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Childhood IQ and in-service mortality in Scottish Army personnel during World War II

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ABSTRACT

The Scottish Mental Survey of 1932 (SMS1932) provides a record of intelligence test scores for almost a complete year-of-birth group of children born in 1921. By linking UK Army personnel records, the Scottish National War Memorial data, and the SMS1932 dataset it was possible to examine the effect of childhood intelligence scores on wartime military service mortality in males. There were 491 matches between World War II (WWII) Scottish Army fatalities and the SMS1932 database; 470 (96%) had an age 11 mental ability score recorded. The mean (S.D.) age 11 IQ score of those who died on active service in WWII was 100.78 (15.56), compared with 97.42 (14.87) for male Army survivors ($p<0.0001$; Cohen's $d=0.22$). Men who took part in the SMS1932 and who were not found in the Army database had a higher mean score (100.45, S.D. $=14.97$) than those men who had been in the Army, regardless of whether they died or survived (mean IQ $=97.66$, S.D. $=14.94$; $p<0.0001$; Cohen's $d=0.19$). Male soldiers with a higher childhood IQ had a slightly increased risk of dying during active service in WWII. Men who did not join the Army had a higher IQ than men who did. Further research in this area should consider naval and air force personnel records in order to examine more fully the complex relationship between IQ and survival expectancy during active service in WWII.

1. Introduction

People with higher intelligence test scores tend to live longer. The first peer-reviewed report of the association between mental ability and mortality was among a sample of Australian Vietnam war veterans who took mental tests when they joined the armed services and were followed up for survival data after war service was completed (O'Toole & Stankov, 1992). The intelligence–mortality association is now well replicated among studies in which IQ-type data were collected in youth, prior to any likely onset of illness that could affect both the test scores and subsequent health (Batty, Deary, & Gottfredson, 2007; Hart, Taylor et al., 2003; Whalley & Deary, 2001). There is, however, an interesting exception to this 'lower intelligence-higher mortality risk' association. In one locality, Scottish men with higher childhood IQ scores were more likely to die on active service during World War II (WWII). In their investigation into the effects of childhood IQ and survival up to age 76 in the Aberdeen-based participants of the Scottish Mental Survey 1932 (SMS1932; Scottish Council for Research in Education [SCRE], 1933), Whalley and Deary (2001) found that the influence of age 11 IQ on survival to old age was weaker in men than in women. They attributed this to the effect of WWII on death rates in men. Whereas women with a high childhood IQ had a consistently better average survival expectancy than women with a low childhood IQ, the pattern for men was different. Whalley and Deary observed that "for men with a high IQ, survival suddenly drops during the Second World War and does not catch up and improve on that in men with a low childhood IQ until later in life" (p. 820). This suggested that the men who were killed during active service in the WWII may have had a relatively high IQ.

The present study follows up this suggestion. The age of people in the SMS1932 was such that many of the males

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would later join the armed services during hostilities in WWII. Here, we bring together data from: the Scottish Mental Survey 1932 (which comprises mental ability scores on the same valid mental test for nearly all children born in 1921 and attending schools in Scotland on June 1st 1932); United Kingdom Army records (which includes all WWII personnel); and the Scottish National War Memorial (which records Scottish deaths in the armed services). WWII military test data were not available to the authors. The present data-linking exercise provides an opportunity to study the association between childhood (age 10.5 to 11.5 years) intelligence in the SMS1932 and the survival of male Army personnel during WWII. Childhood IQ from the SMS1932 is a highly reliable indicator of adult IQ, evidenced by the stability of IQ across the lifespan from age 11 to almost age 80 years (Deary, Whalley, Lemmon, Crawford, & Starr, 2000; Deary, Whiteman, Starr, Whalley, & Fox, 2004). The aims of this study are: (1) to extend the scope of Whalley and Deary's (2001) previous work in the small Aberdeen subsample of the SMS1932 to include the entire SMS1932 dataset in examining whether a relation exists between childhood mental ability and survival expectancy in male soldiers during WWII; and (2) to examine any differences in childhood mental ability between those who were enlisted in the Army in WWII and those who were not.

2. Method

2.1. Participants and datasets

The present study involved the linking of four large datasets—two Scottish, one UK-wide, and one that applies to the British Commonwealth—which are described below. The first three are the 'principal' datasets used in the study.

2.1.1. Scottish mental survey 1932 (SMS1932)

The present study's reference population is the participants in the Scottish Mental Survey of 1932, conducted by The Scottish Council for Research in Education (SCRE, 1933). This exercise tested the mental ability of almost all Scottish children born in 1921 and attending school on June 1st 1932. The original objectives of the study were: a) to quantify the rates of mental deficiency; and b) to obtain information about the distribution of intelligence throughout the country. A group-administered general mental test was given—a version of the Moray House Test No. 12, referred to here as the MHT. It comprised 71 verbal reasoning (predominantly), numerical, spatial and other items and with a maximum score of 76. The correlation between the MHT and the Stanford-Binet Intelligence Test was 0.81 for boys and 0.78 for girls (SCRE, 1933). There are some currently-missing ledgers for the areas of Fife, Wigtownshire and Angus. The computerised SMS1932 dataset consists of 86,520 entries (43,569 males). One region tested a small sample of children born in 1922 and 1923, in addition to 1921, but for the purposes of this study the SMS1932 dataset we refer to contains the male entries only, born in 1921 ($N = 42{,}605$).

2.1.2. Army inventory

An electronic index of archived Army personnel records obtained from the United Kingdom's Army Personnel Centre (Kentigern House, Glasgow, Scotland) contains listings for 8,009,328 men and women who served in the Army after 1921 and no longer have any reserve liability. 208,388 entries in this database have 1921 birthdates. Each entry includes Army service number, name (surname and initials), date of birth, and regiment. Many of the records are incomplete.

2.1.3. Scottish National War Memorial records (SNWM)

The Scottish National War Memorial—based in Edinburgh Castle in Scotland—has archived records of the WWII Rolls of Honour, documenting Scots who died during active service in the armed forces. We obtained permission to access the electronic index—which will be referred to as SNWM—containing listings for 57,705 WWII deaths. Information includes Army service number, name, regiment, rank, date of death, and place of death. Date of birth information is not included.

2.1.4. Commonwealth War Graves Commission

The 'Debt of Honour Register' is the Commission's database listing the 1.7 million men and women of the Commonwealth forces who died during the two world wars. The register, available at *www.cwgc.org*, can be searched for personal, service and commemoration details of war casualties, on an individual basis. This database is useful for verifying details of casualties and providing date of death, rank and regimental information, where missing in other Army datasets.

2.2. Procedure

Table 1 shows the variables available for matching in each of the three principal datasets. All matching was carried out without knowledge of MHT (childhood mental ability) scores. Although the SNWM database contains most of the relevant Army information for the purposes of this study, date of birth information is missing. Date of birth is necessary to enable the cross-matching of military records with the SMS1932 at a later stage. Prior experience in matching the SMS1932 to databases in Scotland indicates that, with surname, initials and date of birth available, ambiguity in matching is minimal (Hart, Deary et al., 2003). The SNWM dataset ($N = 57{,}705$) was compared with the Army Inventory database ($N = 8{,}009{,}328$) in order to identify records which matched, and to provide date of birth information for as many people in the SNWM index as possible.

Table 1
Variables available for matching in each of the datasets

	Army [a]	SNWM [b]	SMS1932 [c]
Army service number	✓	✓	
Name	✓	✓	✓
Date of birth	✓		✓
Regiment	✓	✓	
Rank		✓	
Date of death		✓	
Place of death		✓	
MHT score			✓

[a] Army Inventory.
[b] Scottish National War Memorial.
[c] Scottish Mental Survey 1932.