



# home-education

comparison of home- and school-educated children on PIPS baseline assessments

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## ABSTRACT

This article reports on the performance of reception-aged, home-educated children. Media reports tend to focus on older home-educated children withdrawing from school but very little is known about younger children many of whom have never been to school. This research sought insight into the learning experience of these young children. The study involved 35 home-educated children aged between four and five years of age, from diverse socio-economic backgrounds. The children were assessed using the Performance Indicators in Primary Schools (Start and End of Reception). Whilst the home-educated children outscored their school counterparts, those from lower socio-economic groups outperformed their middle class peers. It appeared that a flexible approach to education, and a high level of parental attention and commitment, regardless of their socio-economic group and level of education, seemed the most important factors in the children's development and progress.

**KEYWORDS** *alternative, attainment, autonomous learning, child-centred, early learning, homeschooling, informal learning*

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## introduction

### background

School is not compulsory in the United Kingdom, contrary to some official notices, for example:

Was your child born between the 1st September 1999 and 31st August 2000? Have you registered your child's name at a school? If not you must do so before 6th Feb 2004. (Oldham Metropolitan Borough Council, 2002)

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In the UK it is not necessary either to register as a home-educator or to ask anyone's permission. There are believed to be about 50,000 children being home-educated throughout the UK (Meighan, 1997), but no one knows just how many there really are. Many parents choose to avoid contact with their local education authority (Lowden, 1993). Rothermel (2002) in a study of 419 home-educating families found the percentage of home-educators not known to their LEA was somewhere between 31 per cent and 65 per cent (in responding to questions some families answered precisely, others with ambiguity). Rothermel (2002) also found that about 50 per cent of home-educated children had never been to school.

These 'not-schooled' children make an extremely interesting group to study. For one thing, study of them is one way we can know more about the value of school for children. Apart from a handful of studies focusing specifically on home-education (e.g. Thomas, 1998), research on school-age children generally looks only at schoolchildren. Rothermel (2002) however, evaluates non-school academic experience in comparison with school performance. Many studies aim to evaluate children's learning and attitudes to school, and yet almost unbelievably, none of these studies has ever used children whose families are electively home-educating as a control.

A recent study that claims to compare 'home children' with children who have attended a formal pre-school setting is Sylva et al. (2003). These researchers used a control of 300 'home' children to evaluate the effectiveness of pre-school education (the EPPE Project). They conclude that, 'pre-school attendance improves all children's cognitive development'. However, it is important to note that their sample of 30,000 children was selected with a bias towards underprivileged families, and that their 'home' children were not chosen from families intending to home-educate (that is to say, these families were mostly anticipating that their children would soon enter school). Thus, the finding that pre-school attendance is better than none may seriously undermine the real value that the family environment can have.

The first year at school has been described as a predictor of future development (Pederson et al., 1978) and one that has a powerful influence on the children (Riley, 1996). Tymms et al. (1997), having evaluated children's learning using their Performance Indicators in Primary Schools (PIPS) Baseline assessment, also concluded that the initial year at school is the one where pupils make the greatest advance in learning. A description of the PIPS assessment appears in Tymms et al. (1997).

Tymms et al. (1997) suggested that in comparing attainment between children who had not yet been to school and those of the same age who had attended for one year, the variance in scores signified that school made a 'massive difference' (in 'Reading' and 'Maths'). They reported that:

. . . it is hardly an unexpected finding to discover that teaching advances learning

. . . For progress what really mattered was attendance at school, the pupil's prior achievements and the school that they attend. (Tymms et al., 1997: 117)

However, their comparison did not contrast schooled with not-schooled children but rather, compared scores from children at either end of the start of reception age scale during school time.

### **academic attainment of home-educated children**

The academic attainment of home-educated children has been well documented. Most recently, figures from the New Zealand Department of Education, from a survey of 619 home-schooled children, indicated that 90 per cent were 'taught at least as regularly and well as in a registered school' (Hollings, 2004). Other supporting research comes from North America, (e.g. Dellahooke, 1986; Lyman, 1998; Rakestraw, 1987, 1988; Ray, 1986, 1991, 1992, 1997, 1998; Rudner, 1999; Scogin, 1986; Tipton, 1990; Van Galen and Pitman, 1991; Wartes, 1987, 1988, 1989, 1990). As yet there appears to be little, if any, published research in the UK.

Bearing in mind that scores on the 50th percentile represent average performance, Ray (1998) determined that home-educated children in the USA scored at the 87th and 80th percentiles in reading and language respectively, while Wartes (1988) found home-schooled children at the 66th percentile, concluding too that maths performance was substantially above average. Scogin (1986) assessed 591 children from 300 families, finding that 73 per cent of home-schooled children were at least a year ahead of their schooled peers in reading. More recently, Rudner's (1999) study involving 20,760 school-aged children found that 50 per cent of the 13-year-old home-schooled children achieved the equivalent of four grades above the public schoolchildren's median scores. He also confirmed above average maths performance with children scoring at the 85th percentile for Reading and the 79th for Maths.

In 1995, an unpublished report was made available to this author by its LEA author examined the reading ages of 70 home-educated children aged between six and 11 years, using an established sentence reading test regularly administered in schools. The cohort was taken from all home-educating families known to one LEA and participation was voluntary. This study observed that the children who had never attended school were, on average, 9.85 months ahead of the expected reading level for their chronological age, while those children who had spent a period at school demonstrated a reading age averaging 4.6 months ahead. Overall 70 per cent of the home-educated children demonstrated reading ages above their chronological age.

Also in the UK, Rothermel (2002), explored the academic attainment of post-reception-aged home-educated children aged 6 to 11 years. Two tests were used: the National Literacy Project Assessments (NLP) with years 1, 3, 5 and

the Performance Indicators in Primary Schools (PIPS Year 2). Each age cohort involved between 18 and 30 children. The NLP assessment results revealed that 80.4 per cent of the home-educated children obtained scores that placed them in the band attained by just 16 per cent of children nationally, whilst 77.4 per cent of the PIPS Year 2 home-educated cohort were similarly graded. Neither social class, religion, parental level of education or having qualified teachers as parents were indicators of children's attainment. The findings gave support to earlier studies that have found home-educated children to achieve grades equal to and better than, their school counterparts.

### **home-education is not school at home**

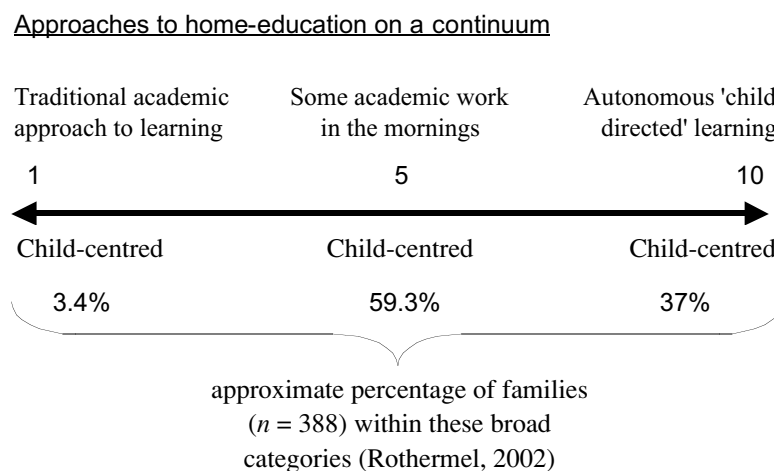
An important distinction to make in any discussion of home-education is that home-education does not equate to school at home. Score-based comparisons therefore, need to be considered in context. In understanding home-education, the difference between formal and informal learning can be particularly important. Thomas (1998) describes formal education as taking place within a classroom setting whilst, 'informal learning can be conceived as of an extension of learning from early childhood' (Thomas, 1998: 5).

Thomas suggests that whilst an informal setting may involve periods of sitting at a table with an adult, it can as easily mean learning in the ordinary course of everyday life, such as during a car journey or visit to the supermarket. Informal learning is synonymous with home-education because it does not take place in a formal institution such as school. Generally speaking, informal education is child-centred and follows the child's lead in allowing children to learn at their own pace, that is to say, there are no imposed age-related targets and the children are most likely to pursue areas of study that interest them rather than those imposed by adults. Schools sometimes purport to let children learn 'at their own pace' (DFES, 2004) but this style of learning is perhaps more usefully applied to a child-centred model, such as the individually tailored approach of home-education.

Home-education takes many formats and Figure 1 may assist in visualizing these. Approaches are shown on a 1-10 continuum with home-education characterized throughout as 'child-centred'. Of course, there may be more, or fewer, child-centred families, but on the whole home education is a child-centred phenomena, whether it involves laissez-faire learning or formal teaching. Religious families tend to come from across the traditional-autonomous spectrum, although the extent to which the more traditional families may be deemed child-centred is open to debate. Thus, the child-centred description in Figure 1 is a generalization rather than rule.

Figure 1 shows the most common format for home-education is one where the children spend whole or part of their mornings engaged in educational

**figure 1** illustration of approaches to home-education in very approximate terms



activities with a facilitating adult (Rothermel, 2002). Also popular with home-educators, however, appears to be an education whereby every day is different and learning is through 'living and doing'. This tends to involve negotiation between adult and child and activities may or may not be supervised or structured. Autonomous education or 'unschooling', as it is called in the USA, is one where the central tenet is child-directed learning (as opposed to child-centred) whereby 'children determine what they learn, when they learn, how they learn, and why they learn' (Bell, 1998) and the child follows his or her 'own interests entirely, with encouragement and access to a wide range of resources' (Home-education UK, 2004). Thus, 'Unschooling is the process of learning through life' (The Freechild Project, 2003).

There are those who relate home-education to 'hothousing', where children are actively engaged in accelerated learning. However, there is no evidence to indicate that this style of education is popular with present day home-educators, especially in the UK. On the contrary, the association between home-education and unconventional families is fast fading as researchers increasingly find home-education taken up by 'mainstream' families (Aurini and Davies, 2004).

Generally speaking, the literature (e.g. Thomas, 1998) suggests that home-education represents a relaxed method of learning enjoyed by parents and children, and more associated with a lifestyle choice than a wish to compete with, or replicate, school. The educational attainments of home-education children described above are particularly surprising given that the nature of home-education is informal and far less structured than school.

The more relaxed and child-centred nature of home education, together

with the evidence that most families have planned it since their children's early years, indicates that children may differ from school-educated children in their progress in literacy and numeracy. In particular, three possibilities are explored in this article:

- 1) Tymms et al. (1997) have reported schoolchildren making substantial progress in the first year of formal schooling. There is no reason to suppose the home-educated children will make similar progress at the same age.
- 2) Home-educated children may be later in acquiring literacy and numeracy skills than schoolchildren due to their parents' more informal approach.
- 3) Alternatively, home-educated children may acquire literacy and numeracy skills before schoolchildren as their parents see themselves as having explicit educational responsibilities at a younger age than parents of schoolchildren.

## **methodology**

### **design**

The current study formed part of a larger survey of 419 home-educating families in the UK (Rothermel, 2002). These 419 families represented 1099 children. This involved a questionnaire survey (to all families), educational and psychological assessments of home-educated children (102 and 136 assessments respectively) and interviews with home-educating families (100 families). The 419 families were themselves selected from a wider audience of 1000 families who took part in the initial questionnaire following dissemination of approximately 5000 questionnaires. Home-educating families were accessed through support networks, LEAs and internet discussion lists. A full description of the selection process is described in Rothermel (2002).

In the current article, information about children's educational progress is supported by interviews with home-educating families. This article presents results from the PIPS (Performance Indicators in Primary Schools) assessment with reception-aged children. The PIPS testing programme involved testing the children at the 'Start' and 'End' of what would be their Reception Year. It followed dates set by the CEM Centre from where PIPS is designed and distributed and the timetable followed that used in schools.

### **participants**

The 35 four-year-old children involved in this study came from diverse backgrounds. A breakdown of social classes amongst the cohort shows a spread from classes 1–8 (Class 1 being the highest social class and Class 8 the

lowest) with over one third of families from social classes 3–8 (social categories determined by Rose and O'Reilly, 1998). Of 631 parents, under 50 per cent had attended university and 27 per cent of 177 parents reported having no qualifications at all.

Whether these children were representative of home-educated children generally is impossible to know. The researcher made strenuous attempts to distribute the questionnaire to as broad a sample of home-educators as was possible. Home-educating families are not obliged to register with any official body and so numbers, characteristics etc. cannot be known about definitively.

Selection was determined according to whether a home-educating family included at least one child aged approximately four years. Amongst the 212 questionnaires returned four months after distribution, 45 families met this criterion and were approached with a request that they participate in a further stage of the study. The early respondent families were members of the home-education organization Education Otherwise (EO), used as the initial means of distribution, although by the time the 'End of Reception' assessment was administered, eight of the 35 original families were no longer members of the organization. Within EO, 119 children were known to fall within the age range sought: this suggested that the response rate from families with four-year-olds (45 completed questionnaires) may have represented close to 40 per cent of those members. All 45 families were approached by letter and from these, 35 participated in the initial baseline assessments. Of the ten families who did not participate, four were necessarily abandoned because of their location, one family declined to assist further, three could not be contacted, one was moving house and the other family were on holiday at the time of the visit. One family agreed to participate but on the day arranged for the assessment, the child participant was absent, having been removed without warning by an estranged parent. By the time of the second interview, of the initial 35 families, one had placed their children in school and a second family had moved, leaving 33 families to be assessed during the second phase of the PIPS 'Reception' assessment. Prior to taking part in the assessments, the families' questionnaires had not been analysed, but the details collected, such as ages, numbers of siblings, learning routines etc. were available to this author.

At the time of returning the initial background survey, families did not know that their children would be invited to participate in an academic assessment programme. Only after families had completed and returned the initial questionnaires were they approached with a view to further participation. The sample used was small but meaningful in view of the good normative data available from the CEM Centre at the University of Durham.

## materials

The PIPS Baseline was designed to monitor children's progress as they enter and pass through their initial year in full-time school. The 'Start of Reception' instrument tested for 'rhymes', 'early reading', including vocabulary and 'early maths', while the 'End of Reception' assessment evaluated performance in these areas, together with 'attitude' and 'self esteem'. The 'Start of Reception' and 'End of Reception' tasks were designed to provide a value-added measure of progress and performance.

For the assessments the following materials were used:

- PIPS 'Start of Reception' Assessment Booklet (PIPS Project, 1997a);
- Parent's Instructions (extracted from PIPS Project, 1997a);
- PIPS 'End of Reception' Assessment Booklet (PIPS Project, 1998a);
- Parent's Instructions (extracted from PIPS Project, 1998a).

To assist with analyses of the data the following publications were used:

- *Performance Indicators in Primary Schools: Technical Report 1999* (PIPS Project, 1999);
- *PIPS Baseline Report 1997/98* (PIPS Project, 1997b);
- *Using the PIPS Scheme 1997/98* (PIPS Project, 1997c);
- *End of Reception Assessment: How to calculate initial feedback* (PIPS Project, 1998b).

## procedure

Performance Indicators in Primary Schools (PIPS) 'Start of Reception' Assessment and 'End of Reception' Assessment was devised in two parts, to be given at the start and end of what would be the 'Reception Year'. PIPS 'Start of Reception' (PIPS Project, 1997a) was administered in September, soon after school entry, followed by PIPS 'End of Reception' (PIPS Project, 1998a) ten months later. The 'End of Reception' provided an extension to the 'Start of Reception' test and involved re-administering those parts of the 'Start of Reception' assessment that a child had not been able to complete, together with the follow-on 'End of Reception' measure.

Participating families were visited in their own homes during the month of September. The researcher spent between one and a half and two hours with each family, during which time a semi-structured, but generally informal, interview took place. At an appropriate time, the family's four-year-old child was assessed. The assessment was either conducted by the researcher, or by a parent, under researcher supervision, dependent on the child's preference. The assessment was administered after the preliminary interview, followed by a post-test discussion and the broader interview. Participant families lived



within an oval that stretched, roughly, from Dundee to Exeter and from Aberystwyth to Norwich. Some assessments took place as early as 7 a.m. and some as late as 8 p.m. The visiting times were worked around children's 'liveliest' hours of the day, parental convenience and within the realms of what the researcher could manage. Where, within households, the interviews and assessments took place, depended very much on what was happening in the house, the time of day and the weather. Some assessments were undertaken at tables, some on the floor, several in the garden and a couple over the breakfast table. Following the elapse of a 10-month period, the equivalent of the school 'year', 33 families were re-visited and PIPS 'End of Reception' assessments were conducted. Once the assessments and interviews were completed, the marks for each participant, as scored per section undertaken, were entered, using pseudonyms, onto a score sheet, as directed by the PIPS Project. These were then forwarded to the PIPS project co-ordinator at the CEM Centre, University of Durham, for initial analysis and comparison with PIPS national data. The formal scores, raw and standardized, were then returned to the researcher, together with relevant graphs and tables, normally distributed to participating schools.

## **results**

### **overview**

The results supported earlier research into home-educated children's attainment in finding that the home-educated children did better than their schooled counterparts.

The PIPS Baseline assessment data indicated that 64 per cent of the home-educated children scored over 91.5 raw score points (75%) at the 'Start of Reception', whilst nationally, the percentage of children attaining in excess of this score was 5.1 per cent. In standardized score terms, this indicated that 63 per cent of children fell into a score bracket usually occupied by just 2–3 per cent of children nationally (PIPS Project, 1997b).

At the end of reception, 2–3 per cent of children were expected to score above the standardized score of 70 (PIPS Project, 1997b). In the home-educated cohort however, 21 per cent of children scored above 70. Table 1 provides the raw score results for the home-educated group (in bold), contrasted with the results given in Tymms et al. (1997). Current national data from the PIPS Project is similar to that given in Tymms et al. (1997).

Despite the high percentages of home-educated children achieving above average scores, their performance in terms of value-added progress was rather poor in 'Reading', as Table 3 below shows.

**table 1** details of continuous variables (extracted from Tymms et al., 1997)

T = Tymms et al. (1997) R = Rothermel (this study)	Mean		St. Dev.		Minimum		Maximum	
	T	R	T	R	T	R	T	R
Start Maths	20.7	27.71	11	5.96	1	13.00	46	34.00
Start Reading	14.5	68.80	10	14.27	1	38.00	47	85.00
Start Total	35.4	96.51	19	18.42	2	56.00	92	119.00
End Maths	39.3	44.36	14	10.37	1	30.00	86	64.00
End Reading	49.5	109.39	23	45.02	1	58.00	86	187.00
End Total	88.8	155.57	34	52.75	3	95.00	170	251.00

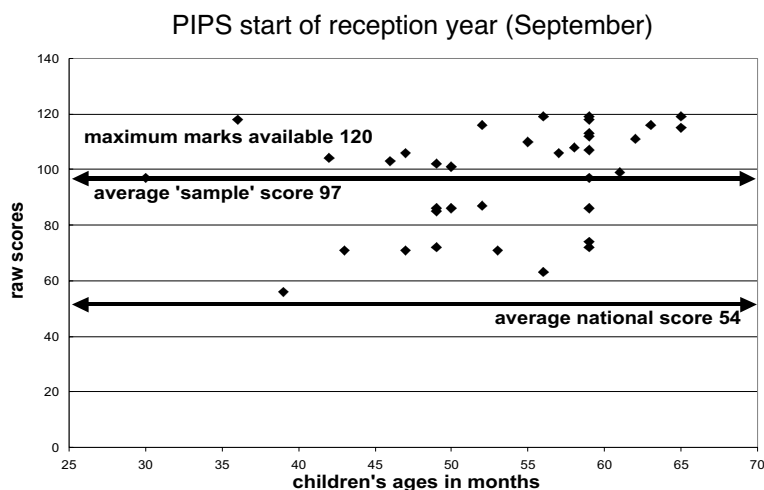
Tymms et al.  $n = 1700$  Rothermel  $n = 35$  (start) and  $32$  (end)

### raw scores

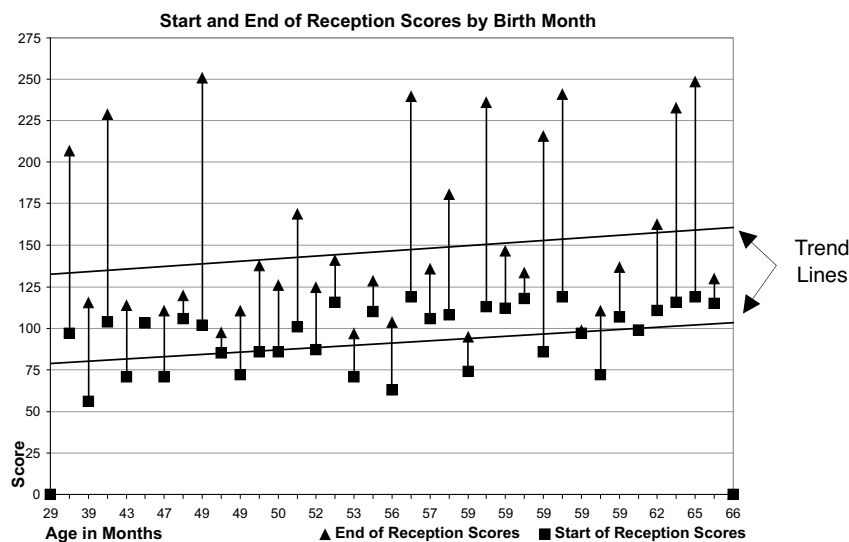
Figure 2 plots the overall raw scores for the home-educated children: one thick horizontal line represents the children's mean score of 97 marks, as indicated, whilst a second marks the national mean score of 54. The maximum score available in the PIPS Baseline assessment was 120 and it is possible to see from Figure 2 that many of the participants' scores were in the upper part of the figure, indicating their high standard of performance.

A number of the home-educated children demonstrated a level of achievement beyond the scope of the 'Start of Reception' instrument.

**figure 2** scattergram illustrating start of reception (home-educated) raw scores



**figure 3** PIPS reception (home-educated) scores according to age



Therefore, as Figure 1 illustrates by the 120 mark ceiling, it was not possible to record their actual level of ability beyond establishing that the ‘Start of Reception’ test was well within their capabilities. Since children were not normally expected to complete all of the ‘Start of Reception’ assessment at the first sitting, the CEM Centre, which publishes the PIPS Baseline measure, did not make the ‘End of Reception’ section available until towards the end of reception year (note, this research used the paper version of the test; in the later computerized version the ceiling point is not used).

Figure 3 illustrates the difference in performance between the children’s ‘Start’ and ‘End’ of reception scores, contrasted with their month of birth. The ‘squares’ represent each child’s ‘Start of Reception’ score; lines extend upwards terminating with an arrowhead, each representing the children’s ‘End of Reception’ score. Two trend lines have been added, the lower one relating to the ‘Start’ scores and the higher one to the ‘End’ scores: these indicate that there was an increment with age, in attainment across the cohort.

The mean age of the children in this sample was 53.6 months, with a standard deviation of 7.78, where nationally, the mean is 51.3 with a standard deviation of 8.87. Although PIPS ‘Reception’ is designed for children aged between 46 and 63 months (PIPS Project, 1999), the national data revealed that children assessed were, in practice, aged within a range of 30 to 76 months. The children in the home-educated cohort were aged between 30 and 65 months.

Tymms et al. (1997) found that the difference in performance between the youngest and oldest children (11 months difference) in their cohort was far less than the difference between children's 'Start' and 'End of Reception' scores. Tymms et al. (1997) suggested that the 42-point increase they found, as highlighted in Table 2, was associated with schooling. The present study, albeit with a very small cohort, also using an 11-month age range (48–59 months,  $n = 22$ ), encountered almost the same phenomenon, but with a difference of 45.32 points.

**table 2** data extracted from Tymms et al., 1997, contrasted with this study's data

	Tymms et al. (1997)	Rothermel (2002)	Tymms et al. (1997)	Rothermel (2002)
<i>n</i>	283**	12*	1700	22
	'Start of Reception' point difference between the oldest and youngest children's scores	'Start of Reception' point difference between the oldest and youngest children's scores	Progress in points for whole group between their 'Start' and 'End' of Reception scores	Progress in points for whole group between their 'Start' and 'End' of Reception scores
Points	18	10.22	60	55.54
Increase in scores between 'Start' and 'End of Reception' and 'End of Reception'			(60–18=) 42	(55.54–10.22=) 45.32

\*The two groups of children at each extreme of the 'Start of Reception' year group consisted of, oldest ( $n = 8$ ) and youngest ( $n = 4$ ), thus totaling 12.

\*\*Oldest ( $n = 117$ ) and youngest ( $n = 166$ ), thus totaling 283.

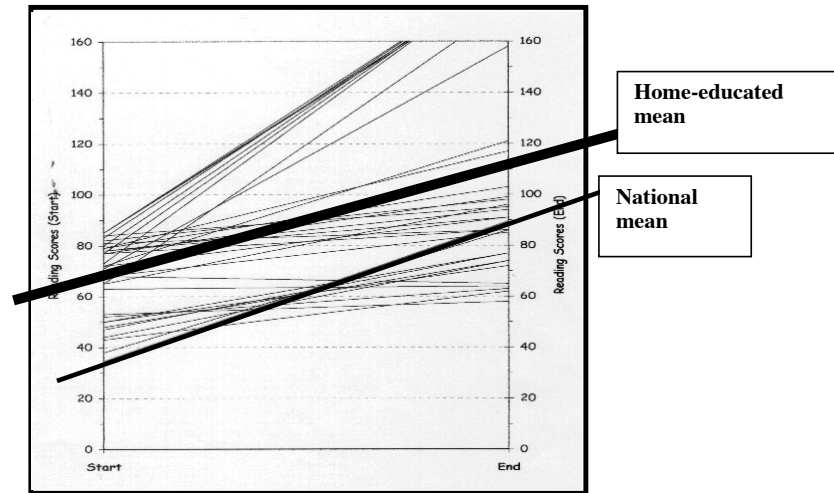
The following two Figures 4 and 5, illustrate the home-educated children's raw score performance in reading and mathematics over the ten-month period. An upward trend in their learning is clearly visible although the mean reading line for home-educated children appears to be converging with the national mean. However, further analysis of the data has shown that this convergence did not extend beyond reception. Rothermel (2004) found that the head start described here was maintained at least until the age of 11 years.

The figures show that the group began the year ahead of their school counterparts and ended it still ahead. The individual mathematics scores (represented by the thinner lines) tended to follow the 20° incline of the mean over the ten-month period, with scores falling fairly evenly either side of the mean. The reading trend was quite different and the mean line for reading actually concealed a considerable variation between individual performance.

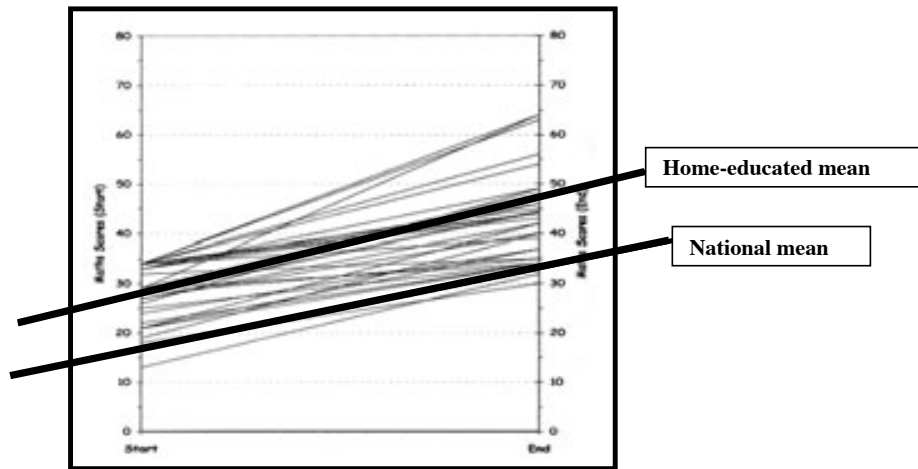
## value-added

The home-educated children's value-added performance in maths and reading

**figure 4** home-educated children's individual reading performance



**figure 5** home-educated children's individual mathematics performance



is portrayed in Table 3. The value-added has been calculated using the children's standardized scores to measure their progress over the year relative to calculated expectations of progression nationally using regression analysis. Since value-added allows for maturational effects, it should be noted that even those children with double negatives (see Table 3) may have made progress. A double negative means that the child made very poor progress in value-added terms. The double negatives on Table 3 suggest that whilst a child may have

**table 3** value-added results over a ten-month period for mathematics and reading

Value-added	National % of children in each value-added category	Sample % Maths	Sample % Reading
++	10%	15.10%	9.1%
+	15%	9.10%	9.1%
0	50%	51.50%	12.1%
-	15%	12.10%	15.1%
--	10%	12.10%	54.5%

progressed maturationally, they did not advance far enough in terms of expectation relative to national norms and their own 'starting' place. Figures 4 and 5 show that all the children progressed, yet Table 3 indicates that 54.5 per cent of the sample were given a double negative (- -) value-added score.

The second column of figures in Table 3 indicates the percentage of children nationally who would be expected to fall within each of the categories listed in the first column. The third and fourth columns present the percentages of home-educated children falling within each of these categories.

As Table 3 indicates, the home-educated children's value-added performance did not follow the pattern predicted by national norms. In particular, Table 3 shows that, in 'Reading', 54.5 per cent of home-educated children demonstrated an increment in learning equal to the lowest measured reading band, normally containing 10 per cent of children nationally. The anticipated improvement in reading ability, seen in 50 per cent of the school reception class population, was evident in just 12.1 per cent of the home-educated children.

### **difference in performance: children from professional and non-professional families**

Table 4 provides the mean scores of the children at the 'Start' and 'End' of their 'Reception Year' when classified according to their parent's social class category (Rose and O'Reilly, 1998). The parent falling into the highest social category was used to determine the social level of the parents together: Table 4 also shows the division of scores according to social class when groups 1 and 2 are contrasted with groups 3, 4, 6 and 8 (there was no one in classes 5 or 7). As can be seen, children from the lower end of the socio-economic class scale significantly outscored those from the upper spectrum of the scale.

Interestingly, the high level of performance seen here from the less affluent children was not replicated during the later primary years where Rothermel (2004) found less than one point difference between children from classes  $\geq 2$  (more affluent) and those in classes  $\leq 3$  (less affluent).

**table 4** PIPS 'reception' mean results classified by parental social class (Rose and O'Reilly, 1998) (*n* = 35)

Social Class	Class 1 High managerial and professional occupations	Class 2 Lower managerial and professional occupations	Class 3 Intermediate occupations	Class 4 Small employers and own account workers	<Class 6 Semi-routine occupations	Significance of start/end differences*
No. children Start/End Start of Reception	13/13	11/10	3/3	4/3	4/4	
Mean Total End of Reception	67	68	75.3	75.5	70.5	
Mean Total Start of Reception	55.2	56.5	65	62.6	71	
Combined Mean End of Reception		67.6		73.6		<i>p</i> < .037
Combined Total		55.7		66.7		<i>p</i> < .015

\**p* < .037 where *t* = -2.169 (df 31) and *p* < .015 where *t* = -2.570 (df 33)

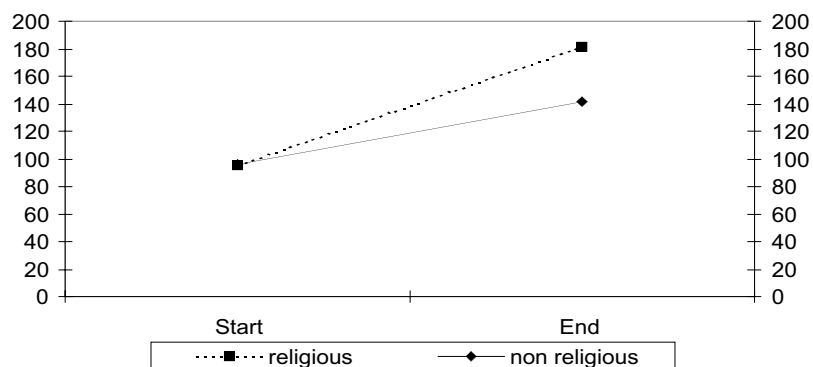
### **difference in performance: children from religious and non-religious families**

The PIPS Baseline data showed that at the 'Start of Reception' the children from religiously affiliated families performed on a par with the secular families. At the 'Start of Reception' the mean standardized score for the children from religious families was 69, and for secular families 69.75. By the 'End of Reception' religious families' children averaged 65.4 and the children from secular families 56.71. Thus, whilst standardized scores relating to children from religious families fell 3.6 points over the ten-month period, the scores of their secular peers decreased by 13.04 points. An independent Samples *t*-test revealed that by the 'End of Reception' the difference in raw scores was significant (*p* < .048 where *t* = 2.061; df 31). Figure 6 illustrates how the children from secular backgrounds demonstrated slower progression over the 10-month period than their religiously affiliated peers, though both continued to make progress. Rothermel (2004), however, looking at children aged six, seven, eight and ten years, found both religious and secular children were performing on a par.

### **difference in performance: boys and girls**

There was a significant difference between gender performance at the 'Start of

**figure 6** year's (school year equivalent) progress of children from religious (start  $N = 11$  and end  $N = 9$ ) and non-religious families ( $N = 24$ )



**table 5** difference in performance between boys and girls

PIPS	Gender	<i>n</i>	Mean	St. Dev	Significance of difference
Start	female	18	67.0	7.8	$p < .012$
	male	17	60.7	6.2	
End	female	17	66.0	13.3	$p < .473$
	male	16	62.9	11.73	

Reception', but by the 'End of Reception' the difference was reduced. At both assessments, however, the girls outperformed the boys, as can be seen from Table 5.

Rothermel (2004) found that whilst girls still outperformed the boys, the difference, unlike most national samples where girls are seen to excel (e.g. Sukhnandan et al., 2000), was not significant.

## discussion

### overview

This article examined the attainment of home-educated reception-aged children. The findings here are tentative and the samples small, but nevertheless, the results are interesting. Overall, the results confirmed findings from other studies, such as those mentioned in the introduction to this article (e.g. Hollings, 2004; Lyman, 1998; Ray, 1998; Rothermel, 2002, 2004; Rudner, 1999; Van Galen and Pitman, 1991), that home-educated children perform at least as well as, or better than, children at school.



The present sample came from diverse backgrounds and parents were by no means a university-educated 'middle class' cohort, as some stereotypes suggest. The home-educated four- and five-year-olds demonstrated high levels of ability and, as Rothermel (2002) has shown, good social skills, apparently gaining from a flexible education tailored to their individual needs and one which often reflected the children's interests. Rothermel (2002) found that the children benefited from the high level of attention given to them by their families. Parents of the home-educated children in this age group tended to have planned for home-education from birth, or at least from very early on; thus the parents had generally given more attention to their children's early learning than they might perhaps have done had they known that the children would soon be starting school. The parents were thus not awaiting the 'big day' when school began and responsibility for their children's education would be delegated to an external institution. Unlike the situation for schoolchildren, for the home-educated cohort, there was no right or wrong time to learn and it may well be that the most efficient way in which to gain skills and knowledge for life, would be to permit children to acquire information at their own pace.

As the children commonly spent their time with either one parent or the other, parental influence appears to have been an important contributing factor in the children's exceptionally high 'Start of Reception' scores. In the same way that Pederson et al. (1978) found that the effect on children of a good teacher was enduring, so the home-educated children's continued high scores may have been the result of the strong bond with their parents: the full academic results from Rothermel (2002) indicate that the correlation between attainment and parental attention may continue, at least until 11 years of age. Just as Tizard et al. (1988) found that teachers responded better to children whose company they most enjoyed, it would seem that the parents were those who had the most invested in their children's development; this pattern created the cycle of positive attribution, described by Georgiou (1999). Tizard and Hughes (1984) found that parents had the advantage of understanding the context of their children's lives, a finding strongly supported by the home-education 'Reception Year' data.

### **predictive value of assessments with home-educated children**

The idea that the tests assessed prior learning and could be of value in predicting future attainment was an unreliable one in the home-education context. Having found good correlations between schoolchildren's 'Start Total' and 'End Total' scores, Tymms et al. (1997) concluded that the extent of schoolchildren's progression related to their prior attainment. However, the correlation between the home-educated children's 'Start Total' and 'End Total'

scores was just 0.27 and this was reflected to some extent in the children's poor value-added scores. In respect of the value-added scores for reading, it may have been the case that whilst children generally start reception without any efforts made to teach them to read, it was not so for the home-taught children. As a result, they could have made their spurt before the first tests that the school-based children made in reception class. This would have given them high start scores and low value-added scores for reading. However, most of the parents involved reported that they had not taught their children to read and indeed, were surprised their children performed as well as they did on the tests.

At home, children's learning was generally not 'planned' in the way it might be in school, particularly at this early age, and parents appeared not to think in terms of 'future progress' but rather of allowing the children to learn at whatever pace suited them. With regard to assessing children's prior learning, the results suggest that the scope of the assessments was too narrow to be able to gauge the true extent of the children's learning. This narrowness might well apply to some extent with both home- and school-educated children. However, it was clear from the tests that there was an assumption about what children already knew, or should know, and it is likely that this was based upon children's usual pre-school environments, that is, playgroup, playschool, pre-school. The home-educated children may have differed because the children had not attended pre-school settings outside the home and therefore, their experience prior to the baseline testing was generally very different from that of the schoolchildren. Here, however, Tymms (2004) argues that many of the national sample had not attended pre-school and so were similar to the home-educated sample. It may have been that the low correlation related to the instrument used and to the unusualness of a home-educated sample (as opposed to a school sample). It is possible however, that the poor 'Start Total' and 'End Total' correlation was the result of the small sample, the number of children who reached the ceiling and the narrow distribution of the children's high score (Tymms, 2004).

While on the one hand the assessment provided data useful to the researcher, on the other hand it told us very little about the children's knowledge and experiences, that is, the hard-to-describe components which many parents reported as part of the quintessential appeal of home education. The data was therefore probably not very useful in allowing us to predict future progress, a theory born out by the children's poor value-added scores. Thus, it seems that if we want data on the children's education in the broader sense, the formal assessment can give only part of the picture and to more clearly understand the home-educated children's experience, academic assessments would need either to be replaced by, or supported with, observation, interview and other qualitative data.

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**progress as evidence of the effectiveness of school?**

Tymms et al. (1997), discussing their schooled group, found that at the 'Start of Reception' with an age difference of 11 months across the group, there was an approximately 18 raw-score points difference between the scores of the oldest and youngest children in the group (all assessed during the same period). By the 'End of Reception' the group progress scores (defined as the difference between the 'Start of Reception' and 'End of Reception' scores) measured approximately 60 points, thereby indicating an association between schooling (the children had by then spent a year at school) and the 42 marks (two standard deviations) increase in scores (i.e. 60–18). Whilst Tymms et al. (1997) used these figures as evidence of the effectiveness of school, there may be other reasons why the progress score is greater than the score difference between the 'Start of Reception' oldest and youngest children. The apparent leap during the Reception year might be unconnected either with school effectiveness or with the extent of prior learning, but rather the result of the transition to school, suggested by Riley (1996) to be a traumatic experience for some children. Bennett and Kell (1989), Cleave et al. (1982) and Tizard and Hughes (1984) all described the upset that starting school can cause to children. It is conceivable therefore, that the transition to school impacts upon some children's baseline assessment scores (hence the large SD reported by Tymms et al., 1997 and Riley, 1996) and that the 'enormous progress' found by Tymms et al. (1997) is, in fact, the result of artificially low 'Start of Reception' scores caused by the children's disorientation and acclimatization to their new situation. However, Tymms (2004) reports that the PIPS nursery assessments (not in use at the date of the study) do not show a drop from nursery to school, although there is a small advantage to those children who had settled in as a result of attending nursery.

The home-educated children demonstrated a slightly greater increase in points over the reception 'year' than had the children from Tymms et al. (1997), that is, 45.32 as opposed to 42. This higher score was curious in the light of the home-educated children's relatively poor value-added scores (for reading, over 50% of the children were in the bottom 10% value-added band). Part, or all of the 'leap' in the home-educated sample, however, could have been caused by the score distribution, skewed as they were to the higher end of the scale, whereby higher scores make more progress (Tymms, 2004). Insofar as the national sample was concerned, the standardization and value-added scores take this into account using regression (Tymms, 2004).

Nevertheless, value-added progress related to the progress made between children's 'Start' and 'End of Reception' scores, whilst the 'points' difference (Table 2) referred to the contrast between the oldest ( $n = 8$ ) and youngest ( $n = 4$ ) children's scores at the 'Start of Reception', and their progress from 'Start'

to 'End of Reception'. Tymms et al. (1997) had attributed what they termed the 'massive difference' in points to the first year at school. However, the first measure was between the oldest and youngest of a cohort of new-schoolers while the second measure was the score difference between the 'Start' and 'End of Reception' – that is, new and not-so-new schoolers. Therefore, it should be born in mind while considering Tymms et al.'s claim of a 'leap', that the 'comparative' measures used were very different. For a more accurate comparison there needed to be a measure of differences between: pre-schoolers a year before entering school and the 'Start of Reception'; and between 'Start' and 'End of Reception'. With the more recent introduction of PIPS nursery tests there is some pre-school data now available but for proper comparison this data would need to come from a cohort who had not experienced any pre-school setting outside the home.

Certainly, the home-educated children's progress could not be attributed to school. During the 'Reception' year, many of the home-educating parents, as the interview commentaries illustrate (Rothermel, 2002), would not have claimed to have 'taught' their children at all, allowing the children instead to learn at their own pace with parents simply responding to their children's lead (i.e. answering questions as they arose), rather than adopting any parent-initiated learning sessions. Nevertheless, it was conceivable that parents, despite protestations to the contrary, were actually observing national, compulsory schooling norms. However, in view of the findings from Rothermel (2002), this explanation is highly unlikely; observations generally showed children learning in relaxed atmospheres that bore little resemblance to school norms.

Over and above the effect that the score distribution had on the points gain, reasonable explanation of the 'leap' might also be that the 'Start of Reception' was biased against the schoolchildren who, owing to (if such a concept exists) the 'waiting to start school' philosophy, were less prepared than their home-educated counterparts, whilst the 'End of Reception' instrument was biased against the home-educated children who did not have the 'benefit' of being trained in more formal test instruments (the 'End' being far more formal than the 'Start'). This would account for the home-educated children's good initial scores (no 'waiting to start school' philosophy), poorer final scores (they were not trained in tests) and poor value-added scores (they started with high scores and did not progress at the rate expected) and also for the schoolchildren's depressed 'Start' scores (disruption as a result of school) and good value-added (settled in and trained in testing). In terms of the 'leap', it could be that the two measures used were too different for useful comparison. Tymms however, argues that having repeatedly reassessed pupils using the same instrument and getting the same results, familiarity had no impact (Tymms, personal communication).

The contrast between the 'Start' and 'End of Reception' assessment, from the viewpoint of the home-educated children, was substantial; the reactions of participants at the times of testing made this apparent. The home-educated children's scores at the 'Start of Reception' were measured on one instrument whilst the 'End of Reception' scores were arrived at using another very different instrument. The PIPS Baseline assessment (in the form used for this work) uses two booklets one for the 'Start' and another for the 'End'. However, during the second part of the assessment 10 months later, children who failed to complete the first booklet had to re-do it before starting the 'End' of reception booklet. Thus, during the 'End of Reception' assessment the schoolchildren were treated to a re-run of the colourful and fun booklet before graduating onto the second more formal 'End' assessment, whilst the home-educated children were given only the second, formal, booklet. Thus, the difference in instruments may have accounted both for the poor value-added performance and also for the apparent 'leap' over the 'year', of the home-educated children involved with this research. The difference between assessment instruments may not have been so apparent to schoolchildren who would, during their initial year, have been accustomed to the style used in the 'End of Reception' instrument, thereby making it possible that their improvement was, indeed, a response to school, either positively (Tymms et al., 1997) or otherwise (Riley, 1996). Tymms however, responds that the PIPS team find the same results (the leap and good value-added) when using the CD version of the assessment all the way through (Tymms, personal communication).

## **affluence**

All the children scored good marks, whatever their background and family structure. However, contrary to the findings of Tymms et al. (1997) the home-educated children from the lower socio-economic groups scored significantly higher than those with professional parents on the Registrar General's classification (Rose and O'Reilly, 1998). The most obvious reason for their doing well, and one that is supported by evidence from other sources, is that home-educated children are, at least amongst their own ranks, free from the stigma of being poor, simply because they are not learning in an environment where affluence and labelling are an issue. Goldthorpe (1996) provided a scenario of how social class in school affects children's chances and this was born out by inference in the work of Galloway (1985) and by the writings of Tizard and Hughes (1984: 256-7). Tizard and Hughes described the 'working-class mothers' as 'just as concerned' for their children as 'middle-class mothers'; they further indicated that mothers from the lower socio-economic classes were more likely to adopt 'traditional approaches' to maths and

reading (1984: 252–3). The difference in approaches to learning adopted by the lower socio-economic home-educating parents and those more affluent parents appeared to mirror that described by Tizard and Hughes and this may well have accounted for the high performance from the children of non-professional families in these school-style tests. Children from religious families also tended to come from non-professional families and although such families were not necessarily strict with their children, their beliefs about duty and self-discipline are likely to have had an impact on the children. The children from families at higher socio-economic levels may have been learning under more liberal values and this method, as the results illustrated, was nevertheless a recipe for success. The key to performance irrespective of background was, it seemed, the availability of parent[s] to spend time with their children, since at least one parent in each family was continually present throughout this period of their child's life. Desforges and Abouchaar (2003) have also commented on the importance of parental attention in children's attainment.

Looking at the older cohorts, Rothermel (2004) found that the academic gap between affluent and less affluent had closed, with the result that there was less than one score point different between these groups. One explanation is that the working-class parents were becoming less structured in their approach as they became more confident. This could have led to a decline in their children's performance on formal tests. A second explanation is that their lack of expertise was beginning to show. The field notes from Rothermel (2002) suggest the former. Whilst it is possible that parental level of education would start to have an impact in the post-11 age group, the interviews undertaken for the wider study show that once families see a need for specialist input they obtain this using correspondence courses or by the children's attendance at sixth form or further education colleges. Home-educators seem to be a particularly resourceful group, as one might imagine from their decision not to delegate legal educational responsibilities to a school.

The fact that findings here contradict the many studies linking social class to low attainment (e.g. Feinstein, 2002) suggests that policy makers might do well to study the home-education model and explore ways in which the benefits could be adapted into mainstream education.

### **formal versus informal environments**

As the work of Aubrey et al. (2000) and Aubrey and Godfrey (1999) has found, starting school at a later age may well have no detrimental effect upon learning skills. The results from the present study suggested that a delayed school start date may have very positive effects. This does not detract from the suggestion that school makes a difference (Riley, 1996), but questions whether such

difference is academically and socially beneficial in the shorter term, as evidenced by the home-education findings from the PIPS Baseline research, and in the longer term, as indicated from the findings described in Rothermel (2004).

Baseline assessment has been described as a tool to assist parents (PIPS Project, 1996) yet this implies that parents might benefit from such external assistance. This attitude was summed up in the final lines of Tizard and Hughes' work:

Indeed, in our opinion, it is time to shift the emphasis away from what parents should learn from professionals, and towards what professionals can learn from studying parents and children at home. (1984: 267)

This statement by Tizard and Hughes echoed the comments from the home-educating families involved with the research. The findings lent support to the idea that parental input was not just a useful support tool, but that indeed, it could substitute for professional assistance.

Whilst findings by Sylva et al. that formal 'pre-school experience, compared to none, enhances children's development' (2003: 1) would appear to conflict with the findings from this research, those authors do also conclude, perhaps paradoxically, that:

The quality of the learning environment of the home (where parents are actively engaged in activities with children) promoted intellectual and social development in all children. Although parent's social class and levels of education were related to child outcomes the quality of the home learning environment was more important. The home learning environment is only moderately associated with social class. What parents do is more important than who they are. (Sylva et al., 2003: 1)

The findings in the present research, underpinned as they are by previous research, provide support for the value of informal settings in children's education and inherently questions the 'accepted' wisdom that children need school to learn. Research into informal learning is scant (e.g. Thomas, 1998) and usually relates to the early years, but nevertheless Aubrey (1997) has highlighted the way in which schools undervalue children's pre-school mathematical knowledge and research by Tizard et al. (1988) has shown that the pre-school knowledge of four-year-olds is a good predictor of future academic ability. In the light of this existing and current research a debate should follow as to whether informal knowledge gained in a supportive informal setting is, at least during the early years, of more consequence than formal education acquired in a formal setting. In the absence of further follow-up home-education research, the question will, perhaps, remain unanswered.

Findings from Rothermel's (2002) interviews with home-educating families show that while for many home educators, raising a family on the equivalent of one income is a burden, the families valued the freedom to live according to their own ideals and relished the flexibility to, 'do what we want, when we

want'. It seems that happiness, a feature of home-education mentioned in Knowles and Thomas (2004), Rothermel (2002) and Thomas (1998), may well extend to raising the children's levels of learning. Certainly there has been much attention given to the role of happiness in our psyche (Carr, 2003; Seligman, 2003) and more recently the debate has been given the full attention of a special issue of the BPS publication, 'The Psychologist' (BPS, 2004). Moreover, some economists are promoting the importance of happiness by quantifying it in positive financial terms (Layard, 2003).

### **individually tailored education (ITE)**

Research focusing on older home-educated children suggests that the findings reported here of high attainment continue through Key Stages 1 and 2 (Rothermel, 2004). However, in view of the overall indication that home-educated children are learning on an entirely different trajectory from schoolchildren it is perhaps unhelpful to think of these children in terms of Key Stages. Expectations and outcomes for these children may have little in common with those anticipated from schoolchildren. Indeed, while the phrase 'home-education' suggests an education taking place in the home as opposed to the school, this is incorrect. Home-education is best described as an individually tailored education (ITE) whereby the children work from a home base but often spend a large amount of their time away from the home itself, instead attending group get-togethers and activities, visiting parks, museums, friends' houses, libraries and 'after school' groups. In general this is an education gained through 'living and doing' (Rothermel, 2002).

### **further research**

Whilst an obvious area further study would be to look at the post-11-year-old group in terms of their academic and psychosocial well-being, a more interesting and revealing one may be to attempt a quantification of the value brought about by home-education. If the home-educated children's high attainment is linked to happiness and parental input then findings can perhaps help generate ideas for the future of education, at least during children's early years.

### **conclusion**

Insofar as the PIPS Reception data was concerned, the home-educated four- and five-year-olds demonstrated high levels of ability and good social skills. The children appeared to benefit from an education that was flexible and tailored to their individual needs and interests. Another important factor was



the attention given to them by their families. In particular, parental input and interest was high. Learning appeared to be on a gentle incline from birth, a process that appears to have suited the children very well.

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