ED 383 879 CE 069 239

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TITLE Older Adults' Needs and Usage of Numerical Skills in Everyday Life.
INSTITUTION Lancaster Univ. (England). Dept. of Continuing Education.
REPORT NO ISBN-0-901800-71-6
PUB DATE 95
NOTE 70p.
AVAILABLE FROM Department of Continuing Education, Lancaster University, Storey Institute, Meeting House Lane, Lancaster LA1 1TH, England, United Kingdom (10.50 British pounds).
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Adult Education; Basic Skills; Coping; Daily Living Skills; *Educational Needs; Foreign Countries; *Lifelong Learning; Needs Assessment; *Numeracy; *Older Adults
IDENTIFIERS *Great Britain

ABSTRACT

A study explored what numerical skills older adults most commonly used in everyday life and pointed at which new numerical skills older people need to acquire. it also ascertained whether any areas were causing difficulties and explored coping strategies. An analysis of approaches to defining numerical skills in everyday life and to assessing adults' abilities demonstrated that a range of different assumptions underlay these approaches. The first phase involved a content analysis based on a range of publicity and information leaflets aimed at older people and a series of semistructured interviews with 16 key informants. In the second phase, a discussion with six older people generated some qualitative information about their experiences in using numerical concepts and the contexts in which they did so. Then, six different older people in a different location each kept a personal diary on a particular day of the week noting how often they made use of numerical skills and the contexts and situations in which this occurred. The main fieldwork consisted of semistructured interviews with 30 older people in 3 locations. Results were as follows: (1) numerical skills used by older adults could be classified as financial, consumer, domestic, technological, leisure, for volunteering, for citizenship, and for keeping mental notes; (2) changes in life circumstances necessitate learning new numerical skills; and (3) difficulties with particular skills and coping strategies differed by individual. Recommendations were made for informing older people about new developments, encouraging intergenerational contact, and encouraging greater participation in learning. (Contains 28 references.) (YLB)

department of continuing education

Older Adults' Needs and Usage of Numerical Skills in Everyday Life

by Alexandra Withnall

Published 1995

LANCASTER UNIVERSITY

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INTRODUCTION

1. The Context

This is the report of a research project carried out in the Office of Adult Continuing Education (now the Department of Continuing Education) at Lancaster University during 1992-94 with financial support from the Universities Funding Council. The project was seen as particularly relevant in that 1993 was designated European Year of Older People and Solidarity Between Generations. The aims of the European Year were not only to seek recognition for the growing numbers of older people in Europe, but also to acknowledge the considerable contribution which they make to the life of their own communties.

On a different level, the work of the project coincided with the launch in the UK of **Adults Learning Maths - A Research Forum**, a new independent organisation which is committed to bringing together research, information and ideas of interest to numeracy practitioners and researchers from a range of disciplines. It is also intended to act as a focus for publication. The establishment of a European network for research, action and training in adult literacy and basic education with a strong numeracy component and a major international conference on adult numeracy held in France in March 1993 also demonstrate the growth of interest in this area.

The overall purpose of the research project, then, was to make a contribution both to empirically-based knowledge about aspects of adult numeracy and to the burgeoning literature of gerontology. It was also hoped that, through its fieldwork, the project would be able to make a small contribution to the development of contemporary ethnographic methodology in continuing education research.

The immediate impetus for the research was a pilot study also carried out at Lancaster University in 1989 (Withnall 1992a). The overall purpose of this pilot study was to take up one strand of an analysis of some of the findings of the 1981 National Child Development Study - the need for more information on how people cope in everyday life with practical problems involving basic skills (ALBSU, 1987). However, the NCDS study had focused on young people. Bearing in mind an earlier finding from a study carried out by the Advisory Council for Adult Continuing Education (ACACE, 1982) - that it was people over 65 years of age who scored consistently less well on tests of numerical abilities - a decision was taken to make people over statutory retirement age the focus of this research.

The aim of this original Lancaster study, then, was to explore the kind of basic skills - defined as reading, writing, oral communication and computational activities - used by a sample of twenty retired people aged between 60 and 90 years in their everyday lives. A further aim was to investigate whether they had established any support networks to assist them in cases of difficulty. Amongst other findings, the study revealed that almost all of the sample had experienced considerable difficulties with the use of various numerical concepts at different points in retirement, often originating in their view, from unhappy experiences of mathematic lessons at school, some of which were still extremely vivid in their memories. On the other hand, it appeared that respondents now had a wide range of hobbies and interests which, in many cases, almost certainly involved them in some quite complex mathematical operations. There was also some evidence of these older people being interested in recent technological developments, especially the use of calculators and computers. In any case, with one exception, all the respondents were happy to turn to a relative or local official for assistance with a problem concerning number concepts (Withnall, 1992a).

One of the conclusions drawn from the findings of these older people's experience of using number skills was that it would be useful to investigate the use of these skills in daily life through the development of a different research strategy. This would explore whether there are any particular kinds of situations in which older people need to seek assistance and whether they had a need for definable numeracy skills at any point. It was also noted that older people do not tend to look for help with either numeracy or literacy problems from adult basic education schemes in any great numbers, an impression confirmed by the Adult Literacy and Basic Skills Unit (ALBSU) who estimated that only about 4 per cent of literacy and numeracy students are over the age of 60 (ALBSU, 1992). It was therefore suggested that a more appropriate response might be to offer training, support and materials to those in network contact with adults who have to seek help with various aspects of basic skills usage. However, it was acknowledged that considerable prior groundwork would be required to identify the networks involved, the nature of the training required and the contexts in which it could be provided, observations also made by Street (1988).

2. Aims and methods of the research

The current project, then was to build upon previous findings by investigating the issues raised in relation to numerical skills in greater depth and by focusing upon a sector of the population - those over statutory retirement age - which, for demographic reasons, is increasingly attracting the attention of policy-makers, researchers and practitioners alike. Briefly, the aims of the research were:

(i) to explore what numerical skills older adults (i.e. over 60/65 years of age) most commonly use in everyday life.

(ii) to investigate whether there are points at which older people need to acquire new numerical skills.

(iii) to ascertain whether any areas were causing difficulties and to explore any coping strategies adopted.

(iv) to make recommendations about the role which continuing education could most usefully play in facilitating learning opportunities in numerical/mathematical skills for older adults.

At the outset, it is important to make some comments about the research strategies adopted. 'Numerical skills' is a broad term and requires definition. Moreover, it must be noted that in formulating the project's aims, we have also linked them to mathematical competences. In fact, the literature of adult basic education suggests that there are a variety of assumptions made by policy-makers, practitioners and researchers about what is actually implied by the term 'numeracy'. Whilst it was not appropriate to examine all the existing definitions, a preliminary task was to explore some of the approaches to the idea of numeracy in the context of everyday life.

Bearing in mind these different approaches, it was decided to make use of an illuminative research method which would involve a varied investigative strategy. It was felt especially important to involve actively a range of older people themselves in the research so that their perceptions and reflected knowledge might be considered together with the observations of a cross-section of those having regular contact with older people as customers or clients in their daily lives. Together with the insights developed by the researchers, the aim was to incorporate these various strands into a connected whole.

In developing this approach, we also wanted to make use of a range of ethnographic methods which might include interviewing; group discussion; encouraging older people to relate their experiences in learning about and handling numerical concepts through listening to their accounts. We were aware, however, from the previous Lancaster research of some of the complexities of gaining access to the desired research population of older people, of establishing trust and of encouraging them to participate

in a research programme as well as of the particular nuances involved in discussing issues related to 'maths'. The sensitivity required in talking to older people, the kind of vocabulary used and the relationship of the researcher to the researched in this context have already been addressed by Withnall (1989).

Secondly, bearing in mind the time and resources available for completion of the research, a decision was also taken to limit the area of investigation to the north-west of England but to broaden the focus of the main fieldwork with older people themselves by basing it, where possible, in three contrasting locations - a town, a seaside resort and a rural area[1]. It was hoped that this might permit access to a wider cross-section of older people with possibly differing lifestyles and daily activities and therefore with a variety of uses of and need for numerical skills.

3. The structure of the report

In Chapter One, some approaches to the concept of numerical skills in everyday life are put forward and briefly analysed. This is followed by a review of some previous studies which are examined and discussed with regard both to their findings and their methodological approaches.

Chapter Two reports the results of two related exercises. The first of these involved the collection and analysis of a range of leaflets, publicity materials, brochures etc. from a variety of local council, public utility and commercial sources providing services to the general public and to older people in particular, in order to examine the kinds of numeracy demands made on readers. Combining these with the researchers' own perceptions of the contexts in which numerical skills might be required, it was possible to identify a cross-section of providers of goods and services to older people whose insights into older people's lives would add a valuable perspective to the research. The second exercise, then, discusses the findings of a series of semi-structured interviews with sixteen such providers.

Chapter Three describes some preliminary work with older people themselves. Initially, a discussion with a group of older people was conducted by the researchers in order to generate some qualitative information about their experiences of using numerical concepts and the contexts in which they did so. The information collected suggested a diary-keeping exercise with a further group designed to tease out in more detail how older people actually operate in their daily lives and whether there are any aspects of numeracy regularly causing problems.

Chapter Four is concerned with the findings of the main fieldwork which consisted of in-depth semi-structured interviews with thirty older people in three different locations. The fieldwork instrument used was developed from the preliminary work described above. In Chapter Five, the various thread are drawn together in order to reach some conclusions based on the overall findings of the research. Finally, to meet the projects's final objective, the implications for educators of adults are discussed and some suggestions made for possible further action.

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[1] Percentages of the general population over statutory retirement age in the north-west region is: Males 65-79, Females 60-79: 14.5%, Males, Females over 80: 3.7%. Source: Central Statistical Office, Regional Trends 29, 1994.

CHAPTER ONE:

NUMERICAL SKILLS IN EVERYDAY LIFE: RESEARCH APPROACHES

1. Introduction

Deciding what constitutes 'numerical skills' is a difficult task since the term 'numeracy' itself is slippery and ambiguous[1]. It is noticeable that, attempting to review the literature on the subject of numeracy/mathematics for adults a decade ago, Withnall et al (1984) encountered considerable problems in reaching a definition. To some extent, they avoided the issue by suggesting that, no matter what level of attainment is reached in youth, there will always be a proportion of the adult population requiring 'mathematical education' at each and every level of skills making a definition almost impossible. More recently, Coben (1992) in a plea for the recognition of numeracy as a field worthy of serious study observed that arguments over the nature of adult numeracy have mainly taken place among practitioners. This may be because much of the academic research which might be of interest to those involved in numeracy training has been carried out from the perspective of a very wide range of disciplines. Since these include education, psychology and social anthropology, they may therefore be inaccessible to practitioners unfamiliar with these kinds of discourses. Coben also notes that a considerable amount of the published research relating to numeracy in general focuses on children rather than adults. In addition, much also emanates from the USA so that it becomes important to take into account different social and institutional contexts when interpreting data and results.

Bearing these caveats in mind, it is still possible to explore some approaches to the concept of numeracy in a social context and to examine some ways in which the use of numerical skills in everyday life have been researched. The remainder of this chapter addresses these issues as a preliminary to describing the activities and outcomes of the project.

2. Defining numeracy in the context of everyday life

The concept of numeracy in relation to the needs of adult everyday life was considered in some detail within the major government enquiry into the teaching of mathematics in schools announced in 1978. The ensuing Cockcroft Report (1982) used the word 'numerate' to imply the possesion of two particular attributes:

- 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 everyday life
- an appreciation and understanding of information presented in mathematical terms eg in graphs, charts or tables or by reference to percentage increase or decrease.

(HMSO, 1982)

The implication of this definition is that a numerate person should have sufficient confidence to be able to appreciate and understand some of the ways in which mathematics can be used as a means of communication, a position also taken by Penny (1984). Moss (1984) agreed that numeracy is part of people's daily routine and therefore each individual determines his/her own needs. Changes in lifestyles may therefore cause changes in needs, so that numeracy is something more than 'basic maths' or 'everyday maths'. Moss also pointed to the necessity to pay attention to the **language** of numeracy and to the process of transferring the written word into a mathematical code. In this way, numeracy, literacy and language are seen as inextricably linked and must be closely related to individuals' personal life circumstances, self-perceptions and expectations. Together they form important skills which enable adults not just to 'function' effectively, but to be in a position to take a measure of control over the circumstances of their own lives.

Evans (1991) points out that in talking about numeracy as a set of skills which can be applied in specific practical contexts, it is also crucial to consider the following:

- the goals (and values) of the activity within which it even makes sense to pose the problem
- the social relations (including the exercise of power) in the setting within which the problem is posed
- the material resources which form the basis for the activity.

It is these aspects, he argues, which make an activity **meaningful** and the meanings are expressed by the language specific to the activity. He is then led to acknowledge that, in principle, there is a discontinuity between eg school mathematics and the numerate aspects and skills of two different practical activities such as shopping or playing bridge. It then follows that we need to learn and develop numeracy within specific contexts, using the languages specific to that activity. This approach must raise a new series of questions about the traditional ideas of what constitutes numeracy and how it

can be taught and learned at different levels. In particular, there may be difficulties regarding the ability to **transfer** abstract skills to other settings. A similar view is taken by Lave (1988) as a result of her ethnographic studies of supermarket shoppers.

Using the new framework of specificity, Evans moves on to examine the possible numerate aspects of everyday life for adults in industrial societies. He particularly accentuates the importance of what he terms 'critical citizenship' ie

> engagement with discussions and debates about individual, family and public well-being and about describing, appreciating, evaluating and deciding on future directions.
>
> (Evans, 1991, p23)

The specific skills he envisages as necessary for the practice of critical citizenship are drawn from a range of other writers and are likely to include:

- knowing about information sources and how to interpret them
- seeking out information produced, but not published
- methods for the production of information/data at a small-scale level in the community

Finally, Evans comments on the **resources** available in what he calls the struggle for critical citizenship, such as access to and understanding of official statistics, mostly those produced by government and accessed through the media. Issues relating to the role of numeracy in critical citizenship have been further investigated through a research project based in the Department of Mathematics at the University of Essex. The project focused largely on the kind of numerical information needed by school governors in order to fulfil their roles successfully (Thorstadt, 1991, 1992).

To introduce the concept of 'citizenship' into the debate, of course, leads us into a different kind of discourse. It begins to open up questions about the nature of the society in which we live, the place of the individual within that society and the very role of education in a modern democracy. Another approach might be to turn Evans's argument on its head. Instead of defining numeracy as an enabling element of citizenship, one might equally well view it as a means of state control, that is, as an instrument of an increasingly bureaucratized administration which imposes a range of mathematically-based requirements on the population through the dominant institutions of society. In this sense, the state must rely on the population's understanding of its

requirements and its compliance in developing 'functional' numeracy skills in order to retain its control. For the population to achieve functional numeracy as part of 'basic skills', the state is willing to fund, at least to some extent, programmes which aim to improve people's basic skill abilities to what is seen as the required level. However, just what is functional for whom at any given time is subject to fluctuation and change as the state itself becomes vulnerable to changes imposed by social, political and economic forces in the world arena. In this sense, the ability to practise 'critical citizenship' may be limited by a range of factors and it becomes an ideological concept rather than a practical strategy.

3. The consequences of innumeracy

In a sense, 'innumeracy' may be an inappropriate term since if we cannot adequately define 'numeracy', then neither can we give meaning to its antonym. Evans (1989) prefers to talk about 'low levels of numeracy' among adults, noting that the consequences of this may be apparent at several levels in society. For example, an individual's freedom of access to further education and training may be restricted and job performance, may be impaired - a functional approach. At a societal level, low levels of numeracy may result in loss of production, waste of resources, even threats to life if vital mathematically-based information is misinterpreted or misunderstood. Evans also shows how low levels of numeracy can have ideological consequences at individual level in that lack of both competence and confidence in their constructive skills and critical insights can lead adults to become dependent on the views of experts or professionals and leave them open and susceptible to an alien mathematical mystique. At societal level, lack of numeracy may result in the growth of myths - ideas which are partially or completely false, but which gain currency and influence the beliefs and actions of different groups and organisations in society as well as affecting the practices of society's various institutions.

Further examples of the ideological consequences of low levels of numeracy have been explored in the USA. Paulos (1988), writing about innumeracy as 'mathematical illiteracy' demonstrates how lack of ability and confidence in dealing comfortably with the fundamental notions of number and chance can lead to an uncritical acceptance of meaningless co-incidence and pseudoscientific theory as well as a misinterpretation of simple statistical information. Dewdney (1993) takes these arguments a stage further by showing how politicians, advertisers, stockbrokers, salespersons and others who make use of numbers, charts and graphs can manipulate individuals by playing upon their innumeracy. This he describes as the common inability to **understand** the rules of percentages, ratios, statistics and basic mathematical logic. In this way, it is easy for

even highly educated adults to be left open to the chicanery of those he calls 'maths abusers'. However, the examples given by both writers appear to call for the ability not just to understand the rules of mathematics, but to develop the skills of lateral thinking in relation to a very wide variety of situations encountered in daily life.

That many people lack an appreciation of the rules of mathematics **together with** these necessary critical thinking skills which would enable them to become 'mathematically literate' is well illustrated by the excitement which greeted the creation of Britain's National Lottery in November 1994. Although the media must bear some responsibility for the hype which surrounded the first draw, few punters appear to have been discouraged by the news that the chance of scooping a £2-million jackpot with a solitary £1 ticket was one in 13,983,816. There also appeared a proliferation of advice on strategies for maximising winnings, none of which in reality, of course, could overcome the enormous odds against winning a fortune.

4. Studying adults' use of numerical skills in everyday life : some previous research

There have been a number of surveys concerned with adults' numerical abilities and how they fare in everyday life. Obviously, none of these surveys were concerned specifically with retired people, although some older adults were questioned in the ACACE survey which was commissioned in association with the Cockcroft inquiry into the teaching of mathematics in schools and carried out in February 1981 by Gallup. In this survey, in which 2890 people over 16 years of age were interviewed, respondents were asked to answer what were considered to be relatively simple and straightforward questions which involved 'the sorts of mathematics which are regularly met in everyday circumstances'. The results were analysed by sex, age group, social class, geographical region and terminal education age. The average correct response rate was 7.74 questions out of 10. As previously noted, respondents over 65 years of age did consistently less well than other age groups; in response to every question, they were the least confident age group and in 8 of the 10 questions, they answered with more pause for thought than any other age group (the difference was less marked on questions concerned with shopping).

Some of the questions asked dealt with reading a timetable and comprehending the meaning of 'the rate of inflation' in relation to assessing numerical information in order to perform calculations with it. It could be argued that these kinds of questions require the exercise of substantially different knowledge and skills from these which demand merely a facility with standard computational methods. The juxtaposition of these

different types of questions illustrates the points made by Evans (1991) regarding the numeracy aspects and skills of different practical activities and the use of language involved.

From the first sample, a second sample of 50 people were re-interviewed and, during detailed discussions, asked to describe how they would deal with a series of 'real life' problems (contained in 22 separate questions) by using mathematical techniques or strategies, including the availability of a calculator. In these second interviews, the level of correct responses was, if anything, lower than on the main Gallup Poll (ACACE, 1982). However, Evans suggests that any apparent differences should be interpreted in the light of differences in the way data were produced. For example:

- differences in the survey and interview situations
- sampling methods, non-response rates and methods of selection for the second interview
- the more practical type of interview questions in the second interview with use being made of, for example, wage slips and bills.

(Evans, 1989)

We might also wish to query the use of the term 'real life' problems. Who is to decide what is a 'problem' in someone else's life and what 'real life' is for different individuals?

The other main evidence about adults' numerical abilities comes from data produced by the National Child Development Study fourth and fifth follow-ups. The NCDS is a longitudinal survey of all people who were born in the week 3-9 March 1958 in England, Scotland and Wales, ie approximately 17,000 people. In 1981, when the cohort was twenty-years old, 12,534 people (74% of the original group) were interviewed. A small part of each interview dealt with respondents' **self-reported** experience of both literacy and numeracy problems. Regarding the latter, 5 per cent, or one in twenty of those interviewed reported problems with numbers since leaving school and 27 per cent of those who reported such problems commented that these now caused everyday difficulties(ALBSU, 1983) More in-depth analysis of the responses showed that problems with number work were reported equally often amongst men and women although men were four times as likely as women to have attended some kind of class for help perhaps because of the nature of their employment (ALBSU, 1987). In the fifth NCDS follow-up, 3 per cent of the respondents, now aged thirty-three, reported numeracy problems. Three-quarters of these particularly

commented on difficulties with multiplication and division, but there no longer appeared to be any major differences between the sexes at this point (Ferri, ed, 1993). It may be that this reflects the changing patterns of the labour market, especially the greater numbers of women in the workforce and the wider availability of training in basic skills for women at work..

Taken together with the previous surveys, this latest follow-up is useful in that it highlights some issues relating to gender and numerical issues. However, in comparing the first NCDS study with the findings of the ACACE survey, Evans (1989) wonders whether the NCDS respondents' self-ratings of their numerical skills were over-optimistic. In this, he echoes the views of Willis (1984) who found the percentage of those reporting problems with numbers suspiciously low - 'Can this really be true? Only 1 in 20?'

In 1992, a survey of a sample of 1650 twenty-one year olds was carried out by ALBSU to assess the extent of literacy and numeracy problems. This sample was drawn from the 1970 British Cohort Study, a longitudinal study of all individuals born in the week April 5-11 1970. The findings were based on interviews which focused on a range of education, and employment issues together with background characteristics and, once again, self-assessed literacy and numberwork difficulties. This was followed by a half-hour assessment of literacy and numeracy skills developed by ALBSU, again based on tasks seen as likely to be encountered in the young people's everyday lives. Although most respondents had little difficulty with most of the literacy tasks, difficulties with numeracy were much more widespread. The majority of respondents had problems with several of the items deemed 'everyday activities' which ranged from calculating change in a shop to extrapolating information from a statistical table. However, it is interesting to note that amongst those who scored poorly on the numerical skills tests, only 26 per cent of the men and 12 per cent of the women actually saw themselves as having problems. The final report notes that:

> Whether a literacy or numeracy problem is perceived as important is probably more to do with its centrality to individuals in their daily lives now, than the objective level of performance reached. Men care more about literacy and numeracy, presumably because of their perceived importance in work - at least at age 21. Women appear to worry less about them. It may be the case that at a later stage in their lives ... the problem takes on a new significance for women.

(Ekinsmyth and Bynner, 1994).

Even though this study made use of both self-reporting and of testing, it can be observed that it is the individual's perception of what is central to daily life which is important - although it might be questioned as to how far the prescribed tests reflected respondents' daily lives. However, the report further notes that lack of literacy and numeracy skills may come to affect individuals at different stages of their lives. When these difficulties are acknowledged by adults, self esteem may also be under threat.

In May 1993, ALBSU commissioned Gallup to conduct a survey among the general public in England and Wales on the use of basic skills (literacy and numeracy) in everyday life (excluding work-based activities). 1060 people were interviewed in a stratified sample. Subjects were asked forty questions about activities which they had done in the seven days before the interview. Of the four activities which more than three in four of those interviewed had undertaken, three related to activities concerned with numeracy. However, there was some variation in the skills needed for each activity. In addition, fewer people over 65 years of age interviewed had undertaken many of the tasks. Asked a question about their own assessment of their competence in basic skills, no significant differences appeared between people in the youngest age group (16-24) and other age groups. However, 13 per cent of those interviewed confessed that they avoided activities which involved making numerical calculations. There was no statistical difference between different age groups in this respect (ALBSU, 1994).

5. Previous approaches assessed

It appears that merely testing a sample of adults on what are seen as desirable numerical skills or even trying to decide what constitutes these skills when related to some concept of 'everyday life' fails to take account of individual life contexts. It implies a functional approach to numeracy by reducing it to a prescribed checklist of measurable skills which are not necessarily related to the wider society and the continual changes which this society experiences.

It appears also that attempts to ask adults to self-report on their difficulties with numeracy (and literacy) probably gives us only a limited picture of the kinds of skills they use and those with which they experience problems. Neither does this kind of methodology allow us an insight into the kinds of activities they may encounter later on in life; the 1994 ALBSU study of younger people could only speculate on these.

It also has to be remembered that all the surveys reported here were carried out for specific purposes ie as part of a larger inquiry. In the case of the ALBSU study of 21-year olds a further aim was to draw particular attention to the problems experienced by young adults in order to suggest urgent courses of action and to ensure that literacy and numeracy programmes developed a higher profile for funding purposes. Because of these factors, the kind of methodological approaches used may have limited applicability to people over retirement age. The task for the current project, initially then, was to develop a wider perspective and explore a range of possible methodologies appropriate to older adults.

6. Towards a definition of numerical skills in everyday life

The foregoing analysis of approaches to defining numerical skills in everyday life and to assessing adults' abilities demonstrates that a range of different assumptions underly these approaches. In exploring the use of numerical skills in the everyday lives of older people, it is suggested that numeracy is something other than a set of mechanistic, discrete computational skills which can be learnt in an artificial context and then transferred to real-life situations. Neither is it merely a set of skills which will enable individuals to function more effectively in a given context which is, in any case, subject to dislocation and change. Perhaps the most acceptable approach to numeracy in relation to everyday life is to conceptualize it as an essentially **socially-based** activity. As such it requires the ability to **combine** both mathematical and communication skills as well as the development of confidence in using numbers appropriately and competently in a range of practical situations as they occur in an individual's life. It further emphasises the ability to access, interpret and respond, sometimes critically, to mathematically-based information both in the immediate and in the wider environment. However, the nature of this information is continually changing or appearing in new forms and it is obviously also necessary to be aware of these changes.

Such an approach lays stress not only on the relationship of language and communication in the development of mathematical skills, but also on the need for personal confidence in understanding and using these skills as advocated in the Cockcroft Report. This approach also encompasses ideas about the empowering effects of the development of an informed critical stance towards the various types of information which may be encountered in everyday life even though there may be limits to the extent to which we may talk about individual empowerment in this way..

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[1] For a more detailed analysis of different approaches to the concept of numeracy and their implications see Withnall, A, 'Towards a definition of numeracy' in Adults Learning Maths - a Research Forum. Proceedings of the First Annual Conference, Fircroft College, Birmingham, July 1994 (forthcoming).

CHAPTER TWO

PERCEPTIONS OF PROVIDERS OF SERVICES AND GOODS

1. Introduction

In this chapter, the preliminary fieldwork which was carried out in the first phase of the research is described. It concentrates initially, on the research team's perceptions of the contexts in which older people might need to make use of basic skills. It further describes a content analysis exercise based upon a range of publicity and information leaflets aimed at older people. Finally, it discusses the findings of a series of semi-structured interviews with sixteen key informants - people who work in a range of institutions, public utilities and shops and who have regular contact with older people. The perceptions of these key informants were used to illuminate aspects of older people's lives and their uses of numeracy mainly in a financial context, but with some reference to regular household and personal tasks.

2. Publicity material

A preliminary task was for members of the research team to brainstorm among themselves possible contexts in which older people might need to make use of numeracy skills in their daily lives. Results were then categorized into situations concerned with:

1 money/financial affairs
2 medical issues
3 legal issues
4 travel both local and global
5 leisure activites
6 involvement in voluntary organisations
7 new technology
8 interaction with children and grandchildren

These lists were supplemented by information collected over a three-week period from a range of widely available leaflets, pamphlets, brochures, publicity materials, circulars, advertisements etc giving various types of information containing numerical information to the public. Whilst most of these were relevant to members of the public generally, in some cases, they were particularly directed at retired or older. Information was all obtained from Lancaster city centre using such outlets as the library, hospital, Tourist Information, DSS, public utilities, and selected shops, stores and travel agents.

To carry out a detailed content analysis of all the materials collected would have been beyond the scope of the project. However, it was noted that much of the information **specifically directed at older people** was concerned with claiming various kinds of benefits, including cash help for illness or injury caused by service in the Forces or as a result of the Second World War. Examples of possible claims appear to have required the ability to perform routine mathematical operations; but, on closer inspection, also assumed the ability to be aware of and deal with somewhat complex personal financial matters such as current accounts, National Savings Certificates, stocks and shares and to understand the components of an individual's weekly income and outgoings. This was particularly true of advice on meeting the costs of residential or nursing home care which, although clearly and simply expressed in an explanatory booklet, is obviously a complex financial procedure involving an adequate understanding both of personal finances and of Income Support regulations and other benefits.

In most of the printed material collected, there were useful lists of sources of help or further information. These sources were used to identify a range of organisations which have regular dealings with retired people as clients or customers and who it was considered, would be able to provide a particular perspective on the kinds of numerical skills older people use on a regular basis and to identify any areas perceived as causing difficulties.

3. Interviews with providers of services and goods

The organisations chosen for further investigation were all located in central Lancaster, except for two sub-post offices. These were situated in more outlying districts, one semi-rural, where there were known to be a high proportion of older residents. The organisations selected to represent a useful cross-section were:

Organisation	Number visited
High-street banks	6
Building societies	3
Sub-post offices	2
DSS Office	1
County Council Welfare Rights Service	1
British Gas	1
Pharmacist	1
Optician	1

In all cases, appointments were made in advance with a request to talk to a senior member of staff, usually a branch manager or sub-postmaster where relevant. It was observed that, generally, bank officials were more willing to grant interviews than those in building societies. This may be related to the wishes of high-street branches to raise their profile or it may merely reflect differing workloads and hence, staff availability. Overall, the willingness of senior staff to give time to the interviewer and their interest in older customers was notable.

Interviews usually lasted for about one hour and were based on a standard semi-structured interview schedule. However, it was necessary in some instances to vary the questions slightly as appropriate to the respondents' place of work and main responsibilities. In all cases, respondents were encouraged to talk freely in order to gain a complete picture of how they perceived older customers' numerical skills, needs and problems.

Overall, a considerable amount of data was collected. Obviously because of the nature of the organisations visited, much of this related to older people's handling of various financial transactions. However, since dealing with finance is a major element of everyday life for all of us, this was felt to offer an important perspective on older people's daily activities. The main themes which emerged from the interviews are summarised below with illustrative quotes where relevant.

3(a) **Banks**

Respondents' estimates of how many of their customers were in the sixty plus age range varied from 20 to 30 per cent. All the banks sent out leaflets with financial information or marketing material centrally, but although the facility existed to target older customers, this was seldom done. Exceptions mentioned in a few cases included short-term investment literature and details of life insurance for older people. One bank offered free statements in braille or extra-large print for blind and partially-sighted customers who requested them.

Although none of the banks visited trained their staff specifically to deal with older customers, it was noted in several cases that these clients liked the idea of having a personal banker and would often seek help from this person on matters with which the individual could not deal. Staff at all the banks were used to referring people to other agencies for help where necessary. Where a branch offered the facility of a private cubicle and an apparently friendly approach, older people would sometimes bring in official documents of various kinds and seek help in understanding some financial aspects of these from a regular member of staff when available.

Generally, respondents noted that older people tended to visit the bank on a regular basis - perhaps once a week, usually alone, but sometimes a married couple together. One respondent observed that if an older customer came in with anyone else, this person rarely accompanied them to the counter - 'they don't want their families to know their financial business' - was a very common observation.

Areas identified as problematic for older customers ranged from dislike of dealing with the new smaller coins because of poor eyesight to specific difficulties such as understanding interest charges and the difference between credit and debit cards - although this was not specifically confined to older people. Some aspects of dealing with finance commonly identified related to:

(i) use of a cheque book for the first time
(ii) problems of understanding bank statements when some cheques were not presented immediately
(iii) strong dislike of cheque cards, charge cards and credit cards plus general refusal to use 'hole-in-the-wall' facilities - 'but older people do seem to have problems remembering numbers - I'm sure it's this rather than the thought of the machinery that prevents them using the hole-in-the-wall to get cash' (branch manager).
(iv) lack of understanding of account charges
(v) queries regarding pension (especially when paid directly to the bank) and insurance payments.

All the respondents commented on older customers' willingness to trust their branch of a particular bank, often because they had 'been with' that bank all their lives. There was considerable emphasis on the problems caused to widows who had been accustomed to leaving financial management to their spouses during marriage. This was seen as common across all social classes and often meant that older women became very dependent on the help of bank staff in dealing with financial matters.

Anecdotal evidence of individual difficulties was strong enought to suggest that many older people do rely on and trust bank staff to perform mathematical operations - 'they don't have much idea of how a bank works' - and to take control of their finances, eg

> 'They (older people) accept that we use calculators and are quite happy for us to work out their problems this way. They seldom ask us to write down the calculation, just the end result.'

'If people have an estimated bill for gas or electricity that they feel is too high, they often bring it into us .... they don't understand that they can pay gas bills here. They seem to think it will get lost in the system so they draw cash and take it down the road .... They can cope with dividing a bill by twelve but get confused when there is a 'long' month and payments are different.'

In spite of these perceived difficulties, one bank manager observed that

'In ten years, things will have changed and the sixty-plus age groups then will be used to dealing with banks at pre-retirement age.'

3(b) **Building socieities**

Building society respondents appeared rather more at ease in dealing with older customers and in understanding their problems and needs. As with the banks customers had often remained loyal to one building society, having saved with them all their lives. However, older customers appeared to appreciate having a passbook rather than a cheque book and tended to use them to budget on a weekly basis rather than monlthy. These customers also tended to visit their building society weekly, seeing it as a social visit where they could also get help with other financial problems from recognisable cashiers. Respondents noted a strong compulsion among older people to 'pay cash for everything'. Although cashiers were not specifically trained to deal with older customers, they learned quickly through experience that it was important to use 'their language' to explain financial issues to more elderly customers. Sometimes, problems related to a fairly straightforward arithmetical misunderstanding such as 'the tendency to add up rows of figures and to get confused when there are subtractions as part of a list'.

Interestingly, one building society respondent observed a growing tendency for older people to open accounts with this particular branch

'In the past year or so, we've had a number of people opening accounts with money they've previously kept at home. They've been worried about the robberies they've read about in the papers.'

In relation to this point, however, both bank and building society respondents noted that some older customers became extremely agitated if they read or saw a news item that a branch of 'their' bank/building society had been robbed and would frequently come in to check that their money was safe. In one instance, news about possible staff redundancies also led to fears of branch closure and misunderstandings about the effect on accumulated savings.

3(c) Sub-post offices

The two sub-post offices visited were situated in very different areas. One served a very mixed catchment area of large council estates surrounded by terraced houses, some pre-war semis and newer detached houses. Customers ranged across all social classes and included students and university employees as well as some local psychiatric hospital patients. Seveny-five per cent of customers were estimated to be over sixty years of age and regular customers often call two or three times a week.

The other post office, situated in a semi-rural area south of Lancaster and two miles from a small market town, is part of a large Spar supermarket. This was opened four years ago after a campaign for this facility was orchestrated by local Age Concern members. The post office is surrounded by an assortment of private housing including large static caravan parks where most residents are over sixty years of age. Approximately 70 per cent of post office customers are estimated to be over this age and over 400 pensions and allowances are processed there.

In spite of their differing situations, a number of similarities could be detected between the two post offices in respect of older customers. The main transactions at both concerned pension payments and various saving schemes as well as the purchase of small items such as stamps. Both respondents noted the difficulties some older customers tended to experience in "pushing money backwards and forwards across the counter"; one had overcome the need for this by use of a calculator capable of printing out details as a receipt, enabling him to subtract money for other items out of pension payments as these were made. The older customer could then see the calculations and check the 'change' from their pension cash.

Both post offices were used for the payment of bills, although customers at the semi-rural post office were more likely to object strongly to the 75p charge for paying some bills this way. At the other, 75p was not objected to since it was less than the bus fare to the town centre. At both places, however, customers tended to prefer to pay gas and electricity bills at the main showrooms in Lancaster when visiting for their 'shopping day'.

Some difficulties were common to customers at both post offices. These tended to relate to:

(i) Saving schemes. 'People ask me which is the best scheme but we are not allowed to give this sort of advice. It's against the law. I just try and give them the pros and cons in round figures.'
'I use straightforward examples - round sums ....'

(ii) Telephone bills. Generally, older customers were felt to find the breakdown of rental charges confusing and did not understand the VAT charges. They also tended to present the wrong portion of the bill for payment.

(iii) Housing rent forms (sent out to council tenants when rents are increased or altered in any way). 'I can't understand it myself ... it's really confusing. I just check the amount to be paid and tell the customer and try and reassure them.'

In general, both respondents felt that 'filling in forms' concerned with financial issues was often a more worrying procedure for older people than worrying about calculating costs and what they could afford. Both were willing to make calls to benefit offices, welfare rights, etc, if unable to handle customers' financial queries on the spot. In general, since older customers came in on a regular basis to both post offices, both respondents were well aware of the trust invested in them by these older people and appeared to feel a certain responsibility towards them regarding financial matters and difficulties experienced.

3(d) Department of Social Security (DSS)

The DSS venue in Lancaster is not easily accessible being situated up a slope with a cobbled pavement. Because everyone uses the same waiting room, DSS staff are aware that older people dislike having to visit. In fact, only about 15-20 per cent do so only 'if they have to'. For this reason, the Information Officer and other staff try to visit local Over-60s Clubs and sheltered housing schemes to talk to members/residents about benefits which may be due to them but which they are not claiming. However, it is felt that many of these older people do not fully understand some of the financial issues - perhaps because they are hard of hearing - and may contact the Information Officer informally after the session or telephone him the following day with a particular query.

In general, staff perceived that official forms, especially those relating to Income Support and the associated fringe benefits and to Attendance Allowance[1] were the most daunting for older people, though this may be related to language issues rather than to the need to perform calculations. DSS staff also felt that 'older people are proud and tend to say they can manage. There is still a stigma attached to claiming benefit.' Perhaps surprisingly, it was the 60-70 age group who were particularly

perceived as afraid of getting into debt and strongly dislike receiving what they regard as charity. The older age groups were seen as more malleable and are more easily persuaded to make changes such as accepting financial help with its attendant necessity to fill in forms.

In general, it was the need to give details of savings and other forms of income which was felt to deter older people rather than any lack of numerical skills. Sons and daughters often helped with form-filling, but it was noted that sub-post masters were seen as

> 'very good about phoning up on behalf of their elderly customers. They understand the forms better and know where to look for the reference number and consequently which section to contact.'

3(e) Welfare Rights Service, Lancaster County Council

Although this service, which began in 1989, does not keep any statistics regarding the numbers of people using the service, Welfare Rights Officers try to carry out four home visits a week and also run an appointment and drop-in service on three days a week. Basically, the function of the Welfare Rights Service is to check people's benefits for them, to advise them on qualifying for additional benefits or explaining how benefits are calculated. The percentage of clients aged sixty plus could not be estimated, but the Welfare Rights team were able to point to some specific issues relevant to older people.

Once again, it was stressed that older people dislike the idea of claiming benefits. The point was made that they often only start enquiring when they move - perhaps to sheltered accommodation - and discover what benefits their neighbours are receiving. In these cases, it is often via a local general practitioner or through relatives or neighbours that financial matters involving form-filling are sorted out. It was also observed as previously that, as they get older, clients are more likely to start claiming extra benefits such as disability allowance. Unless confused or with health problems, these older people were found to be very good at 'mental arithmetic'.

Some problems particularly noted among older people included

(i) Confusion over the (former) Poll Tax which was paid over 10 months - 'people can't understand how it evens itself out'.

(ii) Couples used to receiving one bill for rates each receiving their own Poll Tax bill - 'they didn't seem to realise they were meant to pool their resources'.

(iii) Confusion between calendar months and regular 4-week payments - 'the older the person the more likely they are to want to calculate weekly'.

(iv) Fear of not being able to 'manage' even when their outgoings are written out.

In the latter case, staff spend 'as long as it takes' with each person to work budgets out and in making sure they understand how everything is calculated. In extreme cases, staff will help with budgeting or will refer clients to the DSS or CAB. However, it was noted that

> 'In most cases, if calculations are wrong, it is not an arithmetical error so much as the Benefits people not being aware of full or changed circumstances.'

3(f) British Gas

British Gas's 'Commitment to Customers' includes particular services to households where all adults are over the age of 60 and have particular disabilities or impairments. A Home Service Adviser increasingly makes visits to these households or to sheltered accommodation and also gives talks to groups of older people.

Some particular numerical problems encountered include:

(i) confusion about the 24-hour clock on central heating systems (particularly among older widows whose husbands dealt with these kinds of concerns in the house)

(ii) misunderstanding of weights, measures and temperatures in the cookery books provided with new cookers

(iii) use of thermometers to check on room temperatures - these are issued free to older people

(iv) worries about increasingly high gas bills (interviews were carried out before the imposition of VAT on fuel charges in April 1994) and how they are calculated

Worries about bills were often part of overall concern about general household budgeting. Older clients were found to be prepared to ask the adviser for help in budgeting rather than immediate family members. She also found on occasions that it was necessary to alert Social Services if an older person was having particular financial problems as well as health centres or community nurses since these problems are often related to general health and welfare difficulties; or she may refer customers to the Citizens Advice Bureau for personal help on budgeting matters. Increasingly, the adviser tried to visit sheltered accommodation and to give talks to groups of older people in order to be of assistance over problems both of budgeting and in relation to understanding the kinds of calculations which need to be made in cooking, setting heating times, etc.

A further interview with staff of the central Gas Showroom confirmed many of the comments made by bank and building society respondents. These related to a dislike of using cheques for paying bills - 'they go off to the bank and withdraw cash for immediate payment' - and a refusal to sign anything with the word 'credit' on it. Older people - and at least 55 per cent of customers at this showroom were estimated to be over sixty - were generally perceived to be more ready to buy gas savings stamps or to put money aside each week for payment of bills. Estimated bills were a particular cause for concern.[2]

Related to financial transactions, a range of other confusions had been noted, eg:

(i) the replacement of thermal units on bills by kilowatt hours (European Union legislation). 'We calculate them back into thermal units. We do it on a calculator, then write it down on a piece of paper so that the customer can take it away. Older people don't understand - or believe - what the calculator says.'

(ii) the fact that, although gas and electricity stamps are interchangeable, they cannot be mixed on savings cards.

(iii) confusion between £10 and £20 notes - usually because of failing eyesight.

British Gas puts considerable emphasis on helping older people in its staff training and produces numerous well-illustrated booklets for all customers. One contains a specimen bill in the centre and this has proved particularly popular with older people. Staff were also happy to draft business letters for customers on occasions - 'some customers will bring us anything addressed to them in a brown envelope' - and were frequently rewarded with small gifts.

3(g) Pharmacist/Optician

Respondents in both these cases were employed in town centre branches of well-known chain stores. In the chemist's shop, the interview was carried out with a trained pharmacist who estimated that about 40 per cent of customers coming to the pharmacy were over sixty and tended to come in as couples, with prescriptions on their way back from a visit to a doctor. Prime concerns of older people tended to relate to:

(i) over-the-counter remedies and the prices of these in relation to obtaining them free on prescription

(ii) the need to take medicines regularly and on time and their preference for calendar packs (tablets dated by day of the week) as a memory aid.

(iii) a preference for medicine pots with measures on the side, rather than spoons, for liquids.

The respondent commented on the habit some older people have of decanting pills-for-the-day into different bottles at home, causing confusion about which pills should be taken at what time. This pharmacy currently operated a monitor dosage system in blister packs for rest home residents and hoped to make this available to individuals.

Being situated within a large town-centre store, it was considered that the shop was seen 'as an institution, a bit "Establishment" somehow' and older customers rarely stopped for more than a brief chat; in smaller, local branches, however, they were more inclined to bring in other problems, particularly relating to issues concerned with health, the taking of medicine, etc.

The optician interviewed estimated that between 55-60 per cent of his customers were aged sixty plus. About three-quarters of these visited with a family member or close associate who would often elaborate on what was required or would intervene on behalf of the older person. Staff - mostly female - have on-going training 'which focuses on the handling of elderly patients'. It was considered necessary to 'make time' for the older customer so that they do not feel hurried, but it was also necessary to know what level of technical information to give.

Most of the problems brought to the practice tended to be medical, but were often concerned with issues relating to an ability to distinguish numbers on eg telephones, cooker dials, knitting patterns. Although some additional 'eyeware' and aids were available, staff needed to be aware of sources of other help such as enlarged numbers on telephones, etc, and to be able to advise on these.

4. Emergent issues

In general terms, three aspects of this exercise require comment. The first is that the study was carried out on a very small scale in one particular location. Interviews with other individuals working in other establishments of various sizes elsewhere in the country may have produced different results. The second is that older people are of course, by no means an homogenous group. The general category 'over retirement age' necessarily includes a mix of gender, age, socio-economic backgrounds, living arrangements, etc. Although an attempt was made to interview providers who, between them, came into contact with as wide a range of older people as possible, it may be that the kinds of issues which emerged are only relevant to a particular age-range or socio-economic circumstance. The third point is that informants' perceptions and impressions may have been influenced or limited by their own pre-conceptions of

older people; it was notable that it was often particular instances or episodes which stood out in respondents' memories and were then generalised to all older people. However, if these limitations can be recognised and taken into account, some interesting points relating to older people's everyday lives emerge.

(iii) Much of this exercise was necessarily concerned with aspects of financial transactions in older people's daily lives. What emerged is that the kind of difficulties older people are sometimes perceived to face relate perhaps partly to inability with some kinds of calculation and estimation methods, but more often to a lack of familiarity with eg modern electronic banking methods and basic knowledge about how some of the major institutions in our society actually operate. This is well illustrated by older people's observed preference for using cash for most financial transactions and by their apparent fears as to what has actually happened to their money when it is not actually visible.

(ii) A second issue relates to some older people's perceived reluctance to claim particular benefits, even though this reluctance seems less marked as they grow older. It was noted that these claims do often require the filling-up of quite complex forms and the giving of personal financial information. In these instances, it appears that the kind of numerical skills required were very much bound up with issues of language, of communication and understanding and with older people's perceptions of themselves as independent beings who did not wish to be seen as being in receipt of 'charity'.

(iii) Other issues which were highlighted by the study relate to misunderstandings in relation to the household management aspects of daily life where some numerical skills are required. These included calculating settings for domestic timers, understanding gas and telephone bills, change for small items, taking medicines regularly, etc. One explanation for some of these difficulties is the adoption of standard European practices such as the less familiar 24-hour clock, the partial changeover to the metric system and new ways of calculating the amount of domestic fuel consumed. These difficulties may also be found among younger age-groups. But other factors came into play; gender issues in that some older women traditionally left certain household and some financial tasks to men; age-related problems with eyesight, for example, which makes the identification of numbers, small coins, the differentiation of bank notes, reading instructions, etc a difficult task. Hearing problems may also contribute to a lack of understanding of various issues even when they have apparently

been explained. It may also be the sheer rate of change eg increasingly complex financial demands, new product design etc which many older people find confusing; and this confusion may mask their abilities with numerical skills.

(iv) Perhaps the most notable aspect of the exercise was respondents' sense of responsibility towards older people because of the perceived **trust** placed in them by older customers/clients. This was particularly the case in relation to financial transactions and to household budgeting. It may be the case that because the operationalisation of a range of numerical skills is so closely bound up with the ability to communicate, to interpret and to respond across a range of situations in daily life, older people prefer to rely on a familiar and trusted individual who can cope with or at least advise on, problematic areas of their daily lives where number skills are involved. Certainly, research carried out by NOP Social and Political on behalf of British Gas to investigate attitudes to ageing of six groups in the population including 764 retired people over the age of 55[3] showed that, of those respondents who felt they were treated 'very well/fairly well', eg various organisations, the post office, shops and stores, high street banks/building societies and British Gas were all highly rated; the Social Security Office was less so, but still 43 per cent of the sample were satisfied (British Gas, 1991). However, we cannot be sure of the extent to which these findings disguise some older people's reluctance to complain, an issue raised by Midwinter (1992) in his report into aspects of citizenship for the Carnegie Inquiry.

5. Conclusion

This initial exercise was useful in that it lends weight to the notion of numeracy as an essentially social activity in which mathematical skills need to be seen within the particular context or wider environment in which they are used and in conjunction with the exercise of a range of communication skills. This involves not only older people, but those with whom they come into contact in their daily lives. In general, information gained from the investigations reported here was used to provide the basic framework for the group discussion and diary-keeping exercises described in the next chapter.

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[1] Attendance Allowance is a benefit paid to a person who requires considerable help in daily life because of mental or physical disability.

[2] In December 1994, British Gas announced that its showrooms, to be renamed 'Energy Centres', would no longer accept payment for gas bills, but would concentrate on the sale of appliances only.

[3] The sample was made up of 514 retired white people, 122 retired black people and 128 retired Asian people, all over the age of 55. Black and Asian people in the sample appeared generally less satisfied than the cohort as a whole.

CHAPTER THREE

GROUP DISCUSSION AND INDIVIDUAL DIARIES

1. Introduction

In the second phase of the research, the emphasis in the fieldwork changed to an examination of the perceptions of older people themselves regarding their use of numerical skills in their daily lives. Two strands of this are described and discussed in this chapter - firstly, a group meeting and discussion between six older people facilitated by two members of the research team; and secondly, a diary-keeping exercise in which six different older people in a different location each kept a personal diary on a particular day of the week noting how often they made use of numerical skills and the contexts and situations in which this occurred. This methodology was the result of recommendations made in the previous Lancaster research. It was hoped that, taken together, these two exercises would provide further insights into the variety of older people's daily activities. A further aim was to develop a framework for the main fieldwork by involving older people in the project in what was hoped to be an interesting and innovative manner.

2. Group discussion - the Rainbow Centre, Morecambe

The Rainbow Centre in Morecambe, a seaside town on the Lancashire coast, is run by Age Concern Morecambe. It provides a range of activities for older people and a drop-in facility. A meeting between two members of the research team and a group of six Rainbow Centre members was set up by the Centre's manageress after the purposes of the project had been explained. Participants, five women and one man all aged between 65-75 and described as 'lively', volunteered to take part. The aims of the meeting were :

(i) to generate interest and involvement in the project among participants

(ii) to generate information about these older people's experiences of, and attitudes towards handling numbers

(iii) to ascertain the kinds of contexts in which these older people might make use of numerical skills, using the categories generated by the research team as a basis for discussion

(iv) to ascertain whether there are any areas concerned with the use of numerical skills causing problems in their daily lives

(v) to help participants recognise the importance of their contribution to the discussion in raising particular issues which are central to the lives of many older people in today's society.

Discussion took place informally in a private upstairs room in the Rainbow Centre. The researchers took notes including verbatim comments since it was felt that the presence of a tape-recorder might prove inhibiting to the discussion. Overall, discussion lasted for almost two hours : the main outcomes are summarised here.

(i) Maths/numbers in post education and training

As in the previous Lancaster study (Withnall 1992a), all respondents could clearly recall various experiences of learning number skills and mathematical concepts at school, mainly in what they described as an atmosphere of 'fear' because of the strict atmosphere in which children were educated when they were young. The only man present had been an accountant in his working life and had thus received further training and was used to handling numerical concepts. The women variously described themselves as 'useless' or 'not very good'. None could recall any numerical skills in a job or occupation. Conversely, all felt they were very competent in matters such as household budgeting, suggesting that this was a skill developed of necessity by long years of practice rather than through having acquired all the necessary knowledge and abilities at school.

(ii) Situations where numerical skills are used in daily life in retirement

Using the broad categories developed by the research team, the group was asked to describe activities and situations where they could readily recall regularly using various types of numerical skills in their day-to-day lives. Since this was a group, rather than an individual exercise, the activities described below represent majority responses and perceptions of regular activities.

a) Money/financial affairs

- household budgeting. All were anxious 'to keep out of debt'.
- receiving, understanding and paying bills on time.
- shopping, particularly for food, and the need to compare prices by 'shopping around'. Visits to markets, charity shops and the use of secondhand clothes were

stressed. Some of the group ran agencies in mail order catalogues which required skills in calculating interest charges, collecting amounts of money from customers and dealing with associated paperwork.

- pension, benefits, insurance claims. All members of the group had anecdotal accounts of instances where difficulties in deciding both what could be claimed from various sources and in calculating how much had led them to seek help from staff at the Rainbow Centre. Attendance Allowances for relatives seem to cause particular difficulties, a fact previously noted by the DSS informants.

b) Medical issues

- visiting the chemist, optician, dentist. Dealing with appropriate concessionary charges.
- measuring doses of medicine, times of taking pills, etc.

c) Legal issues

- house purchase and selling was mentioned by two of the group and the need to understand the financial issues together with how the agencies involved actually operated.
- the drawing up of wills and the financial calculations and decisions to be made.

d) Travel (local and global)

- reading and understanding timetables
- calculating the costs of holidays from brochures
- rates of exchange for foreign holidays. Two members of the group went on a package tour to a European country each year. Neither felt they experienced any problems with foreign currency and both enjoyed comparing prices with those at home.

e) Leisure activities

- playing cards
- football pools
- bingo
- knitting and tapestry patterns. Both of these were felt to require the use of estimation and a skill in following complex pattern instructions.

f) Involvement in voluntary organisations

- keeping the books for local church activities (one male respondent).

g) New technology

- 24 hour clock timers and 'new' ovens. The differences between metric and imperial measurements were generally found confusing, although all felt able to cope
- video recorders. Those which involve pre-setting and the calculation of times were found especially difficult
- use of calculators. Where these were understood and used, respondents also confessed to checking totals by 'adding up in the normal way'.

h) Interaction with children and grandchildren

- doing 'sums' with young grandchildren
- learning about computers from computer literate grandchildren. Some disappointment at the lack of formal opportunity to learn about computers because they were 'too old' was expressed by two respondents.

3. Keeping a numeracy diary - The Storth Ladies Speakers Club

It has already been observed that locating and gaining access to groups of older people who are willing to take part in a research project can be problematic. For this second exercise, an approach was made to a local Ladies Speakers' Club. Although not primarily an organisation of retired people, Speakers' Clubs do tend to have a preponderance of older members. They exist to help men and women practise and develop their skills in public speaking; they may also arrange a programme of social events for members. The Storth Ladies Speakers Club which meets in the informal atmosphere of members' homes in and around Arnside, a small Cumbrian seaside town with a high proportion of retired people, agreed to co-operate in the research. Accordingly, a member of the research team attended one of the Club's meetings, took an active part in the proceedings and then spent a considerable time explaining the purposes of the project and the importance of the diary keeping exercise to the overall aims.

Bell (1993) has pointed out a number of problems in the use of diaries as a method of collecting evidence, including the fact that diarists need to be of a certain educational level both to understand instructions and to complete the diary. Accordingly, diarists were given detailed written instructions as how to fill up their diaries and an example of an imaginary completed diary. Each diarist chose a particular weekday and was asked, at the end of that day, to think back and to make a note of every occasion on that particular day when they had made use of numbers in some way. To help, they were asked particularly to record instances of :

i) handling money
ii) measuring
iii) using numbers in any other way they could recall
iv) interpreting numerical information from newspapers or on television

They were also asked to record any thoughts they may have had at the time about the activity together with any instances when they asked for help with any of the activities and who they asked.

Five of the respondents were aged 70-79; the other diarist was 81. At the end of the week, all the women commented that they had been very surprised by the extent to which numbers and calculations featured in their daily lives and how they routinely performed mathematical operations without giving this much thought. Of course, this exercise can do no more than give a snapshot picture of how members of this particular group made use of numeracy on one day, which may not have been typical. Additionally, male respondents may have painted a totally different picture. However, combined with the outcomes of the Rainbow Centre discussion group, the exercise was felt to have achieved its aim of illustrating the possible role of numerical skills in these older people's lives in some depth.

As with the previous exercises, a considerable amount of information was generated. Reported activities were collated under the headings described above together with some illustrative quotes.

(i) handling money

Not surprisingly, shopping featured largely in diarists' lives, an activity sometimes preceded by the need to sort out money for bus fares to visit the nearest town. Shopping activity was problematic for one respondent:

'Have slight hearing problem and to save embarassment, frequently hand shop assistants a one pound coin! I cannot distinguish between 66p or 56p or numbers with a similar sound. Have discussed this with friends (my age group) who experience the same problem.'

Shopping mainly took place in supermarkets, a market hall and, for small items, at a local corner shop. The Friday respondent particularly chose this day as it was market day and she shopped both for herself and for a frail, elderly neighbour who provided a list and an amount estimated to cover the cost. This diarist was thus at pains not to exceed this amount. All the respondents whose diaries featured shopping made careful calculations as to how much food they were likely to need, observing rises in prices of any items, and making comparisons between different types of stores; are particularly noted where cornershop prices were actually less than those of a major supermarket. One diarist reported that she lived with her daughter, explaining that:

'..we share all household expenses ... my daughter does all the shopping and we go over the prices together.'

Other activities concerned buying stamps and postal orders, involving calculating small amounts of change; checking savings and calculating amounts needed to pay household bills. Two diarists, active in local societies, were involved in handling money on behalf of the societies; one, as Treasurer, was required to prepare a balance sheet at regular intervals.

(ii) **Measuring**

Cooking, especially weighing out ingredients for cakes and scones was an activity undertaken by four diarists during the week. Here, the problem of metric measurement appeared again :

' ...I always weigh in pounds and ounces and as things have always turned out well, I won't turn to the new system now.'

'I enjoy baking and cooking, but I find it hard to cope with litres not pints, grammes not ounces and considering how many calories are in different meals.'

Other activities related to knitting and sewing with the need to follow patterns :

'I am knitting a man's jumper and for the first time measuring it in centimetres, and it is not always a perfect fitting following the exact instructions of the pattern book. You have to adapt. Fair Isle patterns need lots of counting.'

Measurement carried out for the purpose of replacing old towels, curtains, etc and the confusion caused by changes to the metric system for measuring materials was mentioned by two diarists.

(iii) **Using numbers**

Given that this category of activity was somewhat vaguer than the others, it was surprising how much similarity over activities emerged from the diaries. Although two respondents recalled further instances of measurement and estimation concerned with baking, the majority of activities were related to the operation of appliances and machines - **remembering** numbers for setting eg the washing machine and video recorder - activities which are closely linked to **understanding** how an appliance operates. One diarist remarked:

'I have just acquired a video with a complex remote control .... As I live alone, I cannot ask someone to do it for me and very few people know or at least could teach me ... I would like to learn.'

Making 'mental notes' of various numbers - eg amounts of petrol consumed by a car, of mileage completed, of telephone numbers, number sequences of keys, of bus and train timetables, even of number of stairs climbed on one occasion were also reported by almost all respondents. Other activities related to leisure pursuits. Two diarists reported watching the television programme 'Countdown' -

'...and pitting my wits against the competition on counting up numbers.'

Two others reported playing card games and 'counting up scores' on their particular diary days, whilst another, a member of a local Poetry Society noted having :

'Discussed metre of a few selected poems. Counted beats making the rhythm.'

(iv) **Numbers in newspapers or on TV**

The exercise may itself have distorted responses slightly in this category of activity since diarists may have been encouraged to pay more attention than usual to items of news in newspapers and on television for diary-keeping purposes. It was noticeable that most of the items recorded related to information gleaned from newspapers and were concerned with government-produced statistics or spending totals regarding matters of social concern such as unemployment totals or house prices. Only one diarist commented on a television news item concerning the possibility of extending VAT to food purchases. However, although interested in such matters, three respondents encountered difficulties in interpretation:

> 'I ignore statistics and numbers in general. It is with an effort that I remember to count the number of noughts when faced with the national debt or the trade deficit.'
>
> 'I find it very difficult to follow budget systems how they are discussed on TV programmes or are itemised in newspapers....'
>
> 'The numbers of unemployed go up. Then pay drops dramatically. What happens next? People do not seem to be regarded as people anymore. They're just numbers.'

Finally, the oldest diarist recorded that she purchased only the local newspaper to check times of events central to her life in a village - times of tides, the days scheduled for the visit of the travelling library and times of various village activities.

4. Emergent issues

(i) The multiplicity of activities which group members discussed and diarists described suggests that different kinds of numerical skills are required and used in the everyday life of these retired people. It has to be remembered, however, that these were only very small, gender-biased samples of older people in a particular part of the country. It must also be stressed that 'everyday life' is itself a complex, rich but highly individualistic pattern of activities requiring a range of abilities, skills and responses to a myriad of situations. At this point in the research and as a precursor to the main fieldwork, it seemed appropriate, then, to try to classify the different **kinds** of number skills used by respondents in a range of situations in their daily lives. The following classification suggested itself from this two-part exercise :

Table 1 : **Classification of numerical skills**

Domestic numerical skills : perceived as necessary by the individual for personal activities and domestic tasks.

Consumer numerical skills : mainly concerned with aspects of managing financial affairs, making purchases etc.

Technological numerical skills : required to understand and operate modern appliances, usually domestic; also may involve computer-based skills.

Leisure numerical skills : concerned with a whole range of leisure activities whether personal hobbies or more complex pursuits involving others.

Numerical skills for citizenship : understanding and interpreting statistical and other information available within the public domain.

Numerical 'mental notes' : remembering and visualising numbers and number sequences for a range of purposes, or for curiosity.

This table is by no means exclusive since many of the categories of activities are inextricably linked. For example, purchasing and learning to operate a washing machine requires domestic, consumer and technological skills together with a grasp of statistical information as an informed citizen enabled to make choices. A further point is the **range** of skills utilised within each category. For example, respondents and diarists pursued a variety of leisure activities ranging from knitting - itself requiring the ability to follow complex algebraic sequences and to visualize geometric shapes - to acting as Treasurer of a voluntary organisation. The skills required for the latter position are also complex, but of a different order.

These observations illustrate well the points made by Evans (1991) - that it is the goals and values of the activity, the social relations and material resources which are crucial to understanding a particular mathematically-based activity. In particular, the goals of the activity will influence the degree of **precision** required. There is also a substantial difference between, for example, completing financial transactions under the eye of an official in a bank or building society and shopping for a neighbour or sharing expenses

with a relative. The question of the material resources needed is well illustrated by contrasting the tasks of weighing and measuring ingredients for baking with extrapolating facts and figures from a newspaper report. In addition, ability to carry out any of these tasks or to make 'mental notes' may be inhibited by poor eyesight or hearing loss as was noted by some respondents.

(ii) One goal of the two exercises was to discover whether there were particular problems experienced by older people in their use of numerical skills in daily life. As perceived by those having regular contact with older people, described in the previous chapter, any difficulties mentioned were connected with aspects of household management, new product design and lack of familiarity with the operations of some of society's institutions. The diarists who expressed puzzlement over statistical information and its presentation in the public arena - or lack of interest in it - illustrate the points made by Paulos (1988) and Dewdney (1993) as to the charges of 'mathematical illiteracy'.

(iii) Although only members of the discussion group were asked to reveal details of their past experiences in learning basic mathematical operations, it was noticeable that there was a certain discontinuity between their school experiences and the ways in which the need to use numerical skills now featured in their lives. The diarists, with the vast range of ways in which they used number skills, also illustrate how new needs may surface later on in life - from budgeting when shopping to wishing to understand how to programme a video. Having more **time** to undertake pleasurable activities - baking, knitting, card games, watching quiz games on television, taking up positions of responsibility in local organisations - also illustrates how the emphasis may change in retirement. However it appears that these older people, at least, felt that they had been able to acquire a range of necessary skills over the lifespan.

(iv) If difficulties in dealing with particular matters involving numerical skills emerged, at least some respondents were prepared to seek advice and assistance, particularly, as noted previously, with regard to financial matters. But there also emerged a certain willingness to continue learning perceived necessary skills, particularly in connection with the use of modern technology. The problem was seen as lack of accessibility to opportunity rather than lack of enthusiasm.

Conclusion

Although very small scale, both aspects of this investigation were considered useful in that they go some way towards illustrating the **range** of ways in which numerical skills are utilised in later life, the **degree** of mathematical skill required and the relationship of this to other aspects of older people's daily routines. They also revealed some of the difficulties experienced by some older people in retirement and suggested some further lines of inquiry.

CHAPTER FOUR

INTERVIEWS WITH OLDER PEOPLE

1. Introduction

The aim of the main fieldwork phase of interviews with individual older people was to explore some of the issues raised through the previous exercises in depth through a more concentrate inquiry with different older people in different locations in the north-west. The research issues which had to be confronted at the outset are discussed briefly below.

(i) location of fieldwork: Decisions about location were taken in the light of the timescale and resources available as well as with regard to ease of making contact with members of the desired research population. Taking these factors into account, three areas were chosen for investigation: Lancaster city centre (urban); Morecambe (seaside); Overton (a rural area in north Lancashire). Among reasons for these choices were that the three areas, although all containing high proportions of retired people, offered a spread of different living environments and contained very different housing stock, shopping and transport facilities. In this way, it was hoped to make contact with a range of older people with a variety of lifestyles.

According to available figures from the 1991 Census, Lancaster (which includes Morecambe and the Lune Valley) has a population of 123,856. Those aged from pensionable age to 74 represent 13.4 per cent of this population; those aged 75-84, 7.2 per cent; those over 85, 2.2 per cent[1]. In the village of Overton, the total population of which is 842 persons, one-third are eligible for retirement pensions. The areas chosen thus had fairly high proportions of retired people in their populations.

Overton is situated some six miles from Lancaster but, until recently, was difficult to reach by road during high tide. Morecambe, once a popular seaside resort, but currently experiencing the effects of economic and social decline, has a mixed housing stock and, increasingly, poorer shopping facilities. Lancaster, a bustling historical city with good motorway access and having two institutions of higher education within its boundaries, provides a focus for visitors and acts as a commercial and shopping centre for people living in the more isolated regions of the Lune Valley.

(ii) sampling: It was decided to focus, in Lancaster and Morecambe, on two particular centres which older people were known to frequent. In Lancaster, The Granary is a drop-in coffee shop and restaurant attached to a town-centre church but

open to the general public. It is a particularly popular meeting place for retired people on a regular shopping trip to the town centre. Possible respondents were approached on one particular day of the week. The Rainbow Centre in Morecambe has already been described. It has a daily range of activities for older people together with a luncheon club. Those who were asked to take part in this fieldwork had no previous knowledge of the project or of the group discussion described in the last chapter. In the village of Overton, it was a comparatively simple matter, initially, to approach possible respondents in the street. No-one refused to take part and all these interviews took place in respondents' homes at their suggestion. This was helpful in providing a familiar, relaxed environment where respondents would feel at ease. In this latter case, it was also possible to utilise a 'snowball' technique, where the first three respondents suggested friends or other contacts in the village who would take part in the interviews.

The decision to select respondents in these locations was obviously a matter of convenience so that those interviewed were not random samples and it was not possible to stratify numbers by age group, class, educational background, etc. Some attempt was made to obtain an appropriate gender balance. Although generalisation of the findings to all older people is not appropriate, the results of this fieldwork provide a useful indication of how numerical skills are used in these particular older people's lives and raises issues which may be **related** to the daily activities of older people in different locations and circumstances.

(iii) interview schedule: Ten retired people were approached and interviewed in each of the three locations using a semi-structured schedule informed by the results of the interviews with providers of goods and services and the group discussions and diary-keeping exercises. Interviews lasted from twenty to forty minutes. Respondents were encouraged to discuss in detail aspects which appeared to be of central significance in their daily lives or which they felt to have some bearing on a particular aspect of their activities.

As previously, a considerable amount of qualitative data was generated. The main findings which emerged are summarised here.

2. Background of Respondents

(i) Characteristics of respondents

Table 2: Age, gender and marital status

Age	Lancaster		Morecambe		Overton	
	m	f	m	f	m	f
60-64	2(w/s)					
65-69			1(w)	2(m/w)		1(w)
70-79		4(3w/1d)	1(m)	3(w)	3(m)	3(2m/1w)
80+	2(w)	2(2w)	2(w)	1(w)	3(1m,2w)	
Total	4	6	4	6	6	4

Key: S: single m: married w: widowed d: divorced

Notable characteristics are the greater numbers of women interviewed; the preponderance of respondents aged over 70 and the fact that one-third of respondents were over 80 years of age including seven of the men. Two-thirds of respondents across age groups and locations were widowed (13 women and 7 men). More of the Lancaster respondents were married. Only one female respondent had never been married and only one had been divorced - patterns which will undoubtedly change as successive cohorts move into later life.

Table 3: Age on completion of full-time education

Age	Lancaster		Morecambe		Overton		Totals
	m	f	m	f	m	f	
14 or under	1	4	4	4	3	3	19
15		1					1
16-18	1	3		2	2	1	9
19-21					1		1

The majority of respondents left school at 14; this was particularly the case in Morecambe. On the other hand, one-third of all respondents had undertaken some form of advanced education. Differences were most noticeable among female respondents in Lancaster.

(ii) Work experience before retirement

Respondents' varied accounts of their work histories illustrate well the range of jobs and careers which both men and women may have across the lifespan. For the women in particular, **change** on marriage or following the arrival of children, was a particular feature. There were also descriptions, eg two women in Overton of helping their husbands in a business venture. Perhaps because of proximity to the seaside, four respondents across all locations had worked in the catering trade at some point; one other had managed a shop. One woman in Lancaster had been a factory cashier; a male respondent in Overton was a trained cost accountant who had worked abroad. Other activities ranged from a former teacher and a social worker in Lancaster (both female), a fire officer in Morecambe to a mill worker in Overton and a presser at a cleaner's who had also run a successful dancing school. One female respondent in Overton was still engaged in part-time employment as a costumed guide at a nearby historic home. Conversely, another female in Overton had never been in paid employment.

The variations in work patterns both through individual lives and between respondents illustrate the complex relationships between gender, family and working life and serve to highlight the ensuing debates which have taken place among sociologists over the last three decades regarding social stratification by occupational classification. In particular, varied previous employment patterns are not a good guide to location in the class structure in retirement, particularly for women. Analysis of this remains problematic (Roberts, 1993). However, these work histories were useful in that they provide a clear picture of respondents' backgrounds and helped to shed some light on their current life situations and attitudes to the use of numerical concepts in retirement.

3. Previous experiences with numbers and maths

(i) Memories of learning maths at school: The idea that mathematical autobiographies can go some way to help us understand attitudes towards learning maths in adult life is currently being explored in a project at Goldsmiths College, London University (Coben and Thumpson, 1994). Obviously ability to recall schooldays varied considerably among these older respondents. However, in all three locations there were some positive memories of maths lessons at school. Many respondents of both sexes recalled specific aspects they had enjoyed such as tables, algebra, the use of logic. Good teachers were remembered fondly. Conversely, fear of strict teachers and bad teaching were cited as reasons for lack of success in maths across the three loc ·ions, but only by three respondents. Geometry, and in two cases, mental arithmetic and 'problems' were recalled as aspects which tended to cause difficulties even among those who had been 'good at maths'.

These findings are somewhat at variance with the accounts given by members of the discussion group described previously and with the responses obtained in the previous Lancaster research (Withnall, 1992a). This may be due to the fact that these respondents were given more time to think back and recall their school experiences. They also challenge conventional wisdom - that older people automatically disliked school and learnt nothing of value in their schooldays. As one male Lancaster respondent commented:

> "I was average in most things, but I got a basic education that's seen me through life."

(ii) Memories of numbers and maths outside school: It was a more difficult exercise for respondents, especially female Lancaster interviewees, to recall ways in which they might have made use of numbers as a child/young person outside school. Lancaster and Morecambe responses mainly related to hobbies - cards and dominoes, counting games such as hopscotch and, particularly among male respondents in Morecambe, an interest in cricket and football scores. The Overton respondents tended to recall more practical activities such as woodwork, book-keeping, knitting, pigeon fancying (involving calculation of velocity). This variation may reflect the greater number of male respondents in this group; or the differences may relate to the kinds of memories respondents had of their early lives and aspects which had come to assume some central significance in their minds.

(iii) Further training involving numbers/maths in a job or profession

Only six respondents, two in each location, could not recall having undergone any further training using numbers/maths since leaving school. However, the extent of other respondents' training experience ranged from formal mathematics training as part of an accountancy qualification to learning to 'reckon up' through being instructed informally by others. The most common type of training undertaken was by those women who had learnt to keep books and deal with balance sheets when helping in their husbands' businesses at some point or who were currently involved in voluntary activity. Rather than undertaking formal courses, these respondents felt they had trained themselves, using 'common sense'. One Overton female respondent was currently taking a maths course at an adult education centre to improve her skills in voluntary work, but she was unsure of the level and where it would lead.

4. Experiences with numbers/maths : retirement

Drawing on the issues raised in the preliminary project work, questions about older people's current experiences and use of numerical skills were based upon an expanded version of the diary-keeping format, ie issues concerned with:

(i) money and financial affairs
(ii) measuring/estimating
(iii) using numbers generally
(iv) new technology
(v) interpreting numerical/statistical information from the media

Respondents were also asked to identify any aspects they found difficult and to describe to whom or where they turned for assistance. Since it may have been problematic for some respondents to admit to any difficulties, the interviewer occasionally needed to probe some of these aspects more clearly and to 'open up' the interview by using a more conversational style.

The main findings are summarized briefly below.

(i) Money and financial affairs

Some notable differences between the three groups of responses were observed. The Lancaster interviewees' most frequently mentioned activities concerned banking procedures including the use of credit cards, dealing with taxes, issues concerned with

household budgeting and supermarket shopping. In Morecambe, almost all respondents identified budgeting as their main task. Amongst the third group of interviewees, where six respondents, unlike those in the other two areas, were still married, there was a greater tendency to leave day-to-day financial matters to 'the wife' (or husband, in one case). There was a more marked emphasis among the women respondents, whatever their marital status and age, on taking pride in their budgeting skills. Three respondents (two widows and one married man in his eighties) appeared to have considerable financial responsibility as Secretary/Treasurer of a local club or church. Only one instance of this was cited in Lancaster.

Regarding any difficulties, over half the Lancaster respondents felt they had no particular problems and generally expressed confidence in dealing with money and financial matters. For those who were experiencing difficulties, these tended to relate to handling large sums involving eg a deceased spouse's estate, insurance claims, PEPS, investments, etc. However, there was considerable confidence in seeking professional help or asking an identified immediate relative for assistance. In Morecambe, apart from 'having no money to worry about', only one respondent, recently widowed, identified any current difficulties. All respondents commented that a relative or friend would, in any case, be approached for assistance if required. In Overton, there was more emphasis on problems relating to banking procedures, eg 'Hole-in-the-wall cards. I'd never have one - it's not safe' (widow, seventies) and income tax - 'I let them charge whatever they want. I shouldn't do that, I know' (married woman, seventies). These respondents tended to be more independent, preferring to 'deal with it myself' or, if married, 'we work it out together'. Widowed respondents, whatever their ages, were more likely to turn to a son/daughter or close friend, perhaps reflecting the relative insularity of daily life in a small village.

(ii) Measuring/estimating

As with the diarists, cooking (by men as well as women), baking and crafts such as dressmaking, crochet work and other crafts were mentioned by both Lancaster and Overton respondents. Men in the latter location consistently mentioned DIY and gardening as tasks for which they also needed to employ skills involving measurement and estimation. Two respondents in each location referred to the occasional need for taking measurements for new curtains and carpets. One female kept a careful record of measurements to avoid having to undertake this task too often. Among the Morecambe interviewees, seven respondents put far more emphasis on this aspect of their lives plus painting/decorating and joinery. It appeared, from responses about

difficulties experienced, that it was this need to measure and estimate large areas which caused problems for many. In all three locations, whatever the activity, it was the metric system of measurement which gave rise to major difficulties, although this was far less pronounced among the Lancaster interviewees. For three female respondents in this group, it was morelikely to be physical problems of mobility (one respondent was was wheelchair-bound) and eyesight which were major stumbling blocks, rather than lack of skill. In any case, all respondents who professed to a difficulty could identify a relative, neighbour or friendly shop assistant who would help, although in each location there was emphasis on 'working it out myself' or being 'self-sufficient'.

(iii) Using numbers generally

In this category of activities, respondents were more likely to describe tasks which they could do easily and/or from which they derived enjoyment. Most frequently mentioned activities related to games such as bridge, cards, bingo, number games on television and, particularly in Morecambe, football pools, betting and gambling (male respondents). The need to understand bus and train timetables and to remember telephone numbers was mentioned by two respondents in Lancaster and Morecambe. Helping grandchildren, teaching dancing (with the need to count beats and metres) and inventing number 'mind games' whilst travelling were discussed by individual respondents in each group.

None of those in Morecambe could describe any real difficulties experienced but could visualize occasions when they might need to seek help. Discussions with friends at the Rainbow Centre or 'figuring it out myself' would be the preferred options for the majority. In the Lancaster location, there were few problems with numbers and their usage as such; difficulties experienced by three female respondents related to remembering 'long columns of figures' and actually **reading** timetables, etc. Remembering - because of impaired eyesight - sequences of numbers also caused problems for seven Overton respondents, particularly a widower in his eighties who had suffered a stroke. Generally, few respondents asked for help with these difficulties although, once again, immediate family members were cited as instant sources of assistance if appropriate.

(iv) New technology

This was a more complex question in that respondents were shown a list of household appliances and gadgets they might possess and asked to describe any experiences in

learning to operate them if they had access to them. Each item on the list ranging from a radio to a computer required some degree of facility with numbers in its operation.

In general, Lancaster respondents possessed the greatest number of appliances and gadgets. Few Morecambe interviewees possessed a stereo or video recorder. Two women in Lancaster owned a computer, although only one understood its use. The single woman had used a computer in her working life but commented, 'They sent the men on courses. The women had to learn themselves.' One male Overton respondent had also used a computer in the work situation. However, seven of the ten respondents in both Lancaster and Overton regularly used a calculator for calculating prices and addition and subtraction generally with varying degrees of confidence. Only one Morecambe respondent did so; no-one else here had any knowledge of computers.

The majority of the respondents were comfortable with common household appliances, although married male respondents in Overton were less likely to be able to cope with the timing and operation of the washing machine or tumble drier. Most difficulties concerned the twenty-four hour clock on timers for central heating and setting programmes for video recording, although some respondents felt confident about this after practice. Opinions were divided among owners and potential owners over difficulties with microwave or combination cookers - some respondents, after initial problems, found timings easy to manage. Others were frightened at the prospect of using an unfamiliar gadget and having to calculate precise timings as well as understanding what a microwave oven can do.

The Lancaster interviewees sought help with problem appliances from a range of sources including 'a visiting policeman', friends, neighbours, relatives, a home help, NORWEB or by close reading of an instruction book. The Overton respondents also included two men who would study a manual, but were generally more likely to ask a son, daughter or close friends.

(v) Interpreting numerical/statistical information from the media

The first part of this question asked respondents to recall any numerical/statistical information they particularly sought in the newspaper or on television. In all the locations, the main information sought was concerned with weather forecasts, times of TV programmes and sport, although only half the interviewees in each place looked for information of this type. An Overton respondent also added, 'I try to keep abreast of things like VAT changes and, I mean, how can inflation be coming down? It's

impossible' (widow, seventies). This comment illustrates well the need to be able to **assess** certain types of numerical information, previously observed.

In the second part of the question, respondents were encouraged to think of any other information obtainable from the news, either in newspapers or via radio/television. Budget changes were most frequently cited across all locations, although most respondents found the question fairly difficult. Unemployment figures, interest rates and levels of inflation were also mentioned. However, Morecambe respondents who answered the question tended to add that they took an interest in these only 'when they concern me'. Of those in Lancaster and Overton who could not respond to the question - and there were no gender or age differences in this - there was a sense of not being 'able to alter anything'. Perceived lack of understanding focused particularly on financial aspects of the news - 'Wall Street and all that stuff'. Although there was a tendency to feel the finer aspects of high finance were not relevant to their lives across all the locations, particularly Morecambe respondents, there were two individuals (widow, early sixties, Lancaster; married man, eighties, Overton) who took considerable interest in these kind of financial matters.

Presumably because of lack of interest, respondents generally did not seek any help on these matters, although some members of the Rainbow Centre admitted that 'we're all good friends here - we're all in the same boat' and that they sometimes pooled knowledge and discussed a particularly newsworthy item during their visits to the Centre. Being 'filled in' by friends or relatives during informal chats was also recalled by half the Overton respondents; those in Lancaster felt able to 'manage' or that such aspects 'didn't matter'. One respondent did add, 'If I wanted to know something, I'd know where to look - like money magazines and work it out for myself' (divorced female, seventies).

5. Learning new skills in retirement

Respondents were asked to recall whether they had had to learn 'any of the things we've talked about so far' since retiring (or indeed, any new skills involving numbers) and how they had learnt. Only half of respondents in each location felt they had had to learn anything new, although there were some differences between them. The Lancaster respondents were generally confident that they 'already knew' about most matters, although taking responsibility for their own affairs in widowhood, including coping alone with home management and modern equipment, was an issue for the

older respondents. Coping alone, particularly with regard to budgeting and cooking using metric measures was an issue for those widowed among Morecambe interviewees. One respondent felt she had 'less to do' now that she lived with her daughter. Respondents here were more likely to take up a new interest such as framing pictures and tapestries (involving calculation), sequence dancing or sewing. Help had been sought at the library and from a daytime adult education class for these activities, although 'common sense' and some assistance from a daughter was usually sufficient.

Few of the Overton respondents had learnt anything new except for those who had undertaken a Treasurer's job in a local organisation. Although they tended to learn the necessary skills 'just by doing it', or 'working it out for myself', one woman had chosen to undertake a maths course to help her. The elderly man who had suffered a stroke had, of necessity, begun to invent systems for remembering dates for his daily routines and to carry out regular exercises involving spatial estimation devised by the hospital he attended regularly.

In connection with these questions, respondents were asked if there was anything they would now like to learn. This kind of question may, of course, be a difficult one to which to respond without due time for consideration and thought. Although responses, particularly in Morecambe, were generally negative - 'not at my age'; 'too long in the tooth'; 'too busy'; 'I don't need things so much now', there was some considerable interest expressed, particularly among the women in Lancaster and men in Overton in using a computer 'correctly' or for graphics. A woman respondent who had already received some instruction from her godson expressed some doubts however:

> 'I'm frightened if I got a computer it would take over my life - I'd be so interested in it, I'd do nothing else - but I'd love to do a course that was aimed at my age.'
>
> (single female, early sixties, Lancaster)

Generally gaining confidence in using numbers especially with regard to budgeting and the mysteries of VAT were also mentioned as was understanding the notation of classical music and the rules of bridge by individual respondents. A particularly interesting desire was:

> 'to understand aspects of astronomy. Like "a million light years", "infinity", "nothing" and how to visualize space. Is that astrophysics? Anyway, for me, it all ties up with the spiritual aspects of the creation of the world.'
>
> (married male, eighties, Overton)

6. Emergent issues

Although this fieldwork was carried out with three small, non-random samples, a number of points emerged which are worthy of note.

(i) The respondents were generally active and enjoyed a variety of lifestyles, although some problems with mobility, sight and memory were revealed. Even though some respondents were a generation apart in chronological age, there were no real differences in responses between age-groups. Current differences in socio-economic circumstances, such as marital status, seemed to have more bearing on the processes of individual daily life in retirement. A further influential factor seems to have been the individual career pattern across the lifespan, particularly for women respondents. On account of this, the difficulties of analysing position in the class structure in later life and thereby making correlations were noted.

(ii) Not all respondents had had bad experiences of learning number skills/maths at school. Even among those for whom this was not the case, there was evidence that number skills had been used and developed extensively in activities taking place outside school and in various jobs where they had been acquired through necessity, often on an independent basis.

(iii) Those questioned made use, as might be expected, of a range of skills in their everyday lives. Although dealing with financial matters loomed large in their activities, there was some variation in these mainly related to individual economic circumstances. Those who were widowed had more dealings with a range of professionals, although again, willingness to do so seemed to be connected to a variety of other factors such as confidence in dealing with these professionals or the availability of a close relative or friend. Some differences of attitude were identified towards taking responsibility for financial affairs in marriage, possibly the result of traditional class-based customs and beliefs about gender roles.

(iv) The range of other ways in which respondents used number skills illustrates the variety of activities undertaken in retirement. Necessary household tasks and leisure activities which call for skills very different from those of financial management occupied a majority of respondents. A notable finding was the involvement, in retirement, of some respondents in playing a role within a voluntary organisation,

together with their willingness to build upon the numerical skills already possessed or to learn new ones. This appeared particularly the case in a more rural area where local involvement is likely to be stronger. There was also evidence of a few respondents' involvement with teaching and learning from children and grandchildren.

Although not everyone would be expected to possess a full range of modern domestic appliances and consumer goods, there was a general feeling of confidence in operating those already possessed even if some respondents had taken some time to acquire the necessary knowledge and skill. These responses may be common among the population at large. Little fear of calculator usage was detected. Although some of the male respondents did not see it as part of their role to grasp the timing and operational systems of 'white goods', women, especially if widowhood necessitated it, appeared more determined to understand new technological developments. Few respondents had had access to a computer.[2]

(v) Respondents were generally least interested in news items requiring the ability to understand and interpret fairly complex financial and statistical information unless they were personally affected. (There were some notable exceptions to this, largely based on existing individual interest.) What would be of interest is the extent to which this disinterest affects other older people and other sectors of the population and the implications for democratic citizenship, however this is defined.

(vi) Although older people may not wish, for a variety of reasons, to admit to experiencing any difficulties, responses suggested that, as found previously, it was metric measurement and calculation together, to a lesser extent, with 24-hour clock timings which causes problems for these older people - although this may be true also of younger age-groups. There were variations, again possibly based upon previous experience and current need, as to how far different respondents were prepared to make use of modern electronic banking facilities. Perhaps the greatest difficulty encountered, however, was the need to take on and cope with a range of new responsibilities following the death of a spouse. Budgeting in retirement was also an issue connected to this. To a much lesser extent, some kind of debilitating illness or decline in faculties meant that new ways of organising daily life and dealing with its numeracy requirements had to be developed.

(vii) The extent to which respondents could identify sources or potential sources of help with numerically-based problems - or indeed were prepared to admit to asking for help - varied. Whilst many of the women could identify a professional source of help

ranging from an accountant to a friendly shop assistant, others showed a streak of independence in using past experience or developing new knowledge in order to 'work it out' either individually or together with a spouse. Being a member of a club or organisation suggested a dependable source of help and advice or just somewhere to talk over common difficulties with like-minded people. Otherwise, there was considerable interaction with sons/daughters (and often pride in offsprings' achievements) or other relatives and sometimes close friends whose knowledge was trusted. The nature of these relationships and the extent to which they might be reciprocal was raised in the previous Lancaster research. The findings might also be compared with responses in the British Gas survey where, although half the 764 respondents stated that they 'don't need to turn to anyone' for 'extra help' generally, 32 per cent would turn to family and 10 per cent to friends and neighbours. The financially less well-off in the 75-plus age group particularly sought assistance from family members (British Gas, 1991).

(viii) There was some variation in the extent to which respondents felt they had had to learn new skills in retirement. 'Coping alone' again surfaced as a major issue for those used to a marriage partnership, although some respondents who had made new living arrangements in retirement found they had more time to take up a new hobby or interest where number skills were required.

(ix) The evidence concerning respondents' feelings about the desirability of taking up a learning activity in the area of numerical skills was inconclusive. The self-perception of being 'too old' to learn or, in fact, of not having sufficient need or time available is often all pervasive. However, curiosity about computers and exploration of other individual interests together with the need for financial skills offers pointers for possible ways forward.

7. Conclusion

The 'conversational' interview technique developed in this fieldwork was useful in generating a wider range of examples of ways in which these older people in three different locations make use of numeracy in their everyday lives in retirement. It also helped to illustrate more clearly some of the areas which may be problematic as well as identifying the kinds of coping strategies adoped. Some of the differences which were noted in responses between the three areas might be explained by the locations in which the interviews took place and the socio-economic characteristics of respondents. These factors may also go some way to account for the observed differences in responses between these interviewees and those who took part, in a different area of the country, in the previous Lancaster pilot study.

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[1]Source: HMSO (1993) 1991 Census. County Reports: Lancashire (Part 1) Vol 2 of 2, OPCS

[2] Recent evidence from eight European countries of the design, production, distribution and useof familiar household technologies illustrates how masculinity, femininity, power and subordination continue to be created and reinforced in this sphere. See Cockburn, C and Furst-Dilic, R (eds) (1994) Bringing Technology Home. Gender and Technology in a Changing Europe, Buckingham and Philadelphia, PA, Open University.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

1. Introduction

Despite limitations of time and resources, the project was successful in exploring further some of the issues raised in the previous Lancaster research, albeit on a small scale. In particular, it attempted to widen existing notions of numeracy in everyday life by combining some of the theoretical insights derived from the literature with an illuminative research approach. In this, it represented a departure from previous, more prescriptive studies of the role of numeracy in adults' everyday lives which had involved testing on a set range of designated functional competences without clear analysis of the different **kinds** of skills and knowledge required; and/or which failed to take account of different individual life contexts.

In this chapter, some conclusions are drawn based upon the overall work of the project. Since the research was intended to have practical outcomes, the implications for those concerned with adult teaching and learning are also discussed.

2. Numerical skills used by older adults in everyday life

The findings of the main fieldwork suggest a re-classification of the table produced in Chapter Three. Because individual activities vary so greatly, it would not be sensible to list skills in any strict order of importance.

Table 4: Classification of Numerical Skills

Financial numerical skills	Mainly concerned with aspects of managing personal finances, planning personal budgets, etc
Consumer numerical skills	The process of deciding on and actually making purchases
Domestic numerical skills	Perceived as necessary by the individual for domestic activities such as cooking
Technological numerical skills	Required to understand and operate modern appliances, usually domestic; may also involve computer-based skills
Leisure numerical skills	Concerned with a whole range of leisure activities whether personal hobbies or more complex pursuits involving others

Numerical skills for voluntary activity	Concerned with the requirements of specific roles in local voluntary organisations which may be taken on in retirement
Numerical skills for 'citizenship'	Understanding, interpreting and, if appropriate, responding to statistical and other numerically-based information available within the public domain
Numerical 'mental notes'	Remembering and visualizing numbers and number sequences for a range of purposes, or for curiosity; numerology; developing personal strategies when physical problems impair abilities or judgement in dealing with practical number concerns

It has to be stressed again that these are not meant to be discrete categories, but rather, show the range of **linked** numeracy related activities with which older people may be involved at any time. It could, in fact, be argued that many of the skills are required by **all** adults in their daily lives; it is merely the emphasis which may change in retirement.

These findings offer further evidence to support Evans' contention that the goals, values, social relations, material resources and degree of precision required are crucially important in understanding each mathematically-based activity (Evans 1991). It is possible to take the arguments a stage further by suggesting that what we are discussing is not just 'numeracy' but rather 'numerous numeracies'. These different numeracies require not only the use of a variety of interlinked skills but also the ability to **change modes of mathematical thinking** even within the same activity. The sequence of tasks required in, for example, deciding on and carrying out a DIY project, which some of the male respondents often did, illustrates the different kinds of cognitive skills required. It may be that this sort of mathematical thinking has become unconsciously embedded over the lifespan and is therefore easily recalled and used **if required**. Where there is little motivation or need, skills are not recalled or developed. This may explain why few respondents were concerned with or understood much of the statistical information produced through the media. When activities impinge on their lives, they are then prepared to learn more and to move into new ways of thinking - often charting complex, demanding and unfamiliar territory.

3. The need to acquire new numerical skills

It is difficult to be prescriptive on this point and to generalise from small samples. However, what does seem to have emerged is that widowhood, particularly when experienced after a lengthy marriage, requires the individual to embark on a new and possibly unfamiliar range of tasks which may begin with immediate financial issues, but may extend to long-term budgeting needs and then to a whole range of other categories of numerical skill requirements. To a lesser extent, taking on a role in a voluntary organisation, deciding on a new hobby in retirement, etc, may also be points at which new mathematically-based thinking modes will be required. The effects of even small declines in age-related physical abilities may have individual implications for day-to-day life and personal needs.

Evidence from the interviews with providers of services and goods further suggests that the need to move into new areas of numeracy and to use and develop new skills can also be externally imposed rather than emanating from invididual life circumstances. Changes in ways in which institutions operate, the adoption of standard European practices, new product design, etc, were identified as areas which seemed to impact particularly upon the lives of older people. This may be the case especially where traditional gender roles resulted in certain numerically-based activities being undertaken by only one sex and therefore not comprehended or fully acquired by the other.

These kinds of issues have been discussed at length in relation to literacy by Barton (1994) who makes one kind of distinction between **imposed** uses of literacy and **self-generated** uses. Such an analysis might well be extended to the different numeracies identified in the fieldwork. Certainly, as Barton also points out in relation to literacy practices, it appears that older people's use of different numeracies is generally situated in broader social relations. These different numeracies are used differently within different life domains at different times.

4. Problem areas and coping strategies

In relation to the above points, it is difficult to state absolutely that there are certain areas of numeracy which are problematic for older people, since so much depends on individual life circumstances, previous mathematical knowledge and grasp of concepts, available resources, current perceptions of need and willingness to be independent in

acquiring necessary knowledge and skills. That stated, it could be suggested that it is financial matters, encompassing a whole variety of issues from claiming benefits to dealing with deceased spouse's estate, which impinge largely upon older people's lives and which, at any point, may cause the individual problems. The difficulties which may be due to even small declines in physical abilities should not be underestimated - distinguishing small coins, hearing what amounts have been requested by shopkeepers, trusting others to carry out shopping tasks, etc. To this might be added the worries some respondents displayed about their personal safety when dealing with financial transactions using electronic banking methods.

Once again, possible coping strategies tended to rely on individual circumstances. However, evidence points to older people's general determination to be independent for as long as possible, to 'work things out', to rely on past knowledge and 'common sense' and not to depend on charity. Whilst there was some willingness to seek professional help of all sorts where needed - and providers of services and goods readily acknowledged the trust placed in them - these respondents, as in the previous Lancaster research, were ready to learn from close relatives, even grandchildren, and friends and to talk over less tangible issues with friends.

5. Implications and recommendations for educators of adults

Because the project was concerned with relatively small numbers of respondents at each stage, further research with larger stratified samples would offer deeper insights into the issues raised - particularly with less mobile older people, members of ethnic minority groups whose first language is not English and those in residential homes. However, from the findings of this project, it is possible to draw out some implications for those concerned with adult learning and teaching and especially those with a particular interest in both basic skills and mathematical education for adults.

(i) The first point is that, although the evidence derived from the exercises and inquiries was not totally conclusive, it seems unwise to assume that all adults in later life necessarily disliked school and mathematics lessons in particular. There were some concrete examples of particular aspects of mathematics which interested and excited respondents and which were still remembered today. Many respondents had familiarised themselves with the use of a calculator; there was a little interest, but also some apprehension, about the use of computers. In view of current and projected developments in technology over the next decade such as moves towards home

shopping and banking, it may be appropriate to begin to devise ways in which those in, or close to retirement, could be better informed about the possibilities and practicalities of such developments in order to build upon their existing strengths even if these have been dormant for a number of years.

(ii) Related to this point, the fact that budgeting and dealing with other **financial affairs** is a significant part of older people's lives makes it tempting to recommend some kind of training concerning older people's particular difficulties for staff of financial institutions, commercial concerns, public utilities, etc. It was observed earlier that some organisations make considerable effort to be responsive to the needs of older people in this sphere (Chapter Two). However, most such concerns would expect to carry out such training in-house using their own staff. For example, many of the Inland Revenue's local tax offices have begun to develop outreach activities to assist older people with their tax problems using trained customer service managers. What may be more appropriate is a series of one-day seminars which would help to **raise awareness** among staff of the kinds of difficulties many older people face at certain points - including their problems with changing product design[1] and new banking methods.[2]

Another approach might be to make contact, as some organisations have begun to do, with local branches of older people's organisations such as the University of the Third Age (U3A), and Age Concern and to make available an outreach service which could inform and advise older people without necessarily depriving them of their independence and dignity in managing their own affairs.

Looking to the future once again, there is no reason why, as more and more families acquire home computers, those in later life should not learn to make use of personal financial software packages. Some of those currently on the market are delivered with multiple levels of expertise so that users can move from managing bank accounts and recording payments and receipts through more expert and professional activities such as VAT accounting, etc, using self-teaching techniques. Familiarity with such software could also greatly aid those who need numerical skills for **voluntary activity** in retirement. As this type of software becomes more widely available and more technically accessible, it may be that those approaching retirement will already possess the necessary hardware plus the skills and knowledge to be confident and independent in managing their own financial affairs through software packages whether at the level of personal budgeting or involving more complex demands. However, such a

development assumes that the idea of learning independently will become more generally widely accepted in the population as a whole and that access to technology will be widespread.

(iii) Closely related to the above are issues concerned with **consumer, domestic** and **technological** numerical skills. It was observed earlier that when perceived need and motivation are present, older people seem able to draw on existing understanding and a range of skills developed over many years in a variety of situations. This may be what they themselves interpret as the application of 'common sense' or the ability to 'work things out'. Certainly, as noted above, manufacturers and providers of goods and services might be persuaded to give more consideration to the availability and design of some of their products together with the provision of clear instructions in their use in view of the burgeoning numbers of older people in society[3]. However, the finding that many of the older people questioned apparently turn to younger relatives for assistance suggests the possibility of encouraging and facilitating the growth of intergenerational activity in this area. For example, adult educators might find it possible to explore ways in which other family members - especially sons and daughters - can become better informed about some of the difficulties elderly parents may face and how to deal with the issues which may arise without appearing to interfere. Contact with children and young people - whether this is through grandchildren or through more formally organised opportunities - offers younger people the chance to play a role in informing older generations about, for example, modern methods of thinking about mathematical concepts within the National Curriculum or the use of computers. At the same time, it appears that many older people, with the wealth of numerical skills and related abilities they have acquired through the lifespan have an important contribution to make in relation to younger people whether this is within the immediate family or through undertaking voluntary activities within community or civic life. These possibilities for intergenerational contact merit further exploration and evaluative research.

(iv) These points are particularly relevant to the kinds of **leisure numerical skills** which many older people appear to have developed. Some of the craft skills such as knitting or hobbies like pigeon-racing survive through skills being handed down to succeeding generations. In an age when many younger people's leisure activities are based around electronic media, older people have much to contribute in ensuring that such skills are not lost. In this way, they have a role as teachers themselves; educators of adults should be encouraged to make use of the skills and talents which many older people apparently possess. However, it may be necessary to pay attention to

unfortunate public perceptions of older people's abilities to teach and tutor others, especially where these result in restrictive age-discriminatory practices in employment.

(v) With some exceptions, the study showed that much of the financial, statistical and other numerically-based information relayed through the media generally failed to make much impact on older people unless they felt personally affected. This may, of course, also be the case with younger generations. Certainly, communication theorists have long been interested in the relationship between mass media, individual perception and the formation of public opinion. However, this finding poses something of a dilemma for those involved in the education of adults. On the one hand, it could be argued that everyone should be well informed about national and global events and trends to enable them to participate actively in the life of a democracy by practising, in Evans' words, 'critical citizenship' (Evans, 1991). On the other hand, this belief must lead us to question the nature of the democracy in which we live and to analyse the extent to which the processes of adult education itself can ever contribute to the practicalities of 'citizenship'. And to what extent should educators of adults assume responsibility for this? A more immediate solution might be persuade broadcasters in particular, to encourage more participative learning through a more rigorous analysis of styles, content and method of reporting, interpretation and presentation of important financial and statistically-based material for different audiences. Certainly, older people are known to rely on radio and television a great deal; one of the recommendations of the recent Carnegie Inquiry into the Third Age was the need for broadcasters to encourage more active learning among older viewers and listeners (Carnegie Inquiry, 1992).

(vi) The wide-ranging ways in which respondents made use of '**numerical mental notes**' offers some ways forward for educators of adults. The need to develop strategies for coping with problems caused by failing eyesight, hearing difficulties, etc, may be best addressed by older people themselves, although adult educators may want to offer the **space**, both physical and mental, to enable older people to discuss these kinds of issues. What may be more appropriate is to concentrate on devising a variety of strategies which will encourage potential older students to pursue existing interests or to explore intriguing mathematical questions in the company of like-minded others. This might be through adult education classes or courses - and the possibility of accreditation could be explored here - or through self-help activities, facilitated by a professional adult educator as appropriate. In particular, it may be possible to set up some kinds of mathematics workshop facility for interested older adults which would allow them to explore aspects in which they were interested at their own pace.

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Introductory 'hands-on' computer experience could be organised in a similar way. However, in view of the busy lives which many older people lead and their apparent self-perception of being 'too old' to learn in many cases, it may be more appropriate to offer such opportunities in a location to which older people have easy access and where they could learn with their peers at their own pace. That this can be achieved with collaboration between appropriate bodies has been demonstrated with a different group of learners in an isolated Lancashire village (Withnall, 1992b).

In the United States, the Senior Net, an on-line network for the over 55s, facilitated by the University of San Francisco, ensures that members (over 14,000 in the USA and Canada) are enabled to communicate with each other on a variety of topics over considerable distances, thereby helping to alleviate loneliness and isolation. Such a development has considerable possibilities for replication in this country and for teaching and learning activity in numeracy/maths and other subjects also.

To encourage older people to participate in learning in greater numbers certainly accords with the National Institute of Adult Continuing Education's (NIACE) recently announced METHUSELAH initiative which aims to set targets for increasing older people's participation in continuing education generally. However, this is not to imply that older people should be discouraged from joining all-age adult education classes and courses where many already learn happily alongside younger age-groups. These issues have been considered at length in a re-evaluation of what constitutes good practice in the education and training of older adults (Withnall and Percy, 1994).

6. Concluding Remarks

Numeracy and mathematics for adults are increasingly being recognised as important components both of the basic skills curriculum and within open-access further and higher education. In view of this, it seems important that the ways in which 'numeracy' is defined and used in the context of everyday life and how the concept is subject both to re-interpretation and change is explored through further empirically-based research. In particular, we need to know more not only about potential learners' early experiences of handling mathematical language and concepts but also how their skills have developed during their lives and how they have built upon their early learning. Such an approach has implications for the pedagogy of numeracy and the role of the teacher/facilitator whatever the setting. Rather than being trained to think in a particular way, learners need the opportunity to test out their ideas, to be enabled to

make connections between concepts and experience and to relate what they are learning to their daily lives as they are currently lived.[3]

In this project, the emphasis has been on the numerical skills used and needed by those over statutory retirement age. The dangers of regarding these older members of society as an easily-identifiable target group suffering uniformly from disadvantage have been continually stressed by gerontologists. In this context, we also have to remember that successive cohorts will reach retirement age - itself a social construct whose meaning has been very much eroded by social and economic forces - from a variety of backgrounds and with a whole range of experiences which are almost certainly different from those of past generations as they reach later life. Neither can we predict the kind of advances in medicine which may come to make life in the later years a very different lived experience from that of the present. For these reasons, the changing circumstances of older people's everyday lives and their usage and need for numerical skills would obviously bear further exploration. At the same time, it has to be pointed out that many of the issues raised in this project may also have relevance for younger age-groups. A current need is to develop the kind of investigative techniques which would enable the findings of this project to be explored in relation to adults in general on a larger scale and in more depth. Numeracy in all its forms underpins our everyday lives in a variety of ways; becoming aware of the ways in which it is constantly changing its meaning and of its many possibilities can only be illuminative.

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[1]The 'Thousand Elders' project underway in the Centre for Applied Gerontology at the University of Birmingham is concerned to apply ergonomic principles to the design of products and equipment used by older people in daily life.

[2] Researchers in the Department of Manufacturing and Mechanical Engineering at the University of Birmingham are investigating ways in which electronic banking methods might be made more accessible to older people, particularly those with sight and/or hearing impairments. The School of Psychology at Cardiff University is developing the Visage Security System which uses a set of three faces rather than a PIN number designed to protect cash machines from unauthorized access.

[3] Adult basic education tutors do, of course, try to build upon students' shared experiences in developing approaches to numeracy in ABE schemes and classes. The kind of processes through which adult students experience 'real' mathematical thinking have been discussed by O'Hagan (1993) 'Can ordinary people do real maths?' Viewpoints, No 16, London, ALBSU.

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