

The relationship between demographic variables and NART performance in normal subjects

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The relationship between NART performance and demographic variables was examined in a group of subjects free of neurologic or psychiatric disorder ($n = 201$). NART estimated IQ was significantly correlated with education, social class and age. The correlation between age and NART IQ was no longer significant after partialling out either education or social class. There was no evidence of a curvilinear relationship between age and NART performance. There was no significant sex difference in NART performance. Nelson's (1982) report of a high split-half reliability was confirmed.

The National Adult Reading Test (Nelson, 1982) provides a rapid estimate of IQ and would appear to be largely resistant to the effects of dementia and depression (e.g. Crawford, Besson, Parker, Sutherland & Keen, 1987; Crawford *et al.* submitted for publication; Nelson & O'Connell, 1978); although negative results have been reported in some organic conditions (e.g. Hart, Smith & Swash, 1986; Crawford *et al.*, submitted for publication). Since its publication the NART has rapidly become a widely used instrument in clinical practice despite the lack of independent research on its basic psychometric properties. The purpose of the present study was to examine the relationship between NART performance and demographic variables in normal subjects thereby attempting to replicate and extend Nelson's (1982) results with the NART standardization sample. Nelson (1982) reported that, in the standardization sample ($n = 120$), NART performance was not significantly correlated with age and concluded that age had no effect on reading ability within the age range examined (20-70 years). However before such a conclusion can be accepted with confidence it is necessary to exclude the possibility that a curvilinear relationship exists between NART performance and age. It may be that performance improves through early adulthood, as the relevant word knowledge is acquired, and declines in old age. This possibility was examined in the present study in addition to attempting replication of Nelson's (1982) original finding with a wider age range.

A further aim was to examine if there was a sex difference in NART performance. Comparisons of male and female performance was not reported for the standardization sample (nor was the sex ratio of the sample). As some studies have reported evidence of female superiority in verbal abilities (e.g. Maccoby & Jacklin, 1974) and as females have also been reported to read significantly more than males

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the possibility of a sex difference in NART performance should be explored. Finally an attempt was made to replicate Nelson's (1982) report of a high split-half reliability for the NART.

Method. NART records were available for 201 subjects (129 females, 72 males) who were free of neurological or psychiatric disorder. The mean age of the sample was 43.6 years (SD = 18.7) and the age range 17-88 years. Mean number of years of education was 10.8 (SD = 1.9) The OPCS (1980) Classification of Occupations was used to assign social class. Comparison of the social class data with the 1981 census figures revealed that there was an under-representation of social classes 4 and 5 (social class 1 = 4.1, 2 = 29.2, 3 = 49.3, 4 = 12.5, 5 = 3.1 per cent).

Results and discussion. Mean number of NART errors was 24.4 (SD = 8.7) and mean estimated IQ was 107.5 (SD = 7.2). The mean number of errors is comparable with Nelson's (1982) results from the standardization sample (mean errors = 22.4, SD = 10.1). NART estimated IQ was significantly correlated with number of years education ($r = 0.51, P < 0.001$), social class ($r = -0.36, P < 0.001$), and age ($r = -0.18, P < 0.01$). The correlation between age and NART performance was no longer significant after partialling out either education ($r = 0.05, n.s.$) or social class ($r = -0.09, n.s.$). Visual examination of the raw data failed to reveal any tendency towards curvilinearity in the relationship between NART performance and age suggesting that the use of correlational techniques was permissible. To examine this statistically the relationship between NART performance and education, social class and polynomial functions of age was modelled by multiple regression. NART performance was first regressed against education and social class. Age, age², and age³ were then sequentially added to the model; none improved the fit of the model to the data by a statistically significant amount ($P > 0.10$ in each case). Thus there was no evidence of a curvilinear relationship between age and NART performance.

In summary the results of the present study using a larger sample and wider age range than the standardization sample can be viewed as confirming that age has little or no effect on NART performance. The raw correlation, although significant, was small and fell to almost zero after partialling out education or social class. Independent samples *t* tests revealed that there was no significant difference between males and females for either age or years of education. There was no significant effect of sex on NART performance (females $X = 107.4$, males $X = 107.8, t = 0.36, n.s.$). Split-half reliability was determined using the Spearman-Brown formula (Thorndike, 1967). A reliability coefficient of 0.90 was obtained which is consistent with the reliability coefficient reported by Nelson (1982) for the standardization sample (0.93) and thus confirms that the NART has high split-half reliability. As the NART would appear to provide a rapid and valid estimate of pre-morbid IQ (see introduction) it is clearly an extremely useful instrument. The results of the present study and O'Carroll's (1987) demonstration of a high inter-rater reliability suggest it can be used with confidence in clinical practice.

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Received 7 May 1987; revised version received 1 July 1987