**Results**

At the time of this analysis, 1290 women and 470 men had completed some portion of the MAP protocol. However, individuals who developed dementia over the course of the study period were excluded from this analysis. This resulted in a sample of 1,362 participants. A further 104 participants were excluded because they did not complete one or more of the three physical measures or any cognitive tests at any wave and 18 were excluded because the relevant covariate information was not available resulting in a sample of 1240 included in the present analysis, 931 women and 309 men. 86% of whom identified as non-hispanic white, 7% as having Spanish, Hispanic, or Latino origin, 6% as Black or African-American, and the remaining 1% included individuals who identified as Native American, Indian, Asian or Pacific Islander.

Some participants completed up to 20 waves with two year intervals however, only the first 10 waves of data collection were included in the present analysis because of the low numbers of participants who had more than 10 waves of data available at the time of this analysis. Approximately 20% of women completed some measures at wave 10 and approximately There were a total of 1362 individuals at baseline, 1100 at year 2, 932 at year 4, 773 at year 6, and 647 at year 8.

**Relations between physical and cognitive functioning**

**Forced expiratory volume (fev)**

After adjustments for age and education, forced expiratory volume (fev) declined significantly in women and men. The decline over time remained significant for both men and women after accounting for height, diabetes, smoking history, and cardiovascular disease.

Between person correlations between baseline forced expiratory volume and baseline cognition ability (intercepts)

Among women, after adjustments for age, there was a significant association between the intercepts of pulmonary function and cognitive performance on 16 out of 18 cognitive function tasks examined. Specifically, the initial level of pulmonary function was significantly positively correlated with the initial level of performance on a digit ordering task, digits backwards test, category fluency, NART, Boston Naming test, Complex Ideational Materials test, Boston Story immediate recall, digits forward, logical memory immediate recall, logical memory delayed recall, word list delayed recall, and word list recognition, line orientation, MMSE, matrix reasoning, number comparison, and digit symbol. Only the association between the intercepts of pulmonary function and Boston story delayed recall performance, and the association between the intercepts of pulmonary function and word list immediate recall performance were not significant after accounting for age. Meaning that the initial level of pulmonary function was not related to initial level of performance on immediate recall of a word list nor was it related to the initial level of performance recalling details of the Boston Story after a delay. However, once years of education was included as a covariate the correlations between initial fev and immediate recall of the Boston Story, both immediate and delayed recall of the WMS Logical Memory story, word list recognition memory performance, and MMSE performance were attenuated. After adjusting for height the association between baseline fev and BNT performance also became non-significant. Thus, after adjustments for age, education and height, significant correlations remained between baseline fev and digit ordering, digits backwards, category fluency, NART, complex ideational materials, digits forward, word list immediate recall, line orientation, matrix reasoning, number comparison, and digit symbol test performance. The addition of smoking history, cardiovascular disease history, and diabetes did not affect baseline associations between fev and cognitive function measures.

Among men, after adjustments for age, there was a significant association between the intercepts of fev and 12 of the 18 cognitive abilities examined. There was a significant and positive association between baseline fev and digits backwards, category fluency, NART, BNT, digits forward, logical memory delay, word list delayed recall, word list recognition, line orientation, matrix reasoning, and number comparison, performance such that men who had higher baseline fev also had better performance on those cognitive tests. However, when education was also adjusted for the significance of the correlations was attenuated between baseline fev and digits backwards, NART, BNT, digits forward, logical memory delayed, word list delayed recall, word list recognition, and number comparison. The association between baseline level of fev and digit symbol performance was nearing significance at the *p* <.05 level when adjusting only for age but became significant at this level when also adjusting for education. When additional covariates height, cardiovascular disease, smoking history, and diabetes were adjusted for there were no changes in the significance of the correlations between baseline fev and cognitive function test performance among men.

Longitudinal correlations between changes in fev and changes in cognition (slopes).

The average rate of change in fev and average rate of decline in cognitive functions were not significantly related after adjusting for age, for any of the cognitive domains examined for men or women.

Correlations between occasion specific variations in fev and cognitive ability score (residuals).

There was no significant correlation between the residuals for each occasion of fev and the residuals of any of the cognitive abilities examined for women or men after adjusting for age. Thus, for a particular individual variation at a specific occasion from the fev predicted by the growth model is not association with variation from the cognitive score predicted by the growth model at that occasion.

**Grip Strength**

Women show a significant decline in grip strength over time. The correlation between the grip strength intercept and slope was significant and negative indicating that women with initially higher grip strength showed greater decline over time.

**Cognitive Performance Tasks**

BNT:

Women do not have a significant slope. The residual variance is significant. There was a significant negative correlation between BNT intercept and BNT slope such that women with initially better BNT performance showed greater decline over time. None of the covariances are significant (intercepts, slopes, residual) between BNT and fev for women. There was a significant positive covariance of the intercepts of BNT and grip strength (R\_IPIC = 0.091, p=.032) such that women with initially better grip strength also had higher BNT test performance.

Men did not show a significant change in BNT performance over time (slope) nor was the residual slope variance significant. There is a significant positive covariance between baseline grip strength and BNT performance for men such that men with stronger grip also had higher BNT performance. There was no significant relation between the slopes of BNT and grip strength for men (R\_SPSC) no were the residuals correlated (R\_RES\_PC).