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ABSTRACT

Within the framework of the International Adult Literacy Survey (IALS), a collaborative effort was made by a large number of industrialized countries to get insight into the level of literacy of their adult populations. In the Netherlands, older adults (918 out of 3,090 respondents) were over sampled to get insight into their specific literacy skills; 40 in-depth interviews were conducted with older adults who participated in the main assessment. Findings indicated the scores of adults over 50 were significantly lower on all scales than those of adults under 50. Nearly 60 percent of the older adults had scores at level 1 or 2, the more problematic levels of literacy skills. Differences could be explained to a large extent to differences in level of education but multiple regression analysis revealed that gender, age, and participation in adult education also significantly influenced literacy performance. In addition to the common background variables, other factors that influenced literacy performance were literacy practices, self-concept, and coping behavior. Further analysis on the relation between educational attainment, literacy performance, and age gave rise to some reflections on the performances of next generations of older adults in the near future. (YLB)

Fundamental Factors of Influence on the Literacy Performance of Older Adults and Their Functioning in Society

Jo Scheeren

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Fundamental factors of influence on the literacy performance of older adults and their functioning in society

ABSTRACT

Within the framework of the International Adult Literacy Survey (IALS) a collaborative effort was made by a large number of industrialized countries to get insight into the level of literacy of their adult populations. In the Netherlands older adults (918 out of 3090 respondents) were over sampled to get insight into their specific literacy skills. In addition to the survey 40 in-depth interviews were gathered among a selection of older adults who participated in the main assessment.
The scores of adults over 50 are significantly lower on all scales than those of adults under 50. Nearly sixty percent of the older adults have scores at level 1 or 2, the more problematic levels of literacy skills. Differences can be explained to a large extent to differences in level of education but multiple regression analysis revealed that also gender, age and participation in adult education significantly influence literacy performance. In addition to the common background variables other factors that have influence on literacy performance like literacy practices, self-concept and coping behaviour will be discussed. Further analysis on the relation between educational attainment, literacy performance and age give rise to some reflections on the performances of next generations of older adults in the near future.

1. The subject of the paper

At first a brief general outline will be introduced of the research on older adults in the Netherlands on the basis of the International Adult Literacy Survey, such as the background of the study, research questions, and the theoretical framework.
Next some results will be presented on differences between older - and younger adults in literacy performance and factors of influence on the literacy performance within the group of the older ones.
Later, based on the fact of the ageing of the workforce in many countries, the results will be focused on work related factors and adult education and vocational training of influence on literacy performance. Further analyses on educational attainment give rise to some reflections on the performances of next generations of older adults in the near future.

2. Background of the study on older adults

This study on older adults has been carried out within the overall framework of IALS, the International Adult Literacy Survey. IALS was a collaborative effort by a large number of industrialized countries to get insight into the level of literacy of their populations. Large samples of adults were given the same wide-ranging test of their literacy skills in combination with a background questionnaire. In the Netherlands older adults were over sampled to get insight into their specific literacy skills. Older adults are seen as a possible group-at-risk because of their average low level of education, decreasing participation into the workforce and indications of social exclusion.

3. Research questions of the study

a) What are the literacy skills of older adults (50-75) in comparison to those of other adults?
b) What are relevant factors in relation to the literacy skills of older adults and their functioning in daily life?
c) In which literacy contexts do older adults experience problems, what kinds of coping-strategies do they develop and what are possible intervention-strategies to help them?

4. Theoretical framework

Within the theoretical approach of IALS there is a distinction of three distinct aspects of literacy: prose literacy, document literacy and quantitative literacy. Literacy is seen as a complex ability, in which people gradually differ, while within the more traditional approaches literacy often was dichotomised. The literacy skills assessed in IALS have been limited to written and printed materials, mainly because of pragmatic reasons. The literacy tasks of IALS refer to different functional contexts such as home, citizenship and work.
In the Netherlands the total sample of adults was 3090 between 16 and 75 years old. Checked on population parameters this sample appeared rather representative for the Dutch population. The number of people between 50-75 in the sample was 918. The data of all participating countries were used for an Item Response Theory Analysis.
Three scales could be constructed:
Prose literacy - the knowledge and skills needed to understand and use information from texts including editorials, news stories, brochures, and instructional manuals;
Document literacy - the knowledge and skills required to locate and use information contained in various formats, including job applications, payroll forms, transportation schedules, maps, tables and charts;
and quantitative literacy - the knowledge and skills required to apply arithmetic operations to numbers embedded in printed materials, such as balancing a chequebook, figuring out a tip or completing an order form.
The scores on these scales vary from 0-500; the scores have been divided into 5 levels from 1 (badly) to 5 (excellent). Level 3 is considered a suitable minimum for coping with the demands of everyday life and work in a complex, advanced society. It requires the ability to integrate several sources of information an solve more complex problems
Further in the Netherlands 40 in-depth interviews were gathered among a selection of older adults, who participated in the main assessment, to answer the third research question.

5. Results

5.1. Older adults in relation to younger adults

Older adults do differ, in interesting ways, from younger adults on the three literacy measures. There is a great internal consistency across the three literacy scales prose, document, and quantitative with a large number of respondents at level 3 on all three scales. One of the main findings is that the scores of adults over 50 years old are significantly lower on all scales than those of adults below 50. Only on the quantitative scale the decrease with age is less than on the other scales. The average score of adults under 50 is at level 3, but the average score of older adults is at level 2. These results are shown in table 1 for all three scales.

Table 1 Proportion of population in age groups over and below 50 years at each literacy level (all scales)(n=3090).

PROSE

	level 1	level 2	level 3	level 4/5
16-49 (n=2172)	6.5	24.7	48.9	19.8
50-74 (n=918)	23.3	40.3	30.6	5.8

DOCUMENT

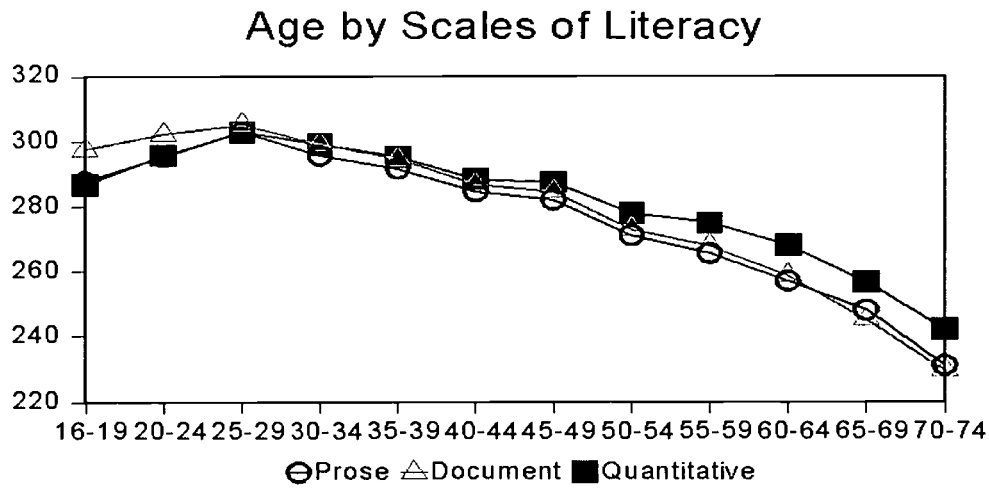
	level 1	level 2	level 3	level 4/5
16-49 (n=2172)	6.3	21.3	48.3	24.1
50-74 (n=918)	22.9	39.4	30.1	7.6

QUANTITATIVE

	level 1	level 2	level 3	level 4/5
16-49 (n=2172)	7.2	21.6	47.4	23.7
50-74 (n=918)	19.3	34.1	35.6	11.0

Although there is quite some variance in the score profile of the older group, nearly sixty percent have scores at level 1 or 2, the more problematic levels of literacy skills.
Roughly 20 % of all people over the age of 50 years old do not score higher than level 1, the most critical level of literacy. Referring to the population of the Netherlands it concerns 700.000 older adults on a total population of 1.260.000 adults of 16 to 74 years old at level 1. So adults over 50 years are in the majority on the most critical level of literacy even though they represent just one third of the total adult population of the Netherlands.
Literacy is connected strongly to age. In figure 1 the development of literacy skills by age is shown for the three scales. They show about the same pattern as can be seen in figure 1. Only the quantitative scale reveals a slightly less decrease than the other scales.

Figure 1

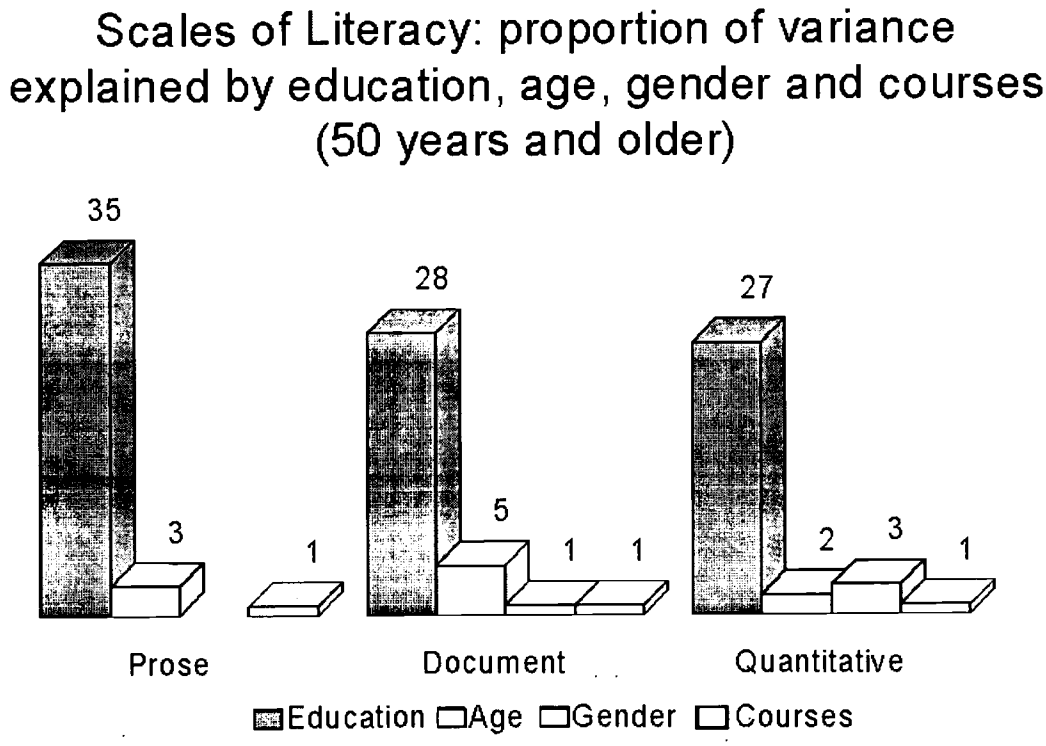


There is a sharp decrease after the age of 50. The 25 to 29 age group on average has the best achievement on the test. Many of those aged 16 to 24 are still in school or left school on a primary or secondary level. The 25 to 29 age group includes more individuals with tertiary education. It seems that further education or post schoolwork - and daily life experience is necessary to reach a high level of literacy (see OECD/Statcan, 1995, p. 82). After the age group of 25 to 29 it is clear that the older the age the lower is the literacy performance. On average adults of 16 to 29 years old score on level 3 whereas adults older than 50 years score on the lower literacy level 2. Looking at the oldest age groups the figure shows a rapid decline of literacy proficiency. The differences can be explained to a large extent to the differences in level of education. Older adults have received less educational prospects than younger adults but analysis of covariance revealed that there are also age-related factors influencing the literacy abilities of older people.

5.2. Diversity amongst older ones

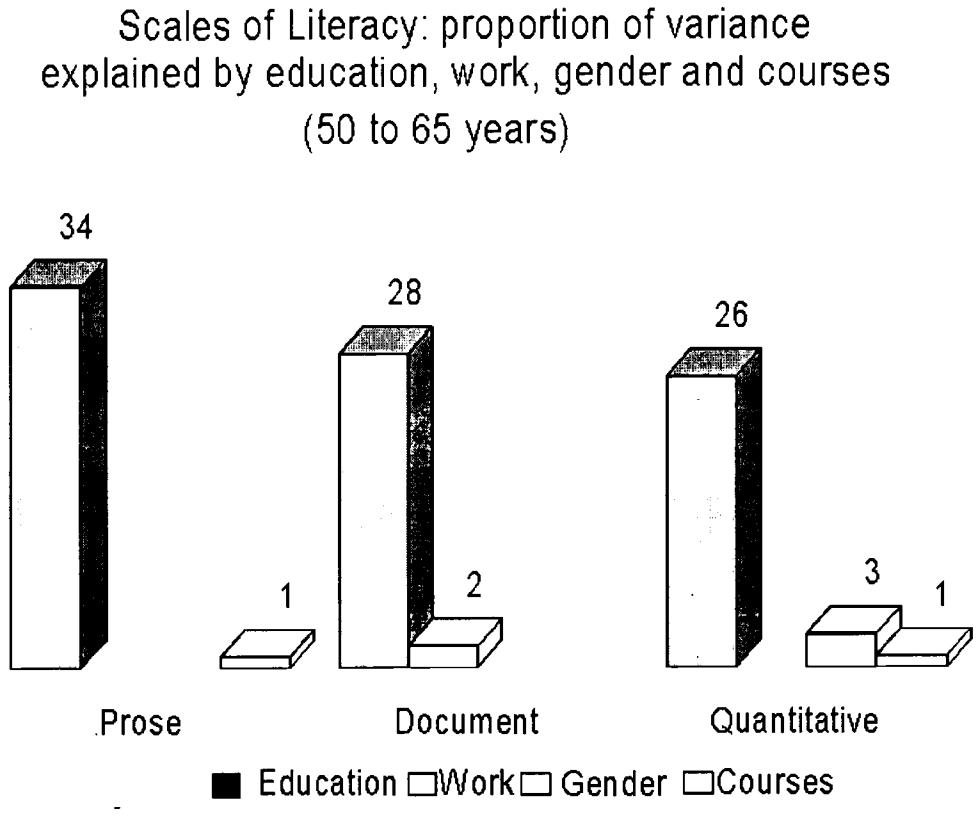
In the first part of this paper there is attention payed to differences between the younger age group of 16 to 50 years old and the older age group of 50 to 75 years old, but the results show remarkable differences within the group of older adults of 50 to 75 years old as well.
The connection between several factors in relation to literacy skills can be described by ways of multivariate analysis. Multiple regression analysis is used to appoint the interconnection of a set of independable factors in relation to one dependable factor (Van Knippenberg & Siero, 1980). This part of the study is concerned with the degree in which literacy achievement is to be predicted by major independent factors like initial education, age, gender, employment or adult education. Multiple regression analysis revealed that the literacy performance of older adults (50-75 years) significantly is to be explained by educational level, age, gender and participation in adult education, as is presented in figure 2.

Figure 2



The majority of the literacy performance can be explained by the educational background of the older adults, in spite of the fact that it has been a long time since their initial education. Obviously the gained educational level plays a crucial part during a whole lifetime, especially with respect to prose skills. Literacy is related to age too independently of education. The oldest older ones have lower skills than younger older ones with the same educational background, notably as far as the use of documents is concerned. Gender is only partial usable as one of the predictive values for literacy achievement at an advanced age. No influence of gender is measurable on the prose scale. On the document and quantitative scale gender has an own influence. Older men score higher than older women, as for quantitative tasks in particular. One conceivable explanation can be the social roles between older men and older women in daily life and the occupational background of the age group of 50 to 75 years where men usually have job-experience and come more in touch with documents or quantitative tasks than a considerable lot of women who run the home. The influence of adult education is rather small, but significant, among other things due to the fact that for the time being relatively few older adults in the sample take part in adult education. Also labour participation tends to be a positive factor on literacy competence, but this cannot be shown in the multiple regression analysis due to the fact that relatively few older adults in the sample of 50 to 75 years old still have a job.
If the age group is restricted from 50 to 65 years, the potential years that older adults are still present in the workforce, age related factors and adult education participation do not have any influence anymore to literacy performance independent of educational achievement. But an influence of labour participation can be seen particular on document literacy in figure 3.

Figure 3

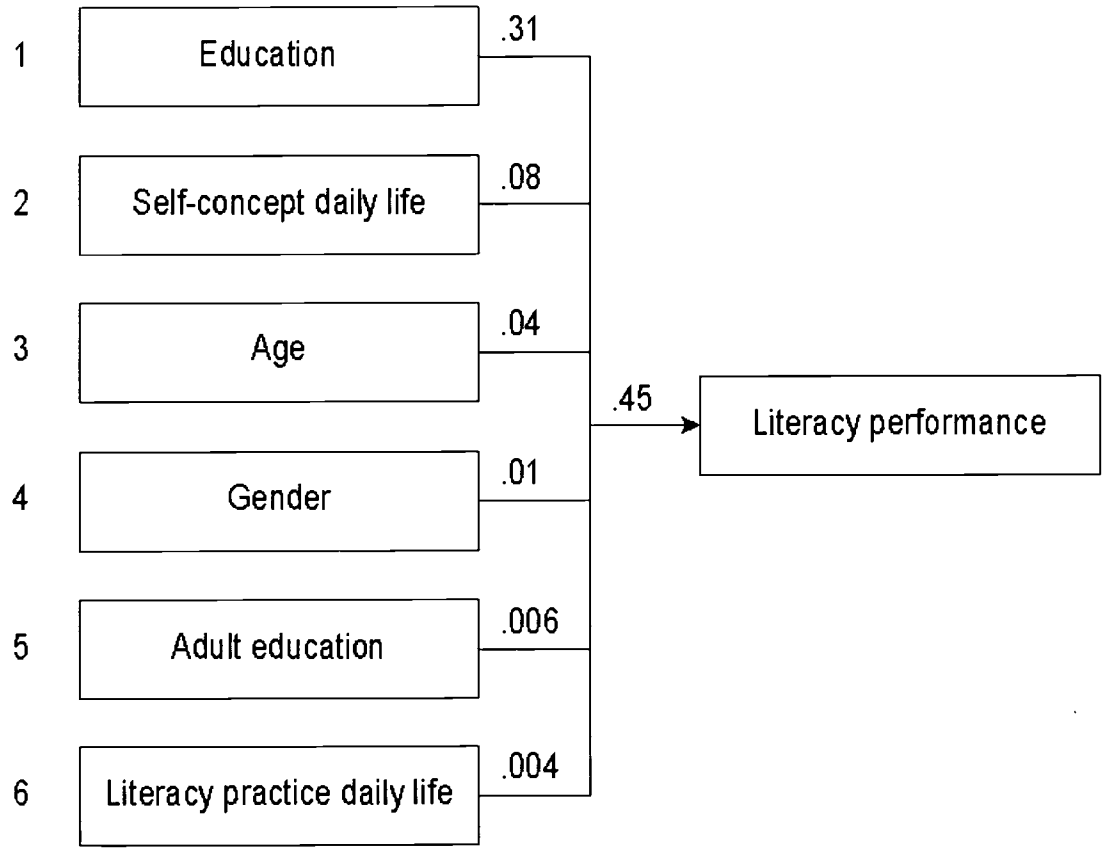


Still being occupied between the ages of 50 to 65 years is, autonomous of educational achievement, positive related to document literacy performance.

5.3. Composite variables that might support or reduce literacy competence

In search for other relevant factors that could sustain or weaken literacy competence than the common background variables already presented, the survey provides for many variables that could be joined together on basis of their equivalence in some main factors influencing literacy. The analysis will be limited to the age group of 50 to 75 years. As a result of arranging variables in some composite factors by means of reliability analyses some major indicators were discerned, as literacy practices (reading and writing) at work, literacy practices in daily life, reading practices at work, self-concept /self-assessment of literacy performance at work or in daily life, and coping behaviour. Some concepts on the basis of arranged variables as cultural/social participation or reading facilities/reading behaviour are less suitable because of low reliability scores (alpha < 0.5). It is convenient, on the basis of their high equivalence (alpha = .97), to match the prose, document, and quantitative scale into one aggregated scale on literacy performance. One identified composite factor with a substantial influence on literacy performance is the self-assessment of their literacy skills or the self-concept of literacy performance in daily life by the respondents (alpha = .85). The factor self-concept has its own remarkable independent influence on literacy performance. The factor itself has its share in accomplishing literacy tasks, in the manner of a self-fulfilling prophecy. A positive or negative self-image about the capability to perform literacy tasks will have a favourable respectively a counterproductive effect on the motivation to perform literacy tasks to one's exacting extreme capability. The self-concept or self-image on literacy performance is an interesting factor for it is one that is to be influenced, perhaps in combination with adult education. Figure 4 based on multiple regression analysis shows that self-concept is the second best predictor after initial education.

Figure 4



As interesting as factors that have a substantial influence on literacy performance are factors of which we expect to have an influence on the performance of literacy but the expectations could not be proved in the analysis, at least not on account of the variables in the survey. The figure above shows the tiny independable influence on literacy performance of literacy practice in daily life (alpha = .72), one of the factors that could have influence on literacy achievement. The question is whether literacy skills and literacy activities interact. IALS respondents were asked to report on their every day reading and writing tasks. A general tendency is that individuals at higher literacy levels report that they carry out a practice more frequently, so literacy skills and literacy practices are highly correlated. However literacy activities are correlated with educational achievement so high, that no independent influence of literacy practice remains in the regression analysis.
There is no evidence in the analysis for the proposition that, autonomous of the level of educational achievement, more literacy practice in daily life leads to higher literacy skills.
Furthermore one factor that is expected to have an autonomous negative influence on literacy performance is loss of memory at an older age. Although the IALS respondents were asked specific questions on this item in the survey no significant effect of self-reported memory problems on literacy performance was perceptible in the regression analysis. On closer inspection almost no difference in scores on the literacy scales in the survey could be seen between older respondents who report that they have sometimes a loss of memory (18.3 %) and other older adults who informed to have no problems with memory.
An obviously potential physical deficit of older adults is a factor that could exert influence on literacy performance. In the survey questions were asked on viewing problems, hearing deficits, language deficits, learning deficits and other health problems lasting longer than 6 month. Despite the fact that older respondents report somewhat more physical deficits than younger respondents almost non-influence of the several deficits on literacy performance could be derived from the regression analysis.

5.4. Work related factors of influence on literacy performance

In society we see a growing interest on the issue of older employees due to the ageing of the workforce and potential unfavourable effects, particularly economical, of that event. Also it is assumed, that for further economical growth and competition workers need high levels of literacy proficiency. Starting from that reference point it is of interest to compare the literacy proficiency of older and younger employees and the particular influence of age and education. Table 2 shows the differences in literacy proficiency of older and younger employees.

Table 2 Proportion of population in age groups of younger employees (16-49 years) and older employees (50-64 years) at each literacy level (all scales) (n=1806).

PROSE

	level 1	level 2	level 3	level 4/5
16-49 (n=1536)	4.6	22.8	51.0	21.7
50-64 (n=270)	12.5	35.8	41.6	10.1

DOCUMENT

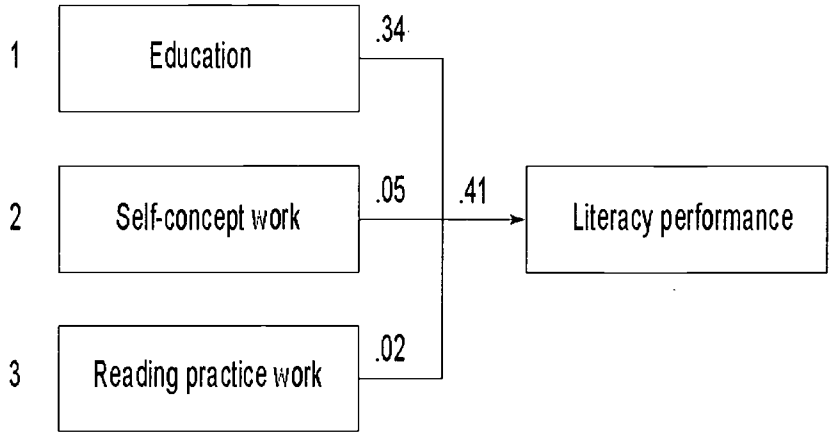
	level 1	level 2	level 3	level 4/5
16-49 (n=1536)	4.1	19.0	50.1	26.8
50-64 (n=270)	9.3	36.6	39.1	15.0

QUANTITATIVE

	level 1	level 2	level 3	level 4/5
16-49 (n=1536)	4.5	18.2	49.8	27.7
50-64 (n=270)	9.0	33.0	38.4	19.7

Although many individual older employees perform better on the literacy measures as a lot of younger employees, it is clear that on average older employees are not as good as younger employees concerning literacy proficiency. Almost half of all older employees scores on the lower levels 1 and 2 while of the younger employee group on average one-fourth scores on the lower levels. The differences between older and younger employees are less sizeable on the quantitative scale. Analogous with the total population analysis of covariance are done on the sub-population of employees to examine if all the difference in literacy performance between the age groups is to be attributed to educational background. Also in this case educational background accounts for a large part the literacy performance, yet a minor part of the lesser literacy performance of older employees can be due to age related factors. On the basis of the foregoing analysis on the age group of 50 to 75 years the conclusion is drawn that literacy practice in daily life has shown no influence on literacy achievement. For analysing the influence of literacy practice at work (alpha= .87) on literacy performance the age group is limited from 50 to 65 years old, the plausible age-period for being in the workforce at an older age. In contrast to literacy practice in daily life a substantial influence of literacy practice at work is to be seen on literacy performance. When adding the factor of literacy practice (reading and writing practice) at work to the usual background variables in the regression analysis only two factors are left as independent factors of influence on literacy performance: initial education and literacy practice. Other factors are outshined by these two factors in the age group of 50 to 65 years. After enclosing only the reading practice at work (alpha = .80) to the analysis this factor overshadowed even literacy practice (reading and writing) at work in general. More precisely, mainly reading practice at work is also an important factor of influence on literacy performance. There is a positive connection between literacy performance and the frequency of performing reading tasks common at work like memos, manuals, diagrams, spreadsheets or bills. Comparable with the influence of the self-assessment or the self-concept of their literacy performance in daily life by the respondents is the influence of the self-assessment or the self-concept of their literacy performance at work (alpha= .81). Next to educational achievement the self-concept of literacy performance is the second substantial factor of influence on literacy performance. After appending this element to the other factors the influence of reading practice at work is smaller but remains provable as can be seen in figure 5.

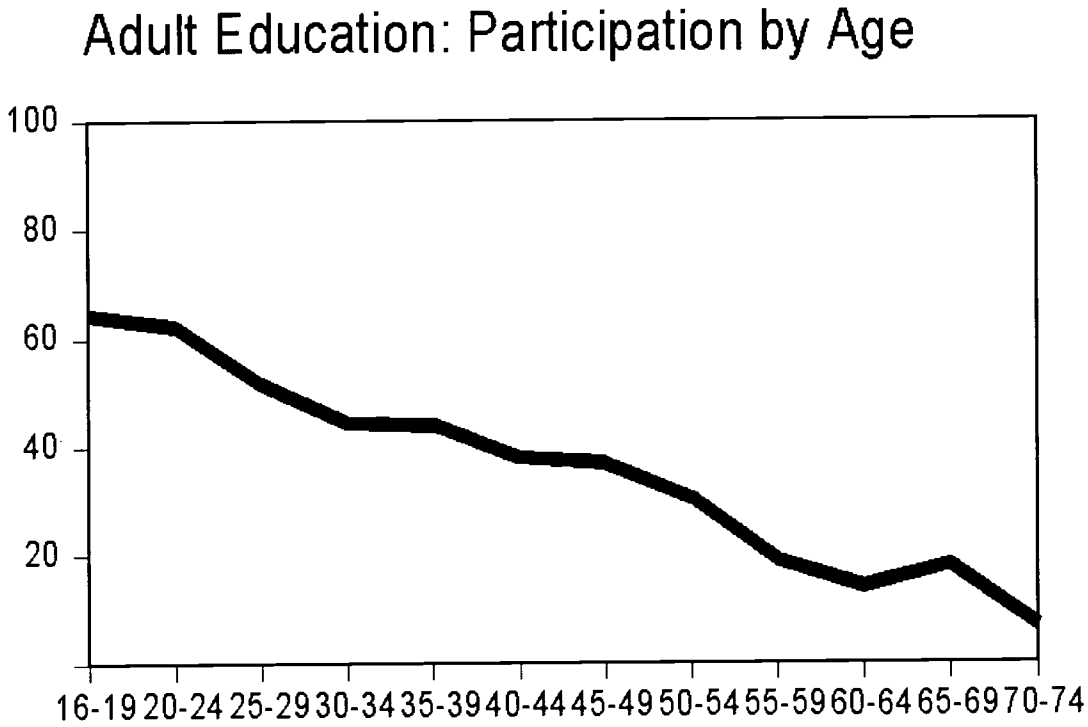
Figure 5



5.5. Adult Education participation of older adults and vocational training of older employees.

Initial education is the mayor factor that affects the literacy achievement directly. A similar influence one could expect from adult and continuing education. Adult and continuing education is one factor that could have an immediate influence on literacy performance on the condition that a large number of older adults take part in this additional facility.
Large differences can be seen in the participation of the different age groups in adult education. It ranges from on average 70 percent of the young ones (16-19 years old, including students) to 35 percent of the older adults of 50 to 75 years in the last 5 years. If the time limit is restricted to one year (the last) the participation in adult education is 45 percent and 19 percent respectively. The proportion of the different age groups who take part in adult education in one year is presented in figure 6.

Figure 6



The term continuing education is misleading as for the older age groups. The bulk of them do not participate in education any more.
Even though older adults take part in adult education substantial less than younger ones, it is to be expected that the participation of older adults will rise in the near future. In general the next generation of older adults is higher educated than their predecessors. That higher educated adults participate more in adult education than low educated adults is constantly confirmed in research literature. Furthermore because of an expected shortage of younger employees, employers will do a greater demand on older employees to train their skills according to the latest technological developments. Such being the case, it is of importance whether participation in adult education has influence on the level of literacy proficiency of older adults. Table 3 represents the relationship.

Table 3 Proportion of population of 50 to 75 years who participated in adult education in a time limit of one year at each literacy level (all scales) (n=918).

PROSE				
	level 1	level 2	level 3	level 4/5
yes (n=175)	8.6	34.3	44.0	13.2
no (n=743)	26.8	41.7	27.5	4.0

DOCUMENT				
	level 1	level 2	level 3	level 4/5
yes (n=175)	11.4	32.6	41.7	14.3
no (n=743)	25.6	41.0	27.3	6.0

QUANTITATIVE				
	level 1	level 2	level 3	level 4/5
yes (n=175)	8.6	28.0	42.3	21.1
no (n= 743)	21.8	35.5	34.1	8.6

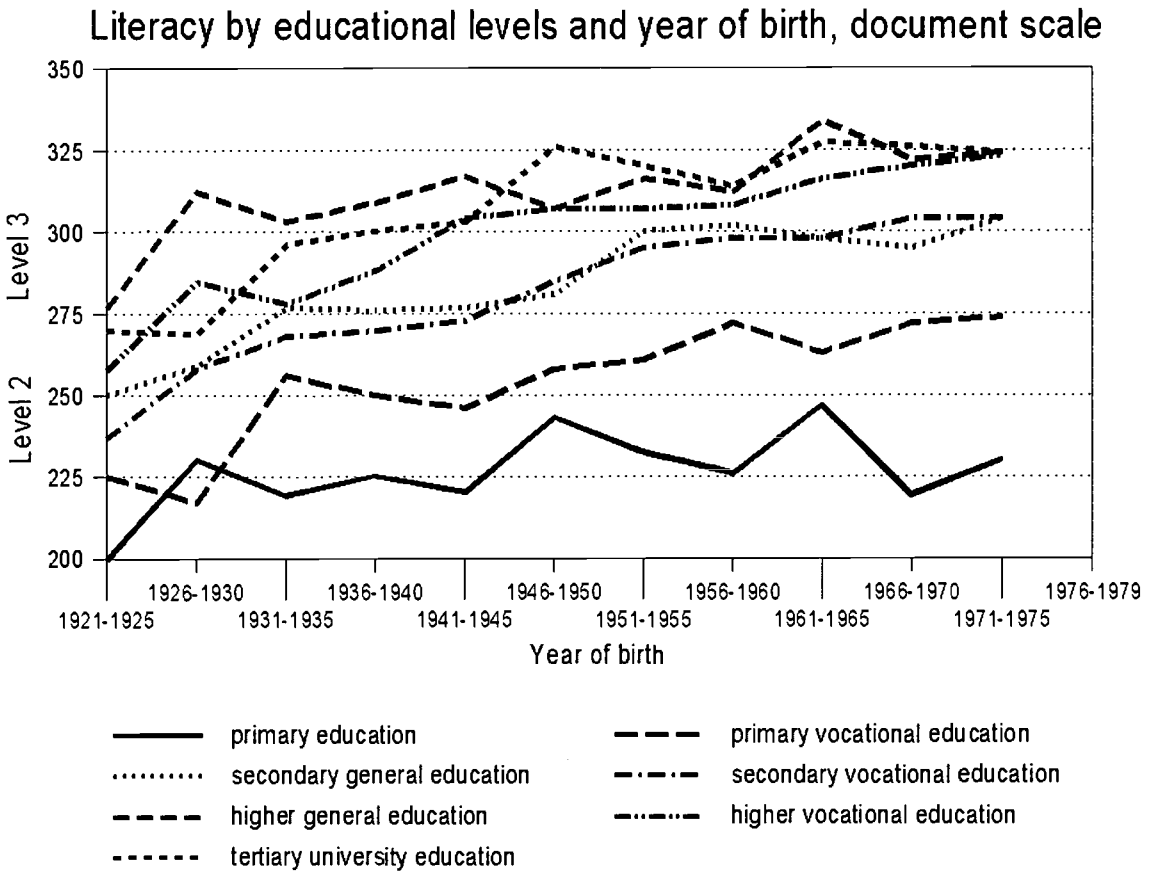
Although there is no causal connection between these findings they draw attention to intervention opportunities by using adult education. Because of the strong relationship of adult education with initial education an analysis of covariance with initial education as covariance gives a more detailed insight in the relation between the variables. After excluding the influence of initial education only a slight but significant influence of adult education remains standing.
A focus on the older workforce clarifies the differences in adult education participation between older and younger employees and the influence of adult education within the group of older employees. Of the employees younger than 50 years old almost the half of them has received training within a time limit of a year as against round one-fourth of the older employees in the age of 50 to 65 years old. Employees in the age group of 50 to 65 years take more part in adult education (29.3 %) than other adults in the same age group (16.7 %). Higher educated older employees participate more in adult education than low educated older employees. Older employees who have received training score higher on the literacy scales than other older employees. It appears to be a strong relationship between educational achievement, adult education participation, literacy skills on the one hand and on the other hand participation in the workforce. Older adults with a high educational achievement, taking part in adult education and have a high standard of literacy proficiency participate more in the workforce than other older adults. The three connected factors function as catalytic agents for participation of older adults in the workforce. The other side of the story are the low educated adults who have fewer opportunities to benefit from training to improve their general literacy and job-related skills. Furthermore low-educated older adults take less part in the workforce than well-educated older ones. If their activities in daily life provide few opportunities for literacy activities or only limited literacy activities, skills may even decline if they are not challenged in their job-activities or have been excluded out of the workforce.

5.6. Education

The results of the preceding analysis show that the differences in literacy performance can be attributed to a large extent to differences in level of educational attainment. It is not surprising that there is a

strong relationship between educational attainment and literacy performance: most people learn to read in school, a setting that offers the most opportunities to use and improve literacy.
But the relationship is not straightforward. In the Netherlands over 40 percent of those who have not completed secondary education have literacy scores at level 3 or 4/5 on the literacy scales. The large numbers of adults who reach high levels of literacy without having achieved high levels of education suggest that while education is the most common route to literacy skills, it is quite possible to acquire literacy skills through other means than formal initial education participation. Many adults reached their highest literacy performance on an age that is -sometimes far- behind their period of formal educational participation.
Older age groups have received less education than younger age groups, and the differences are also reflected in differences of literacy proficiency between the age groups. Because younger age groups have received more initial education than older age groups there are larger proportions of younger adults with higher literacy skills. Compared with other countries the differences are in the Netherlands particularly large between 16 to 25 year-olds and 46 to 55 year-olds (OECD/HRCD, 1997, p. 28).
Further analyses are made to compare for several age groups the performance of literacy based on the different levels of educational attainment. As an example for the three literacy scales figure 7 shows the literacy performance on the document scale in relation to educational attainment and the year of birth of several age groups.

Figure 7



With the exception of the primary educational level on each of the educational levels younger age groups perform in general higher on literacy than older age groups.
It suggests on the one hand that on each particular educational level higher standards of literacy skills are reached as the years progressed. So a general higher literacy proficiency of younger adults compared with older adults can only partly be attributed to the fact that nowadays more students go to higher

levels of education. Also each educational level itself improved on reaching higher literacy proficiency on students nowadays.
On the other hand the lower literacy performance of older adults on each educational level supplies a slight indication for the possibility that adults lose some particular literacy skills during lifetime when they pass into disuse. Also it provides some evidence that parts of skills or factual knowledge learned long ago are nowadays not useful anymore in daily life.
Looking at the international norm in IALS that draws the line between the basic levels of literacy (level 1 and 2) and level 3 and 4/5, figure 7 also indicates that older ones with years of birth from 1920 up to 1950 (45 to 75 years old) and an educational attainment on a primary or secondary level will nowadays probably have literacy skills deficits. So deficits of literacy skills are also found to a great extent in the 'younger' older generations.
Also these days a lot of young adults are trained at an insufficient literacy level to function well later on in society. All adults, independent of age, who have an educational attainment less than the secondary level of education, are missing some essential literacy skills. Because of constantly higher demands on people, due to fast economical - social and technological developments, it is plausible that standards for literacy will also rise in the near future. Adults who nowadays have sufficient literacy skills at their disposal could have deficient literacy competence in the future to function at an acceptable level in society. So the issue of inadequate literacy skills can not be played down in anticipation of a die out of the oldest, low educated, generations. This fact has to be a challenge for adult education and particular vocational training in the light of ageing of the workforce.

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Biography

Jo Scheeren is currently researcher at the Department of Education at the Ghent University, Belgium, Recently he worked on a policy analysis aimed at the implementation of Lifelong Learning in Flanders, the Dutch-speaking part of Belgium. In the Netherlands he has worked on several research projects involving adult education, often with a focus on older adults. Furthermore he is writing a dissertation on literacy of older adults, mainly based on the data of the Dutch part of the International Adult Literacy Survey.

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