What mathematics calculations do adults do in their everyday lives?

Part 1 of a report on the Everyday Mathematics Project




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This first part of a report on the Everyday Mathematics Project presents information about the topics, frequency, amount, type and methods used by adults in calculations in their everyday lives. This serves to demonstrate the relevance of primary school mathematics, especially in terms of mental computation and estimation strategies situated within authentic contexts.

Introduction

The type of mathematics taught in schools is often criticised for being irrelevant to students' lives and not based in 'real life'. This article is Part 1 of a three part report that documents the findings of a research project that investigated the mathematical calculations completed by adults in their everyday, non-occupational lives in an Australian context.

Part 1 of the report on the Everyday Mathematics Project, outlines the findings that emerged from analysing data gathered from 160 participants who were asked to record the mathematics they completed in their everyday, non-occupational lives. Firstly, they were asked to describe three of their most typical types of mathematics calculations and, next, they completed a daily log of their everyday mathematics calculations. In all, details of over 1200 calculations were collected during the first stage of the study and these calculations are the focus of this article. Based on an analysis of 1224 calculations from 160 participants, this article summarises the topics, frequency, amount, type, difficulty level and methods used in these calculations.

What mathematics did we do in 1999 and before?

Almost sixty years ago, Wandt and Brown (1957) reported on a study undertaken in California which investigated the way adults performed non-occupational calculations in their everyday lives. Wandt and Brown were among the first researchers to investigate social usage of mathematics in adult life. They were particularly interested in the role of mental mathematics and in the role of approximate solutions to problems, or estimation as it is called today. The findings of their study revealed that mental calculations outnumbered paper and pencil (written) calculations, and that, while many calculations required an estimated answer (30%), most calculations required an exact answer (70%). Lave (1988) provided further insight into the calculations that were completed by adults and the context in which they took place, such as shopping and personal weight management. Her work demonstrated that the way in which mathematics was used in everyday life did not necessarily reflect the formal calculation processes that were taught in schools. Although involving children rather than adults, the study by Saxe (1988) also found that the way mathematical problems were addressed in everyday contexts (for example, selling candy) was influenced by the cultural contexts in which they occurred. The problems associated with de-contextualising mathematics calculations were further explored by Evans (2000) and Greiffenhagen and Sharrock (2008).

Seventeen years ago a research study was conducted in Australia to determine the types of mathematics calculations completed by adults in their everyday, non-occupational lives (Northcote & McIntosh, 1999). The study became known as the SAUCER (So, Adults Use Calculations Everyday Research) Project. By building on and replicating aspects of Wandt and Brown's (1957)

much earlier seminal study, the SAUCER Project aimed to supplement our knowledge of everyday mathematics within an Australian context. The 1999 study (Northcote & McIntosh) included 196 participants who reported 596 calculations that they completed in their everyday, non-occupational lives. Like Wandt and Brown's earlier study (1957), the SAUCER project required participants to record their mathematical calculations across a one day period. The study found that a high proportion of calculations (85%) completed by adults in their everyday, non-occupational lives involved some form of mental mathematics. More of their calculations were estimations (58%) compared to those that required an exact answer (40%). Addition (46%) and subtraction (42%) dominated the mathematical operations that featured in their calculations. When the calculations were analysed to determine their purpose, time-related issues dominated (25%), followed by calculations associated with shopping and money (23%).

When asked about the location in which calculations were completed, almost half (48%) of the calculations reported took place in the participants' homes—mainly in the kitchen for the purposes of food preparation and cooking. Of the remaining calculations completed outside the home, the most frequently reported location was a shop. Over two thirds of the calculations were deemed to be at a lower primary level of difficulty with the remaining calculations (35%) at an upper primary level and very few (under 2%) at a secondary school level. A variety of objects such as clocks and measuring devices were used in 19% of the calculations whereas only 12% of calculations involved the use of calculators. Most calculations took place in the morning and, on average, the participants in the study completed 3 calculations per day.

Between 1999 and 2015

Since the 1999 (Northcote & McIntosh) study was conducted and published, a number of changes have occurred in the *Australian Curriculum: Mathematics* (Australian Curriculum Assessment and Reporting Authority, 2013). Also, Australian teaching standards have been defined at a national level (Australian Curriculum Assessment and Reporting Authority, 2013). While changes in the curriculum and teaching standards have influenced what and how mathematics is taught in Australia, changes in technology have influenced mathematics and the way we teach mathematics (Attard, 2013; Goldenberg, 2000; Myers, 2009). Our use of technology has increased, especially our use of online, mobile and computerised technologies, resulting in a mixture of both positive and negative impacts (Lentz, Kyeong-Ju Seo, & Gruner, 2014; Price & Kirkwood, 2014; Rosen et al., 2014). Benefits to children's mathematical learning have been identified in some contexts as a result of using technology, especially in association with the use of virtual manipulatives, mathematical play in virtual contexts and computational fluency (Lentz et al., 2014; White & Singh, 2005). However, one of the problems associated with the overuse of technology by children and teens, not just in school but in their lives in general, has been "increased obesity, reduced physical activity, and decreased health" (Rosen et al., 2014, p. 364).

Despite the benefits and disadvantages of using technology in mathematics contexts, technology has become an incidental aspect of most people's everyday lives. This development is reflected in the rationale for the new Australian mathematics curriculum which cites the use of technology as being integral to mathematics:

> Mathematical ideas have evolved across all cultures over thousands of years, and are constantly developing. Digital technologies are facilitating this expansion of ideas and providing access to new tools for continuing mathematical exploration and invention. (Australian Curriculum Assessment and Reporting Authority, 2013)

The application of learned mathematics to everyday life has also become more topical; teachers are encouraged to teach mathematics in a way that is relevant, meaningful and authentic (Carraher & Schliemann, 2002; Coben, 2003; National Numeracy Review Report Panel, 2008). *The National Numeracy Review Report* (National Numeracy Review Report Panel, 2008) describes functional numeracy as "everyday fluency with arithmetic and measurement and perhaps the capacity to find one's way around" (p. 5). Much has been written about students' and teachers' views about everyday mathematics (Coben, O'Donoghue, & FitzSimons, 2000; Kargar,

Tarmizia, & Bayat, 2010; Thompson, 1993; Vale, 2002; White, Way, Perry, & Southwell, 2005/2006) and the effect of poor numeracy on the lives of adults (Parsons & Bynner, 2005).

However, little research has been conducted to validate claims about the actual everyday mathematics completed by adults, and adult numeracy continues to be an under-researched area (Coben, 2003). Despite a plethora of research studies arguing that everyday mathematics should be taught to children and adults, and a compilation of assessments aimed to establish adult competency in mathematics and the outcomes of curriculum modification (Cooper, Cooper, & Dunne, 2000; Evans, 2000), little further research since Wandt and Brown (1957), Lave (1988) and Northcote and McIntosh (1999) has been conducted to establish the specific types of mathematics adults engage in on a daily basis. Furthermore, very few, if any, investigations have been conducted to determine the type of non-occupational mathematics calculations completed by adults within Australian contexts. The importance of adult numeracy in everyday life has long been, and continues to be, a concern for educators, school administrators and government bodies (Coben, 2003; Gal, 2000; Johnston, 2002; National Numeracy Review Report Panel, 2008; Parsons & Bynner, 2005).

The 2011–2014 study: Everyday Mathematics Project

To update the findings from the 1999 study (Northcote & McIntosh), a cross-institutional research team from Avondale College of Higher Education in New South Wales and Edith Cowan University in Western Australia replicated the earlier study to determine the types, amount and nature of mathematics calculations completed in the everyday, non-occupational lives of a group of 160 adults in Australia. This study has become known as the Everyday Mathematics Project, or SAUCER II, and was conducted between 2011 and 2014. To gather information of both a qualitative and quantitative nature, a mixed methods (Creswell & Plano Clark, 2011) research approach was adopted. This methodology ensured that the number, type and context of the calculations could be investigated. To select its participants, researchers in the recent Everyday Mathematics Project utilised a mixture of sampling methods including selective sampling (Burns, 2000), to ensure a spread of participants from a range of age groups, and convenience sampling (Patton, 2015), to extend the sampling within each age group.

To determine the actual calculations completed, as well as the purpose and context of these calculations, all of the 160 participants in the study completed a questionnaire and kept a daily log of calculations. Twenty of the participants were also interviewed. Five types of data were gathered:

- **Data pool 1: Participant information**
  Demographic information from the 160 participants was collected, including age group, gender, location of residence, occupation and level of education reached.
- **Data pool 2: Typical calculations**
  Before they completed a 24-hour log of their mathematics calculations, participants were asked to identify three of the most typical types of calculations they completed in their everyday lives. In all, 450 calculations were described by the 160 participants.
- **Data pool 3: Daily log of calculations**
  Each participant kept a 24-hour log of the non-occupational mathematics calculations they completed in their everyday lives. A total of 774 calculations were reported.
- **Data pool 4: Situational data**
  As part of the 24-hour log, additional situational data were gathered about the context of each of the 774 calculations including location, methods, topic, purpose, difficulty level and nature of the calculations.
- **Data pool 5: Interviews**
  Twenty participants were interviewed to gather further calculation examples and to explore detailed information about the context of their calculations.

Analysis of the qualitative data gathered from the participants' responses to the open-ended questionnaire items and interviews was conducted using content-analysis and comparative-analysis methods (Patton, 2015). The quantitative data gathered from the questionnaires were analysed by compiling summaries and descriptive statistics, and correlation tests were conducted to determine relationships between the data sets. Each categorisation of data in the findings presented in this article, has been linked to the specific data pools from which they were sourced.

This article outlines the findings that emerged from analysing data pools 1–3. Part 2 of the report (future article) will report on the findings from data pools 4–5. Finally, Part 3 of the report will consider pedagogical implications of the study in conjunction with the current *Australian Curriculum: Mathematics* (Australian Curriculum Assessment and Reporting Authority, 2013).

Participants in the Everyday Mathematics Project (2011–2014)[1]

In the recent study, participants from six different age groups were sought, including 160 participants from the age of 18, through to people over 70 years of age (see Table 1).

Table 1: Number and age of participants in the 2011–2014 Everyday Mathematics Project.

Age range	No. of participants	Percentage of participants
18–30	42	26
31–40	22	14
41–50	22	14
51–60	23	14
61–70	14	9
71+	37	23
TOTAL	**160**	**100**

Further demographic information about the participants is outlined in Table 2, including their gender, primary occupation, highest level of occupation and residential location.

Table 2: Demographic information about the participants.

	No. of participants	Percentage of participants
Gender		
Female	103	64
Male	52	33
Not specified	5	3
Primary occupation		
Professional	48	30
Retired	43	27
Student	38	24
Home duties	9	6
Trades	7	4
Other or not specified	17	11
Highest level of education		
University or college	95	59
High school	41	26
TAFE	15	9
Other or not specified	9	6
Residential location[2]		
Western Australia	83	52
New South Wales	75	47
Queensland	1	0.6
Victoria	1	0.6

Findings from the 2011–2014 study: Everyday Mathematics Project

From the 450 typical calculations and the 774 daily calculations that the 160 participants reported in the current study, the topic, number, method, difficulty levels and exact or estimated nature of these calculations were analysed[3]. Examples of each calculation type were also collected and analysed. The outcomes of these analyses are outlined below.

An analysis of the 1224 calculations reported by the 160 participants in their questionnaires and daily logs provided insight into how these calculations were related to the mathematics topics represented by the three strands of the *Australian Curriculum: Mathematics* (Australian Curriculum Assessment and Reporting Authority, 2013). In some cases, calculations reflected one or more strands. Over 80% of all calculations were related

Topic of calculations

1. Demographic data about the participants was sourced from Data pool 1: Participant information, described earlier in this article.
2. Most participants lived in suburban or semi-rural locations.
3. Findings reported in this article were sourced from Data pool 2: Typical calculations (450 in all) and Data pool 3: Daily log of calculations (774 in all), described earlier in this article.

to number and algebra and just over 60% were related to measurement and geometry. Very few calculations (less than 1%) related to statistics and probability[4].

When each calculation was categorised according to the topics of the strands and content descriptions in the *Australian Curriculum: Mathematics* the most common topics of calculations were revealed as being either money and financial (in the number and algebra strand) or time (in the measurement and geometry strand). For example, "Figuring out my gross pay for the hours I worked last week, e.g., 32 × 22.11 = $70.52" and "What time do I need to go to the gym for a half hour run + 15 minutes drive to work to be there by 3 pm? 30 + 15 + 15 = 60 minutes (1 hour) = 2 pm". The top ten most common mathematics topics reflected across the 1224 calculations are outlined in Table 3.

Table 3: Top ten most common mathematics topics[5]

Mathematics topic	No. of calculations	Percentage of 1224 calculations[1]
Money and financial	388	32
Time	370	30
Subtraction	195	16
Addition	194	16
Counting	145	12
Mass and height	105	9
Length and distance	104	8
Volume and capacity	87	7
Multiplication	48	4
Fractions and ratios	27	2

Calculation method used

While reporting the calculations they completed within a 24-hour period (774 calculations in all), participants were asked to record the method they used. The methods they reported included: mental, written, computer, phone, calculator, use of an object, discussion, counting aloud and drawing. Some calculations were completed using a combination of these methods. Most of the calculations were completed using one method only (636 calculations, 82%), 116 calculations (15%) involved the use of two methods, 16 calculations (2%) involved three methods and 4 calculations (0.5%) involved a combination of more than three methods.

The most common method was mental mathematics being used in 665 (86%) of the 774 daily calculations reported:

- 551 calculations (71%) involved the use of mental mathematics alone; and
- 114 calculations (15%) involved the use of mental mathematics with an additional method (such as written, calculator, phone, discussion, object, computer).

The second most common method, written mathematics, was used in 79 (10%) of the 774 daily calculations reported, including:

- 26 calculations (3%) involved the use of written mathematics alone; and
- 53 calculations (7%) involved the use of written mathematics with an additional method (such as mental, calculator, object, computer).

Other calculation methods included:

- the use of an object such as such as measuring scales, measuring tapes, cups, watches, clocks, playing cards, timetables, receipts and rulers (72 calculations; 9%);
- the use of a calculator (60 calculations; 8%);
- the use of a computer (25 calculations; 3%);
- discussion (6 calculations; 1%);
- the use of a phone (5 calculations; 1%);
- counting aloud (3 calculations; 0.5%); and
- a drawing (1 calculation; 0.1%).

Most of the calculations that involved the use of objects were related to measurement, such as using a measuring cup described as "making spag bol for dinner—needed to measure sauces" or using a ruler in a quilting class for "measuring and cutting fabric (to scale)". Surprisingly, the use of mobile phones and computerised technology in the context of completing mathematical calculations did not feature as strongly as may have been expected in this set of results. As very few calculations were completed in discussion with others (for example, discussing day-care costs with a spouse or discussing credit card payments with a bank advisor), it is assumed that most calculations were conducted by individuals working on their own.

4. Because some calculations were categorised as being related to more than one mathematics topic, these percentage statistics add up to more than 100.
5. Because some calculations were categorised as being related to more than one mathematics topic, these percentage statistics add up to more than 100.

Exact or estimate

All but two of the 774 daily calculations were reported by the participants as requiring either an estimated answer, an exact answer or an answer which included a combination of an estimated and an exact answer. More than half (62%, 476 of 772) of the calculations recorded in their daily log required an exact answer, such as "How much money would I have left in my bank account? $300 – $120 = $180. On the other hand, 37% (285 of 772) of answers to their calculations required an estimated answer such as "I estimated the time I would take to iron 3 handkerchiefs, 2 shirts, and 1 pair of pyjamas to see if I could do it before visitors arrived". Very few answers (1.5%, 11 of 772) required a combination of both exact and estimated answers.

Level of difficulty

Of the 762 calculations that were allocated a difficulty level by the participants when provided with a 1 (easy) to 5 (difficult) scale, most calculations were categorised as being easy (level 1) or quite easy (level 2) whereas very few of the calculations were categorised as quite difficult (level 4) or difficult (level 5). Table 4 outlines these findings. A proportion of the calculations were categorised by the participants in the study as neutral in terms of difficulty. The participants made their own judgements on the levels of difficulty; therefore, they are subjective assessments based on their perceptions of their own abilities in mathematics.

Table 4: Difficulty level of calculations in the Everyday Mathematics Project.

Level of difficulty	No. of calculations	Percentage of total (762)
1. Easy	501	66
2. Quite easy	174	23
3. Neutral	66	9
4. Quite difficult	16	2
5. Difficult	5	1

Amount and frequency of daily calculations

The number of daily calculations completed by each of the 160 participants each day ranged from 1 to 18 (range = 17). The mode, or the most typical number of calculations completed each day (by 38 people), was 3. The mean number of calculations that adults completed on a daily basis was 4.8. When analysed by age group, the 18–30 year olds completed the fewest calculations (mean = 4.17) whereas the 61–70 year old age group completed the most calculations (mean = 6.57) across a period of one day. Overall, except for the 70+ year olds (mean = 4.62), there was an increase in the average number of calculations per day as the participants' age group increased: showing a lower number of calculations completed by the younger age group and a higher number of calculations completed by most older age groups (see Figure 1). A Pearson product-moment correlation coefficient was computed to assess the relationship between the mean age of participants and the mean number of calculations reported in a 24-hour period. Between the 18–30 and 61–70 age groups, there was a high positive correlation between the two variables ($r = 0.95$, $n = 5$, $p = 0.007$) but this reduced when the 71+ age group was included. This finding was quite different from the findings of Wandt and Brown's (1957) study which stated: "No correlation with age was apparent in an inspection of the data" (p. 152).

So, what has changed since 1999?

Similar to the claims made by Brinkworth (1998) about students' preferences for mental mathematics strategies, the adult participants in this study also preferred to use mental rather than written strategies. This result was largely similar to the findings of previous studies about the prevalence of mental strategies above and beyond written strategies in adults' non-occupational mathematical calculations (Northcote & McIntosh, 1999; Wandt & Brown, 1957). Interestingly, less of the calculations in the recent study were reported as being completed by using objects (9%) compared to the 1999 study in which 19% of calculations were completed using objects. However, the number of calculations in which calculators were used (8% in the recent study and 12% in the earlier study) has not changed substantially, although participants may not have reported extensive use of calculators in the recent study since their availability is now incidental in everyday life for many people (for example, on mobile phones).

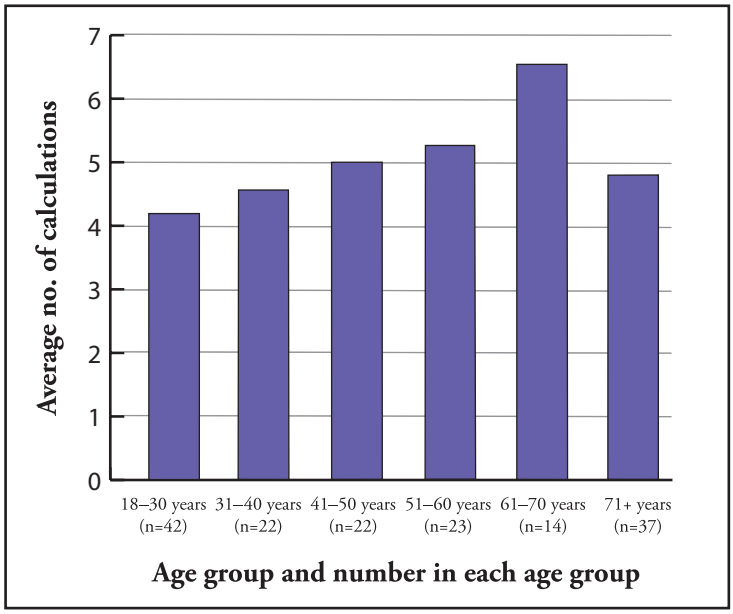


Figure 1: Average number of calculations by age group per day.

Wandt and Brown (1957) found that almost one third (193 of 634) of calculations were approximate, which led them to conclude that "approximations do enter into a sizeable percentage of everyday applications of mathematics" (p. 153). However, most of the calculations in the Wandt and Brown (1957) study were exact: 70% (441 of 634) of calculations. By 1999, the trends were somewhat reversed. The 1999 study (Northcote & McIntosh) indicated that most calculations were estimations (58%), compared to 40% of calculations which required an exact answer. More recently, the trends have reversed again. This study's results about estimations and exact answers were more similar to Wandt and Brown's (1957) earlier findings. These recent results indicated that most of the reported calculations required an exact answer (62%), compared to 37% of calculations that required an estimated answer.

In terms of the numbers of calculations reported during a 24-hour period, this recent study found that participants completed an average of five calculations, which was higher than Wandt and Brown's (1957) results of four calculations per day, whereas the earlier 1999 study found that the participants completed three calculations per day. This change may be due to the inclusion of wider age groups of participants in the recent study. These results should be interpreted conservatively, as Wandt and Brown suggest:

> Since there were undoubtedly some applications that were inadvertently omitted in the reports of the subjects, this figure should be considered to be a conservative estimate of the average number of non-occupational applications of mathematics made daily by the subjects in our sample. (p. 152).

Surprisingly, the results that emerged from analysing the participants' typical calculations and their 24-hour logs of mathematical calculations in this replicated study did not reveal evidence that internet-connected devices or mobile technologies featured strongly in the processes that adults used to complete mathematical calculations in their every-day, non-occupational lives. There may be many reasons for this. For example, the use of mobile-phones, hand-held tablets and laptop computers may be viewed as so common in every-day life that the participants may simply have forgotten to record how or when they were used. The incidental use of technology may have reached a point where it is almost transparent to some of the participants in the study. However, when interviewed, participants described additional examples of how they used technology to complete mathematical calculations. Findings from an analysis of the participants' interviews will be reported in the second article of this series of three articles, *How, Where And Why Do Adults Do Mathematics Calculations In Their Everyday Lives?*, to be published in a future issue of this journal.

In terms of the topics of calculations completed, the recent study's results were very similar to the 1999 study; most calculations were related to money and financial issues or time, and more calculations involved the operations of subtraction and addition

than multiplication or division. For example, "I calculated the change I would receive from $20 after spending $13.51 on fruit and groceries" and "Calculated the cost of graduation $65 + $65 + $175 = $305". The dominance of addition and subtraction may be due to these operations being easy to complete and because these types of calculations are so common in everyday contexts. Also similar to the 1999 study, the 2011–2014 study found that very few calculations were considered difficult with most calculations being reported as being easy or quite easy.

While age has not been a heavily researched factor in the numeracy and mathematical skills of adults, Coben (2003, p. 10) reported that "Younger and older adults tend to have slightly poorer skills". Although our project did not attempt to assess adult mathematics abilities or numeracy expertise, the results of this study show that older adults tend to do more mathematics in their everyday lives than the younger adults who participated in the study. Alternatively, the older adults in the study may have been more aware of themselves doing mathematical calculations and, therefore, may have recorded more calculations than their younger counterparts. Or, younger people may have had particular reasons for not completing calculations as regularly as older people.

Lave (1988) found that everyday mathematics was not necessarily viewed as being related to completing calculations, but as part of an everyday activity such as grocery shopping. For example, "Paid for groceries $40 and received $4 change. $40 – $36 = $4". This phenomenon may also be present in the findings of this study, as participants may have undertaken more mathematics than they reported. However, while Lave found that social relationships were often integral to everyday mathematics activities, the results of this study do not reflect this—most calculations were completed by the participants on their own.

The lack of calculations that appeared to be related to the *Australian Curriculum: Mathematics* strand of statistics and probability may be due to participants not associating this strand of mathematics with calculations, such as those involved in sports reports or articles in the press that include graphs and tables. In 1957, when the Wandt and Brown study was conducted, statistics and probability was not generally considered to be a part of mathematics so it is not possible to compare this aspect of the recent study with their earlier study.

While the results of this recent study into the everyday mathematics calculations completed by adults can be compared to earlier studies, one of the most important contributions of this study is that it was completed within an Australian context and no such studies that we are aware of, since the earlier 1999 study, have taken place in Australia. As such, this study provides a unique account of the types of mathematical calculations reported across a range of contexts and age groups by 160 adults living in Australia.

Initial implications of the findings for teachers

The findings presented here about the topics, frequency, amount, type, nature, and methods used in calculations performed by adults in everyday life represent a collection of authentic examples of how mathematics is used in the non-occupational lives of 160 adults ranging from the age of 18 through to over 70 years. The results of the study itself could be shared with students to demonstrate the relevance of their primary school mathematics curriculum to application in adult life. Also, the data collection instruments could be used with students to encourage them to study their own use, or their family members' use, of everyday mathematics. Furthermore, the actual examples of the calculations reported in this study could be incorporated by teachers into practical activities for children to demonstrate types and topics of typical mathematics calculations.

Although the purpose of school is not only to prepare students to be competent in the everyday uses of mathematics, there are some clear links between the structure and content of the *Australian Curriculum: Mathematics* and the types of calculations reported by the participants in this recent study of non-occupational mathematical calculations. For example, the heavy emphasis on calculations involving number appears to justify the large proportion dedicated to number and algebra as a strand in the *Australian Curriculum: Mathematics.* Furthermore, the importance of the topics, money and financial mathematics, and units of measurement, in the *Australian Curriculum: Mathematics* becomes more evident as these were

highlighted as some of the most common types of calculations. Similarly, the high proportion of calculations that relied upon mental mathematics skills (86%) appears to justify this aspect of the current curriculum. Since much of the mathematics reported in this study required exact calculations (62%), compared to 37% which involved estimations, teachers are recommended to include both types of exact and estimated calculations in the activities they plan for primary school aged children.

Since many calculations were categorised as involving more than one operation or more than one topic or type of calculation, these findings support the way in which many teachers already set mathematics problems for children in primary mathematics classrooms; that is, using a combination of authentically-based methods, topics and operations. The fact that many calculations were deemed, by the participants, to be equivalent in difficulty to lower or middle primary school mathematics, highlights the relevance of primary school mathematics to everyday life. Further pedagogical implications for how the findings of this study may be applied to primary mathematics classrooms will be presented in the two follow-up articles that will be published in the future about this project, as Part 2 and Part 3 of this research report.

Conclusion

This recent (2011–2014) study has shown that the most common topics of the everyday, non-occupational mathematics calculations completed by the sample of 160 adult participants were related to time, money or financial issues and these calculations were broadly grouped as number or measurement calculations. On average, the participants completed about 5 calculations per day but the most common amount of calculations completed by 38 people was 3. There was a strong correlation between the participants' age group and the amount of calculations they completed each day; participants in the 18–30 year old age group completed the least amount of calculations whereas those in the 61–70 year old age group completed the most calculations.

The most commonly used method of calculation was mental mathematics and the second most common method that participants used to complete a calculation included some form of written method, or 'paper and pencil' as Wandt and Brown (1957) would have described such a calculation. Participants also reported using calculators and other objects to complete calculations. Some used computers and phones, while other participants discussed their calculations with other people, counted aloud or created drawings. By far, most of the calculations appeared to be completed by the participant on their own, rather than with someone else. The majority of the calculations were categorised by the participants as being at a low level of difficulty, equivalent with lower or middle primary school mathematics, and very few of the calculations were categorised as being difficult. More than half of the calculations required an exact answer whereas just over a third required an estimated answer. This represented a definite change in the results of earlier studies (Northcote & McIntosh, 1999; Wandt & Brown, 1957).

This article is the first in a series of three articles that will report on the Everyday Mathematics Project (2011–2014) in the *Australian Primary Mathematics Teacher* journal. The second article in this series, *How, Where And Why Do Adults Do Mathematics Calculations In Their Everyday Lives?*, will focus on the context of the mathematics calculations completed by the participants in this study and the third article, *Adults' Everyday Mathematics Calculations: What Does It Mean For Our Teaching?*, will further consider the pedagogical implications of this project for primary school teachers of mathematics.

Note regarding percentages quoted in this article

For ease of reading, the percentages presented in this article have been rounded down or up to the nearest whole number, except where the percentage result was less than 1.0.

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