would not allow him to recognise the existence of any spaces of numeracy within him. I will explore the gendered trajectories of Steve and Jalal’s relationship with mathematics in Chapter nine, alongside the full sample of participants, but in this chapter I have endeavoured to illuminate the strength of the fantasy that Steve draws upon, that mathematics is a monster that has to be slain. But success has come at the loss of familial cohesion. However, it was Jalal’s use of the

words “it destroy me” that was the starker example of the “terrible fiction of the idealised classroom … where the fantasy of freedom is expected to be played out” (Walkerdine, 1986: 26).

In stark contrast to Jalal’s quest to uncover the mechanisms that will release his capitals (to enhance his life in the UK) Philly continuously blamed her ‘innate’ self for not being able to “put the icing on” the learning cake. She was the participant who most violently took on the visceral properties of learning mathematics, and in doing so became animated at the times that she could position herself as a valuable asset to the community. On initially hearing Philly’s stories I was perplexed that she should then choose a three-day residential programme but having explored the ways in which she engaged in capital exchange to maintain her sense of privilege I unmasked her ‘choice’ for the mode of participation.

To Philly, the mismatch of her privileged background and where she “had ended up now”, was explained through a discourse that sought to explain the architecture of her intellectual worth and in this way, the powerlessness of being considered innumerate was embodied through the painful ways she described herself to ‘be’ non-mathematical. The value of her capitals were most apparent in the ways in which she sought to navigate an identity as a subject of pain, but to simultaneously maintain a privilege that prevented her from being jettisoned, particularly by the gaze of the professional, into discourses of the abject Other.

Fatima was surprisingly non-committal about her relationship with mathematics, and her resistance to learning through collaborative measures will be explored over the following two chapters. Unlike Steve and Jalal, it would not be accurate to say that mathematics is something that was done to Fatima; problem solving was the form of mathematics that she most enjoyed. Yet, from her interviews and from the observation in class, it was clear that she did not imagine learning mathematics to be achievable through collaborative methods. Whilst Fatima has undoubtedly experienced being positioned as the abject ‘Other’ without recourse to a voice, it is problematic to conclude that her narratives were indicative of a subaltern unable to speak (Spivak, 2003). However, whilst Fatima frequently demonstrated her ability to resist, her

stories also unmasked the ways in which discourses had come to be inscribed on her body. She was frequently compelled to thread stories of paying bills, managing her finances and donating to the temple, so as to position her sense of selfhood as an economically stable, ethical subject.

Steve, Jalal, Philly and Fatima, in different ways, have given insights into how their subjectivities have come to be politically and institutionally placed, within and through the hegemonic discourses that have “normalised” the learning of mathematics through a collaborative approach. Consequently, the ways in which they have told their stories allow glimpses at the gendered, raced and classed policy discourses that have ultimately served to pathologise them as intellectually lacking. My intention for this chapter has not been to generate a theory of learning nor to create a panacea from which to ‘solve’ the barriers to learning of/for each of the participants. Neither has it been my intention to provide a seamless analytical consensus of the narratives. Each of the frameworks that I have mobilised has its own limitations. Each has strengths and it has been through combining theoretical frameworks that I have been able to investigate the complexities of discourses of difference of identity formation in and between notions of inclusion and exclusion.

In taking this approach and by looking to how these stories have come to be structured, produced and consumed as configurations of the self, I have revealed some of noises that can accompany the (non)learning of mathematics. In the next chapter, I open the analysis to the full sample of participant learners and interrogate the ways in which they take up, negotiate and reject the discourses of best practice. In Chapters six through eight I explored why, through their identity work, Jalal and Steve in particular (but it was also apparent within the narratives of Kath, Karigalina and Tony) in marking their aspirations to be validated as intellectually able, looked to discourses of mathematics to signify their control over the affective domain, and in particular their mastery of ‘reason’.

Chapter 7: Learners negotiating regulatory discourses

In Chapter five, I deconstructed the ways in which the interest in the Great British ‘skills deficit’ has unfolded since the nineteenth century. I also interrogated the discursive production of the numerate and responsible citizen, and discussed the impact in terms of ontology and epistemology, particularly with regards to the shape of the mathematical knowledge on offer within the sector. I then looked in particular at the regulatory gaze of the SfL intervention to gain an understanding of how policy interventions organise and monitor the forms of knowledge on offer, and the ways in which policy construction ultimately shapes what it feels like to ‘do’ and to ‘know’ mathematics in the classroom. I deconstructed how teachers have been discursively objectified as ‘dinosaurs’, and out of touch with the ‘real’ world (Avis *et al.*, 2002; Foster, 2005), and I have suggested that the discursive practices that objectify adult learners as in need of reform offer fewer and sharper subject positions. In Chapter six, I ‘storied’ Steve, Jalal, Philly and Fatima and deconstructed their narratives using Bourdieu’s tools of habitus, field, and capital, alongside a broadly post-structuralist understanding of performances of ‘being’ and ‘doing’ mathematics.

In this chapter, I build on these foundations and apply a Lacanian lens to gain new understandings of how learner participants have come to negotiate, take up and resist the potential range of subject positions available to them, as adult learners returning to the classroom to learn mathematics through the discourses of the SfL strategy. The aim is not to glean insights into the practices that appear to ‘work’ in the classroom but to investigate the ways encounters with mathematics are constituted by (and constitutive of) the forms of mathematics on offer, and participants’ engagements within and through these discursive practices. In taking a Foucauldian analysis of power, the focus is neither on the individual nor the collective, nor even the institution perceived as most likely to exercise power. It is the techniques, the forms of power, that are of most interest and it is through the regimes of truth that Foucault (1980) offers a means to understand the ways in which power is inscribed on the body. In turning to Lacan, whilst maintaining a Foucauldian approach, the intention is to look behind the narratives to gain insights into the psychic domain; particularly desire. In

starting this chapter, it is useful to return to Brown (2011: 125) to reframe the importance of the notion of desire:

I never attain the object of my desire. Indeed, my desire mistakes its object, ever caught between a language that does not quite fit. The notion of desire, perhaps better translated as “wish”, explains my motivation in terms of something that I want to acquire, even if I’m not quite sure what this thing is exactly. ... yet this desire and the way it shapes my progress into the future can never be captured. There is something beyond my reach that excites me ... or perhaps alternatively, if I take the desired outcome to be the yardstick, this surplus might be seen as a lack.

This section explores the ways in which this sample of adult learners has come to be caught within and between the gaps of contradictory policy and pedagogic discourses. Through taking a psychoanalytical approach it is possible to reveal how the adult learner becomes engaged in a fantasy of the discourses of ‘success’, rather than the forms and practices of mathematics/learning. By using Lacan’s distinction between the symbolic, imaginary and the real domains, I extend understandings of how the individual comes to construct desires of being an ideal learner within the imaginary domain. By exploring how fantasies and desires are negotiated through perceived expectations of the self within the symbolic domain it is possible to reveal the psychic costs. By taking this approach it becomes possible to look at the ways in which desires, fears and hidden motivations govern how individuals come to comply with policy constructions without any specific compulsion to do so.

7.1 Learners ‘take on’ discourses of collaborative learning

In the following extracts, I point to the narratives of Alexandru¹³, Sandra, Kath and Tony to uncover the ways in which they have ‘taken on’ the discursive production of mathematical knowledge within the constructivist model of the collaborative learning environment. Throughout their interviews, these participants compared previous stories of not learning mathematics with their contemporary positive experiences, but the potential threat of a return to ‘failure’ was ever present, and loomed within their

¹³ Alexandru gave three interviews, but for reasons explained in Appendix Two, I have not felt it appropriate to draw on his narratives to uncover the manifestations of power in discourses of collaborative learning.

accounts. Alexandru, Sandra and Kath, in particular, can be read as having narrated their emerging mathematical selves as subjects negotiating in and between imaginary and symbolic orders. Alexandru talked of the “liberty” of allowing learners to discuss and explore their mathematical thoughts. However, his explanation of the benefits of this approach was expressed in ways suggestive of particular demands he perceived to be made of him as a more able learner within the symbolic domain:

I think this present of letting students talk to each other and teacher looking over them. That is a good thing because well honestly some of the students don't always understand all of the lesson ... So ... giving them the chance to talk together could give them a balance somehow. It gives the teacher a possibility to see where you should go and when to make things clear.

In contrast it was clear that Sandra (in the same class as Steve) was relieved by the shape of the knowledge and valorised what she termed the roots, or the “simple” maths, arguing that once mastered it would inevitably propel her into engaging with harder tasks:

From the first day, from the first day she [contemporary teacher] finds out what you know and she will take you right back to the basics ... and it's like bloody hell, my Mr. Nichols [secondary school teacher] didn't used to do that. He just used to think you were thick, and you know that's why I hated maths ... I was like, OK, bloody hell, let's just get it over and done with. But ... I actually enjoy it and that's unbelievable. I mean my brother just don't believe me. I rang him and said ‘yeah, I just come out of a maths lesson’, and he was like ‘you actually stayed until 9 o'clock?’ I was like ‘yeah!’

Sandra was comforted by the recognition that authentic mathematics (for example BIDMAS) exists even within the most mundane of everyday tasks. In comments resonant of Valero’s (2002) findings, Sandra’s contemporary experiences of learning were recounted as a collective one. She narrated as though she, her peers and her tutor were collectively able to unpick mathematical knowledge that had eluded her (and her peers) in the past. Despite the buoyancy of her accounts, it is possible to point to linguistic markers that revealed her fear of returning to the site of the classroom:

Sandra: I like the mixture of the discussion, and an example being put up and then as a group, we are working together. So also, you are getting knowledge from your other members as well.

Tracy: OK, is there any time when you hear impatience?

Sandra: No, I suppose it is because I am sat with a bunch of teachers. So, if you are going to teach, you have to have patience and we are a good group. We work well together. So it's like no, no I never feel that way or else I wouldn't bloody sit in that group. I would move to another group.

Sandra's fantasy of being accepted in the mathematical classroom was not the product of skills she was acquiring, but of finally having the opportunity to enter the mathematical space previously denied to her. Sandra's notion of empowerment did not lie in mastery of the academic discipline, but was projected onto the actions of her teacher. Whilst it is possible to deconstruct her narratives to identify the conditions that enabled transformation her narratives were not indicative of an agentic learner - confident in articulating and adjusting mathematical ideas. Despite the euphoria brought about by the feelings of success, "it's bloody marvellous", Sandra stories were characteristic of what Brown *et al.* (2004) refers to as a defended memories characterised by the loss of historical encounters of mathematics. As the above extract reveals, the potential risk of being rejected as a mathematician permanently hovered just below her narratives of doing mathematics.

Kath's stories were also suggestive that learning GCSE mathematics was empowering. Kath was particularly seduced by the discourse of the enterprising individual, by facing her gremlins she could now forge ahead with new career opportunities:

... and you know, even with getting a degree and stuff, I've never changed it [her career]. And you know, perhaps getting maths might actually give me the kick up the bottom to go.

It was clear that Kath found the idea of passing the test the most imaginable outcome of her contemporary learning experience but she acknowledged the gap between her performance in class and her ideal performance as a mathematician. In ways suggestive of the high-performing students in Brown *et al.* (2004) Kath appeared motivated by the appeal of closing the gap between her imagined performances in the GCSE examination and frustrations of her lived experiences of doing mathematics in the schoolroom. Kath was actively engaged in her own words "to battle to pass" the test, and appeared happy to buy into the assumed collective ideal of the qualification output. However, in relation to the constructivist account she repeatedly returned to

stories of mathematics as something external, something that was out of touch with everyday people and this aspect of her narratives will be explored in more detail in Chapter nine. It was clear that the act of doing mathematics was positioned as potentially interesting and exceedingly satisfying on reaching a conclusion but not relevant to the everyday needs of the ‘average’ person.

Following Foucault, discursive practices construct subjectivities which then inscribe particular social meanings from which the individual then acts upon herself. It is possible to locate how Kath invested in the socio-cultural construct of the benefits of the collaborative learning environment:

When I first came I thought ‘God, you know, I know nothing ... I thought, well you know I got an E, I can’t be that good ... but actually, I surprised myself ... you know it’s interesting and it’s good to know and it’s amazing when it all comes together and I think the whole maths thing is really exciting and Paula [peer] seems to be on the same sort of wave length ... she can do some stuff that I you know, I just can’t get, ‘I still don’t get it tell me again’ and the same thing for her with me ... just sort of helping each other out.

Tony also narrated stories of the mathematical self from socio-cultural constructions of learning:

Well, doing mathematics is like going on a journey. By the end of it, you get there. But it depends on where you want to follow. You are coming from Lewisham and you want to get to Kennington. Well, you might decide to go through Camberwell, but maybe you decide to come through Elephant. It’s the same in the end, it’s just how you get there.

As Tony’s stories turned into discussions of his motivations to return to education it became clear that the numeracy qualification would ensure his entry to Higher Education as an engineer. As these conversations progressed, the ways in which he ‘took up’ discourses soon fell within the policy-orientated view of success. Tony’s was a story of gaining a qualification at the expense of the Constructivist emphasis on deep learning. Tony, whilst excited by his experiences of learning mathematics in the contemporary classroom, was not interested in mastering the ‘building blocks’ of mathematics and he was by no means seduced by the ideal that he could develop the mathematical skills to solve everyday problems in different contexts. Tony held an instrumental view of mathematics. He wanted cultural pointers to read the exam

questions efficiently and ‘bite-sized’ formulas to demonstrate his mathematical skills with expediency. Tony, whilst seduced by the privileged positioning of his tutor within the organisation, narrated mathematics as something that was external to him: a threshold to a new career:

He [the teacher] gets you involved. There is a word he usually uses. We are the customers. He is selling a product so the customer is allowed to look around for what they want to buy. It's not ... do it this way. ... When you are stuck he asks can I help you, do you need my assistance? Paul [his teacher the previous year] went straight to it. But here you can work it around without even stressing yourself, which is fantastic. Just for example ... if you are looking for 0.3 of an hour ... I would have said OK 60 minutes is equal to an hour and then 30 min equals to half ... I would bring it down until what 0.3 means... but the way that [name of teacher] did it ... we got another formula. We know that 0.3 is over 10 times we are looking at 60 minutes so its 60 over 1. Then we can do this [crosses out the zeros] and then 3 times 6 is 18. That's 18 minutes, that's point 3. ... Now I realise that ... any point ... times that number by 6. Simple! Forget about 60, 10 no! Let's take point 2. It is 2 x 6 that is 12 minutes. I say Ohh yes, it very interesting. ... Great teacher, great teacher.

Tony was invigorated by the offer of mathematics through a model based on the market economy. He was able to identify his positioning within the class as an agentic, enterprising individual ‘choosing’ the most effective strategies to help him pass the exam, which he required to go to University. Although it is evident from his discussion that his previous teacher frequently engaged with the SfL principles of relating generalised mathematical rules to the everyday contexts¹⁴, Tony’s preference was with his contemporary teacher, who in this instance gave a prescribed mathematical procedure to learn to solve a particular mathematical problem.

In contrast, Kath and Sandra ‘took on’ the feminine qualities of mathematics, like discussion, problem solving etc., and Kath’s stories in particular revealed a deeper desire, which in ways similar to Sandra was suggestive of the allure of finally overcoming the self. What is of particular interest to the aims of this thesis is that although all three narrated stories that they had indeed managed to tame the mathematical knowledge on offer none bought into discourses of the everyday value of mathematical knowledge. Kath and (to an extent) Tony placed mathematics within

¹⁴ From Tony’s narratives, it is clear that Paul, the previous teacher, used time as a context to teach the learners how to use partitioning so that they could calculate with time. I assume that he then used these examples to demonstrate how to use partitioning to calculate a percentage of an amount.

the esoteric domain, and in ways similar to Steve (although with more comfort) looked to the taming of mathematics (and more specifically the gaining of a qualification), to stake a claim of their own intellectual worth. Sandra, on the other hand, was relieved to be able to grapple with algebraic principles (like BIDMAS) within a contextualised problem, where she could trace through the logical reasoning of the procedure.

In Chapters two and five I considered the Humanist construction of the agentic learner as traditionally formed of masculinist notions of the rational, agentic and enterprising individual. Kath, Sandra and Tony, whilst valorised as citizens willing to confront their skills deficit, retained defended memories of lacking and of being positioned as in need of reform. It is these narratives, of identity formation between the ideal and defended memories of the past, which remain central to deconstructing learning stories, and which can unmask some of the psychic costs of returning to the classroom through a constructivist account.

7.2 Learners resisting

In the Constructivist account, the most effective way for an adult learner to learn mathematics is to engage with peer to peer co-construction of mathematical knowledge, and to value what Usher (2002) refers to as soft skills demanded by the knowledge economy, for example team work, problem solving and leadership. Consequently, learning through SfL demands individuals to take on particular subject positions, not only in relation to the everyday forms of mathematics but also in relation to the shape of the mathematics that is on offer. Learners are expected to undergo transformation, to learn to value their own and their peers' constructions of mathematics, to articulate their own ideas and to explain their mathematical schemata. To gain insights into the forms of resistance it is useful to return to a Foucauldian understanding of power. Within this tradition, power cannot be theorised as being exercised only through hierarchical relations that subordinate. Instead power is understood through the ways in which it circulates, and whilst there remains a possibility of the condition of agency, an individual is understood as to be unable to ignore and/or circumnavigate the effects of power.

In the previous chapter I looked to material and structural constraints to gain insights into the resistance expressed by Fatima, Jalal and Steve, who in very different ways told stories of being marginalised by the hegemonic discourses of the SfL intervention. To return and extend the quotes (where necessary) from the previous chapter, I will briefly return to the forms of resistance expressed within these particular stories of (not)learning mathematics.

Jalal: For me it's just open and another way to avoid stuff. I don't see it as useful, as more destructive. I am not negative, but from what my experiments from what I see, I find it a very bad way to learn. You are going to end with disabilities in your mind. If you don't know how to do something, but if even the curriculum help you to avoid ... if it doesn't make me learn these things ... It doesn't help me, he destroy me a little bit.

Fatima: I always enjoy doing by myself rather than somebody else ... maybe it is for selfish reasons, but I think I absorb more and, erm, and I'm out there to absorb and not ... to help somebody else... It's very unfair for me to say my one is the best, so I said you know, we can just choose any of them so it's up to you ... I mean there are some stubborn people ... so I said go ahead and then half way through they want to change their mind to my one and I says no your one probably sounds interesting.

Steve: I kinda dropped out of the maths ... it's needed and what not ... to be honest ... half of that stuff I had forgotten (laughs) ... there is one more maths-related hurdle ... (to become a teacher) you have to do some kind of test ... just to see if you average, so I know that's coming and I am really not looking forward to it at all. The plan is to ... knuckle down the weeks before this test and make sure that I have got my times table in my head, back to front.

As revealed in the previous chapter, Jalal recounted troubled and troubling stories, located primarily within diasporic spaces. He was far from ambivalent about the necessities of maintaining mathematical rules, the certainty, the logic, and the rationality that he assigned to the mathematical space. In applying a Lacanian lens, it is possible to reinterpret the ways in which he narrated his stories of learning in Morocco, sustained through identity markers both within the ideal and the symbolic domains. Comments such as "I think that I am smart. I learn quickly, I have a lot of ideas and creativity" demonstrated how he engaged in a fantasy of self-fulfilment that was in conversation with the neo-liberal project of achieving a rational, agentic, and unified individual state of being. In being asked to make sense of his experiences of studying numeracy in the UK Jalal was immediately thrown into a powerful and

debilitating struggle, which demanded that he discursively reconstruct his self as a student of numeracy. His once unified and strong identity as a successful academic fractured, and his once secure positioning became exposed as fragile and threatened, both within the realm of the ideal and the symbolic. On being confronted by a restrictive range of subject positions, Jalal literally embodied the discourses inscribed on him and sank into a narrative of frustration, humiliation, anger and pain:

He doesn't want to stop and wait for the guy to make it right ... he humiliate him.

It is here, in using the words of Žižek (2006: 19), “we enter the domain of covert operations, of what power does without ever admitting it”, in that Jalal had ‘happily’ silenced the fears and anxiety of repeated failure through his success at university. I have outlined the desperate negotiations as he sought his rightful position within the knowledge economy, and in being unable to sustain his identity as a unified and successful learner, Jalal turned inwards and defended himself from experiencing feelings he simply could no longer bear (Žižek, 2006). In a final bid to protect his identity from further challenge Jalal curled up and withdrew to the periphery of the community of practice. In returning the analytical attention to Bibby’s (2011) use of Lacan’s mirror, Jalal (like Sandra) can be seen as looking at the learning of mathematics through a mirror of perfection. Jalal attempted to construct his mathematical self through a binarised logic which then reduced the resolution of his mathematical gaze. But unlike Sandra, Jalal’s was a violent act. He simplified and condensed the available discursive positionings by “whittling away his complexities” (Bibby, 2011: 37). Frustrated and angered by his own rejection as a mathematician, he fixed his mathematical self into a matrix that was based on exclusion.

To unpick the particular forms of resistance within his comments it is useful to return to Walkerdine (1986, 1996, 1998). Walkerdine (1986:67) exposes the ways in which the pedagogical device of collaborative learning is premised on spaces of freedom from which the enterprising individual can be developed and where “practices are set up to produce certain responses, based on a theoretical edifice which defines them as normal”. Policy has discursively constructed the contemporary classroom as *the* space for adult learners to develop and progress their skills of mathematical thinking. As will be explored in the next chapter, there are restricted spaces for counter narratives, but

these are risky and temporally bound. In consequence, there remains an assumption that, with the right coaxing, the adult learner can come to trust their mathematical freedoms, and it is within this space that Jalal's stories of learning must be read. Freedom, within the constructivist paradigm, is understandable only in terms of the capacity of the autonomous and rational individual to establish a new identity through relations of knowledge and skills within the everyday domain. Walkerdine (1986: 28) provides a useful summary, from which it is possible to situate Jalal's form of resistance:

In this way, subjects are brought forth those who are (self-)fashioned and positioned as active learners and as self-regulating subjects, where the subjectivity stimulated is one that regards the maximisation of capacities and dispositions appropriate to maximising their own productivity as both necessary and desirable.

It is untenable for the neo-liberal ideal learner to transform their life chances without engaging with the project of the self. This demands individuals to open up the spaces of their selves. Problematically, in the spaces of the SfL intervention, the others (peers and teachers) tend to be positioned as 'othered'. Whilst the FE practitioner is discursively objectified as a "dinosaur" (Avis *et al.*, 2002) and out of touch of the 'real' world (Foster, 2005), the reform discourses available to adult learners offer fewer subject positions. According to Oughton (2007: 259):

teachers are found to be constructed by the text within a deficit model, as needing help, guidance, and instruction, while learners are positioned as also deficient, passive, childlike and 'other'.

It is within this particular classroom, this curriculum and this form of mathematics that Jalal is expected to transform and 'grow' free of his past injuries. Although it was Steve who opted out of learning mathematics, it is an impossible fiction that Jalal is expected to reconcile his quest for the "magical" mathematics which eluded him in his past. I feel that to associate the name of the teacher with Jalal's resistance would play into the discourse initiated by Callaghan, that holds the "teacher responsible for, and the guardian of, a moral order in which rebellion is to be transformed into freedom" (Walkerdine, 1986: 56). Nevertheless, it is important to relate the narratives. Jalal's teacher also talked of discomfort with the expectation that students will take up the discourses of SfL:

It's all about identity ... [students say] that's the way that we do it in my country and it's about saying well forget about your country. This is where you are now and this is how you have to do it, and it's huge. ... I don't like it but there is the exam.

Jalal questioned the notion of making mathematics more accessible by framing the knowledge within the everyday domain, but interestingly it was only Karigalina who questioned the processes of meaning making. Through a story that she recalled of an artist friend she made light of the Humanist fantasy of being able to interpret the actions of the logical individual:

I have a friend who is a famous painter. He is a famous painter in Lithuania, err, and basically all his life, I mean from a young age, he was famous. Maybe I shouldn't say, but some of the days, he told me the critics in the newspaper they kind of like say, erm, "oh this work he wanted to say that, that, that" ... and they were explaining and arguing about what he wanted to say in his work. And he said, "all that I wanted was to get the money because I was drunk the night before and in the morning that was the hangover and I needed the money and I just painted something." ... And I always remember it, there is no way you can imagine what a person thinks about something.

7.3 Learners negotiating

Lave and Wenger (1991) hold that engagement in learning requires the learner to 'take on' a discourse of identity transformation as in the cases of Kath, Sandra and, to an extent, Tony. The following extracts tease out some of the ways in which a learner, who in experiencing success in the mathematical classroom, looked to negotiate their positioning against particular expectations that they perceived to be demanded of them, by the discursive practices of SfL. Although the following learners had positive things to say about their contemporary learning experiences, in this section I look to the gendered ways in which these learners come to be subjectified and often positioned within the spaces of the 'other'. Each of the following four learners experienced 'success' in the classroom, but each in their own particular ways negotiated their identity not as an agent filled with self-discovery, but through stories of their defended desires. As subjects of mathematics that, whilst supporting their peers, protected themselves from the memories of past injuries of encountering mathematics.

In the following section I particularly draw on Brown *et al.* (2006), Walshaw (2010), Bibby (2010) and Walkerdine (1986) to demonstrate how these stories have come to be negotiated through gendered trajectories (such as working hard, catching up, and helping others), so that the benefit to their mathematical selves cannot be misconstrued as boasting, or perceived to come at the cost of progress made by peers. Karigalina in the following quote is negotiating gendered identity work to accommodate her emerging privilege within the classroom:

Karigalina: So my opinion, treat everyone like you want to be treated. So ... I'm trying to keep up to help these ladies because they are behind and sometimes they don't understand ... so I always keep in mind that they might need my help ... so this is why I am keeping an eye on them and doing my own work ... at the end of the year, (it is) your exam scores but I'm thinking if somebody needs help, then I can sacrifice just a little bit of my ... I have a book and I have a husband who is very, very good at maths, and if he can, he will help and so I do that.

In ways that were surprisingly similar to Sandra's narratives of 'taking on' the discourses of SfL, and indicative of Bibby's (2010) findings, Susan's accounts of learning in the collaborative environment pointed to defended feelings despite her contemporary success. In consequence, her subjectivities can be theorised as taking on positions that are at once powerful and powerless. In glancing at Susan through the constructivist account, it is possible to demonstrate her agency in relation to the freedom she experienced in determining the ways in which she interacted with her peers. However, this agency is not equivalent to Swan and Swain's (2010) suggestion that, in overcoming her resistance, she has recovered her 'authentic' natural ability as a mathematician. In taking a socio-cultural account, Susan's is a relational story of the ways in which her habitus has been transformed through the particularities of the social interactions of the field, her classroom. The following extract was taken from a learning activity, where Susan was working in a 'girls' team' who was then asked to defend her mathematical thinking against the 'boys' team'. I will then compare this narrative of negotiation with a second extract, where Kath (working collaboratively with her peer Mary) revealed different things about the spaces of agency. I will then conclude this section by interrogating the ways in which each of these examples spoke loudly about the positionings that were offered to them as female subjects in the SfL mathematical classroom:

Teacher: Do you ... agree with the boys?
Susan: Wait, let me see. No [giggling from within the group]

Boys: And why not? Why is this different?

Susan: B (the letter) doesn't have a [interrupted]

Fahema: B doesn't have a symmetry line

Boys: Yes it does. There is one right? [Looks at teacher]

Fahema and Mary together: No, it doesn't have it

Fahema: Because the other bit is bigger

[Susan has taken the letter and folded it and handed it to the boys]

Fahema: Look so you can't fold it, it doesn't fit

Mahmood: Oh, so this doesn't fit. This annoy me.

Susan: Yeah, it depends on how you write it, but with this one here doesn't fit.

In terms of taking turns to speak, Susan's use of silence (and the resulting folding of material to visually prove her mathematical point) could, within traditional models, be read as an example of Susan's lacking confidence and agency; pathologized as dependent on others to talk within public spaces. On closer inspection though Susan's responses reveal the effects of the power of knowing that she had the 'correct' answer, but also an awareness of the stakes of being publicly revealed as having made a mistake. It is useful here to take a minute to glance at a passing comment made by Steve, who articulated the psychic cost (to him) of facing humiliation in the classroom.

The worst-case scenario is (laughs) answering a question ... and saying the most ridiculous answer. Or just getting it wrong. It's alright if you are a bit wrong ... everyone gets where you went ... Then you can think well, I had the right idea. But if you've got ... where did I get that from? I am totally lost.

Susan empathised with the boys. She understood the risk of being revealed in the class as simply not 'getting the point and found a means to demonstrate the 'answer', but

without interrupting her assumptions of ‘normal’ ways to behave in the classroom. However, in the following extract it is possible to see how she negated reasons she chose to demonstrate, rather than assert the ‘correct’ answer to the ‘boys’ team. There are interesting classed, gendered and raced aspects of this encounter (which will be discussed in 7.4.1.), where I theorise the use of silence as a form of gendered resistance through a discourse of respectability, of being polite and empathetic towards others:

Tracy: ... but you didn’t just say you’re wrong

Susan: No, I think, well that’s rude innit? ... she [Fahema] has a loud voice and I don’t know, she just kind of over shadows and I don’t really like kinda going on top of her and stuff. Manners, yeah I didn’t answer ... I just let her explain.

Whilst not speaking within the classroom space, in ways similar to Walshaw’s (2010) investigations, Susan took control of both the direction and the duration of the discussion. By folding the paper and then handing her mathematical solution to the boy’s team, her comment “yeah, it depends on how you write it, but with this one it doesn’t fit” demonstrated an awareness that the ‘boys’ team had a command of the mathematical principle and could accurately calculate the number of lines of symmetry. With this, Susan recognised that the ‘incorrectness’ of their answer lay within the geo-political situatedness of their previous experiences of learning mathematics. The ‘boys’, in having previously learnt mathematics in Pakistan, did not have command of being a subject of SfL and so only had access to particular forms of mathematical knowledge. Through a Bourdieuan (1992) lens those that operate like “fish in water” will have a ‘natural’ privilege over others that are not aware of the rules of the game, but this analysis does not allow for an understanding of the ways in which Susan, despite not speaking, took control of the mathematical content.

During classroom observation I was able to record the times, the duration and the contexts when Susan spoke out in class. This analysis unmasked some of the hidden gendered trajectories that she quietly performed. When Susan spoke towards the end of the session she placed herself at the centre of the learning community and made herself acutely visible by calling a halt to the activity:

No wait! Wait! No wait! I've got 16. Yous lot got eight. Wait! Oh I see. I stopped at the centre and counted. Why? Don't know. Can't remember. It's okay, I see, I see! Silly mistake [hums quietly to herself].

I use Walshaw's (2010) works to understand how subjectivities construct the conditions of possibility that privilege some practices over others to unmask how Susan organised her vocalised practices around her understanding of being feminine. She voiced her mathematical opinions at a time when she perceived herself to be lacking, inferior, against the 'real' mathematicians (the Pakistani young male adults in the class) who she perceived would know the answer. This is in contrast to the understanding she demonstrated to the 'boys' during the opening activity, but which she consequently denied to herself where she reasoned that it was her lack of logical thinking -her affective domain - which led to the 'wrong' answer. In undertaking a study of Susan's text, I argue in line with Walshaw that deploying a Foucauldian analysis limits the opportunities available to celebrate spaces of Susan's agency. I would be able to discursively construct the gendered positions available to her but I would not be able to take into account the ways in which Susan continually fashioned and refashioned her practices of participation, within and through the community of practice.

This was particularly in regards to Mahmood (a relationship I will glance at in the next section), with whom she held in particular esteem as a 'real' mathematician. When asked to recount her experience, Susan's immediate response fell within the constructivist account and in ways similar to Karigalina in the first extract, Susan negotiated the constructivist demands to be an agentic learner by modifying her mathematical voice, to be perceived by others as being helpful.

Susan: ... when you don't get something and you have to do it by yourself, it's worse. You know, you're stuck but when you really, really, really don't get something and you do it in maths and you do it together ... it kind of takes the burden off. Everyone's kinda thinking at the same time

Tracy: Can you tell me why you stopped with your work and decided to help him [the learner next to her struggling with the activity]?

Susan: Cos I'm not like that. Obviously if someone needs help, you just help them.

With her emphasis on “really, really, really, don’t understand”, Susan is caught within an inner dialogue, continually repositioning herself in relation to the mathematics that she could tame, through a dialogue that sought to maintain her sense of femininity in the mathematical space and reconcile the memories of painfully sitting in a class, disengaged with the mathematics and being punished for chatting with her friend. As Susan told (and then retold) her stories of (not) learning mathematics in secondary school, they began to transform from memories of being idle and gossiping with friends into feelings of intense isolation, inadequacy and otherness to her friend whom she recalled effortlessly transforming the sums on the board into ticks on a page of homework. As Susan once again returned to feelings of exposure, her facial expressions changed to that of a subject in need of a professional gaze. When I asked her motivations for participating in this study, she answered with a smile, “I thought you would just be like Mystic Meg and tell... [laughs] tell me what I got to do.” It was in interviewing Susan that I became aware that there might be a research question around the ways in which learners reconfigure themselves (and/or mathematics) when confronted with success in the classroom. Susan repeatedly started to hum as a means to comfort herself in ways that resonated with Bibby’s (2011: 84) findings of learners who feel:

... overwhelmed by the task of learning, feeling empty and hopeless, being incapable of putting your hand up and asking for help, wishing the teacher would slow down and see the agony and misery in your face.

In returning to Kath, who generally took up the discourses of collaborative learning, Kath and Mary juxtaposed Susan’s gendered trajectories of collaborative learning. Throughout the two-hour class, each had equal input into the solution and frequently finished each other’s sentences. Neither rushed ahead in their own thoughts, and both actively slowed down the processes of articulating their mathematical practices to ensure that the other understood. The ways in which they practised their mathematics remained in line with Mendick’s (2006) findings, through a gendered trajectory of caring for each other, working hard and discovering meaning, rather than displaying the more masculine characteristics of precision and speed:

Mary: Mass is density times volume. MDV! Yeah

Kath: I can't remember this properly. Look at what my figure is coming out to be. It's got to be, I've got it in here somewhere. Haven't I?

Mary: Density times volume

Kath: Equals the mass

Mary: Yeah

Kath: Yeah so that's for the mass ain't it? So

Mary: If this times, no hang on

Kath: Hang on! What do we need to know?

Mary and Kath together: We need to find out that.

[They then work on the question independently for about ten minutes before they discuss their findings]

I suggest that in the above account it is possible to talk, albeit with extreme caution, of agentic mathematical spaces within Susan, Karigalina, Kath and Mary's stories of learning. Whilst I argue that they cannot be theorised through what Boaler (2003) refers to as a "dance of agency", skipping intuitively in and between spaces of prescribed procedures and problem solving as required by the activity, neither can these examples of mathematical practices be simply the product of the regulatory practices of the classroom. The subjectivities on offer are the products of myriad competing discursive practices, both of the classroom and of the wider social milieu. It is through deconstructing what Brown *et al* (2006: 88) refer to as the "fragile ontological states" of the individual, of looking to the ways in which they try to fit into the community of practice, to make others feel at ease and/or to satisfy the regulatory gaze of the teacher, that the extent of the complexities of the task of confronting the mathematical self is revealed.

7.3.1 Silence and the classroom

As bell hooks (1994: 143), writing mainly within the post-modern, suggests:

Even though students enter the "democratic" classroom believing they have the right to "free speech," most students are not comfortable exercising this right to

"free speech".... Especially if it means they must give voice to thoughts, ideas, feelings that go against the grain.

Hooks (1994) provides theoretical possibilities to start thinking about the ways in which the embodiment of mathematics, as white, male and middle classed, brings about bourgeois constructions of collaborative learning into the classroom, and in so doing inhibits and silences many of the learners. As previously discussed, in the analysis of Jalal, returning to mathematics through the spaces of SfL can disrupt expectations, both in terms of the form of the mathematics, and the pedagogy on offer. Traditionally, encounters of mathematics have been experienced under the regulatory gaze of the teacher, with the expectation that the individual should seek to maintain self-control and order in the classroom, hiding their emotions at all costs. It can therefore come as a surprise when mathematical knowledge is framed as a human construct, where the very purpose of knowledge is to bring about discussion through properties that, at will, can be manipulated by the individual and/or the collective.

When Moser (1999) set about reworking the curriculum, he assumed that teachers and learners shared the epistemic and ontological assumptions of the socio-cultural account. He assumed a shared vision of what 'new' spaces of mathematics could and should offer, particularly in relation to empowering learners to find and articulate their own (mathematical) voice. In naturalising the pedagogic technique of collaborative learning, the official discourses ignored the ways in which a spoken positioning of mathematics engendered new feminine qualities (like estimation and caution) into a body of knowledge which had, traditionally, been considered logical and linear (Walshaw, 2007).

I have considered the ways in which Susan used silence to enable her to act in collaborative ways, and Karigalina also used silence in interesting ways. Karigalina (introduced at the top of section 7.4) took on the role of the facilitating teacher, quietly working on her own, but listening to her colleagues to ensure they were on the 'right track'. The ways in which she discursively constructed her subject position played out in complex ways. Her performance of supporting others did not only come from a gendered location of a caring and supportive mother. In returning to the quote at the

start of section 7.4, there was an interesting intersection between the isolation of the 'othering' as a migrant subject, and her performances of collaborative learning:

Last year I took GCSE English and I noticed that, erm, that I was the only one non-British, so I didn't get help from any of the students. ... yeah so my opinion treat everyone like you want to be treated so since then, erm, I'm trying to keep up to help these ladies because they are behind and sometimes they don't understand ... so I always keep in mind that they might need my help so this is why I am keeping an eye on them and doing my own work ... I can sacrifice just a little bit of my time right and then I can catch up at home with these questions.

As outlined, Susan internalised her past encounters of schoolroom mathematics as the product of her own faulty character. During the lesson observation, at times she appeared silenced by the expectations of social behaviour in the classroom. She negotiated the spaces that she perceived to be full of conflict through using silences, and was the only learner I observed to demonstrate (and not to repeat) learning points to her peers. As I have explored through using the works ofWalshaw (2007), Susan's practices of not speaking could easily be dismissed as pathologically lacking within the constructivist classroom. However, it would be too neat to simply categorise Susan's and Karigalina's behaviour as passive or disinterested. Both (in interestingly different ways) refrained from engaging in vocalised practices with the intent to speak and reveal mathematical 'truths'. Both positioned themselves as privileged, and each sought to undertake the act of balancing the new construction of their own mathematical self through identity positionings that polarised the genuine and brilliant mathematicians, but significantly, also distanced themselves from the other 'others' in their class; peers who continued to struggle with the content of the mathematical knowledge on offer.

In very different ways Susan and Karigalina's mathematical work can be understood as being formed within and through the gaps of the mathematical practices hidden within the classroom. The ways in which they both shaped their mathematical identities fell in and between the expectations of what is assumed to be the most effective way to produce knowledge. Both sought to sustain an illusion of their unitary self as they struggled to reconcile their new and emerging relationship with mathematical procedures through silent performances of what they assumed to be the

ideal way to learn. Whereas Karigalina looked on to support others, to defend against her own fear of feeling isolated, Susan (like Kath and Sandra) expressed enjoyment in working collaboratively, citing that working with others enhanced her understanding of mathematical practices. In this way, Susan whilst producing herself as a learner of mathematics, pointed towards engagement and participation, but remained censored by her understanding of democratic ‘free speech’ within public spaces, and underwent considerable gendered identity work to not be considered impolite. Susan, on being confronted by ‘success’, immediately compared herself (and her right to speak) to the one individual in the room whom she positioned to be the only ‘natural’ mathematician in the classroom, “Mahmood [her peer] he’s just so fast. So quick, quick, quick and I want to be like that, fast”, and in doing so, she compared her success to what she imagined it would feel like to learn ‘real’ mathematics in the classroom.

Philly’s stories of learning have been deconstructed at some length in Chapter six, but the insights into her injuries can reveal things about how she negotiated the socio-cultural discursive practices of collaborative learning. Philly’s account was the most aligned with Solomon’s *et al.* (2010) findings of pupils working in lower sets. Philly’s interpretation of the question “tell me about your experiences of collaborative learning”, led her to demonstrate her ability to care and support others lacking in confidence. Bibby (2011: 75) suggests that “safe spaces (of learning) are often small and hard to find, even for those who would utilise them, let alone outsiders who might judge”, and as we have seen in the previous chapter, her desire for a safe learning environment was vital for her to even be able to enter the classroom, let alone the mathematical space:

most of us sit there with a load of crap in our heads, how on earth does other stuff we really need to get on, stay in our head with all this other stuff going on? ... I want to be able to be open as much I can. As much as I'm able to at that particular time, on that particular issue ... but I close down. Close down, yeah.

Philly was not the only participant to internalise the 'problem' of not being able to learn mathematics. Susan and Kath also cited what Steve termed a "stinky attitude" in a bid to reconcile their new found ability to 'do' mathematics in the classroom:

Steve: When I did my GCSEs again, the people I used to live with, one of them was an electrical engineer and he knew everything and he sat down with me for 2 hours a day showing me fractions. I mean simple fractions and my mind was just not there, and I couldn't see what he was doing and I think literally ... I didn't want to know. At the time, I thought God why can't I get it and now looking back I don't think I could have been that stubborn ... I have always been if my mind is closed then I am just not going to get it ... it may have been that.

Kath: I know why I didn't do well (at school) ... I messed about and erm was you know, taken out of the maths lesson and made to do like work by myself. So, if you don't understand ... and you haven't got the teacher to explain it and I was in that frame of mind, 'oh well I'll just do it myself.' And I didn't do any course work, so stupidly I didn't do it.

Susan: Well I never did any homework, so I guess it's my fault that I'm at the stage that I am now, but I also know that the way that some people teach is a bit weird ... Well, I didn't understand it anyway ... they would just come in and start talking and they would expect you to be able to catch up.

In placing their 'difficult' selves at the centre of a discourse of blame, all four participants carefully negotiated the inclusion of what Skovsmose (1994) refers to as the structuring processes of mathematics. However, what was left out of the accounts was also striking. All spoke convincingly of the need to be numerate but none associated this form of mathematical knowledge with something they felt needed to be mobilised within them. It was only Fatima who spoke of a terrible sense of shame and vulnerability at not having the confidence to check her change:

I feel very confused and nervous to check because I do know that it is a bit difficult for me. So I do look at this to the nearest change for me. So if it was sort of £1 something and erm I gave you £2 and it cost me ... 25p. ... then I think, you know has he given me £1.50 something. If there is something there, then it's fine.

Philly spoke of a relief of not making terrific mistakes when buying curtain material, Susan of being chastised by her mother for not being able to perform a percentage calculation in a shop with immediacy, but none placed this sense of loss in a relational account of what they wanted to achieve from returning to the classroom to learn mathematics through the spaces of SfL. The final chapter will reflect on what happens to mathematics when what was once considered impenetrable becomes penetrable. This chapter has sought to interrogate the implications for positioning, given the subjectivities available to participants within the SfL intervention.

7.4 Summary

By drawing on the works ofWalshaw (2004, 2007, 2010) alongside Bibby (2008, 2010, 2011) Brown *et al.* (2004, 2006) and Brown (2011), this chapter has offered an interrogation of the ways in which the learner participant have variously taken up, negotiated and/or resisted the subject positions offered to them as adult learners of mathematics through discourses of SfL. I have drawn from a Lacanian psychoanalytical perspective and examined the fantasies and desires as the participants imagined the ‘ideal’ learning environment and/or value of mathematical knowledge. In taking this approach I exposed how this sample of participant learners have come to reconcile the gaps between fantasies (within the imaginary domain) by creating fabrications of the self to meet the perceived expectations of the ideal learner within the symbolic realm.

Kath, Sandra, Susan, Karigalina and Tony all gave complicated accounts of learning; each were suggestive of the ways in which they have shifted their sense of selfhood towards the notion of being able to do mathematics. Whilst Kath, Sandra and Tony tended to look through a mirror of perfection, each negotiated their own spaces in ways in stark contrast to the collaborative account. Sandra and Tony positioned their emerging identity in relation to the teacher, and Kath, Susan and Karigalina as an external but interesting body of knowledge. I have argued that learners cannot be positioned as agentic, enterprising individuals, ready and able to leave the concerns of the material world outside of the classroom. But neither can they be read as docile bodies simply yielding to the discourses of how they should learn.

Practices of learning and forms of mathematics may be inscribed on bodies, but the ways in which the individuals converse with the big Other in the symbolic domain, and/or the fantasy and desires within the imaginary, shape (and are shaped around) the structuring processes of learning and are productive of a range of positionings. Where most of the learners took up many of the aspects that are vital to the collaborative classroom, Susan and Karigalina used silence to negotiate their mathematical selves in ways that highlighted the importance of the affective domain. Each cited the use of silence as a way to protect themselves and their othered peers, from the prospect of fear, humiliation and failure as productive of, as Susan recalled, ‘having numbers put

in their face" and in this way their particular use of silence was at once powerful and powerless. Powerless because the act of silence was inscribed through the gendered production of 'doing' mathematics and of speaking within public spaces, but powerful because the product of the silence disrupted the hierarchy of power that traditionally has served the interests of the white, male and middle classed 'autonomous' individual, and the discourses that have framed learners as consumers of 'choice'.

It was through listening to Jalal and Steve's stories that the impossible fiction of freedom in the classroom was exposed. Through looking at collaborative learning through a mirror of perfection associated with the esoteric domain, both participants became marginalised by the neo-liberal account of the self in the mathematics classroom. For Jalal, the resulting frustration turned to anger and further reduced the resolution of his mathematical gaze, expelling him from collective discourses of the aims and purpose of his course. However, Susan, Karigalina and Sandra negotiated the expectations of social behaviour in the collaborative account, and it is through Žižek's (2006) understanding of agency as a 'meta choice' (for example Susan's and Karigalina's use of silence) that the product of identity work/self-identification can be read as extending the range of subject positions that they assume to be available to them. Discourses of best practice engages the learners and teachers in particular performances of mathematics. The extent to which the administration of the curriculum allows space for the teacher will be explored in the next chapter as I look to the empirical data to reveal the effects of the "terrors of the performativity" (Ball, 2003) that were outlined in Chapter five.

Chapter 8: Teachers negotiating the demands of the reform agenda

Education reform is spreading across the globe ...This epidemic is ‘carried’ by powerful agents, like the World Bank and the OECD ...The novelty of this epidemic of reform is that it does not simply change what people, as educators, scholars and researchers do, it changes who they are (Ball, 2003: 215).

The intention of this chapter is to deconstruct the notion of ‘success’. Whilst positioned as a neutral and objective measure, success is in fact deeply ideological and the questions I ask of this chapter do not seek, as I did in Chapter five, to interrogate the history of the present measurements of progress. Instead, I look to the narratives of the teachers, to consider how they have come to make sense of, talk about, and reason through the performance indicators of best practice, professionalism and standards. Ball (2000: 220) suggests the “taxonomies of effectiveness are often little more than socially-constructed floating signifiers” that privilege particular aspects of discourse. I am therefore, interested in the processes by which these discourses of performativity have come to be taken as common sense and argue in line with Brown and McNamara (1999: 88) that “official languages become an imposed form of anchorage that taints the space people see themselves working in”. In this way, I look to Hall’s (2000) understanding that it is only through analysis of a particular discursive formation through which the 'situatedness' of common sense definitions of teacher professionalism, best practice, and standards comes into play. It is for this reason that in this chapter I make connections between the previous findings of learners’ performances of the ideal learner and performances of best practice as narrated by the participant teachers.

8.1 Regulatory gaze

Constructivism is the dominant view of learning, at least within the mathematics education community. It is not difficult to understand why: it offers a theoretical rationale for the desire of most teachers to shift the locus of authority and control from the teacher to the pupils; it offers a justification for mixed ability classes and individualised learning; the powerful metaphor of children constructing their own knowledge seems to describe the processes which are currently emphasised as thinking mathematically, particularly in problem-solving (Lerman, 1993: 20).

In Chapter five I worked through the ways in which the networks behind the regulatory gazes have become so naturalised by the social actors within the field that the discursive construction of the self-motivated, enterprising ‘teacher’ has come to be constituted as *the* professional teacher, working within a corporate culture. Whilst I agree that FE practitioners, like all teachers, wrestle with the expectations of being able to meet the demands of best practice, it is important to look at the notion of resistance. The FE sector has remained a site of what Shain and Gleeson (1999) referred to as an industrial relations battlefield, and in terms of this particular sample, three of the participant teachers had been involved in “all out, indefinite” strike action. At the time of writing, staff at another college were returning to work after another “all out, indefinite” strike action and it is for this reason that these participant teachers cannot be simply theorised as subject to the “terrors of performativity” (Ball, 2003) inscribed on their bodies. But the injuries caused by the continuous assault on professionalism are clearly present within their narratives, and the fraughtness of the silences, the ambiguities and contradictions of performing to notions of best practice and professionalism will be examined in detail. The intention now is to turn to the narratives of the teacher participants to provide new insights into the compulsion to undergo identity work to demonstrate policy constructs of ‘success’, whilst remaining ethical to the transformative potential of returning to education.

Before I start the interrogation of the teachers’ narratives, I want to return attention to the professional details of the initial sample as outlined in the methodology. The intention of positioning the teachers within their own organisation was not to equate and justify these teachers’ practices within the demands of best practice, as this would fall into a direct conversation with a culture of performativity. The intent was to frame the ways in which this small sample of teachers’ professional standing within their own organisations could bring about different readings of the conditions of possibility to take ‘agentic’ decisions about their practice, given the privileged positions made available to them as successful practitioners. In returning to the ethical question posed in the methodology chapter, I now protect the identities of the teacher participants by excluding the pseudonyms in this chapter, and simply refer to each extract as coming from Teacher A, Teacher B etc., but I have maintained my name, to reveal the points at which I intervened in the discussion.

In using a sample of teachers that have come to be privileged by the positions offered to them within their organisation, I argue that this particular sample of teachers unmasks a diversity of positions that is not on offer to, say, a ‘new’ teacher entering the field. Or, for example, an experienced teacher positioned at the margins of professionalism and/or under the external gaze of the administrative procedures of those perceived to be ‘failing’ their learners. This is not to provide a sense of permanence to this positioning; part of the terror of performativity is the discourse of ongoing assessment. There is no assurance that a teacher privileged today will not tomorrow be under the gaze of the technologies of the capabilities framework. The spaces of agency that I hint at through the narratives of these teachers is therefore, not calibrated against the classical liberal interpretation of the freedom to act. It is a paradox of the sector that, whilst referred to as one of the most regulated in Europe (Keep, 2006), the ‘control’ of the syllabus remains at the level of the teacher (Moser, 1999), although I argue that the contemporary neo-liberal discourses of ‘creativity’ and ‘innovation’ are particularly restrictive in terms of the types of ‘risks’ that are deemed acceptable for teachers to exercise in the classroom.

It is for this reason that I travel beyond Foucault’s interest in discursive production to look towards the material to gain insights into meaning, associations within and through social interactions, the effects of power and the production of subjects and objects of best practice. In taking this approach, I turn to Bibby (2010, 2011), and Brown *et al.* (2006, 2008) use of pedagogic mirrors, to theorise the ways in which tales of agentic decision-making in the classroom are but the products of an illusion of choice. I demonstrate how, as the teacher enters into discussions of agency, she encounters her own monologue with the ‘big Other’ within the symbolic domain, typically using the spaces for planning (for learning) as a bargaining tool, a yardstick for measuring the conditions for the opportunity to enact her desires in the classroom. Žižek (2006: 14) sums up this theoretical framing:

... because of the performative dimension, every choice we confront... is a meta-choice, which is to say a choice of choice itself, a choice that affects, and changes the very coordinates of choosing.

8.2 Teachers negotiating best practice

The effects of the culture of performativity were sharply felt in the classroom and the discursive practices of the SfL Intervention were always present within the conversations. The extract below occurred within 10 minutes of the group discussion and demonstrates that it is possible to consider the teachers in terms of their pedagogic ‘meta’ choices:

Teacher A: Erm, there is a difference between ideal, what I would like to do and the reality, what I have to do in practice. So which one are we doing here? Because ideally I would hate, ideally I would not be teaching to the exam, but in reality, I have to!

Teacher B: I too thought about examination and assessment and then I thought, no that's just you being a manager now ... and then I thought no it's the learners. It's the learners too. Particularly the bit about making it clear about what they are expected to achieve and how they will be assessed because actually, they want, a lot of my learners are coming because they want the level 1, or the level 2, or the entry level. They want some piece of paper at the end of the year that says something. So I would be doing them a disservice if I didn't. So, I think actually, this is what the course is set up for. This is the aim. This is what we are being funded to do, so I think I ought to be mentioning it, and making it clear throughout the year.

Tracy: You seem to feel uncomfortable about having this as an aim?

Teacher A: I feel extremely uncomfortable.

Teacher B: I don't know about extremely uncomfortable, there's an air of discomfort ... it's not my first priority as a teacher. I want the learners to develop as mathematicians ... but there's a lot wrong with the national assessments but there's validity in that piece of paper and that is empowering to people. So, if I can get people through then that not only as a curriculum leader does it make me happy, but that makes me happy as a teacher too.

Teacher A: Fair point.

[About 10 minutes later, the discussion returned to the accreditation]

Teacher C: You're right, I mean talking about this. I mean students come with, they want proof that they've done something, so definitely, they want to mark their own achievements, like society tells them they should want to do, you know the expectation. ... There is a sense of achievement ... But then there is an awful lot of pressure to, much more now I think than there was 25 years or 30 years ago ... to

accredit every last goddam thing. Well, will we get a certificate at the end of this afternoon?

Tracy: You get a muffin!

Teacher B: Can we declare that to the IFL15? Declare a muffin?

Teacher D: Do we frame it?

Teacher C: So we are all compelled to prove that we've done things. Because you know, why should they take your word for it ... you say, oh well I've worked for 25 years, but you have to prove it in some way to show that we have done these things.

I have used this extract to challenge and reject the notion that teachers, even when consciously reflecting on their own practice, are able to stand outside of discourse and reflect on their own practice and/or the shape of the mathematical knowledge on offer to the adult learner. From this short excerpt it is possible to reveal the inconsistencies between the teachers' image of themselves as a 'good' teacher, and the ways in which they perceive they are expected to perform through policy. Whilst Teacher A takes pleasure in resisting the framework that they know must govern their actions, in their bid to escape the demands of the regulatory gaze, they seek a division between the real and the ideal (Žižek, 2006). This division is brought about by a negotiation in the realm of the symbolic, to enable this teacher to re-route desires and bargain with the fantasy of the authentic ethical self, whilst maintaining the privileged position within and through SfL discourses. It is clear from the sentiment "I feel extremely uncomfortable" that it is these very elements that Teacher A seeks to exclude what Žižek (2006) refers to as 'dirty truths', that is the necessity to teach to the exams, which most haunts their identity as a 'successful' practitioner. In taking a Foucauldian turn, despite the narratives of resistance, Teacher A does not engage with a conceptual struggle to disrupt the necessity for exams. In negotiating their own approximation of the demands of performativity, Teacher A remains unconvinced of the authenticity of their work and their identification as a 'good' teacher is at risk.

In analyzing the ways in which Teacher B attempts to silence the tensions between

¹⁵ Institute For Learning, the body at the time of the research that sought to professionalise the workforce by membership.

desires to enhance learners' mathematical understanding and to perform to normative technologies of power, it seems Teacher B has conflated an assumption that learners' share a common goal (gaining a qualification), with their own 'common sense' policy orientated reading of success. Teacher B, unlike Teacher A, has been able to negotiate the demands of the symbolic in ways that, whilst remaining an ethical teacher, legitimate a desire to follow the 'rules' and to comply with the demands of the funding mechanisms. In doing so, Teacher B is 'happy' to be seduced by discourses that use the notion of a qualification output, as an effective gatekeeper to further opportunity. This negotiation is both a product of, and productive of, the discourses in the classroom. Teacher B is compelled to sustain the narrative of the importance of a clear progression route (whether it be an improved career, to help a child with homework or the therapeutic effect of overcoming a gremlin), which becomes acutely visible at the point at which 'success' is gained. In looking through a Lacanian mirror, it is possible to see how Teacher B's perception of the lack of conditions to achieve perfection carries no "kernel of wrongness" (Bibby, 2011: 37), which makes it easier for Teacher B to live with the imperfections than for Teacher A. As Brown and England (2011: 77) explain:

It is this personal need in determining professional identity that predominates over any actual externally imposed performative criteria, or any actual alignment with a collectively defined ideological programme. The teacher may not need to reach a final resolution of such dilemmas and may continue to work with many such notions variously activated according to demands made in different professional contexts.

Whereas teaching to the exam incurs a pedagogic cost (of mathematical thinking) for Teachers A and B, it is the personal assault of the 'audit culture' that is most apparent within Teacher C's account. Teacher C, by stressing previous eras of basic skills provision makes it possible to map the points at which the reform agenda has incurred a personal cost to their own identity; a professional teacher with longstanding "service" to the community. In a surprising contrast to the findings of Osgood (2010), Ball (2003) and Bathmaker and Avis (2005), the role of Ofsted and/or inspections was never visited by this group of teachers. All appeared caught within (or resigned to) the myth of the need for precision and accountability that typically surround discussions of best practice. Within this localised conversation, it is possible to begin to unravel

some of the subjectivities that arise from the “terrors” of performativity and it is in this light I particularly subscribe to Rabinow’s (2002: 340) latter understandings of the technologies of the self, in that the self operates and constitutes their own field of possibilities:

... the behaviour of active subjects is able to inscribe itself ... it is the set of actions on possible actions; it incites, it induces, it seduces, it makes easier or more difficult ... in the extreme it constrains or forbids entirely.

8.3 Teachers negotiating creativity and innovation

In the contemporary discourses of education, where exam success is privileged but the pedagogic demands of mathematical thinking is expected, the quest to meet the discursive practices of innovation and creativity requires the teacher to negotiate complex identity work to meet the demands of often polarising discourses. In theorising discourses of creativity Ball (2000) suggests that the competing demands of conformity/uniformity whilst simultaneously demonstrating the ability to foster the learning conditions to promote creative thinking, have resulted in key actors reconfiguring the notion as ‘fast track’ solutions, or as Simmons and Thompson (2008) suggest, with the sole intent to compress and organise both time and space in the classroom. It was within this neoliberal context that discussions of creativity arose and in this section I look to the narratives of the teacher participants to reveal struggles to foster creativity. It is also worth taking a moment to briefly return to the effects of power from within the group where these discussions took place. In the words of Bathmaker (2001: 4), teachers are compelled to continuously negotiate public discourses that frame them as either:

... dupes or devils in the eyes of the critics, for on the one hand not conforming wholeheartedly to prescribed managerial practices and, the other, not using the opportunities they have to transform teaching and learning in preferred ways.

Whilst all of the teachers could be understood to have been on what Kitzinger (1994: 105) referred to as “best behaviour”, their comments at times were characteristic of defended narratives, with their responses lurking in the shadows of the ever present threat of being perceived as ‘failing their learners’. It is through brief moments of conflict that Kitzinger’s (1994: 2) fragments of the discursive construction can be felt:

It would be naive to assume that group data is by definition ‘natural data’ in the sense that it would have occurred without the group having convened for this purpose ... (but) tapping into such variety of communication is important because people’s knowledge and attitudes are not entirely encapsulated in reasoned responses to direct questions. Everyday forms of communication such as anecdotes, jokes or loose word association may tell us as much, if not more, about what people ‘know’.

An example of the tension between the teacher participants as they silently fought to secure their positioning within the context of the research is especially evident in the following excerpt. Teacher B disrupts the flow of the discussion, by performing to the gendered trajectory of caring for a less experienced colleague, confirming to Teacher D that they were indeed on the right track, with their definition of best practice. Teacher D acknowledged the confirmation (and was visibly comforted at the time), but then appeared marginalised. In this instance, Teacher D did not contribute further to the discursive construction of creativity:

Tracy: How would you describe creativity in the classroom?

Teacher A: Depends how many glasses of wine we’ve had! Mathematical creativity means for me, it means either to be able to find lots of different solutions or lots of different ways to handling the problem. But also, it means if you can transfer what you have learned from that, to something else, you can see other contexts that you can use

Teacher D: Making connections?

Teacher B: That’s it, yes

Teacher C: I get them to do maths and stuff on flip charts, so they are working out giant size problems ... (which) I try to get them to value [laughs], but actually it looks fantastic when they’ve finished ... it’s like cave art to me. It has the same depth to it, the resonance. You know, whether it’s the handwriting, the colouring, the way they arrange it, and sometimes they’re so fantastically creative ... You know they definitely come and say they can’t do it, and they do the most amazing things and you can be genuinely really artistic without ... you know, algebraic equations

Teacher A: That’s a different creativity. So, that’s creativity in that sense.

From this extract, it is possible to see that Teacher C holds closest the notion of mathematical beauty, and sees a benefit in trying to find ways for learners to share the

pleasure of atheistic qualities within the esoteric domain. This comes as a surprise to Teacher A, who holds a less secure relationship with the academic discipline. Teacher C's notion of mathematical beauty holds few markers of interest for Teacher A, who does not look to the beauty of mathematics to sustain a niche of creativity. In order to gain more depth of understanding behind this approach it is possible to refer back to Teacher A's recollections of experiences of learning mathematics in secondary school, which they equated with "... the answer line must be with a ruler. You're bringing it all back now. No wonder I hated it".

This extract suggests that Teacher A has not encountered mathematical knowledge as something that could be interesting, or beautiful, within its own space. Whilst the transformation of now 'doing' mathematics as a numeracy teacher has undoubtedly given this teacher a new insight into their mathematical selves, mathematics is narrated as a body of knowledge that is internal. For Teacher A, creativity is more in line with the policy orientated view of 'success'. Creativity is less about the beauty of number and more about the spaces of innovation to invent new and imaginable contexts that are immediately relevant to the learners' lived experiences. In ways that are conducive of the constructivist paradigm, for Teacher A, the mathematical needs of the learners are most effectively met when the mathematics is presented in a neatened, contextualised form, which talks to the everyday domain, and in particular to the demands of the labour market. In the following extract Teacher D returns to the centre of the group to discuss creativity, but only once the conversation had returned to discourses more familiar with the SfL strategy:

Teacher D: It depends on the type of course ... the [name of course] I run isn't accredited. It's just about them.

Teacher A: That would be fantastic.

Teacher D: Yes, so obviously I don't really think about what they are expected to achieve, because there isn't expectation. Just that there is an expectation that they will learn something [laughs].

Teacher A: So how do you decide what to teach them?

Teacher D: Well I, erm it's ... I kind of just follow with where we go, erm yes. Just started off looking at place value, the ideas and seeing and

thinking what they needed, seeing what they wanted, yeah, erm, and it was very strong ... the reason they wanted to do it was to help their kids. So I got them to bring in ... children's homework that was confusing ... and it's nice to have that ... Yeah I think we can all see the non-accredited thing as ideal in some ways.

Teacher D, on being asked to explain processes of planning, immediately turned to the regulatory gaze and the structure of the curriculum to construct a response.

Achievement was framed within a policy orientated view of success and the organisation of learning was as dictated by SfL. In conversing with the 'big Other', Teacher D's narratives of creativity became a discourse of common sense, indicative of a framing that there was no other place to start planning, other than with place value, the start of the adult numeracy core curriculum. As Hardy (2004: 106) explains:

It is the trick of power to masquerade as common sense that leaves us unaware of our effects on practice ... for how these practices gain their power.

With this framing it is possible to see how the instruments of the curriculum reform have become part of the very body of the mathematics that is on offer within SfL, and this is why Teacher D is unable to articulate 'good practice' outside of the organisation of the curriculum. As Brown (2006) comments, by using metaphors to build specific traits into the notion of best practice (such as the surveillance, pedagogic discussions, hard to reach learners), spaces of 'success' have been restricted to discussions of pedagogic expertise. In line with Maguire, Ball and Braun's (2013) findings, whilst all the teachers produced counter narratives that resisted the demands made by the qualification framework, it was interesting to note that none brought the attention of the conversation to the particularities of the SfL curriculum. In this way, the notion that there is something that can be labelled good practice (as a fixed and policed entity) was neither scrutinised nor problematised. A Foucauldian understanding of the effects of power of the disciplinary technologies and the notion of self-governance (how the teachers policed themselves within the informal group discussion), highlighted the ways in which the discourses and practices of neo-liberalism have produced new academic subjectivities from which it is difficult to find spaces for the actors to resist. Each participant, in their own and surprisingly different ways, revealed that it is unimaginable to talk of teaching in ways that lie outside of the intervention.

In Chapter five I looked to the discursive construction of numeracy as a new way of thinking about mathematics, a curriculum organised to be inclusive to all, through a paradigm exclusively connected to employment. The assumption being, according to Maguire *et al.* (2013), that it is possible to learn things (in this case mathematics) by drawing from experiences in everyday life, to learn how to be flexible in thinking in ways that can enhance productivity in the workplace. Blackmore (2006) asserts that educational discourses have failed to engage with the gendered locatedness of the socio, economic, and cultural trajectories that inform life chances. Writing from a critical feminist perspective, she demonstrates that despite the high proportion of women learners within the sector, the gender wage gap has significantly increased with discourses of Lifelong Learning.

The above excerpts demonstrate the ways in which these teachers have, despite their critical engagement with the regulatory gaze of SfL, invested in discursive truths of the ‘crisis in skills’, the importance of flexibility, of training to be employable. Ultimately through a lack of discussion about the technologies of administration of professionalism and best practice, they had re-inscribed ideas that the nature of reform (to assure quality within the field) is both precise and scientific:

Normalising discourses around the notion of quality are cultivated and become embedded, so that it is possible to identify neoliberal values within the text whereby good quality (via professional standards) is deemed ‘attainable’. The acquisition of ‘quality’ becomes possible through the neoliberal constructs of regulation, accountability, measurability, excellence/best practice, standardisation and symbolic value. Alternative constructions of quality become silenced (Osgood, 2010: 46).

In the final extract, Teacher C used a ‘throw away’ comment with the intent to conclude and smooth differences in and between the discursive constructions of best practice. Within this context, it is useful to look to the exchange below to gain insight into the ways in which these teachers, even when on best behaviour, jockeyed amongst themselves to maintain a sense of their privileged positions. Teacher C was irritated by Teacher A’s ongoing efforts to help Teacher D to identify the infinite number of strategies and contexts that were available to them in the classroom. I suggest that, from this exchange, it is possible to deconstruct the ways in which the

teachers were primarily engaged in a monologue with the ‘big Other’ to maintain the authenticity of their privilege:

Teacher C: Everyone, everyone has been in these cul-de-sacs before, even the most brilliant teacher on this planet. I am sure you hit a cul-de-sac once in a while and you think, I wish I had approached that different.

Teacher D: I think possibly you would find another way. Another context.

Teacher A: It’s about the context, but I think there is also an argument for time. Maybe … if the student is dead set against it, then walk away. Then at another time come back to it again linking it to … a context that they might be happier doing … or where they actually do it, tell them well, that’s exactly what you’ve just done. So get in by the back door.

Teacher D: I remember with an ESOL student last year. There is a whole kind of language to do with estimation. It’s about guessing. Why should they guess if they can do the calculation? So, should you do the estimation first? Sure it’s inter-related but…

Teacher A: But if you put it in a context. For example, we do something with the Argos shopping, so they have a sheet and they decide what they need to buy and before they even look at the catalogue - How much do you think it’s going to be? So then, they do just a rough figure … then they go to the catalogue and then it makes sense.

Teacher C: … we do all those things. It’s all practical with money and it should be made easier for them, but some people just think why and legitimately why? And even with all the contexts, sometimes you just have to say, “I don’t know why.”

Through applying Butler’s (2005: 416) ideas of identification as enacted fantasies, it becomes possible to examine the ways in which, on being disrupted by the ongoing fabrications of what constitutes best practice, the teachers began to expose the fictions in one another’s accounts:

… The words, acts and desires produce the effect of an internal core or substance, but produced on the surface of the body, through the play of significant absences that suggest, but never reveal the organising principle of identity as a cause. Such acts and gestures … are performances in the sense that the essence or the identity that they otherwise purport to express are fabrications manufactured through corporeal signs and other discursive means.

Teacher C disrupted the regulatory ideal that asserts the conditions of possibility that can overcome any barrier to learning and in the process, exposed the relentless fantasies of Teachers A and D as a fiction. The ‘trust’ awarded to the ‘good’ teacher was exposed as fragile, conditional not on years of ‘good service’, but on ongoing performances of the performativity culture. For the briefest of moments, the identification markers of being a good teacher were exposed as a fiction, and the notions of professionalism and best practice were recognised as an enacted (but unachievable) fantasy. Teacher C’s angry response can be read as the product of taking a considerable risk to identify the constituents of best practice, as being anything other than scientific truths. However, in the end, the desire to hold onto a coherent account of what constitutes best practice won and within a minute, the teachers collaborated once again to weave a new myth to sustain the constructivist illusion that learning to one’s best ability is not only possible, but probable and empowering:

Teacher A: So they come with the maths but they don’t have the language to explain it and to work out the whole culture of maths here.

Teacher B: You know I don’t think that’s only second language speakers. I think that’s across the board and I think that’s where having the language can be really empowering. Just last week I took another tutor’s class. We looked at multiplication and partitioning. I didn’t use the word but the learners recognised it and used it. They had done it with addition. They were so pleased that they knew the word. I know what I can do, I have a word for it. I know that word.

Teacher C: Yes the jargon … yeah we try not to bamboozle people but that’s a nice reminder that it’s quite nice to have the language. It’s so completely specialised isn’t it? Then actually opening it out when people begin to read it out loud, say rather than looking at it and thinking what on earth is that? I mean that is fantastically empowering. I literally mean the old Marxist clause, you know the whole chapter four thing. That they take the means of production and go away and think I can do that. Yeah multiplication – yeah I can do that. Yeah like partitioning.

In conclusion, it is through the fragments where the teachers discursively produced themselves as subjects of the now corporate culture of the sector, where they most battled to portray a unified identity. Each used narratives of resistance to weave a critical distance from the aspects of the reform agenda, which most alienated the

production of their selves within the ideal domain. It was through the occasional ways that they jostled with each other that the fear of a weighty loss of professional standing was unmasked, and it was this fragility of notions of best practice, professionalism and meeting standards that the most fiercely enacted fantasies were subsequently produced. But in experiencing this alienation, none of the teachers deployed counter narratives that sought to resist or even question the grander narratives of SfL. Ball (1990: 165) suggests that alienation is linked to displacement of imaginable individual qualities, by the requirements of performativity. The result is often productive of narratives of inauthentic practices and relationships:

a regime of truth, management empowers the manager and objectifies and subjects the managed ... power, knowledge and the body are interrelated in the achievement of subjectification.

The teachers demonstrated that they had all found spaces to resist the demands made of them, but only through deploying the vocabulary particular to the agenda for reform; occurrences that Ball (1990) who in borrowing from the works of Louise Morley, would cite as acts of ventriloquism. In their different ways, all negotiated with, but took up, the language of the reform agenda to reconcile their own personal fantasies of the authentic and ethical teacher against the perceived fabrications demanded of them by the culture of performativity:

We learn to talk about ourselves and the relationships, purposes and motivations in these new ways. The new vocabulary of performance renders old ways of thinking and relating dated or redundant or even obstructive. We must become adept at presenting and representing ourselves with this new vocabulary and its prescribed signifiers and the possibilities of being ‘otherwise’ to or within it are extremely limited (Ball, 2005: 146)

8.4 Connections between teacher and learner narratives

Susan, Kath, Sandra and Alexandru’s stories of learning mathematics provided accounts that were most similar to the teachers’ constructions of ‘good practice’. Susan most strongly performed to discourses of a ‘preferred learning style’, and readily deployed the language of an active and visual learner to explain her preference for collaborative discussions. In doing so, Susan also revealed how her teacher performed to what she assumed to be my expectations of best practice. I have already

touched on this story in Chapter seven, but to provide a further glimpse, Susan reflected on an activity where the teacher had cut out individual letters, and asked the learners to organise and display, taking into account the number of lines of symmetry and rotations:

Susan: I was really tired that day ... I think I would have went to sleep [laughs]... if I come in and she was doing it in a different way. I liked it that way, it was good.

Tracy: So was it just for enjoyment?

Susan: Well, no, ... it's a better way for ... me to learn I guess.

Tracy: Can you tell me more about that?

Susan: I just like physical things a bit more. Like it's easier for me to, erm, when I am doing stuff, rather than just someone putting numbers in my face.

Tracy: So, when you say putting numbers in my face, are you thinking of a time, or a teacher or...

Susan: No, just in general that's how everyone kind of teaches nowadays. Just, there's no time to do all of that stuff, like all the time. I guess she has to prepare if she is going to do something like that, but it is nice to do that stuff once in a while.

What is important here is that Susan did not call for prescribed mathematical procedures. Nor did she equate the extent of her mathematical knowledge to the speed at which she could arrive at an answer. In contrast, Susan looked to creative problem solving activities that allowed her to explore and to deepen her mathematical understanding. This response has gendered connotations which will be explored in more detail in the next chapter, but on being asked how she would like to be able to 'do' mathematics, she immediately deferred to her past encounters, and referenced the role of the teacher, rote learning and the need to recall patterns and procedures at speed:

Susan: Mahmood [her peer] he's just so fast. So quick, quick, quick and I want to be like that fast ...it just takes me ages to ... remembering it. Drilling it into my head.

Tracy: Drilling? That sounds noisy and painful.

Susan: Yeah, but you know those things you do naturally? I want to do it like that.

The contradictions and tensions in Susan's reflections talk directly to a remark made by Teacher C, whom she had never met. When the two comments are placed side by side, they reveal interesting insights into the noises that can accompany learning. The comments tell us something about the ways in which teachers and learners fabricate the processes of learning, to survive in what Brown (2013) refers to as the theatre of the classroom:

Teacher C: I really think here the students are going to pick out the things we don't pick out now. I think they're really going to say ... this is what we want to be able to do. We want to be able to pass an exam; we want to be able to solve the problem; we want to be able to do it quickly and right.
Absolutely that's what they are going to say.

Susan narrated her stories in ways suggestive that the processes of learning are external. In ways similar to Jalal, Fatima and Karigalina, learning was depicted as something that the teacher knows best, and similar identification can be found in Teacher A's account. Teacher A recounted their own stories of struggling to access the mathematical knowledge offered to them whilst in secondary school. Their experiences of alienation lay as a foundational stone, central to their quest to deconstruct mathematical knowledge and to make it easier for their learners to access. In this way, Teacher A reworked their own fears as a positive professional attribute, which enhanced how they were able to reconceptualise generalised mathematical rules into 'bite-sized' chunks. Applying a Lacanian lens, this can be read as employing a mask to cover the anxieties and fears that they held in relation to their own grasp of mathematical knowledge. But in recognising the fantasy of being able to tame mathematics, in the form of contextualised numeracy, the characteristics of patience, the spaces for therapy within learning, and the characteristics of empathy were also held by Teachers B and C, who each held a strong identification as a mathematician,

and were also conducive of the attributes stated as of most value, by nine out of the 11 participants¹⁶.

Whilst Sandra, Philly, Susan and Karigalina immediately pointed to the affective domain as the initial starting point of good practice, it was by no means brought forward by all of the learners. In glancing back at Steve's stories, he like Jalal and Tony was taken by the allure of the fantasy of performing the kind of mathematics that is valued within academia. The differences in and between the constructions of worthwhile mathematics will also be explored in the final chapter, but for now Usher (2002: 147) enables a comparison between the forms of mathematics in esoteric domain with the 'soft skills' of the numeracy on offer through SfL:

What then, can be said about the kind of workers needed by such an economy? In very simple terms ... they need to be flexible and multi-skilled with an openness to learning. They must be at home in a work environment shaped by globalising processes and the information and communication revolution. They must, as a minimum, be IT literate. The skills required have been described as 'soft skills' and are themselves knowledge intensive - skills to do with problem solving, collaborative work, leadership and knowledge application.

It is the 'soft skills' of problem solving, collaboration and knowledge application / transfer, which are principally on offer within the collaborative classroom. This brings attention to the fragility of the assumption that adult learners are united by a shared understanding of a desired learning outcome. The assumption is that each learner is responding to the call to 'tame' their gremlins, so as to improve their career prospects. Tony, through his stories of trying to access the level required for university entrance, resisted the subject position of a vulnerable adult learner in need of repair. Tony expressed the intrinsic value of gaining mathematical knowledge, but in doing so required identity work to restore his position as a patient (and grateful) skilled migrant worker, trying to access Higher Education:

I applied to go last year with [name of university], err, but the only reason why they didn't take me then ... they are considering age and ... loads of experience ... I did a level 1 of maths, but I was still trying to enrol. You know thinking with my experience that level 1 would be OK, but they said unless you get level 2. So

¹⁶ Fatima and Jalal were the only two learners not to express the need for the teacher to engage with the affective domain.

I said OK that's not a problem, if I have to wait I will do it. No education is a waste.

It would not be difficult to imagine Steve, Jalal, Karigalina and Tony questioning Teachers A and D's relentless exercise of finding the right context to motivate them, or Teachers B and C's focus on empowerment, language and the therapeutic spaces of learning to protect them from the injuries of their past. Within a Constructivist paradigm it is possible to read how Jalal and Fatima could be expected to 'naturally' engage with 'quality' discussions and develop a sense of agency as expressed by Kath, Tony and Sandra and hinted at by Karigalina and Susan. In having been 'taught' how to accept numeracy as a valid form of mathematical knowledge, it would then be assumed that each would learn to identify (albeit in their own agentic ways) with the collective motive for learning mathematics. Each would be expected to realise the value of their own knowledge, which would then empower them to act in enterprising ways, and thus spur the conditions of possibility that would transform their relationship with mathematics. On learning to trust and value their own and their peers mathematical thinking, by the end of the year, all would be expected to celebrate mathematical thinking as an embodied space within; empowered by the realisation that it is not an external body of knowledge and/or something that is done to them. In the words of Solomon (2007: 16):

Identities are constituted by, and constitute, classroom communities of practice which emerge as a product of short and long term processes and their interaction: deeply embedded pedagogic scripts, gender and ability discourses and discourses about mathematics, and the shorter term events which are built on within the classroom through repetition and narratives combined to make up individual trajectories through mathematics.

The following quote reveals how discourses of citizenry had crept into the narratives of Teacher C, who related strongly to a Marxist understanding of the transformative potential of education. In a context of describing the ways in which they had in the past built an informal curriculum for teaching literacy and numeracy to ex-offenders, Teacher C explained that getting people to work in groups was not always an effective strategy, but did have the following benefits for developing a cohesive society:

Teacher C: It's about getting people to work together and you need to learn about how to have a conversation with people without getting into an argument.

Actually being able to listen, and to make sense of what the other person is saying. Not just saying “you’re having a go at me” but to see at what they are trying to get at, and that takes quite a lot of interpretation.

All of the participants assumed that the purpose of group work was to find consensus within the group. In the previous chapter I explored the ways in which being asked to contribute in a public space required the learner to expose their mathematical selves, and to do so, I touched on the ways in which each (in their own particular ways) looked to the homogeneity within their learning community to find shared allegiances, or how identifying their needs as generally different to their peers (apart from Kath) placed them in a fragile position, from where Susan, Karigalina and Jalal all expressed that it was rude to interrupt and/or comment on ideas expressed by their peers. As discussed in Chapter six, the nuanced ways in which participants (do not) relate to the notion of learning in a collective, reveals the effects of social articulation of difference within the mathematical classroom. Jalal was scathing of the assumed democratic governance embedded within the Constructivist ways, but in more subtle and complex ways Steve, Tony, and Karigalina also resisted the discursive threads that were particularly concerned with equality, democratic freedom, and free speech.

8.5 Summary

The focus of this chapter has been to theorise the discursive production of the meaning of best practice, and to gain new understandings into the ways in which teachers have come to be caught in and between the competing fabrications of what it means to be a good teacher. I have endeavoured to reveal the ways in which the regulatory frameworks have set the conditions for governmentality and that it was within these subjectivities that the teachers were compelled to perform acts of ventriloquism (Ball, 2003), as they negotiated with the perceived demands of performativity. Public discourses position the ‘good’ teacher as an ethical and compassionate individual, ‘driven’ to help learners to meet high standards, and within this construction the classroom is a ‘safe’ place where freedom and democracy is assumed to provide a culture of aspiration to inspire the becoming of an agentic and enterprising individual. For Teacher A, the imperfections of performing to the demands of best practice brought forward all that was considered bad about the audit culture, whilst veiling all

that was good about being a good teacher (Bibby, 2011). The costs of imperfection for both Teacher B and Teacher C were less visible, although both undertook considerable identity work to intellectually distance themselves from the practices that they felt conflicted about (Brown *et al.*, 2006).

The policy production of success by examination result was at once challenged by Teacher B's use of the statement "an air of discomfort", but simultaneously accepted as a suitable mechanism for quality control, and the assessment of success. Teachers C and D made little of the notion of teaching to the exam, although Teacher C's comment "evidence every Goddam little thing" gave a glimpse into the injuries caused to morale by the assault of the audit culture. In taking a Lacanian perspective, it is possible to see the ways in which the teachers' discursive construction of 'best' practice required what Boaler (2003) refers to as a dance of agency. The teachers were caught in identity work that compelled them to flit between the fragmented and disparate external demands made of them, as they fought to conceal the discontinuities between the competing demands of what constitutes good teaching, ethics and learner success.

Chapter five interrogated the history of Moser's discourses of numeracy, and positioned ANCC as taming the sleeping monster assumed to be mathematics. Sandra appeared relieved that the unruly masculinity (of precise forms of knowledge) could be tamed by using everyday contexts. In doing so, she framed her contemporary encounters as a collective experience where finally she, and her peers, had been given the key to enter the mathematical spaces that had been previously denied to her. In this way, Sandra recounted her tales through a mirror of perfection that was remarkably different to Jalal, Steve, and to Teacher A, who had tamed mathematics through gaining an understanding of context. This was in contrast to Teacher B, who regarded mathematics as somewhat of a guilty secret. Although uncomfortable with the accolade of being judged as having mastered reason, their narratives revealed that they found pleasure in being able to 'do' mathematics. However, Teacher B did not want being able to 'do' mathematics to be used as a tool to mediate their position, either in familial or public spaces, and in this way, this was perhaps the tale that revealed the most about the indicative power of being judged as mathematical.

I have endeavoured to show how it is inevitable that the teachers' claims of expertise in the classroom is systematically performed within and through the dominant discourses that seek to neaten and regulate discussions of best practice and assess mathematical 'success'. Analysis of this discussion has exposed ways in which this sample of teachers have felt compelled to negotiate the subject positions open to them, to make sense of and maintain the ideal of the authentic teacher. This negotiation has been located within the ever tightening and silent discursive monologue between the personal aspirations of what it means to perform as a 'good' teacher and the external demands placed on them by the culture of performativity. As Walshaw (2008: 29) suggests:

In order to serve the dominant political will, approaches to understanding teaching and learning must ignore the inherent messiness of education classrooms and instead support the normalising processes that follows from the government's preferred discourse on what is possible and necessary for education; that is, for it to become an education that is desirable.

In committing to the post-structuralist turn, my starting point has been with a subject who is compelled to perform to perceived expectations of what is demanded by external discourses. Whilst I start with the position that it is the discursive construction of individuals that determine what she perceives herself to be able to know, each of these stories narrated by the participants offer complex accounts of the ways in which each approached and avoided particular aspects of mathematical knowledge. In the final chapter, I look to the masculinity of mathematics to explore the locatedness of the gremlin. Does it lie within a difficult body of knowledge, or is it a character flaw that lurks within? This leads me to deconstructing the particular forms of the individual's relationship with mathematics, and the ways in which the participants consider the gendered characteristics of mathematical discourses to be significant. The ways in which learners have looked to public discourses to negotiate and rework their (non)mathematical identities as they (re)position themselves as more or less 'able' to do the 'do-able' forms of mathematics.

Chapter 9: Fragile Mathematics

In Chapters seven and eight, I mobilised a Lacanian framework (within a Foucauldian tradition) to consider identity work as the learners and teachers took up, negotiated with and resisted particular aspects of the discourses of best practice, professionalism and standards. Whilst many of the accounts suggested that the learners had internalised many aspects of the injuries caused by repeated failure, as innate inability to do mathematics, their accounts also pointed to how they allocated blame to the administrative regime for placing teachers within a culture of performativity.

Focus in this chapter, is on the ways in which the participants go about continuously re-assessing and splitting their own mathematical spaces into what they perceive to be do-able and un-do-able mathematics. Chapter three I referred to Walshaw (2008) who suggests that, in the past, research that has privileged the discursive construction of policy production has typically tended to downplay theoretical discussions of material and structural constraints. Similarly, research focusing on structure and material has tended to be analysed outside concerns of discourse.

In response to this concern, I recall aspects of the three distinct theoretical frameworks – Bourdieu, Lacan and Foucault – to consider how the participants navigate gendered discourses of mathematics to split mathematical knowledge (and their mathematical selves) to make sense of their ‘success’ in the classroom. In taking this approach, I continue to travel beyond the discursive construction of resistance, by thinking about the disjuncture in and between the representation of the forms of mathematical knowledge, particularly by those participants who confront (and attempt to reconcile their past injuries) through transforming their identity as a ‘successful’ mathematical self. This leads to a consideration of the shape of un-do-able mathematics, as expressed by the participants.

By drawing on aspects of Jones *et al.*(2000) Brown (2013), Mendick (2005, 2006), Mendick *et al.*(2008, 2010, 2011) and Bibby’s (2010) works on learner engagement with mathematical forms, I consider ways in which the learner participants, on being confronted with their emerging mathematical success, conceive their own gremlins as

having been tamed, and/or innate character flaws as having been reformed. I explore the locatedness of identity once particular aspects of mathematical knowledge have come to be tamed; first I turn to a discussion of gendered perceptions of forms of mathematics.

To achieve this, I split the concluding chapter into three parts. The first section, looks to the narratives of the participants to explore the gendered use of language that seeks to split discussions about mathematics into binarised accounts of difference, frequently based around those that can and those that cannot do mathematics. In the second part, I adjust the axis of interrogation to look more closely at what happens to the discursive construction of the relationship between the form of mathematical knowledge and the construction of selfhood, particularly at the points where recognition of transition in identity is articulated. The final section explores the ways in which the participants go about trying to keep a unified identity as a (non)mathematician.

9.1 Gendering of mathematics

There are a number of ways in which I have claimed in previous chapters, mathematics to be perceived as the domain of the white, the male and the middle class. Throughout this thesis, I have hinted at the ways in which mathematical knowledge is assumed to share characteristics perceived to be of most 'value' to society; that is of the independent, rational and enterprising man. In returning to the theoretical discussions of the gendered trajectories of mathematics (worked through by Mendick *et al.* 2010) that I addressed in Chapter five, I start this section with an interrogation of the ways in which these participants have drawn attention to the discourses that have constructed a taxonomy of worthwhile and useful mathematical knowledge. I will also investigate the effects of the discourses that determine the 'types' of people that should have access to knowledge in the esoteric and the everyday domain.

In Chapter five I touched on the dualistic nature of mathematical spaces on offer within the public discourse of mathematics. I explored the ways in which, on the one side, public discourses are concerned with those that simply cannot do mathematics.

Here the metaphor of an abhorrent creature, the gremlin, was introduced to explain the impact on society, and on the individual ‘afflicted’ by a poor understanding of basic skills. It was unclear as to whether the body of mathematics itself was a gremlin that needed to be tamed, or the individual, but Brown (2013) suggests that the opaqueness of the metaphor was introduced with the purpose of conflating the individual (positioned as in need of reform) through the difficult body of knowledge, to construct a more general discourse that something needed to be tamed for Britain to secure a more productive and competitive economy. But within this discursive framing there remained a moral compulsion for the ideal observer (those with good basic skills) to treat both the mathematics and the individual with compassion (Hamilton, 2011), positioning the adult learner as “deficient, passive, childlike and ‘other’” (Oughton, 2007: 259).

At the other end of the spectrum, there is the brilliant but flawed mathematician, who also needs to be treated with caution. Again, it is unclear whether the struggle for perfection lies within the “beautiful body of knowledge” (Mendick, 2005), or with the driven pursuit that causes the fragile individual to become susceptible to the harshness and complexities of human interaction (Mendick *et al.*, 2008, 2010). Or if it is a flaw within the genius gene which causes the individual to experience discomfort during social interactions (Brown, 2013). Walkerdine (1984, 1988) and Walkerdine *et al.* (2001) trace how the Enlightenment turned its scientific gaze on the human body and produced a ‘truth’ about women’s nature that positioned her outside of rationality. From a Lacanian stance, in recognising the adult learner as ‘othered’ (and in being offered the metaphor of a gremlin as an identity marker), it becomes possible to reach new understandings of how the adult learner can be thrown into a crisis by the process of encountering new forms of mathematical ‘success’.

Chapter six explored Steve’s, Jalal’s, Philly’s and Fatima’s private constructions of mathematics. In Chapters seven and eight I glimpsed at some of the ways in which the participants wrestled with the fragility of their own identity, as they encountered the myriad demands made of them, whilst simultaneously taking up, negotiating and resisting the subject positions offered to them as teachers and learners of mathematics, through the SfL intervention. I now intend to extend these threads to deconstruct the

careful identity work undertaken by the participants as they struggled to make sense of their performances of being judged as mathematical in the classroom.

Through tales of conquering the technical formulas versus the negotiation of meaning, the genius versus the ordinary, the rightness or wrongness of the answers, and the heroic effort of all or nothing, Steve was the participant who most frequently engaged with romanticised stereotypical fantasies of mathematicians; as independent thinkers, who in following their own road, will inevitably triumph in their endeavours (Mendick, 2005):

For me [doing mathematics] it's kind of like jumping off a building and thinking am I going to land ... if something's gone wrong then it's back, back and there's the mistake ... it's like satisfying ... It's incredibly fun if you go through the long formulas, like trigonometry, or like what the algebra stuff is. It's really satisfying if you get it right, I mean if you go through the steps 'oh I remember I have to use this, I remember I have to do that' and then you get the answer and you double check it, and 'oh yes' it's right ... I mean if I could plug in a USB and have all of the formulas ... I would just be away ... I would love maths.

Kath started her narratives of her mathematical self through a discursive resistance that 'someone like her' would enjoy the act of doing of mathematics, however she ended her story in surprisingly similar ways to Steve:

You know there have been a few things that I really struggle with, and probably always will, but also I have got to 35 and have never ever needed to know circle theorems, and you know all that sort of stuff. But you know it's interesting, and it's good to know and it's amazing when it all comes together. And I think the whole maths thing is really exciting.

But given the similarity of the construction of the euphoria of finally entering the mathematical space, Kath privileged the feminine qualities of gaining enough understanding of the context to be able to estimate the answer:

You know sometimes you can get it near enough and you can look at it again and think, well maybe it's a little out. It's this. So I think you can get too caught out with trying to get it absolutely bang on all the time and waste so much time.

In a different identity formation, Karigalina's fantasies of doing mathematics were equally powerfully gendered. Karigalina equated mathematical knowledge with memories of learning to play chess with her father, and as such, the doing of mathematics was recounted as something that was unyielding, totalitarian, and

demanding. In so much, Karigalina constructed the doing of mathematics as something that was by necessity going to be hard, and like Jalal and Steve, she enjoyed the fantasy of the allure of an answer, identifiable only as correct or incorrect. Each in their own ways was seduced by the offer of a form of knowledge that was at once rational and logical. In positioning themselves as autonomous individuals, they each constructed their identities through the conditions of possibility “to become, as it were, entrepreneurs of themselves, shaping their own lives through the choices they make among the forms of life that are available to them” (Rose, 1999: 230). As can be seen, Karigalina’s discursive practices were, in particular, in conversation with the gendered findings of Mendick *et al.* (2008):

Maths hasn’t changed for years … it amazes me that people invented all this and now we’re doing it. A little bit different, but we’re doing it, and it’s still the same numbers. It is the Arabic numbers for 5,000 years and … I see this is just fascinating … plus I saw the movie where the mathematician, a professor from Princeton University … and he had some mental problems and he invented the new way of financing … and I think that all talented people they are kind of, like freaky.

In contrast, for Jalal the stakes of maintaining mathematical knowledge within the symbolic domain could not have been higher. Whilst Steve and Karigalina fought to preserve the male characteristics of mathematics, Jalal saw “the single act of compromise would result in the death of mathematics, mathematical knowledge, and/or the mathematical self” (Bibby, 2010: 24). The qualities he deemed feminine (for example, estimating or finding an alternative strategy), whilst he acknowledged were useful, diminished the value of the mathematical spaces on offer to him. In ways different again from Steve and Karigalina, Jalal’s “extreme mathematical gaze” (Bibby, 2010: 24) sought to sustain the illusion of the objective and rational form that he valued as higher than the ‘softer skills’ characteristic of SfL. In using a Lacanian framework, in ways similar to Teacher B, Teacher A’s desperate attempt to maintain the perfect object positioning (of good/ethical teacher), using narratives surprisingly reminiscent of Bibby (2010: 24), the feminine qualities that Jalal enjoyed in the other areas of his academic studies “are projected entirely onto the arts and humanities”. For Jalal, the mathematical spaces within him were at once valorised, but by necessity entirely devoid of humanity:

With all my studies so far in maths ... It is very rigid ... It's just the precise point that you need ... when you go like this, the maths lose their things. Their purposes, because it becomes like the human sciences. That you can say what you want, do what you want. It's up to you. You take the responsibility ... I mean it was interesting about the mind, but you need the answer.

Even with her defended desires of being judged as mathematical replaying through the memories of her previous encounters of mathematics, particularly within the symbolic realm, Susan joked about and enjoyed the feminine qualities of collaborative working and problem solving. But, when asked about the different kinds of mathematics that she would like to perform, unlike Kath, Susan automatically deferred to the masculinised domain of mathematical knowledge:

Tracy: I swear you just said that maths was fun.

Susan: Oh really, [laughs] oh gosh! What is the world coming to? [Laughs] Oh no! No. Maths, no, oh gosh, no. It's (working together) funnier in maths ... I guess, in that sort of stuff to be honest.

[About 5 minutes later]

Tracy: So what do want out of this class?

Susan: Most of the time it's remembering it ... drilling it into my head ... Yeah you know those things you do naturally? I want to do it like that ... I just, I just want ... to be able to do things fluently without, without thinking twice as hard as everyone else

However, it was Philly who narrated the most specific gendered reasons for not learning mathematics during her schooling years. As can be recalled from Chapter six, Philly's account of her life story was often convoluted and multi-directional, in her words "going off the boil". But in this particular instance, her meaning was clear, precise and thought provoking. Whilst Karigalina also pointed to the historical gendered segregation of access to knowledge during her secondary schooling, there is no need to tease out the hidden examples of gendered 'otheredness' in Philly's thoughts of doing mathematics:

Philly: My mother was never keen on maths and I remember her talking about her mother saying 'it's all funny to me; I don't know anything about it you know'. So it's almost like hands off ... So I think I have been brought up in that sort of environment ... the untold thing, that you know

men are better at that ... I don't necessarily feel it now, but it's still sort of in there ... and then there's the internal voice ... you shouldn't know this. This is too hard for you. You don't need to know this.

Karigalina: I didn't even try to remember any rules as the teacher just said to us girls, "ok you are counting and equations and you don't need more than a certain level, especially as girls get married have a husband have a family".

With the compelling strength of the above quotes, it is worth comparing the injuries caused by the experience of repeated failure (as experienced by each of these learners), with an account from Teacher B. Teacher B in having experienced the success of an undergraduate degree in mathematics, the first in their family to enter university, recalled their own struggle to enter the mathematical space. Through a gendered trajectory that was reminiscent of Brown and England (2004), Teacher B retained a sense of discomfort as they recalled being publically awarded a space amongst the intellectually able. As will be seen in the following excerpt, on being challenged by Teacher C to reflect on their resistance, Teacher B, immediately closed the discussion, recognising the dangers that others would see them differently if they continued to articulate their pleasure in doing mathematics. They did not want their pleasure to be used as a tool to mediate their relationship with others, and deflected the necessity to talk about the label of being a mathematician by deferring to the discourses of SfL. In recasting the definition of mathematics as "an everyday mathematician", they were able to include their students within the parameters of the pleasure gained in doing mathematics:

Teacher B: I remember I got married just after gaining a maths degree and my wedding certificate describes me as a mathematician – which I just found WHAT? NO! THAT'S NOT ME! [I have used capitals to relay the projection of voice] and I had just got a maths degree so, I don't know what it means being a mathematician.

Tracy: Why no, that's not me?

Teacher B: No, that's not me. I'm not a mathematician.

Teacher C: What do you think that means?

Tracy: Wow! That's a strong reaction.

Teacher B: It is. It is, isn't it? And that's the reaction that our learners have. Now all these years later, now I think most of the population are mathematicians. Because what's a mathematician – if it's someone who uses maths confidently, with some competence, some understanding and ... some validity ... Well if I can use maths in a way that it works, well then, am I not a mathematician?

Teacher C: I mean at the beginning there. After you got married. It wasn't to do with the maths. It was to do with the marriage.

Teacher B: No! On your marriage certificate. I had just finished and didn't want to put unemployed, but I could of, but the label!

Teacher C: Well, I didn't know you could even be categorized.

Teacher B: You have to have a label [name of teacher participant]! Come on!

In the ensuing discussion, which included only Teachers B and C, mathematics was framed as providing each of them with a safe place; a place that they could enjoy, but it was a lonely activity. Each spoke of the ways in which this pleasure (in doing mathematics) was continuously challenged, and never assured. Despite the pleasure of having succeeded, and having been framed as able, they repeated what Black *et al.* (2009) confer as a well-rehearsed narrative of being revealed in the public space as being clever. From the following excerpt, Teachers C and B revealed their ever-present fear of not understanding. Each returned to memories of “simply regurgitating” the process, and for Teacher B it was only on becoming a mathematics teacher that they gained a different identity with mathematics (other than self-indulgence). From this space flowed a different account of their relationship with mathematics education, rather than their still insecure relationship with the academic discipline:

Teacher C: Yeah - probably depends on the pitch of the problem that you are trying to deal with. There are certainly things that I can't solve mathematically

Teacher B: Yes, I'm the same. I can do a lot less maths now than the point that I couldn't see myself as a mathematician but I am happier to accept the label now.

In returning to the participants' stories, the ways in which Jalal's stories conjoined with Philly's and Karigalina's gendered trajectories was surprisingly relentless. All

three projected fantasies of their father onto the doing of mathematics and all in ways that were completely devoid of emotion. These stories were generally polarised against the warmth (or emotional turmoil, in the case of Philly) of their relationship with their mother. Through glancing at the following accounts, it becomes possible to gain new understandings into the ways in which mathematics can come to take on embodied properties within the discourses of the wider social milieu. Philly, Karigalina and Jalal all valorised mathematical knowledge as something that was masculine and autonomous. For them, mathematics was done by someone who was self-sufficient, unyielding and often orientated towards public society (Bibby, 2010). In each of these accounts, the participants polarised their own sense of self, in different ways, as ‘non-mathematicians’:

Karigalina: Ok my dad, he's erm ... almost tyrant, dictator ... his father was taken, you know the Stalin depression ... he had crossed over the borders so ... (he was) put in jail in Siberia ... and his mum ... she died from hard work ... he was starving and living on the streets and ... he went to army and ... this is how he became that very heavy man in my life ... it is still hard for me to cope with his behaviour ... and my mum she is the very nice lady. ... She never shouts ... she put me in a music school and she wanted me to learn art and all this stuff ... but my father he told me how to play chess.

Jalal: I went to his [his father's] office and oh dear. He was working you know, and all this maths and all this stuff, and all these things that he keeps in his head. All the fundings ... with water ... the electricity, and it was a big amount of money. I could see all the money and this man, there was no switching.¹⁷

Jalal presents a strong sense of his ability to self-regulate, and talked of rationality, the importance of using the right method, and the need to follow the preciseness of the rules. In doing so, he fervently rejected “the subjective contingency that maths can be more feminine” (Bibby, 2010: 28). In contrast, Philly’s and Karigalina’s stories were frequently performed through the structure of hierarchical relations of masculinity and femininity that shaped her childhood experiences. Returning to habitus, it becomes possible to look for Philly’s “gendered dialectic” (Skeggs, 2004b: 21) and practices of femininity (Osgood, 2010) that were apparent throughout her account. Through her expressions, postures, speech styles etc. (Youdell, 2006), Philly communicated her

¹⁷ This comment is in relation to earlier discussions of his father’s decision not to accept bribes

particular ways of (not)being mathematical and her sense of positioning came through a gendered discourse of picking at her food and fasting (to purify her body rather than taking medication for depression), narratives that inform the primary processes of her self-identification, not only as a subject in the classroom but more widely in society (Holt, 2010):

I mean as he was a work-study engineer that's all we saw puffing away on cigarette ... puffing away and up until all hours sometimes with his graph paper and it all seemed very boring and too much out of my scope and I couldn't even begin to know what it was all about.

9.2 Taming mathematics?

There is something significant in mathematics that needs to be accounted for... It has properties and a precision that produce results unlike other symbolic frameworks. These properties orient our apprehension of mathematics but do not fix our ways of talking about it. Consequently, mathematics as a system is empirically referenced to seemingly tangible objects that ultimately slip away ... In part then, the existence of mathematics is underwritten by its materialisation in structures, processes and human action, things you can point at. ... As a learner of mathematics, my sense of where it is located is never finally resolved. Is it part of me or not? Have I made it? Have I pointed to it? Or have I picked up bits of it intact as if it is a commodity from a supermarket shelf? These concerns prevent any final resolution (Brown, 2013: 1).

In the collaborative model, it is demanded that the agentic learner undergo a transition, not only how they participate, but also in their identity with mathematics (Solomon, 2007). Within this model, it is possible to measure incidents of interactions within a group, although Susan's use of silence complicates such measurements, the question remains about how such a transition can be measured. In response, Brown, Jones and Bibby (2004) posit that the mathematical understanding of normal, as in the deviation from the norm, is not only used by the professional to measure progress. Although they problematise the administrative technology of 'normal', as a mechanism that silently controls and contains the site of the self, they also argue it is the very concept that contains the conditions of possibility, which then enables the adult learner to travel beyond the traditional division of those that can and those that cannot 'do' and/or 'be' mathematical.

A Lacanian perspective of identity is theorised in relation to the sense-making processes of identification, although the assertion of ‘normal’ embeds an assumption that progress is both static and linear. Brown (2013) argues that to widen the subjectivities on offer, despite the complexities and the dangers, the notion of ‘normal’ can be used as a yard stick for the learner to measure their own sense of ‘averageness’. On encountering ‘success’, this yardstick I argue, can then provide the authorisation for the individual to access a broader range of subject positionings (outside of being bad at mathematics), which then enhance the possibility of the conditions, which enable a transformation in identity to take place. In regards to the stories told by the participants, linguistic markers of ‘being’ normal were mobilised to indicate that an internal transition had in some form taken place.

The classroom observations demonstrated the complicated and non-linear ways in which the learner participants made sense of their lived experiences. As a method, it revealed empirical evidence of how the participants went about measuring themselves, typically against their peers, and the narratives of the semi-structured interview provided insights into how they came to reconcile their identity, as they re-organised their thoughts after experiencing both success and loss in the classroom. In listening to the stories, it is possible to see how the criterion for being good at mathematics shifted in relation to emotions brought about by recollections of their historical encounters and of positioning within the immediate learning context. To exemplify the complexities and the similarities of how these participants called upon the other ‘othered’ (non)mathematicians in their class, it is worth recalling the thoughts of Steve and Susan, and also Kath and Philly:

Steve: There is one more maths-related hurdle ... to be a teacher ... it's like competency because you have to be across the board. I mean just to see if you're average.

Susan: I just want to know maths [laughs] obviously I am going to need it so I want to know maths. I want to be able to do things fluently without [pause] well thinking twice as hard as everyone else.

Kath: Erm sometimes we come up with an answer and it's right and we talk about why it's right and sometimes we can work it. Paula is actually very good at that. I mean she will go right back to the beginning and go that's that and that's right because of that and you put those together and that's

why it comes out like that. Whereas I am a bit well OK, I get that answer and I get that bit, but I don't understand where that bit has come from, right there, so we just talk it through until we chance upon something that makes sense and then carry on with that.

Philly: You know it might take a day of trying to get it right on one particular issue and it might just, you know the building blocks and whammo, it all opens up and off they go.

Tracy: Has that ever happened to you?

Philly: No I don't think it has ever happened to me before ... but it could. I think it could.

Such measurements of 'being normal' were not based on a summative receipt of a qualification, but on being publicly recognised as being good at mathematics within the space of the classroom. To return to the constructivist discourses of SfL, it has been assumed that now, once the unruly mathematical forms have been reorganised into neat categories, the body of knowledge on offer has been tamed. With 'good' practice and diligence, it is assumed that learning can be planned so that every individual can engage in 'suitable' problem solving activities, contextualised in ways that enable the learner to take meaning from their own everyday life. In this setting, as Brown *et al.* (2004: 170) ask, "what can be said of the transition between the fear and friendliness and abhorrence and affection" once the unruly and un-do-able mathematics has been tamed? And the learning behaviours of the individual reformed? In this section, I move away from the value placed on mathematical knowledge, to gain further insights into the forms of transition experienced by the participants, especially on those having encountered 'success' in the classroom. As expressed by Brown *et al.* (2004: 19):

In an environment where selection and assessment are powerful markers of who we are, this ... approach can give us understandings of the pain, the pleasure, and power in our relationships with mathematics.

In taking this Lacanian position, I agree that that an individual requires the discursive means to recognise and measure their own performance. But I also highlight that it was through the so-called spaces of 'averageness', where the participants carried out the most complex formations of identity work. In being judged mathematical, the participants had to distance themselves from the stereotypical characteristics of those

‘others’ they perceived to be naturally talented in mathematics. But they also had to reconcile their identity against the other ‘othered’ peers, who had not been so successful with grappling with the difficult body of knowledge. The intention of this section is to re-interrogate the participants’ stories to find new insights into relationships with mathematics, and in particular to deconstruct changes in perception of mathematical knowledge, and the effects of this change on relationships with other ‘others’ in the class.

9.2.1. Susan’s stories of taming mathematics

In ways that were similar to Kath’s, Tony’s and Sandra’s stories of success, Susan can also be read as in the process of ‘becoming’ a mathematician. With this recognition of transition in identity formation, the exchange below hints at the complexities and tensions that lie between an identity of the self, using number calculations in the real world, and the positioning of the self within the discourses of mathematics in the classroom:

Tracy: Do you ever find yourself translating what you do in shopping into the classroom?

Susan: Maths ideas but not maths language, because you see fractions all the time. No, not all the time [starts humming]

Tracy: I like that, what do you mean by maths ideas?

Susan: Erm, how to work things out, yeah just how to work things out ... like the ‘2 for 3’ or the 25% off.

Tracy: So do you ever sit there in the shop and think ok, what did we do in maths?

Susan: Yeah sometimes, but then sometimes it just comes [humming]

Tracy: Ok and sometimes you sit there in class and think about when you went shopping.

Susan: No, never actually. When I am in the shops I think like maths, but when I am in maths, I don’t think about in the shops.

Tracy: ...Oh dear, I always banged on about shopping in the classroom!

Susan: No, you really can't! No!

Tracy: Can you use imagination, a bit like art.

Susan: No, not me anyway maybe for Mahmood [peer] but not for me, no.

Tracy: You're looking at me as though I am crazy.

Susan: Yeah, I am trying to! [laughs] No, but yeah, just no.

From this extract, it is possible to glance at some of the ways in which Susan's emerging identity as 'successful' was misaligned with both her identification as 'bad at maths' and her relationship with an external, mostly useless body of knowledge. In trying to paint a unified picture of her 'learner self' in the space of mathematics, Susan splits the body of knowledge into a binarised matrix (Mendick, 2005), where she seeks to make a distinction between the do-able (and the now understandable) mathematics, against the un-do-able and un-understandable complicated algebra and meaningless statistics that she recalled from her past. In recognising the benefits of the everyday application of her mathematical skills (for example, calculating percentages in the shops), Susan was compelled to find a comforting distance between the skills that she can do, and the complicated mathematics that she maintained as un-do-able for someone 'like her'. In line with Brown's (2013: 170) findings:

Demons are abhorrent creatures. They install fear and are best avoided. Yet mathematics as a demon has managed to "lick" this student. Does this imply that the demon has been tamed and that some kind of affection lies in between the student and the subject? Has the student's own fear of the subject been licked and if it has, how were the transitions made between fear and friendliness, abhorrence and affection made?

Certainly, Susan's was not a case of a linear transition from fear to affection, and was indicative of a continuous spiral between fear and affection, and it was evident that she was not alone in this compulsion. It is with this understanding that the impossibility of the task that is required from the constructivist account, to measure transition as experienced by the learner, is revealed as another impossible fiction. Brown and England (2004) explain that it is through engaging with the established order, through the processes of identification that lie within the discursive arrangement of binary thoughts, that learners are expected to articulate their changing

relationship with mathematics. The next section looks to the thoughts of Hall (1991: 48) to think about the processes that the participants have used, to identify the aspects of mathematics that have become do-able:

Processes of identification are also psychic ones. For example, we are establishing patterns of sameness and of difference that can be understood as happening through splitting between that which one is, and that which is the other.

9.3 Splitting mathematics

Walkerdine (1990) offers insights into what can lead learners to imply that they 'ought to' have been able to previously understand the mathematics that they are now doing. This, again, is an assumption embedded within the Humanist approach to schooling, in that there is a logical linear sequence that facilitates mathematical thinking. The feelings of loss, explored within this next section, were primarily rooted through discourses of guilt at not having learned the first time around, and Walkerdine (1986) explains that, by locating the self within the gaps of missed opportunity, the learner is not only splitting the mathematical content, but also engaging in the act of splitting her mathematical self from the ideal mathematical student.

I have primarily explored the concept of division through Walkerdine's (1986, 1990a, 1990b) and Mendick's (2005, 2006) focus on Modernist productions of binary logic. These works reveal how the gendered production within this empirical data has tended to fall within a gendered split that essentialises hard working girls against naturally gifted boys, and fast recall of memory against slow-burning understanding. In returning briefly to a Freudian-influenced psychoanalysis, it is Klein (1997) who located the concept of splitting around paranoid-schizoid and depressive positions, describing the individual's tendency to split as an unending psychic process to manage reparation. The process of splitting concerns relating selfhood to a highly idealised self, or the abjected and ejected other, and is understood in terms of a defence against aggression. In effect, the individual seeks to protect the 'good' aspects of the object by splitting off the perceived 'bad' that has become entwined with spaces of aggression. Benjamin (1988: 63) offers a broadened out concept of splitting to include a process

whereby unity is broken down through the ways in which the unconscious body defends itself, by projecting ‘bad aspects’ onto the ‘other’:

The psychoanalytic concept of splitting, like that of repression, has a narrow, technical use as well as a broader metapsychological and metaphoric meaning. Just as repression became a paradigm for a larger cultural process, so might splitting be suggestive not only for individual psychic processes but also for supra individual ones. Technically, splitting refers to a defense against aggression, an effort to protect the ‘good’ object by splitting off its ‘bad’ aspects that have incurred aggression. But in its broader sense, splitting means any breakdown in the whole in which parts of the self or other are split off and projected elsewhere. In both uses it indicates a polarization, in which opposites—especially good and bad—can no longer be integrated; in which one side is devalued, the other idealized, and each projected onto different objects.

With this broader understanding, it is possible to move towards a Lacanian understanding which frames the process of splitting that focuses on relations of having and lacking, where splitting occurs “between that which one is, and that which is the other” (Hall, 1991: 48). Brown (2013) suggests that, to make sense and to stabilise shifting mathematical identities, subjects of mathematics divide mathematical knowledge into oppositional categories. The first he suggests, is the ‘un-do-able’ mathematics of the ‘naturally’ brilliant and able mathematician. In now re-aligning this analysis with Brown’s focus on mathematical content, I look to the ways in which the discursive construction of the ‘un-do-able mathematics’ is a product of socially constructed discourses of a ‘mathematical gene’, where the body of mathematics is perceived to be apolitical, individual and embodied through an assumption of masculinity. What is of particular interest to the findings within this thesis, is the ways in which the characteristics of the mathematical gene becomes less visible, as the individual identifies with ‘becoming’ mathematical. The second category is concerned with the do-able mathematics and the mathematical forms that have been tamed and/or mastered. In borrowing from Brown (2013) and Brown and England (2004),

The table below reveals how these participants used binary comparisons to make sense of their transition from un-do-able to do-able mathematics.

Table 5: Splitting maths into do-able and un-do-able forms of knowledge

Complicated and potentially un-do-able mathematics	Easy do-able mathematics
Susan Individual, algebra, statistics, GCSE, incomplete homework, pieces of paper, numbers in her face, irrelevant but proof of something	Active, visual, repetition, mundane, problem solving
Sandra Powerful, raced, complicit neglect, irrelevant, blank pages, others getting help	Love, empowering, respect, mundane, roots, reasonable answer, means something, building blocks
Kath Irrelevant, enticing, exciting, satisfying, bang on, risky, probably straightforward, headless chicken, a block, writing it down, gatekeeper	Just know it, estimate, wage packet, bills, normal, useful but mundane, understanding
Karigalina Gatekeeper, memory, interesting, balanced, static, brilliant, fragile, interesting, alone, explanations	Not mentioned
Philly Too hard for someone like her, too serious, obsession, rational and logical, not for women, eating blotting paper, stuck down on paper	Repetition, get round it, survival, carpets and curtains, no terrific mistakes, fear, sick and humiliation
Jalal Magical, God-like, real maths, x and beta and p and all this stuff, organise to get smart, lost, complicit neglect, inequality, poverty, exacting, external, not like the human science, static	It's not the maths that I imagine as maths, internal, living, responsibility, illogical to teach this way, avoidance, no intellectual discipline, can't transfer into esoteric domain, destroy me
Steve	

Exciting, jumping off buildings, long formula, intellectual test, USB needed, battling, gatekeeper, static, risky, measuring stick	Useful, need it, angles and stuff, basic stuff, too easy to be interesting, mundane, annoying, should have destroyed it, time consuming,
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Tony	
Beautiful, gatekeeper, intellectual training, irrelevant	Useful, consumer, have to do it, nothing a waste

Alexandru	
Beautiful, patterns, memory, prescribed procedures, static, satisfying, dependent on teacher	Freedom to choose, useful, interesting, discussions, economic domain

Fatima	
Not mentioned	Alone, problem solving, doesn't need reading and writing, fun, patterns, communicate with son, shame and embarrassment

Abul	
Too hard for him, lost in long complicated procedures, dropped out of university (economics), gatekeeper	Repetition, competition, homework, ticks, have to do, satisfying but unnecessary

In line with Mendick (2005), the act of splitting mathematics enabled many of the participants to maintain a safe and accomplished position of average, which protected them against the constant anxiety of coming across unexpected and un-do-able forms of mathematics. Consequently, the placing of the self, outside of the do-able mathematics, othered from those others who possess the mathematical gene, was not by necessity a violent act. Steve spoke about 'real' mathematics being "out there", equating the anticipation of finding the correct answer to the thrill of jumping off a building. Kath suggested "there's no point in squawking ... running round like a headless chicken". Whilst they each worked equally hard to sustain the binary division, for Steve the process of taming mathematics was recalled as a solitary journey, full of pain and ecstasy.

The transition for Kath was more pragmatic, although her transformation was as much concerned with reconciling her loss (of getting to grips with her emotions) as with getting on with the business of doing the do-able mathematics. In comparing the self

with their peers, both Steve and Kath were able to motivate themselves to close the gap, to jostle with others, to secure their privileged positioning as being judged as mathematical. However, Kath associated achievement in the class with an inevitable sense of loss:

Paula and I are really excited about, well not excited but really want to know about vector geometry and you know she [the teacher] is saying it is A* which it probably is, and we are probably not going to get the answer right, but we would like to have a stab at it. And you know, every week she's not had time to go over it ... she gave us a handout, but you know, to me, someone else has written that out and I'm sure it makes sense, but I can't get it unless she can write it out while I'm there, and then I can at each stage, I can see.

Kath and Steve, through their stories of taming the unruly mathematics, exposed their emerging mathematical sense as a fantasy. In ways similar to Karigalina and Susan, Kath and Steve were eventually able to reconcile their success in taming mathematics, because as an adult they had grown emotionally and could put aside their anxiety. They could see the benefits of working harder and strategically completing homework and, consequently, all looked to themselves, poor classroom management (apart from Karigalina who was schooled in Lithuania) and to their teachers to allocate blame for their previous underperformance in taming the do-able mathematics. In returning attention to a fleeting conversation with the constructivist model, which assumes resistance to be a behavioural barrier resolved by effective classroom management, all the participants, even the ‘successful’ Teacher B, rejected the privileged agentic positioning of a mathematician. For the majority, the very act of splitting the mathematics into two domains provided them with an imagined sanctuary from which they could feel secure. This finding provokes uncomfortable questions (in line with Mendick *et al.*, 2008) about the unproblematised assumption that learners want to be able to prove their mathematical worth.

But, as Brown (2013) works through, this position of safety was always maintained through a relational opposite to the un-do-able mathematics. In this way the pleasure of doing mathematics was sustained by the threat of anxiety and fear of re-meeting un-do-able forms. These stories of making sense of success, of taming the demons (both within the affective domain and in terms of the body of knowledge), simultaneously revealed how these particular participants were compelled to carry out identity work,

to authorise their new relationship with mathematics within the space of a non-mathematician. As Mendick *et al.* (2008: 80) explain:

These kind of oppositions between activities of calculation and mathematics, between calculating and reasoning, between surface and depth, and their projection onto people are important for maintaining the elite position of mathematicians.

Returning to the thoughts of Benjamin (1988: 63) who describes the settings from which individuals typically engage in the act of splitting:

Wholeness can only exist by maintaining contradiction but this is not easy. In splitting, the two sides are represented as opposite and distinct tendencies, so that they are available to the subject only as alternatives. The subject can only play one side at a time, projecting the opposite side onto the other

Kath was particularly aware that she was finding more aspects do-able and sought to mask the fragmentation, by projecting the ‘un-do-able’ as the type of mathematics that should be left to the geniuses - those naturally brilliant, with the time and the passion, who can extend knowledge by imagining the unimaginable:

I have looked at the gas bill ... more closely recently ... and I think to myself my God if there is someone in an office and they work out everybody's gas bill using stuff like that, and obviously they do, and so when actually you really sit down, and really think about it. Yeah, I can sort of see. But still there are some things like circle theorems that I will never understand why someone might have sat down and worked that out ... But you know, I think that's the same for other things. I mean coke cleans off the grease from the oven, but why would someone ever put coke over their oven in the first place? I mean it's just one of those funny things.

However, for Tony, Jalal, and Steve the ‘beauty’ of mathematics was idealised. The productive passion that they expressed projected this beauty into another realm, whereby its sense could only be captured through narratives of bravado to capture an unknowable fantasy of what could be achieved through controlling un-do-able forms of mathematics:

Tony: Maths being what it is. Everything in life comes from mathematics.
Everything, everything, everywhere.

Jalal: The maths I imagine to be maths is x and beta and p and all this stuff.

Steve: Long formulas like trigonometry or like what the algebra stuff is.

Alexandru and Karigalina, in appearing more confident to accept a label of being mathematical, were able to provide more detail about the properties of un-do-able mathematics. They idealised the form, framing it as un-do-able now, although locating it as possibly do-able in the future:

Alexandru: Well someone told me a few years ago that music is maths [playing the piano with his fingers] ... I think I was a small child, and he tried to explain how keys and the chords work. Like you subtract this from this and you get this [again using his fingers to get the cords] but I don't know how it works. I didn't get it. I hope to sometime.

Karigalina: Yes maths is about balance, so it should be balanced like in our life in our society and like our lives in our planet everything has to be balanced. If there is one shaky then another up and another one down then it is like a shaky situation like we have now with our environment, you know the situation with the ice.

However, it is Philly who most starkly captured this dichotomy within her narratives. For Philly mathematics remained un-do-able, and her mathematical self was expelled from any spaces that she perceived to be occupied by mathematics. The exchange below gives insights into the profound sense of loss that she feels in simply not being made that way:

Tracy: Can you give me an example of higher maths?

Philly: Is it trying to work out how big the sun is or how big the? ... I wouldn't know ... but there are people in the college who are actually into that ... obviously that is maths. Its erm ... To me it's too serious ... It's dry ... not sociable. It's not nice ... cold ... very boring and too much out of my scope.

Within these stories, particularly those empowered by having tamed aspects of the previously imagined 'un-do-able' mathematics, it is clear that the markers of identification remain tied to the notion of a mathematical gene. Within this construction, the euphoria of being able to do mathematics was constantly framed by the inevitable loss of inevitably reaching the 'un-do-able' aspects of mathematics. In this way, their contemporary success was shrouded by the fear of failure and, as Mendick *et al.* (2009: 98) suggest, through the kind of memories that "subjectifies the

learner and fills them with fear.” Although mathematics was recognised as useful both inside and outside of the classroom, the participants sustained a clear message that, at any point, the mathematics that they were currently encountering and doing, could and probably would simply stop clicking at any time.

Whilst it was clear from the stories that the pedagogic spaces of SfL were perceived to offer a softer side of mathematics (where for some, mathematical forms could be manipulated in fun, interesting, and even intriguing ways), it did so through offering the feminine qualities of practical and everyday mathematics. Although the usefulness of the experience was generally narrated as positive, the validity in reconciling this kind of knowledge as do-able was trapped within the binarised matrix, where the value of gaining this knowledge could only be judged in a relational opposite to the loss of the abstract mathematics of the past. In consequence, the transformation of the self within the mathematical spaces on offer demanded that the value of the feminine qualities (like rounding, compromise, support) be recognised, whereas from the narratives it was clear that it was masculine forms of mathematics which were characteristically articulated as having been tamed.

The un-do-able mathematics remained a marker (albeit protean) that masked the shadows of past injuries. It is through gaining insights into the psychic complexities that it becomes possible to gain new insights into why the academic discipline of mathematics is likely to remain positioned as unruly for most, and as a debilitating gremlin for a few who ‘fail’ to meet the perceived abilities of normal. Whilst the problematiques embedded within the constructivist account have been explored in detail throughout this thesis, there is also considerable space within the narratives to recognise the allure of experiencing mathematics as something that can be social. The mathematics that nine out of the eleven participants constructed, were through stories of ‘success’ and all had undoubtedly gathered distance from the dark, isolating world that Jalal was restricted to, or which Fatima could not imagine.

9.4 Summary

In conclusion, Chapter five considered the processes of normalisation in terms of policy production and the organisation of learning, with Chapters six through eight

unmasking the power relations, organised through the normalising practices of the classroom, particularly with regards to the notion of best practice and the pedagogic model of collaborative learning. By connecting in chapter nine what is perceived to be normal with the psychic power of the individual, I finally uncovered the forms and the ways in which this knowledge has come to be expressed as privileged, and by whom (Hardy, 2004). It is within this context that in this chapter I have looked to the dichotomising practises of splitting mathematics into do-able and un-do-able forms, to facilitate identity formation as being ‘normal’, thereby rendering the subjectivities on offer more appealing to the adult learner, but by necessity permanently framed by anxiety of the fear of sudden loss of understanding.

The initial section of this chapter found, in line with the findings by Mendick *et al.* (2010), that whilst the participants challenged the stereotypical characteristics of the public domain (mathematicians as brilliant yet fragile, or ‘afflicted’ by gremlins), they simultaneously drew on cultural markers to sustain their identification with mathematics. Although the discursive construction of the mathematics needed to sustain the knowledge economy holds predominantly feminine characteristics, ‘real’ mathematics continues to be masculinised. The first, as an unyielding masculine academic subject; the second, learnt through a masculine dialogic pedagogy; and finally the third, as reproductive of particular masculinities, such as rational thought, autonomy and choice (Bibby, 2010).

Jalal and Fatima held the most heightened sense of ‘otherness’ to mathematics, which falls in line with Walkerdine’s (1990a: 54) conclusions that it is “undoubtedly the case that subjects from oppressed groups experience more keenly a disabling sense of fragmentation”. But the defensive state was also transparent in Steve’s troubling stories of the familial cost of learning mathematics and within Karigalina’s use of silence in the classroom. Jalal, Steve and (to an extent) Karigalina’s resistance shared a compulsion to only engage in the mathematical practices that they perceived ought to be ‘done’ in a mathematical classroom. The form of this mathematics was valorised as residing within the masculinity of the mathematical domain. For these participants, the depth of pleasure from experiencing success had to outweigh the risks of being exposed as not possessing the intellectual capacity to take control of the mathematics

that was on offer to them. Fear was evidently in the shadows of the conditions of success, and for these participants, in line with Bibby's (2008) findings, the risk of participating could not be pacified by all, through a compulsion to engage with mathematical discussions within the everyday domain.

Jalal divided his mathematics into the valuable knowledge of the esoteric domain and the mundane common sense of the everyday, whilst Steve tended to fill his mathematical spaces with heroic discourses of gendered oppositions, conjuring up immense feelings of pain/fear and pleasure/ecstasy, continuously negotiating complex identity work to position himself as an “average” mathematician. Karigalina, Susan and Kath, whilst experiencing an altogether more comfortable positioning, also carried out their identity work through a notion of average that allocated their mathematical selves to caring and nurturing others; all the while ‘othering’ themselves from the other ‘others’ in their class, who continued to struggle with the unyielding rules and regulations demanded by the academic discipline of mathematics.

In returning to the noise that can accompany learning, when Susan, Kath, Sandra and Philly returned their talk to recollections of un-do-able mathematics, they did so through citing the assumed masculine properties of precision, competition and the naturally talented, in the process othering themselves as wanting to understand the mathematics that they used. In contrast, Jalal, Steve and Fatima rejected the pedagogic expectation of being asked to express their opinions and to explain their mathematical thinking, with Karigalina participating silently, through a discourse of helping others. Tony took on the masculinised qualities of consumer, strategically picking and choosing the strategies to help him meet his requirements to progress, whereas Sandra and Philly sought the therapeutic spaces where their ideas would finally be heard and counted as a valuable contribution to the group’s body of knowledge. However, it has been through interrogating the binary overlay that the differences between the do-able and the un-do-able mathematics have been most striking.

In Chapter nine I have endeavoured to tease out how neoliberal discourses promote masculine characteristics in ways that sustains the hundred and fifty-year-old fantasy of teaching mathematics as a means to ensure the transformation of an

underperforming learner into ‘enterprising’ adults. An adult, who then in return, fulfils their potential in logical, self-regulating (Walkerdine, 1988) and entrepreneurial ways (Ball, 2008). I have looked to the empirical narratives to unmask how the narrators fell into patterns of language, using binaries to tell a tale, to reveal the spaces and the form of the subjectivities they perceived to be on offer, as they reflected on their transforming relationship with mathematics.

Chapter 10: Conclusions

In this thesis, I have produced a theoretically informed critical analysis of how subjects of mathematics undergo identity work, as they were confronted by ‘success’ in the classroom. By starting analysis by paying attention to the narratives, I looked to the empirical data to reveal ‘things’ about the complexities and tensions of identity formation. In establishing theoretical grounds to justify a mobile epistemology, I sought not a reconciliation or ‘neatening’ of the contradictions in and between the theoretical perspectives. Nor did I attempt to make a synthesis of discrete findings. I sought neither to preserve or destroy alternative understandings, nor to privilege epistemology over ontology. I listened to the narratives and, in seeking ways to make sense of the ‘things’ that I noticed about identity formation, I sought out shifting relationalities ‘knowing’ that this approach would disrupt analysis. In truth, it was by troubling the boundaries of the theoretical frameworks, by wrestling with the conceptual ‘tool kits’ and teasing out the gaps that I cultivated an energy that sustained my intention to craft different histories of the human subject, of policy, of mathematical objects and of the texts.

In Chapter One, I put forward a policy context and outlined the emergence of the pedagogic device of collaborative learning, and explained the mathematical spaces on offer within the sector. In the second chapter, I mapped the academic debates that informed my theoretical perspective and justified a critical rejection of the Humanist model of the unitary individual. In leaving behind the certainty (and the allure) of the constructivist paradigm, in Chapter Three I then framed the theoretical perspectives and mapped the decisions that led me to mobilise three very distinct frameworks (Bourdieu, Foucault, and Lacan) to unmask the complexities and contradictions hidden within these intriguing stories of adults (not) taming mathematics.

In Chapter Four, I justified the research tools as fit for purpose to collect empirical data that was rich enough to reveal classed, gendered, and raced trajectories of mathematical practices, identity work and formations of selfhood. The five data chapters then unpicked each of the research questions. I mobilised a shifting epistemology to trouble various productions of common sense ‘truths’ about teaching and learning and analysed the embodied ways in which the participants related to

mathematics. In Chapter Five, I primarily looked to post-structuralist critiques of the Enlightenment's liberal vision of the agentic, rational and unitary individual, to untangle and demystify common sense truths about teaching and learning, and examined how public discourses frame learners as subjects of mathematics (Q1). In Chapter Six, I then turned to the narratives to 'story' four of the participants, to explore the ways in which biographical, social and structural processes interacted with dominant discourses to shape the processes of identification (Q2). Then in Chapters Seven and Eight, I primarily conversed in, between and through authors writing through a Lacanian account to unmask the psychic costs to the participant as she strived to meet the demands of how she perceived she was supposed to fit in within the discourses of the symbolic domain (Q3).

In Chapter Nine, I returned to the Cartesian reliance on dualism to interrogate how the participants sought gendered differences to reconfigure their mathematical selves. Finally, I turned analysis to techniques of 'splitting', to understand why participants sought to 'split' mathematical knowledge (and their mathematical selves), and to make sense of their positioning in the classroom (Q4). In this concluding chapter, I draw together the key findings and synthesise discussions to reflect on the noises that accompany learning and to outline the implications of the research for practitioners and policy makers. I conclude with possible directions for future research.

10.1 Key findings and themes

This section summarises the findings of the study in relation to the following themes that address the stated empirical research aims: discursive positioning and processes of subjectification (Q1); the compulsion to undergo identity work (Qs 2&3); and to reveal how subjects of mathematics split knowledge to position themselves as more or less 'able' to 'be' mathematical (Q4).

10.1.1 Subjects positioned by discourse

Starting with critical analysis of the history of the present, I interrogated how neo-liberalism connects political, social and institutional discourses to sustain 'common sense' practices of the self; framing the adult learner as an agentic individual, willing

to undergo transition, not only with how she develops her mathematical thinking, but also with her identity as ‘mathematical’. I revealed how public discourses position the ‘good’ teacher as both ethical and compassionate, ‘driven’ to help learners fulfil their potential. I have shown how, within this construction, the classroom is positioned as being a ‘safe’ place that promotes a culture of aspiration, from which the agentic and enterprising individual *will* thrive.

I also questioned normative productions of the universal ‘We’ (as individuals able to control desire) and interrogated how the structures of identification (politicians, media discourses and public imagination) have come to construct subjects of numeracy through discourses of waste; of not having realised their own potential, concluding that the forms of knowledge on offer inscribe particular practices on the subjects of SfL.

Analysis of the empirical data in Chapters Six through Nine revealed myriad configurations of ‘success’, exposing it to be a deeply ideological metaphor. Steve underwent complex gendered and classed trajectories of identity work as he negotiated a sense of his averageness to sustain spaces of mathematics within him. In ways similar to Kath, he did not construct tales through narratives that revealed mathematical knowledge to be unsurmountable, but as achieved through finally being able to overcome his “stinky attitude”. Jalal on the other hand, in being consumed by his desire to re-join the fragments of his ‘authentic’ self, became trapped by discourses of ‘wish fulfilment’. The resultant frustration and anger compelled him to violently exclude his selfhood from any spaces of numeracy, but to sustain the possibility of conditions for his return to discursive constructions of ‘belonging’ to the knowledge economy he frequently mimicked discourses of active citizenry.

Philly continuously located faults within the architecture of her intellectual self, and with discourses akin to the gremlin within (as with the ‘Get On’ campaign), she viscerally embodied properties of learning mathematics through narratives of feeling sick, fleeing a room and of “eating blotting paper”. It was by weaving Bourdieu’s understanding of engagement with capital exchange through post-modern readings of ‘otherness’, that I could reveal how Philly (unlike Jalal or Fatima) was able to

maintain her privileged positioning in ways that prevented her from being jettisoned into discourses of the abject ‘Other’.

Fatima undoubtedly experienced being positioned as the abject ‘Other’ and fought hard to avoid being positioned as a subject without recourse to voice. However, whilst she frequently resisted the positions on offer to her, her stories unmasked the inscription of discourses of ‘hard to reach’. Whereas Steve, Jalal and Philly all narrated stories of mathematics as an external body of knowledge, in a surprising twist, Fatima was the only participant to hint at mathematics as coming from within, although she made it clear that she could not imagine furthering her mathematical knowledge through collaborative ways.

In conclusion, the discursive sites from which these narratives were produced tell us things about the rules (and the vision) of the ‘ideal’ learning environment. I revealed powerful overlays of binary logic (of the ‘genius gene’ versus the gremlin within; of the masculinity of powerful mathematics as opposed to useful numeracy; of the knowledge economy versus the knowledge society) and interrogated how discursive signifiers made it difficult to identify with being judged as mathematical.

10.1.2 Masculinities / femininities of mathematical knowledge

Through interrogating empirical productions of ‘real’ mathematics, I have concluded that narratives of ‘real’ mathematics required the esoteric domain, and were reliant on a matrix constructed from oppositional binaries that placed higher values on the characteristics assumed to be ‘masculine’.

Kath did not envisage herself as someone who could naturally enjoy mathematics, and so whilst hers was a tale of empowerment – a case of “getting on with it” – it was also framed through a feminised discourse of caring and hard work. In contrast, Steve also frequently engaged with romanticised stereotypical fantasies of capturing mathematical knowledge. He discursively constructed stories of ‘happily’ fighting a gallant battle to ‘destroy’ mathematical questions and was only ‘willing’ to reproduce, on demand, the mathematical art forms of the esoteric domain and can thus be understood as valuing mathematical experiences through narratives of ecstasy or pain.

Mary was comforted by the feminine qualities of mathematics, but when pressed to articulate what she wanted to achieve, she immediately reverted to masculinised forms of knowledge in terms of speed, accuracy and precision.

Each performed their narratives through hierarchical relations of masculinity and femininity. In the majority of cases, the feminine qualities (both of mathematics and of working in collaboration) were recounted as useful, however it was striking that apart from the stories told by Sandra, the cost of this comfort tended to come at the expense of the value of the mathematics on offer. Such performances sustained the “valorisation” of those ‘Others’ with the mathematical gene, who naturally resided in mathematical spaces. Each participant storied mathematics as something that could be pleasurable, but the worth of ‘doing’ (for example, to pass an examination) had to outweigh the risk of participation, and this had implications for the ways in which they participated in the collaborative classroom.

10.1.2 Learners undergoing identity work

My starting point for this thesis originated with the perspective of a subject compelled to perform to perceived expectations and demands arising from public discourses. Whilst starting with a Foucauldian perspective allowed a theoretical analysis of subjects and objects of mathematics, in Chapters Seven through Nine I travelled beyond ‘purist’ interpretations of performances of self-crafting. In mobilising a shifting epistemology, I revealed complex accounts of the kind of mathematics that she perceived herself to be able to know, and by teasing narratives of fantasies, desires and fears, I revealed ‘things’ about the psychic costs of returning to the mathematical classroom as an adult learner.

Each participant gave complicated accounts and most were suggestive that they had shifted towards narratives of ‘becoming’ mathematicians. Whilst Kath, Sandra and Tony tended to look through a mirror of perfection, each negotiated their own mathematical spaces through narratives that troubled the collaborative account. Sandra and Tony positioned their emerging identity in relation to the teacher, and Kath, Susan and Karigalina as an external but interesting body of knowledge. The teachers were also caught in the compulsion to undergo identity work, compelled to perform acts of

ventriloquism to conceal the discontinuities between the competing demands of what constitutes good teaching and achieving learner ‘success’.

It was within the ‘safety’ of the classroom that all sought protection from memories of past encounters; of fear, humiliation and failure. Susan recalled “having numbers put in her face” and in this way, her particular use of silence was at once powerful and powerless – powerless because of the gendered production of ‘doing’ mathematics and of speaking within public spaces, but powerful because the product of the silence disrupted traditional assumptions of the ‘autonomous’ individual, and consumers of ‘choice’. It was sadly through Jalal and Steve’s stories that the impossible fiction of ‘freedom’ in the collaborative classroom was exposed.

Kath, Karigalina, Susan, Steve and Tony all told powerful stories of being able to do mathematics, but their narratives also pointed to discursive constructions of the ‘naturally’ talented. Each assigned discourses of rational, predictable and logical reasoning to mathematical knowledge and so revealed the situatedness of ‘common sense’; both as a product of and productive of Humanist assumptions that privilege traditional understandings of gender, class and race.

I revealed how, on being confronted by ‘success’, the participants became trapped in a discourse terrain of binary division as they sought to negotiate enjoyment of their higher esteem. Narratives of otheringness were thus exposed as holding a guilty allure, privileged against the ‘an-others’ in the classroom, those still struggling to tame the unruly maths. I found relations with mathematics and mathematical identities to be fragmented, perpetually moving, in a sense unpacked as the narrator sought to prioritise, reconcile and perform contradictory configurations of ‘success’.

10.1.3 Splitting mathematics and the mathematical self

I concluded, in line with the post-structuralist project, that neoliberal discourses promote masculine characteristics that sustain the 150-year-old fantasy that ‘successful’ teaching of mathematics *will* transform the underperforming learner into an ‘enterprising’ adult. I have looked to the empirical narratives to unmask how the narrators fell into patterns of language, using binary logic to tell a tale, to reveal the

spaces and the form of the subjectivities they perceived to be on offer, as they reflected on their transforming relationships with mathematics. Having considered the processes of normalisation and organisation of learning, particularly with regards to the pedagogic model of collaborative learning, I travelled beyond analysis of ‘resistance’. I was empirically led as I turned to perceptions of ‘normal’ and ‘average’ to finally uncover the forms (and ways) knowledge is privileged, and by whom. It is within this context that I explored the effects of the dichotomising practise of splitting mathematics into do-able and un-do-able forms. This enabled exploration of the locatedness of identity formation, as the participants worked hard to make sense of their ‘success’ in the classroom.

Whilst most challenged the stereotypical characteristics of mathematicians as brilliant yet fragile, and basic skills learners as ‘afflicted’ by gremlins, the participants simultaneously (and continuously) drew on cultural markers from within the public domain to make sense of their relationship with mathematics. At the time of the research, discourses of education perpetuated the perceived importance of developing the feminine characteristics of the knowledge economy (such as team work and negotiation), and ‘real’ mathematics was framed as something masculine. It was narrated as unyielding, learnt through a masculine dialogic pedagogy; and narrated as something that was reproductive of such things as rational thought, autonomy and choice. Do-able mathematics was frequently framed as common sense, with the markers of ‘real’ mathematics remaining something that only ‘natural’ mathematicians can solve.

Jalal and Fatima held the most heightened sense of ‘otherness’ to mathematics, but the defensive state was also transparent in Steve’s troubling stories of the familial cost and within Karigalina’s use of silence in the classroom. Esoteric forms of mathematics were valorised and the depth of pleasure (from experiencing success) had to outweigh the risks of being exposed as not possessing the intellectual capacity to take control of mathematical knowledge. With fear so evident in the shadows of the conditions of success, the risk of participating could not be pacified by all through the compulsion to engage with mathematical discussions within the everyday domain.

Steve tended to fill his mathematical spaces with heroic discourses of gendered oppositions, conjuring up immense feelings of pain/fear and pleasure/ecstasy, continuously negotiating complex identity work to position himself as an “average” mathematician. Karigalina, Susan and Kath, whilst experiencing an altogether more comfortable positioning, also carried out their identity work through a notion of average that allocated their mathematical selves to caring and nurturing others; all the while ‘othering’ themselves from the other ‘others’ in their class, who continued to struggle with the unyielding rules and regulations demanded by the academic discipline of mathematics.

I found that despite the dangers, discourses of ‘normal’ were used by the participants to stimulate the conditions of possibility that enabled a reconfiguration in their identity, and their transformation to something akin to mathematical that was simply not narrated as accessible during stories of their secondary schooling years.

10.2 Discussions and implications

10.2.1 Methodology and theoretical framework

I have framed myself as an ‘insider’ within the field and have wrestled with three distinct theoretical perspectives to illustrate how mathematical relationships are fraught with emotion, tension, silences and antagonisms. In the broadest sense, each of the theoretical perspectives shares allegiances. Each moves analysis from the centre to the ignored and/or excluded and focus on similarities as well as on differences. Each looks to the complexities of lived contradictions and markings of difference to de-centre the individual. Each is concerned with manifestations of power and positioning. Although each shares alliances in terms of a wider epistemic shift, I have introduced epistemological tensions into the heart of this thesis. It was only through the richness of the life history account that I was able to develop the substantive themes as they arose from the data. However, this approach has challenged the limitations of each of the theoretical frameworks.

Theorists working within the psychic domain look to fantasies and desires to interrogate how ‘choices’ are framed, but in troubling language, I challenged the ‘structuralist’ focus on social order. Where Bourdieu breaks down the Cartesian

dualisms of logic, Foucault looks to how subjects come to be constrained, how they negotiate and resist the positions inscribed on them. It has been by looking to Bourdieu and Lacan for tools for theoretical analysis which has enabled me to converse with the empirical data about tangible ‘things’, and how visceral embodiment of mathematics impacted on identity formation. By deploying Lacan’s psychoanalytical framework alongside Foucauldian conceptual tools, I have been able to interrogate the locatedness and effects of subjectivities and reveal ‘things’ about the psyche of the individual.

It has been by analysing the stories through these very tensions that I have been able to retain a sense of the messiness of the compulsion to undergo identity work. By simultaneously drawing from these theories, I have thought about the compulsion to undergo identity work, and the negotiations needed to be judged as ‘normal’. I have searched the history of the present, traced regimes of truths and considered how fantasies, fears and desires impact upon identity formation, without essentialising what it means to be human. It has been by teasing out the hidden processes of learning that I have contributed to the existing body of knowledge and have made methodological contributions to mathematics education research.

10.2.2 Implications: Noises of learning

My search for complexity and difference has unfolded organically through the ways in which my theoretical research questions spoke to the empirical data. The findings suggest that although the majority of the participants expressed a sense of fulfilment regarding their contemporary (or in the case of Steve, previous) encounters of mathematics, they remained subjects of discursive construction of numeracy with complex, thoughtful and thought-provoking identity work as they wrestled with different configurations of ‘success’.

To return to the constructivist discourses of SfL, I have shown how numeracy and functional skills mathematics have been presented in neatened, contextualised forms that talk to the everyday domain. I have shown how teachers, even when involved in critical thinking, assume that now, since the unruly mathematical forms have been reorganised into neat categories, the body of knowledge has in effect been tamed. This

produced discourses which assumed, with 'good' practice and diligence, that learning can inspire and motivate each and every individual.

I then returned to the narratives, and moved away from the value placed on mathematical knowledge, to listen to how they made sense of their transition into something akin to 'mathematical'. I found that the narratives repeatedly fell into a pattern of binarised language as the participants struggled to make sense of their emerging privilege within the classroom. In doing so, I also unmasked how techniques of splitting mathematics crept into the narratives as a means to mediate the spaces of their mathematical selves. Although discourses of hard work frequently entered the scripts, problematically inferences of an innate mathematical gene remained visible, which complicated the identity work they were compelled to undergo. There was a secret, seductive and dangerous power attached to 'being' judged as mathematical and of adhering to normalised and normalising constructions of the self.

The participants underwent complex identity work as they jostled with their peers, to secure their privileged positioning, but were careful not to be interpreted as impolite, arrogant or revelling in 'success' at the expense of the 'Others' – those yet to tame the body of mathematical knowledge and still suffering in the classroom. It was thus rarely a case of a linear transition from fear to affection.

What came out of investigating the techniques of splitting was the euphoria felt by the majority of finally being able to enter a mathematical space. Although mathematics was recognised as useful both inside and outside of the classroom, the psychic cost of the constant reparative repair, sustained a clear message that, at any point, the mathematics that 'someone-like-them' found do-able, would simply stop clicking at any time.

In conclusion, I find 'common sense' explanations of the so called 'numeracy problem', such as that set out by NIACE (2011: 3), fail to recognise manifestations of power and/or the psychic risks and the turmoil that (as in the case of Jalal, Steve, Fatima, Philly and Tony) accompanied the decision to return to learning mathematics:

We are a nation quite happy to admit to being ‘bad at maths’... almost wearing it as a badge of honour, in a way that they would never admit to not being able to read and write.

10.2.3 Limitations of the study and the future

In this final section, I consider improvements to this thesis and how this study can be further developed. The strength of this thesis has come from the evolving nature of my epistemological journey through three distinctive frameworks. This approach ensured an iterative study that was shaped as much by the narratives as by the limitations, as I put each of the frameworks to work. This meant that each encounter with each of the theorists was shaped by the data, resulting in empirically driven analysis rather than a theoretical imposition of analysis.

However, this also meant that as I read the narratives I furthered my own understanding of each of the theoretical perspectives. If I had read more about diasporic struggle before I conducted the second (semi-structured) interview, then I could have gathered richer data particularly from Jalal. In addition, I would have also allocated my time slightly differently, and would have engaged more heavily with the tutors, so as to extend understandings about regimes of truths and to reveal more depth to configurations of ‘success’ in the classroom.

I would also extend the classroom observation time so as to be able to ask different questions about transforming relationships with mathematics and the processes of ‘taming’ mathematics. If I had placed an earlier focus on narratives of un-do-able and do-able forms of mathematics, I would have been able to make more specific use of the ways in which the participants used binary logic as the means to split mathematical forms and to narrate stories of becoming mathematical.

Through conducting this research, I unravelled and troubled the processes by which the learners drew connections between the subjective experiences of their contemporary mathematical practices, and discourses within the public domain. This study indicates that critical understanding of the learner, mathematician and teacher (as subjects of social, political and economic constructs) is vital to further

understanding about the ways in which mathematical practices are shaped in the classroom.

On a theoretical level the project could be extended by:

- Looking in more detail at the ways in which the teachers construct both their own identities of mathematics as well as the identities of their learners, and to explore any connections between these.
- Observing classes and reflecting with learners on how they perceive their relationship with mathematics to be transformed, to discuss what happens to the form of mathematics once it is tamed, and the implications of not being able to split the mathematical self from the mathematics that they encounter.
- Asking more questions about identity formation and trouble assumptions about why it is important to feel normal.

On a practical level the project can be extended by:

- Adapting the ‘stories’ to a format suitable to be theorised by teachers. This would encourage critical engagement and reflection about the imposition of ‘common sense’ assumptions about learners and about their mathematical and pedagogic practices.
- Rolling this format out in CPD sessions and conference presentations that attract teacher audiences.

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Appendix 1: Visual representation of the national qualification framework

National qualifications framework	Compulsory schooling, A-levels and university	
National Qualifications Framework Level 5	Honours degrees	
National Qualifications Framework Level 4	Foundation degrees, etc.	
National Qualifications Framework Level 3	A Levels, IB, etc.	
National standards for adult literacy and numeracy		
Level 2	National Qualifications Framework Level 2	GCSE A*-C
Level 1	National Qualifications Framework Level 1	GCSE D-G
Entry level 3	National Qualifications Framework Entry Level	The standard expected of 9- to 11-year-olds
Entry level 2		The standard expected of 7- to 9-year-olds
Entry level 1		The standard expected of 5- to 7-year-olds
Pre-entry level	National Qualifications Framework Pre-entry level	

(Carpenteri, 2010)

Appendix 2: Details of the sampling and selection processes for the document analysis

Throughout the thesis, I have discussed how dominant discourses become the means by which discursive 'truths' are established, and how these 'regimes of truth' then come to act as common sense truths about teaching and learning. In chapters six through nine I looked to the ways in which policy has constructed stereotypical characterisations of adult learners (typically as in need of reform) and the inclusion of policy materials from different historical periods has enabled nuanced understandings of the variability and stability within and through official discourses about the adult numeracy learners.

I provide two visual depictions of the overall chronology. Table 1 provides the historical markers of the notion of the term 'numeracy'. Table 2 includes reference to the policy texts that I consider to have influenced the implementation of the Skills for Life strategy. I have also included the policy texts that continue to discursively construct the shape and form of the mathematics on offer within the sector. Due to the number of policy texts (and the research questions of this thesis) it has not been possible to include analysis of all, so I restricted discussion to the policy texts that related to the construction of numeracy, the numerate citizen and the employable subject.

Table 1

Historical Markers for the production of the notion of 'numeracy'

- | | |
|------|---|
| 1867 | Britain underperformed in the Paris Exhibition, which sparked a series of enquiries into the state of technical education in the UK |
| 1877 | City and Guilds of London Institute was formed in, instructed to devise accreditation for vocational training |
| 1889 | The Technical Instruction Act
Created new powers for boroughs to "devote a penny per person" (rates raised from a tax on alcohol spirits) to technical and manual instruction |
| 1868 | The Taunton Report
Although Adult education was not included in this report, Taunton in talking about parents forged new spaces for public discourses to develop schooling in line with structures of social classes. |
| 1902 | The Education Act
Focused policy narrative on the need for apprenticeships. An historical pointer that is recalled by Schuller and Watson (2009) as when the notion of 'educational opportunities for all' began to emerge as an imaginable 'right' within the psyche of the nation. |
| 1959 | Crowther Report
A Report into the social risks associated with the transition between school and employment where the term numeracy was first coined. After the Crowther Report, public discourses constructed subjects of numeracy through discourses of not having the opportunity to realise their own potential. This pathologised |

- youth leaving school at 15 (and by implications their parents) as skills deficient and of disrupting the social and economic fabric of society
- 1964 Industrial Training Act
 This Act saw a political ascendency for the FE sector. Whilst the notion of numeracy was not explored, funding streams were explicitly justified through furthering the discursive link between economic opportunity and social and political stability.
- 1982 The Cockcroft Report: Mathematics Counts
 A report into the teaching of mathematics in schools where Crowther's definition of numeracy took on a new meaning of mathematics in the 'everyday' domain. Shaped by discourses of Utilitarianism, Cockcroft reconfigured the acquisition of 'numeracy' skills as an essential marker for being judged as a 'responsible citizen'
- 1997 The Second International Adult Literacy Survey
 The UK was ranked only 13th out of the 25 participating OECD nations
- 1997 Does Numeracy Matter? Evidence from the National Child Development Study on the Impact of Poor Numeracy on Adult Life
 A report into the comparative and combined impact of poor numeracy and literacy skills in adult life
- 1998 The Learning Age: A Renaissance for a New Britain
 The initial green paper of New Labour setting out the epistemic and ontological purpose of adult education in the UK
- 1999 Improving Literacy and Numeracy: A Fresh Start, A Report of the Working Group chaired by Sir Claus Moser
 A report commissioned to analyse and the levels of basic skills amongst adults in England. By staking an authority in the scientific precision of statistical analysis, Moser 'objectively' defined the economic, political and social costs produced by adults 'lacking' the basic numeracy skills for survival. Moser re-organised numeracy into three bundles of skills (number, measure and statistics) contextually bound within a logical sequence of computational skills, which was assumed when mastered correctly, would inevitably produce logical reasoning and encourage articulation of mathematical ideas.

Table 2

	From numeracy to implementation of SfL strategy and beyond
2000	Launch of Learn Direct
2001	Roll out of the Skills for Life Strategy including the Move On campaign, introduction of Adult Numeracy, Literacy and English as a Second or Other Language (ESOL) Core Curriculum, the Key Skills qualifications in 'Communication' and 'Application of Number' and FENTO standards and Teacher Development Agency framework for subject specific qualifications (numeracy, literacy and ESOL)
2004	Roll out of the Skills for Life Embedded Learning Portal
2005	Response to Smith Report, the roll out of the Standards Unit: Improving learning in mathematics: challenges and strategies
2006	Response to Smith Report the establishment of the National Centre for Excellence in the Teaching of Mathematics
2007	Response to the Foster review: Ofsted merges with Adult Learning Inspectorate Building the vision for the Skills for Life Strategy
2004	Skills for Life Annual Review 2003-2004 The 2003-2004 Annual Review on SfL strategy that measured the success of the strategy against the targets set in 2001
2005	Foster Review: Realising the potential, a review of the future role of further education colleges A review to define the purpose of the sector
2006	Leitch Review of Skills: Prosperity for all in the global economy - world class skills A review commissioned to identify the UK's optimal skills mix for 2020 to maximise economic growth, productivity and social justice
2007	Response to Maths4Life discussion paper: launch of Thinking Through Mathematics, CPD events, numeracy materials specific to meeting the needs of adults learning mathematics
2011	The Wolf Review: Review of Vocational Education A report into the vocational education offered to 14-19 year olds in England, with specific attention to the role of mathematics and literacy in the workforce. Wolf criticised the SfL strategy, dismissing functional skills as "conceptually incoherent" placing GCSE mathematics at the centre stage of all adults engaged in post-16 education
2011	Review of Informal Adult and Community Learning A Liberal Democrat and Conservative government report that continued to prioritise funding for young adults 'lacking' in English and maths skills. The report sought to re-establish the terms 'English' and 'maths' for adults
2015	Skills funding letter of sets out the responsibility of funding as shared between the employer, the sector and, through the introduction of loans, the individual.

Appendix 3: Reflections on collecting data

Reflections on conducting the group discussion

In planning for the first focus group discussion, I took what Morgan (2010) terms as a funnel approach to facilitate a conversation in ways that I perceived would take the discussion into unexpected directions. I started the event by outlining that the purpose of the discussion was to gather a range of opinions (Morgan, 1997) and then asked the participants two form into pairs to discuss two specific questions:

What characteristics are needed to be a mathematician?

How would you identify a good mathematical problem?

After 20 minutes, I requested that the group join and to summarise their previous discussion, which grounded the opportunity for all the teachers to be heard and ensured that the teachers would tell, and then retell their stories. After an hour, I asked the teachers to turn their attention to a list of 10 key teaching principles (Morgan and Krueger, 1993), a product of TTM, which I had sent (prior to the event) to give time to the teachers to organise their thoughts. I had prepared some prompt questions but in the event, I intervened very little and on the occasions where I did, it was to ask the participants to give further fluency to their discursive construction. The conversations were transcribed verbatim.

Two of the four participants knew each other and all knew ‘of’ each other from regularly attending network meetings and CPD events. The homogeneity within the group and the familiarity with the topic meant that trust was quickly established, but that there was scope for the individuals to challenge one another and to disagree. I was aware of the potential for the power dynamics to limit some of the individual’s involvement in the discussion or from expressing opinions that may have been perceived as deviating from the norm (Wall and Swan, 2000-2009). However, in the event as was suggested by Morgan & Krueger (1994), where there was a tendency for the group to produce a discourse of conformity, it did not culminate in an easily defined consensus. Simultaneous to the group conforming around the grand narratives of the notion of ‘best’ practice, counter narratives continuously occurred in ways that gave a glimpse at some of the hidden subjectivities structured around the fantasy of performing best practice in the classroom. Thus I found the group dynamics to be similar to those described by Kitzinger (1994: 113).

Regardless of how they are selected, the research participants in any one group are never entirely homogenous. Participants do not just agree with each other they also misunderstand one another, question one another, try to persuade each other of the justice of their own point of view ... Such unexpected dissent led them to clarify why they thought as they did, often identifying aspects of their personal experience which had altered their opinions or specific occasions which had made them re-think their point of view

Whilst I planned to be able to include all of the participating teachers within a series of three focus groups, in the event for personal health reasons I was unable to follow

this pathway. Unfortunately, I was not able to gather a large enough sample for this to be consider a self-contained data collection technique, but the stories that I collected during the two hour discussion gave insights into the processes of normalisation as the group came to conform around specific discourses of best practice. Although I was unable to conduct a focus group, I was able to conduct one small group interview, consisting of the initial sample of participants and whilst this data cannot stand alone, it does provide insight into how fragile the notion of 'success' is, especially when inscribed onto the body of the practitioner under the gaze of performativity. After this event, I then visited each of the teacher participants in their classroom settings. The tutor identified a class, I met the group and presented my research idea and explained the nature of participant involvement. Unfortunately, I was not able to attract any learners from Jane's adult education classes however; I was able to gain the interest of four learner participants, from the remaining three tutor participants.

Reflections on life history interviews

The principle of reciprocity is central to ethical practice, so I felt it essential to ascertain the motivations of the participants to join the research. Steve and Abdul stated a long gap in their recently changed timetable as motivation to participate. Subsequent to this interview, both participants changed their work patterns so this gap then became unavailable. Whilst Abul left the research (although he was happy for me to use the data from the interview), Steve's experience as a participant awoke an interest that led him to engage with a research opportunity that presented on his access course. He conducted a small research study to explore sociological perspectives of taking secondary students on school trips, as part of a schooling programme.

Three of the participants (Fatima, Jalal and Philly) were motivated by their feelings of having had their voice silenced in the past, and expressed that they now wanted their stories to be heard. It was the richness within these narratives, along with Steve that motivated me to extend my analysis of post-structuralist discussions of power relations, discourse positioning, and performativity to include material consideration and the affective domain.

Alexandru wanted to practice speaking English and Susan wanted to be shown how she could best learn how to learn. As the interview progressed, it became painfully clear, that Susan had been enrolled on an unsuitable course, way below the level of her existing qualification outcomes, and desperately sought career guidance. Tony and Karigalina presented as enterprising and creative citizens, seeking out the research to progress their own interests in conducting research and/or in publishing stories. Sandra wanted to be interviewed to recognise the practice of her tutor, stating that she was amazed that she "made time" to attend the mathematics sessions (held at 7pm on a Thursday night), and felt so empowered by her contemporary experience of learning mathematics. Finally, Kath provided another gendered 'caring' perspective, simply stating that she wanted to help me, to get the information I needed, for my project.

I was surprised by the differences between the encounters of silences (Susan, Karigalina and Alexandru) that occurred within the interview space. Alexandru was not confident about his use of English and so I closed the questions. Whilst this approach elicited limiting and closed responses that stayed close to the anticipated intention of

the question, Alexandru's assumption that there was an expected or 'correct' answer pointed to the specific geo-political, cultural, and social spaces of his previous encounters of education in rural Romania and to the instability within the diasporic spaces of a migrant learner within the sector. Although Alexandru but did not provide enough rich detail to 'story' his narratives, his success in the classroom pointed to a transformation in his relationship with mathematics.

In contrast to the twenty minutes I spent with Alexandru, Philly spoke for over 90 minutes and often in convoluted ways. Although she produced valuable and rich stories, on transcribing her comments verbatim, I ruminated on my in-action 'decision' not to use the topic guide to structure the interview in ways that would have been more convenient for the research. When the next participant Fatima took a similar pathway and launched into what Tamboukou (2003) refers to as rehearsed stories, I became too concerned with collecting 'real' data about her level of mathematical skill, made two very clumsy attempts to change the direction of her narrative. After transcribing and reflecting on the first three interviews (Philly, Alexandru and Fatima), I reflected on my 'progress' as interviewer and on discussion with my supervisor, decided to keep walking the very narrow line between encouraging and constructing stories (Tamboukou, 2008) about previous encounters of mathematics. The preparation of a structure from which to pose questions, enabled me to gain some valuable insights into her 'silences' in negotiating the mathematical successes that she encountered in the collaborative classroom. Susan's use of silence within the classroom acted as an enabler for peer learning and this compared to Karigalina's use of silence, who whilst listening for errors during her 'groups' discussions of mathematics, completed her own work in isolation. This will be discussed in more detail, with 'silence' theorised in chapter seven.

Appendix 4: Planning group discussion

Getting started (about 10 minutes)

Remind about the project, confidentiality, recording
Going round introducing themselves and choosing pseudonyms

Why have you been chosen?
In a typical class you will ask your learners to:

- Discuss to understand mathematical concepts
- Express and communicate mathematical relationships
- Reflect as they extrapolate from data
- Assess the “message” hidden in data
- Think critically about data
- Express observations as they explore mathematical relationships
- Assimilate data from multiple sources and form conclusions
- Personalise a coherent approach to solving real problems in the real world

Discussions (about 60 min)

Can every learner learn?

Areas for probing

Say something about how students feel about learning maths, cognitive, social, cultural, political

What characteristics are needed to be a mathematician?

Areas for probing

reasons for difference in who can do maths and who likes maths,
the role of the social over the individual
do there learners need / want to become mathematicians?

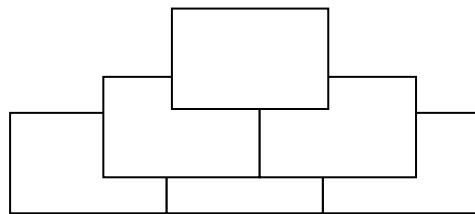
How would you identify a good mathematical problem?

Areas for probing:

Knowledge, Make sense of task, potential to transform task, pose and write mathematical problems, make sense of strategies, assess the impact of own mathematics in context of a real life situation, assess own communications skills, transferability skills to solve problems given unknown situations, assess own and others mathematical strategies, adapt own approach in line with class discussion

Individually (about 20 min)

How would you prioritize the following statements (when you develop your own learning programs) within the pyramid provided? Feel free to change the shape of the pyramid or to add in your own principles - but please justify reasons for doing so.



Encouraging learners to be able to identify their own perceptions and values of mathematics? [i.e., mathematics is discovered, mathematics is constructed by humans]

Developing a deep understanding of concepts and relationships between mathematical and other life contexts?

Developing strategies for passing an exam

Discussing errors and popular misconceptions

Problem solving and explaining strategies

Posing and writing own mathematical problems

Confidence in use of mathematical language and symbols

Making it clear to the learner what they are expected to achieve, and how they will be assessed

Using ICT and interactive resources (tactile) in the classroom

Developing mathematical accuracy & speed

Developing mathematical creativity

Using the learners backgrounds (in relation to norms, beliefs, values, etc.) to determine the pedagogical process

Appendix 5: Interview topic guide

Primary purpose of the interview – to explore learner values.

1. To pull together stories of encounters of mathematics
2. To situate current family influences on education
3. To situate how family / cultural background has impacted on identity as a mathematician
4. Find examples of decisions, choices and actions
5. Illicit a symbolic representation of mathematics (personal – usually learning experience, social – parent, peer, public)
6. To identify positioning (with particular regard to the ideological, individual and social branches) and to explore how disposition and habitus has changed in relation to the field. Family / cultural influences
7. Returning to education (past and present experiences). How participants navigate hierarchy and make sense of manifestations of power
8. Narratives of ‘normal’ (listen in stereo for examples of beliefs that are on the edge of group social norms)

Secondary purpose of interview

1. To start participant thinking about the similarities and differences between past and present learning experiences
2. To situate participants preferred approaches to learning to deconstruct in the second semi-structured interview
3. Identify fantasies and fears

Checklist

- Information and consent forms
- Advice in the local area
- 2 tape recorders
- Notepad and pen
- Interview guide

Biography

Birth and family origins
Family household / earning capacity / health and education of members
Interests
Commitments / responsibilities
Future aspirations

Discussions of best practice

Rules or procedures?
Like it? What different?
What pitfalls?
Example of got it moment
Age realised (not) good at maths?
Expectations? Same as teachers?

Life history experiences

key choices and decisions
life challenges and actions (maths)
how end up doing what you are doing?
Memories of school / family / other families doing maths
Any mismatches between school / college and self expectations

Being a mathematician and doing mathematics

Tell me a story that includes mathematics
How does mathematics relate to your everyday life?
Right or wrong maths?
What sparked motivation for joining?
support / feeling about commitment from others?
fears & worries
colour or smell associated with mathematics

Introductory phrases

Can you tell me about? Do you remember an occasion when? Could you describe in as much detail as possible?

Follow up questions

Repeating key phrases, tell me more about,

listen for strange references, tonal change, look for body language

Probing questions

is there anything else you'd like to add?' I don't quite understand what you mean by could you explain that part to me again? you said xyz, so how do you feel about abc ...?

Specifying questions

What did you actually do, how did you respond / react? Have you experienced this yourself? How did it happen? Could you tell me about the views? Let's move on to your views can you give some examples

Direct questions

You mentioned xyz' and raise your voice What happened?

Indirect

How do you think other people might have felt?

Structuring questions

We have already discussed this', or do you stop them and say 'Can we come back to this later

Interpretative questions

'So what you're saying is?' Is that correct, is that how you feel? Is it correct that you r main anxiety is

Concluding

Is there anything else you would like to say?

Can cross into another discourse by what did you learn from that – but be aware that is what you are doing.

Appendix 6: Semi-structured interview questions

Methodological approach

A post-structuralist recognition of multiple discourses. Identities are continually shifting and reshaping and as such recognition that there is no fixed reality or experience. Looking for sense making rather than meaning making.

Phenomenological approach to questioning – the learners hold useful insights into their meaning making processes. The questions intend to interrogate the participant's position in relation to the mathematical activity. How did they make sense of the codes within the activity and what devices did they draw on within their existing learning systems that they have in place?

The interview will follow one of two pathways depending on the response by the participants. It is anticipated that problem solving activities are more likely to produce a discussion that lends itself to questions of manifestations of power and messy group work. A knowledge based discussion (developing discrete based skill(s)) will more likely invite second pathway that intends to interrogate how the participants identified the mathematical that they have tamed.

Semi structured interview -

Primary purpose of the interview

1. Identify how the participants recognised and made sense of the codes/activity
2. Identify how the participants positioned themselves in the learning community and in relation to mathematics.
3. Co-construct how participants approached using the language of mathematics

Are you still happy to be interviewed?

Purpose of activity – do you remember when you were asked to work out the number of bricks. Can you tell me about the purpose of the learning activity?

Can you describe why you were asked to do the activity? Ped level and on task level

Discourses of best practice and ideal learners

Negotiation

Who in the group identified the aim of the task?

How did they do this?

Who identified the steps? Can you talk me through how this worked? Did things change?

How? (tape slice if really stuck?)

Were there any moments where you felt

Constructing knowledge

What part did the teacher play during the activity?

Tell me about the context

How do you feel about the role of the teacher?

How do you feel about learning from each other?

What needs to change?

At what points does your thinking involve your first language? At what point do you revert to English?

What do you identify as everyday maths? Do you translate between everyday thinking into a more formal mathematical language?

Did this help your learning?

Appendix 7: Participant table

Life experiences	Being a mathematician and doing mathematics
<p>Primary - The problem was with the teachers ... I am at an age to ... think about it and seriously, the people weren't altruistic to do these jobs ... in the primary school, I can remember the teachers most of the time having tea and cigarettes outside</p> <p>Secondary - With the baccalaureate ... at this moment things are now or never. If you don't learn these things, that's it ... the teacher they look at you like this and they don't help you ... you have to pay a good amount of money ... when it came to the exams they have 20 in the maths and ... they are like gods ... without paying they are good you know, but with this they are gods.</p> <p>Now - I find it a very bad way to learn. You are going to end with disabilities in your mind. This curriculum ... if it doesn't make me learn these things ... it doesn't help me he destroy me little bit. ... I don't know if it is the same curriculum with English people if it is like this, then they are going to struggle like me and they are going to arrive to this kind of complex maths and they are going to be stuck like me. They can't move on. No good</p> <p>At home - My father he was working with the engineer you know. The roads, foundation you know all the things that you need in the city and things like that. Yeah he was good at maths ... but the problem is corruption everywhere. I have one letter for him. I read it after he died ... things could be better than this you know ... Still its true ... but not how he wanted (mimes with his body refusing the money) ... I was respected because of him ... And I loved it you know, just he was so good you know ... and I was feeling the responsibility of the all these things and it was horrible ... You know they tell me this bridge here is this your papa this bridge and I said yeah he did this you know and I feel very, very proud about it. But you know my sisters, everybody is struggling with stuff, doing this stuff, women's stuff, you know with stuff but that's ok. We are OK.</p> <p>My mum was just in the house. My dad was very religious and couldn't let her you know work ... It was a small city ... and you couldn't give a job to his wife, you know because she has all the time I think a degree. I think one of the first degrees in Morocco. You know she can write, speak French and write and read and do maths</p> <p>My dad used to read a lot ... newspapers, and a lot of other books to do with the politics and the religion ... I read it, after I have grown up ... I was spending some holidays and ... I closed the door and I was reading. I think for around 400 magazines from the BBC Arabic.</p> <p>On equality - I mean, I feel hurt because I know I didn't get the help from the teachers ... The system is not, the system is very ... it can't just work on what you go with to the school ... you can't complain ... unless you have someone to complain for you ... It was chance of my school because I think my dad was all the time just humble. I think he put me in that school ... because I could walk there ... I can remember the faces ... of the people in the class with me and sometimes it is very sad. Sometimes ... you know I may be passing and they have no job, or some job like sweeping the road. This is not a bad thing but these people can do better than this, you know if they have a good experience at the start</p> <p>Career - Yes I have a bachelor in law and ... it's a bachelors here too. I used to work as a manager in a hotel at Marrakesh ... and this is the reason why I didn't want to come here. I believe sometimes, that I think like this ... I don't think any more about luxury, or to do what I want to do, or want you know. I will tell you the truth I</p>	<p>If you are good ... you are lucky ... to do other important stuff, to get better jobs. And these jobs are like this (shakes hand as though hot to touch) you know the Moroccan people say to the kids ... what do you want to be – a pilot. And ... they are asking me, and I say engineer and then after a few years it is getting down and it's just teacher or something like that with no maths. (Laughs) I mean when you say ... about the results at the university, you have to be careful as you will lose at the end.</p> <p>It's not the maths that I imagine as maths ... you know stuff I think ... when we go to real maths and x and beta and p and all this stuff ... you know, it was just like for me signs you know. It was like some kind of magic you know.</p> <p>With all my studies so far in maths, there is just one result ... before I had never heard of rounding. It doesn't have any purpose any utility in my life. Even back in my home country we don't do this, we don't do it! We don't know it ... you know, to bring things to the dot ... It is very rigid ... It's just the precise point that you need. You don't need the skill of rounding and from my view when you go like this, the maths lose their things. Their purposes because it become like the human sciences. That you can say what you want, do what you want. It's up to you. You take the responsibility ... I mean it was interesting about the mind, but you need the answer. In maths the numbers and what they mean for me is that they are right. You don't have to round them. That's it, that's the point.</p> <p>I agree that people need to have strategy to solve problem but in this exercise it has the same ... values and you have to go to the correct answer in the end ... I mean the same exercise can take a lot of ways. There is a lot of strategies ... (that) can go different way and go to the same number ... but that everyone has the same exercise and different results. I think for me is more diversion, people cannot understand the purpose of the class, the purpose of the lesson.</p> <p>... No this is illogic in this way ... for me it's just another way to avoid stuff. I don't see it as useful, as more destructive ... One day you are going to be in need for this kind of other thing, but ... this kind of exercise, it give you the possibility to go around but when you come to one serious situation. When you have to use this for an exam ... and they don't give you a way around and then you going to be stuck. You are going to find that you failed even if you get a mark this year. For a year you go to but then you find yourself very weak in other areas, and in other exams they don't tolerate these kind of things.</p> <p>My dad was serious and dry ... he was a really good guy. He would give us the responsibility ... to do the shopping for the whole week ... to buy kilogram of stuff and I lost half of the money. Half of the money you know was not in my pocket anymore ... I mean it was a serious matter. I would be punished ... I had to decrease the prices of something ... to say they are not in the market and ... I know I cannot cover all this money but some of it. It was tricky man after the loss. It was very, very bad things ...</p>

<p>feel pretty confused about it ... I want a better job, I'm smart. I learn quickly. I have a lot of ideas and creativity but I'm getting old and I have a family and all these things don't give me the time.</p> <p>I try to talk ... the learning centre to ask for advices because I want to take some short cuts. I mean everybody wants a good life with more money and these but I want you know, just to have enough to support the family and have enough to save money to do some business. These are the things that I am thinking about ... I don't have the confidence in my English ... I wrote an article in the magazine about politics ... but in English I wish I had the skills to do this. I can't just learn how to do this, not with the spelling not with all the words.</p>	<p>I went to his office and oh dear. He was working you know and all this maths and all this stuff and all these things that he keeps in his head. All the fundings ... with water ... the electricity and it was a big amount of money. I could see all the money and this man there was no switching.</p>
<p>Discourses of best practice</p> <p>Do you enjoy that aspect of maths? As a team talking ideas through with each other?</p> <p>I don't think this is a good idea ... you need distance and you need to know how to explain it. Maybe the bridge of language ... Another guy he came to help me and he just take the mouse and he did (clicks with his finger moving imaginary mouse across a screen) ... and I said no are you going to show me and so he starts doing it. I said no, I want to explain to him how I want to learn first. Like leave my hands on the mouse and no just tell me do here, do here and he cannot. He just (clicks away with his hands) leave me waiting there and ... erm it just ... don't help it make the case more complicated ... I think that he should be stopped and I think he should get a naughty, to understand ... you shouldn't do it this, especially when the teacher sees these things ... because some students cannot ask questions to other students. Maybe some students can ask a question, but he humiliate him and so he cannot come back to him</p> <p>You can find the solution that is easy for you. Everyone is going to win and find the solution in the end ... He is not going to make mistakes ... and (he will) use the operations that are easy for him and arrive at the result. But the purpose, the process of learning is that you want to go into things that are very hard for you, that are not easy for you to learn. For example, if I have a problem ... I have to do more and this exercise should ... give me the clues and push me to go to this result. But if you just to make a strategy, definitely you are going to ... bypass ... all the time</p>	<p>Performances</p> <p>I think to myself this is crazy you know. I think to myself you can forget these things so easily. The other day i had to do the 3 numbers times and I couldn't remember how to do it ... and this is the easy things for me ... until then I think I'm good at maths and then after... it becomes very, very difficult. It is true I forget them and this is what makes the human lives very, very interesting</p> <p>At the end of the hour, I started to think like this, like we just want to find the solution. Let's make an estimation of what we want and make for example the size of the bricks ... and we can see the price some bricks and the glue to hold it together and ... then we just do, but Alexandru, he just wanted to calculate how many bricks there are in this 60 meter and how many in one metre. He wanted the size ... For me it doesn't make a difference it's just er, an exercise on paper you can count bricks, milk They said some people are stopping us ... it doesn't mean that you should classify them. Everybody should work the same things and everybody should respect the others ... I am not teacher ... but I am smart. I think and I can work it out. Yesterday there was this man. He was not happy but he understood everything ... he doesn't want to stop and wait for the guy to make it right ... I think they need control for these things ... yeah it's good to come to England it's better to learn English and it's good to learn the maths and to learn everything to do with society</p>

Appendix 8: Information sheets

What is mathematical wellbeing? What are the implications for policy, curriculum design and pedagogical approaches?

Participant General Information Sheet: Tutors

My name is Tracy Part and I am an experienced numeracy teacher and teacher trainer and have taught in a variety of educational settings including adult education, further education, prisons and work-based learning. I have also co-authored a booklet (with Barbara Newmarch) on how to teach number, published by the NRDC, which is available through the maths4life portal on the NCETM website.

I am currently a PhD student with London Metropolitan University and would like to take this opportunity to invite you to participate in my PhD research project to attempt to define and measure mathematical well-being. This information sheet will give you a short overview of the aims and objectives of the research and will also provide you with an outline your role as the tutor participant, as well as the role that your learners' will undertake. If you do decide to participate and open the opportunity up to your learners, then I will provide your learners with a separate information sheet and ask for their informed consent.

Before you decide whether or not to participate, it is essential for you to understand the nature of the research, how it is going to be conducted and your role as a participant. Please take your time to read the following information and do not hesitate to discuss the implications of this research project with colleagues, family or friends. Contact me if you have any questions or require any further information.

If you do decide to go ahead, any agreement will be based on the strict understanding that your participation (and the participation of your learners) is voluntary and that you may at any stage withdraw yourself from the research cycle. You can also be assured that if you do decide to withdraw, then I will accept your decision and will not ask you to outline your reasons.

Many of you know me and have worked with me in a professional capacity and so I want to make sure that you do not feel obliged to participate. The research process should prove to be both interesting and enlightening and I so I want to stress the importance that your motives for joining the research team are based purely in a personal and professional interest in the research topic; mathematical well-being. It is especially important that you, as a candidate on the Additional Diploma, do not feel that I have asserted any undue influence on you and that you do not feel coerced into participating. You must understand that you have the freedom to withdraw from the research at any stage.

What do I mean by well-being?

The term well-being has been borrowed from Amartya Sen's Capability framework. The framework is important to me because it uses the term well-being to make a distinction between the opportunity (or capability) to succeed and the action (or function) of success. Sen's ideas around capabilities and well-being have provided the conceptual framework from which welfare

economists constructed the United Nation's Human Development Index. For further information on the framework you can refer to
http://en.wikipedia.org/wiki/Human_Development_Index.

What do I mean by mathematical well-being?

I want to give learners the time and space to reflect on their previous experiences of learning mathematics. I want to listen to a variety of learning stories to try and unpick (and discuss) how an individual's perception (and the perceptions of their friends and family) of mathematics has impacted (and continues to impact) on their ability to develop skills and procedures in a formal learning environment.

I intend to chat with learners and ask them to choose the mathematical and processing skills that they perceive “good” mathematicians hold. At the start of the study I will ask them to reflect on their personal mastery of each of these skills and at each stage of the research cycle, I will ask the learners to return to and update their reflections. At the end of the research program I hope to invite all of the learner participants to a focus group to discuss if it is possible to identify common learning experiences and/or to come to a consensus and rank the mathematical and processing skills (or capabilities) that learners’ value as constituting a strong mathematical well-being.

Why am I doing this research?

There have been a number of in-depth studies into effective ways of teaching numeracy, however little has been done to explore the usefulness of the concept of mathematical well-being or the importance and value that foundation level adult learners place on the different mathematical and processing skills that they develop as a student. I am an experienced teacher and I want to know how learners feel about “mathematics”, to unpick their perceptions and values and to question the purpose of learning mathematics. I also want to be able to develop a list of mathematical and learning capabilities that the learners have identified as being important in order to motivate learners and provide a learning experience that will enhance their mathematical well-being.

Who can take part?

I am inviting numeracy tutors who are interested in discussing the concept of mathematical well-being and who are willing to allow me to interview and observe their learners. I am looking for both new and experienced teachers and from teachers delivering numeracy to adults at foundation level across a variety of educational settings including; FE, adult education, community based learning and / or work based learning.

What will you need to agree to?

As a tutor I will ask you to agree, in principle, to attend two focus groups (one at the start and at the other at the end of the research cycle) to discuss a list of mathematical and processing skills that you feel are essential to the success of your learners on foundation level course. If possible I would like you to keep a reflective diary, podcast, or even a recording of your thoughts throughout the research cycle.

Essentially it is your learners who will be invited to participate in the research program. You learners will need to volunteer and will need to understand that they are free to withdraw from the research at any stage of the cycle. If they agree, your

learners will be:

- invited to 2 to 3 individual in-depth interviews
- asked if they can be observed during a numeracy session
- invited to a focus group.

How will I gain consent from the learners?

All learners will be provided with a separate information sheet and will be asked if they would consider being involved in the study. I will ensure that all learners are provided with plenty of time to think about the implications of participating in the project. I will also encourage them to discuss the project with family, friends and tutors and will make myself available to answer questions before they agree to participate.

I will ensure (and ask you to confirm) that if a learner decides not to participate, or if they withdraw, that their decision will in no way influence or impact on the quality of their learning experience nor will their decision impact on their continued participation as a numeracy learner.

What will I do with the information?

I will transcribe every discussion (group and individual) and if you are interested I will give you a copy of the transcript. The transcript will only be read and used by me and not be used for any other purpose. The information from these discussions will form the basis of my PhD thesis, which will be assessed in order for me to gain the PhD degree.

However the transcripts might also be used as a basis to write and publish articles in academic journals. I will provide you with a summary of my findings and you are welcome to see the final thesis and/ or a copy of the articles before they are published.

Will everything you say to me be kept private?

All information collected during the research will be strictly anonymised and all names changed. The location, staff and learner names and any other identifying factors will also be anonymised in any report or publication arising from the research. All relevant parties will have the opportunity to comment on any articles prior to the publication. All data will be kept in a secure location and the data protection act will be adhered to at all times.

Contact information

Tracy Part London Metropolitan University, IPSE, 166-220 Holloway Road, London N7 8DB. Mobile number: 07960 417 741
email: tracypart@hotmail.com

How do you feel about maths? Do you value mathematical skills? Are there some skills that you think are more important than others?

Information Sheet: Students

Hi. My name is Tracy Part and I have been teaching for about 15 years. I have taught maths, English and ESOL in the UK, the Canary Islands and in Mongolia. I am hoping that I will be able to achieve a PhD out of this research and to disseminate my ideas so that other teachers can plan numeracy programs that are more effective for learners.

Before you decide whether to participate, it is essential for you to understand what I am going to do, and how I am going to do it. Please take your time to read the following information and to discuss this project with family, friends or teachers. I would also like you to contact me if you have any questions or require any further information. If you do decide to go-ahead you will do so as a volunteer and this means that you can stop the research at any stage.

What do I want to find out?

I want to chat with you and ask what makes a person “good” at maths. I want you to pick the skills that you think are most important for learning maths and then to think about how you would like to go about developing these skills.

Why am I doing this research?

I enjoy teaching and want to be able to use your ideas to design a maths program that gives you a voice in the planning and makes the learning really worthwhile.

What will I ask you to do?

- I would like you to make a web of mathematical well-being
- I will interview you 2 or 3 times (it depends on what you want and how long your course is)
- I would like to come and see you in a maths classroom
- I would like you to read my findings and to make comments on my ideas

Who can take part?

I want 1 or 2 learners from your class. It doesn’t matter if you like maths, or even if you hate it - I am interested in your experiences as a maths learner.

What happens if you say yes?

I will send you an information sheet that I will ask you to sign and to return to me. You need to make sure that you give yourself plenty of time to think about the project and to discuss this with family, friends and tutors. I will answer any questions that you have.

I will also ask you to sign a consent form to allow me to come to your class and record what you say as work with your peers in your class.

What happens if you say no?

Absolutely nothing. Don’t worry it has nothing to do with your numeracy course. You can stay in the class and not be part of the research.

What happens if you want to stop half way through an interview?

You are a volunteer and so you can stop at any time that you want. I will not ask you to explain your reasons for leaving the project.

What will I do with the information?

I will transcribe all our conversations and you can read a copy and let me know what you think. The transcript will only be used by me and not be used for any other purpose. The information from these discussions will form the basis of my PhD thesis, which will then be marked in order for me to gain the PhD degree.

These transcripts might also be used as a basis to write and publish articles in academic journals. I will provide you with a summary of my findings and you are welcome to see the final thesis and/ or a copy of the articles before they are published.

Will everything you say to me be kept private?

I won't use your real name, your tutor's real name or the name of the college where you study. This means that if someone reads my PhD, or an article that I have written, they won't be able to recognize you - even if they know you well. All the tapes will be password protected and I will destroy them as soon as I have transcribed our conversations. Any transcript will not include your real name and will be kept in a locked cabinet in a locked room. I will keep to the rules that have been set out by the Data Protection Act.

What will you get out of it?

You will have the chance to say how you want to learn and I hope to be able to share your views (and my findings) with other maths teachers. You will also get a chance to think about how you learn. We are going to make a web of maths well-being (a bit like an ILP but more interesting!) and I am going to ask you to track how you feel about each of these skills. This will help you to think about how you learn and hopefully, to become a more efficient learner.

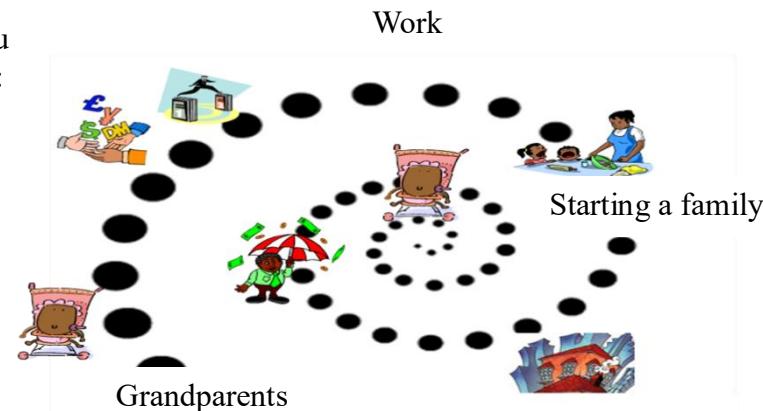
Contact information

Tracy Part London Metropolitan University, IPSE, 166-220 Holloway Road,
London N7 8DB. Mobile number: 07960 417 741
Email: tracypart@hotmail.com

The research

I want to chat with you about how you prefer to learn maths. I will ask about:

- Your family
- Your educational history
- Maths in your everyday life
- What is higher maths?
- Key decisions in your life
- How you feel about learning maths
- Feelings about discussing maths
- Who you are learning maths for
- Your expectations about learning maths



I will tape the interviews and transcribe what you say.

The process:

- Interview 1 - about an hour long. You talk about your life now and your memories of learning maths.
- Observation of you learning. I will tape you discussing a learning activity with others in your group
- Interview 2 – about an hour long. I will ask you questions about your discussion. How you felt. What you liked or made you worried. What you were proud of.
Start web of well-being

Interview 3 – about an hour long. Discuss web of well-being. The maths activities you liked and what you would like to see in the future.

Appendix 9: Consent forms

The interview

The first interview

It won't be a maths class - I want to find about you and want you to find out about me. I want to know how you felt when you learnt maths as a child, as a teenager and as an adult. I want to know what you like about your class now. I want you to choose the skills that you think are really important for learning maths and then to assess how confident you are with these skills.

The second interview

I will have already been to observe you in your classroom so we will start off by talking about that class. I may ask you to talk about some of the activities and to describe how you felt about "doing" maths. I will ask you to go back to your web and to think about whether anything has changed, and if it has why.

The third interview (if we have one)

If you are on a short course then I will probably only see you twice but if you are on a longer course then I will try and see you for a third time at the end of the year. We will go back to the web and talk about the things that you find easier and the things that you find difficult. We will talk about the things that you have learned and the skills that you have found most and least useful.

Is there any risk?

We are going to be talking about your previous experiences of learning maths and this may lead you to feel frustrated, angry or upset. You can choose not to talk about any experience or you can stop the interview at any time.

How long will each interview take?

I can't give you an exact answer to this but each interview should be about 1 or 1 ½ hours long.

How will the information be collected?

I will record and then transcribe the conversation. I will ask you to read the record and make any comments on the interpretations that I have made

Agreement to participate in the interview

- I understand the purpose of the interview
- I understand I have the right not to do the interview and the freedom to stop at any time
- I have thought about the harm or discomfort that I may experience as a result of talking about my experiences of learning
- I have been told why Tracy wants to ask me questions
- I understand the type of questions that Tracy is likely to ask
- I understand that I can ask any questions that I want to ask
- I understand that I can choose not to answer any questions

- I have been told that I will remain anonymous.
- I understand that anything that we talk about remains between us, unless I disclose a crime that I or someone else has committed, and that the tutor will only be asked to contribute if I ask for it.
- I have been told that the information that I give will be used as part of a PhD project and will appear as a PhD thesis in university libraries. I have told that the information may also be used to write a book, articles or in future CPD training programs.
- I have been told that the interview will be recorded and transcribed. I have been told that I can read the transcription and make comments for the analysis.
- I have been told that the researcher will adhere to the data protection legislation.

Signature of participant

Signature of researcher

Name:

Name:

Date:

Date:

Consent form: FOCUS GROUP

Aims and objectives of the focus group

- To discuss the usefulness of the concept of mathematical well-being
- To discuss how learners' perceptions of formal mathematical structures can impact on their learning progress
- To identify a list of mathematical and processing capabilities that can be presented to the learners
- To discuss the usefulness of a web of mathematical well-being as a tool for reflection.

Format of the focus group

- There will be up to 5 numeracy tutors and the researcher present during the discussion. The discussion will take up to 2 hours
- All tutors will be asked to keep the content of the discussion confidential
- The discussion will be recorded and transcribed
- The discussion will be coded and the names of the tutors will not appear on the transcript
- The tutors will be encouraged to read the transcript and to make comments on the interpretation made by the researcher.

Agreement to participate in a focus group

- I understand the purpose of the study
- I understand I have the right not to participate and the freedom to stop at any time
- I am aware of and have discussed the implications of participating in the study including any harm or discomfort that I may experience
- I have been told the aims and objectives of the focus group
- I have been told that I will remain anonymous and that any individuals that I name will also remain anonymous or will be known by a pseudonym.
- I have been told that the information that I give will be used as part of a PhD project and will appear as a PhD thesis in university libraries. I have told that the information may also be used to write a book, articles or in future CPD training programs.
- I have been told that the focus group discussion will be recorded and transcribed. I have been told that I can read the transcription and make comments for the analysis.
- I have been told that the researcher will adhere to the data protection legislation.
-

Signature of participant

Signature of researcher

Name:

Name:

Date:

Date:

Consent form: Mathematical well-being. Non-participatory lesson observation

Aims and objectives of the non-participatory lesson observation

- The non-participatory observations will act as a tool for structuring the discussions during the second phase of the interview process.
- Watch the learners react to mathematical tasks and problem solving activities
- Provide concrete examples that I can use with the learners to discuss how they feel about implementing formal mathematical procedures.
- Watch the learners interact (verbally and non verbally) with the tutor and his/her peers in their learning environment.

Potential risk or harm to your emotional well-being

I will be asking learners to reflect on their learning in your class, which could potentially place you (as the tutor) at the centre of our discussion. However, I am experienced in conducting teaching observations and formulating feedback and see it as part of my role as a researcher to refocusing the learner away from you as a teacher and back towards a discussion about self reflection.

Format of the observation

- I will explain to the whole group what I am doing and what I hope to gain from the observation
- I will explain that I will place a voice recorder next to the learner(s) that are participating in the research so that I can use their comments for discussions during the second interview.
- I will come at the start of the class and remain in the session until the learners leave the classroom.
- I will particularly focus on the learners that are participating in the research and will take notes and record their reactions throughout the class.
- I will not require a lesson plan but it would be helpful if I could retain a copy of the materials that you use during the session.

Agreement to participate in the non participatory lesson obsevation

- I understand the purpose of the study
- I understand I have the right not to participate and the freedom to stop at any time
- I am aware of and have discussed the implications of participating in the study including any harm or discomfort that I may experience
- I have been told the aims and objectives of the not participatory lesson observation
- I have been told that I will remain anonymous and that any individuals that I name will also remain anonymous or will be known by a pseudonym.
- I have been told that the information that I give will be used as part of a PhD project and will appear as a PhD thesis in university libraries. I have told that the information may also be used to write a book, articles or in future CPD training programs.
- I have been told that the observation will be recorded and transcribed. I have been told that I can read the transcription and make comments for the analysis.
- I have been told that the researcher will adhere to the data protection legislation.

Signature of participant

Signature of researcher

Name:

Name:

Date:

Date:

Appendix 10: From epistemological struggle to a shifting epistemology

It is important, at this final stage of my doctoral journey, to return to the theoretical framework, and to confront the tensions that I brought into this thesis by working within (and through) three distinct perspectives; all of which hold very different epistemological positions.

I asked the participants to narrate their mathematical histories, and remain respectful of the narratives that they offered. I also remain ethical to my promise to tell their stories and to extend understanding of how adult learners in the FE sector, relate to schoolroom discourses of mathematics. I thus started my analytical journey with the narratives. As I became increasingly engaged with how to perform analytical exercise, I took advice from Foucault (2002) and Ball (2009) and looked to the theoretical framework as a tool bag from which to shape the analysis of the data. By choosing a shifting epistemology, I did not hold the intend to dismantle, preserve or destroy any particular aspects offered by the perspectives. Neither did I wish to ‘plug’ the gaps as the substantive themes began to emerge from the empirical data. In consequence the first stage of my epistemological journey concluded with the realisation that the conduit for the link between theory and practice ran through the ways in which I chose which exerts to analyse - and how.

However, the evolving nature of my epistemological understanding was shaped as much by listening to the narratives, as by understanding (and teasing) the limitations of the frameworks that I put to work. For example, it was with Philly's narratives that I realised that to conduct a discursive analysis just would not work as an appropriate tool to tease out insights from the descriptions of her bodily encounters with mathematics. I found that it was in exploring these kinds of epistemological gaps that I disrupted the analytical process and in a sense, it was this tension that encouraged me to step back from the theoretical perspective, and in effect, step back inside the practice (the narratives) to tease apart the fragments (within the fragmented identities) and to explore the locatedness, relationality and direction of its scattering trace.

It was only by looking to Bourdieu, that I could travel beyond analysis of embodied ways of knowing mathematics to understand how the corporeal is inescapably present within social practices and relations to investigate what Archer and Francis (2006) referred to as the “profound material consequences” on identity formation. Through mobilising Lacan, I was able to continue with the epistemological perspective of discussing tangible ‘things’ (for example, mathematics and collaborative learning), but in ways not possible through looking through Bourdieu’s lens (of habitus, capitals and field), I could de-centre and trouble what is perceived to be the objective structures or the ‘real’. As I became mistrustful that Bourdieu could satisfactorily provide the tools to ‘de-centre’ the human, in the latter data chapters I turned to a combination of Lacan’s psychoanalytical account and a Foucauldian tradition, to trace how regimes of truth entered the texts, for what reasons, and to whom these ‘truths’ privileged.

Perhaps the most exciting aspect of writing has involved my own struggle to wrestle with how to maintain ethical adherence to the data, and to simultaneously extend understanding, by interrogating the silences, and the gaps within the narratives. Steve

readily mobilised amusing anecdotes to tell his stories. It was through interrogating his narratives of bravado (which frequently entered his text) that it became clear that to continue to study mathematics, was too risky in terms of the overall outcome of the project of his self, and the violence within his resistance was revealed. But it was principally in using a Bourdieuan framework, I was able to reveal the depth of his habitus tug. It was only through investigating the origins of his sense of shame; of leaving behind the dispositions, and practices that he had acquired through his early life experiences (in other words his working-classness), that I was able to explore the effects on his mathematical practices, of his decision to ‘free’ himself (and “become academical”).

Steve made it clear he was prepared to revisit mathematics in the classroom, but only for high stakes purposes. He was prepared to “knuckle down” and study for a ‘gatekeeper-type’ examination (for example, to qualify as a newly qualified teacher) but he was not prepared to be tested through contextualised examples that came out of the everyday domain. I needed to move from Steve’s habitus tug towards understanding why he discursively constructed himself as a “typical working-class, (East) London lad,” to wrestle the complexities out of his narratives. I did not want to lose the complexities within his identity work in the interests of maintaining a coherent theoretical synthesis. It was only through combining the three distinct theoretical frameworks that I was able to reveal Steve’s shifting sense of becoming, of shame and feelings of loss that unable me to unmask the complexities behind his eventual decision to bypass the compulsory mathematical content of his course.

In another example, in looking to the identity work under-taken by Jalal, the complexities of the processes of his identification were also revealed. Jalal (like Steve) also used narratives of bravado, and who in having fought the material constraints of poverty, framed his selfhood as an agentic and powerful protagonist. Whilst he was not engaged in an inner struggle to recognise his intellectual worth, I could mobilise Bourdieu to understand why (and how) he desperately sought the interview space to reveal the depth of his capitals, to have his worth externally validated, and his intellectual capacity celebrated as valuable. Unlike Steve, Jalal viewed knowledge through a mirror of perfection, and in looking to Foucault and Lacan I could then re-trouble his oratory style to reveal the severity of his sense of loss by his positioning in the UK. In utilising a shifting epistemology, I could reveal the psychic costs of Steve’s habitus tug, Fatima’s framing as ‘hard to reach’, and Jalal’s harrowing account of not learning.

In a final example, it was through travelling beyond the individual and analysing within a Foucauldian tradition that I could interrogate how Susan, Tony, Kath and Steve all thrived on the allure of overcoming an unyielding, totalitarian and exacting body of knowledge, devoid of emotion. I looked to the patterns of language within the participant’s narratives to interrogate how they valorised ‘real’ mathematics as something that was male, and self-regulating. However, it was only through returning to the psychoanalytical account that I could then untangle how the fantasy of fulfilling one’s potential, was enacted in the class. In turning to Lacan I could show how it was by entering into mathematical spaces that the fantasy of self-control becomes releasable within the imaginary domain. In this way, I could unmask how whilst each of Steve, Susan, Tony and Kath’s narratives were performed as pleasurable, the ‘doing’ of mathematics (for example, to pass an examination) was required to

outweigh the psychic costs of the reparation work, which was demanded by returning to the mathematical classroom as an adult.

In conclusion, in starting the analytical process by listening to the narratives, I was looking for substantive themes (for example class, psychic investment, corporeal encounters, gender, race). I sought out the tensions, which I then worked through, to rigorously analyse the data. I argue that it was precisely in taking a mobile epistemology that I was able to maintain the threads of the narratives. It has been through maintaining a dialogue between the theory and the practice that I was able to retain a sense of the messiness that Tamboukou (2008: 94) refers to as a “matrix of subject positions” and extend understandings of the processes of ‘taming’ mathematics.