



# FOCUS ON RESEARCH

## **A HUNDRED AT NINETY: THE COMMON CAUSE HYPOTHESIS OF AGEING TESTED IN FOUR WAVES OF THE LOTHIAN BIRTH COHORT 1921**

### **Researchers**

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### **Aims**

- To study the trajectories of change from age 79, via age 83 and 87, to age 90 in: cognitive abilities, physical fitness and physiology, mood states, activities of daily living, and quality of life.
- To assess whether the starting points of these trajectories influence their rates of decline.
- To assess the causal directions between pairs of these trajectories.
- To discover the determinants (genetic, health, lifestyle, and psycho-social) of differences in these trajectories.
- To discover the multiple determinants of survival from age 79 to age 90.

### **Project Outline/Methodology**

The study involved the Lothian Birth Cohort 1921, a group of people whose general intelligence was tested at age 11. In this study, 129 of them had their cognitive abilities tested at 90 years, having been seen already at 79, 83 and 87. On three occasions the same test they sat at age 11 was repeated. Physical fitness was also assessed, similarly to previous testing waves. This included measuring 6 metre walk time, lung function, and grip strength. Measurements of bodily symmetry taken at age 87 were repeated at 90. These involved measurements of the lengths or widths of a number of parts on the right and left side of the body (e.g. fingers, wrists, ankles). Blood samples were taken for biomarkers of ageing such as inflammation and oxidative stress, and some additional laboratory blood tests were used to detect illnesses.

### **Key Results**

Cognitive abilities and physical fitness tend to decline with age, but different indicators have different ageing patterns. Sex, childhood IQ, education and social class explain differences in levels of different cognitive abilities. Sex affects the amount of decline in some cognitive and physical variables—females decline less than males. People who took part in all waves of the study have better cognitive abilities and experience less decline than those who dropped out. People with poorer cognitive abilities at 79 and those

who look relatively old compared to their peers, are at increased risk of death before they reach the age of 90, even after taking into account differences in health status. Personality matters: women who are less agreeable and men who are less conscientious and of below-average ability are at an increased risk.

### **Conclusions**

The study was performed as planned and all original aims were met. Different aspects within and across domains show different ageing trajectories—some decline rapidly and steadily, others are relatively stable. There are associations across the domains of ageing. Cognition, personality, and age rated from a face, predict mortality risk in the ninth decade of life.

### **What does this study add to the field?**

This study adds the knowledge of multiple predictors of mortality in the ninth decade. In addition, this study demonstrates that cognitive ability is a lifelong trait—people who are intelligent as children remain intelligent through old age.

### **Implications for Practice or Policy**

About 30% of cognitive ability is stable, the remaining portion might be a target for interventions to promote successful ageing. A simple rating of an individual's age has predictive value over objectively measured health. As such, it may be a useful and cost-efficient clinical tool.

### **Where to next?**

Several analyses and research papers in addition to those planned were undertaken and produced. Once all biomarker data are available, we shall longitudinally examine them to elucidate mechanisms that may underpin 'common cause'. In another wave of the study we will scan brains of the surviving members of the 1921 cohort to find out how brains of people of different abilities differ.

### **Further details from:**

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