# Appendix

## Table S1. Robustness check: Testing attrition bias, vision

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (1)  Vision | (2)  Vision | (3)  Vision | (4)  Vision | (5)  Vision | (6)  Vision |
| Sample | Total | Total | Women | Women | Men | Men |
| Estimation model | FE | FE | FE | FE | FE | FE |
| Time-varying controls | Yes | Yes | Yes | Yes | Yes | Yes |
| IPW | No | Yes | No | Yes | No | Yes |
|  | *B*  95% CI | *B*  95% CI | *B*  95% CI | *B*  95% CI | *B*  95% CI | *B*  95% CI |
| Age | -0.007\*\*\* | -0.008\*\*\* | -0.002 | -0.002 | -0.011\*\*\* | -0.012\*\*\* |
|  | [-0.009,-0.004] | [-0.010,-0.005] | [-0.005,0.001] | [-0.006,0.001] | [-0.014,-0.008] | [-0.015,-0.008] |
| Age2 | 0.000 | 0.000 | 0.000\* | 0.000\*\* | 0.000 | 0.000 |
|  | [-0.000,0.000] | [-0.000,0.000] | [0.000,0.000] | [0.000,0.000] | [-0.000,0.000] | [-0.000,0.000] |
| Time to spousal loss  (ref: ≤ - 4th year) |  |  |  |  |  |  |
| - 3rd year | 0.002 | 0.011 | -0.014 | -0.015 | 0.013 | 0.041 |
|  | [-0.088,0.092] | [-0.089,0.111] | [-0.109,0.080] | [-0.123,0.093] | [-0.254,0.281] | [-0.222,0.304] |
| - 2nd year | -0.022 | -0.009 | -0.019 | -0.009 | -0.093 | -0.070 |
|  | [-0.099,0.056] | [-0.096,0.078] | [-0.107,0.068] | [-0.105,0.087] | [-0.263,0.077] | [-0.265,0.126] |
| - 1st year | 0.052 | 0.049 | -0.014 | -0.028 | 0.257\*\* | 0.266\*\* |
|  | [-0.036,0.141] | [-0.056,0.154] | [-0.113,0.086] | [-0.148,0.092] | [0.063,0.451] | [0.065,0.468] |
| + 1st year | -0.323\*\* | -0.376\* | -0.314\* | -0.384+ | -0.446\*\* | -0.449\*\* |
|  | [-0.551,-0.096] | [-0.667,-0.086] | [-0.622,-0.006] | [-0.801,0.033] | [-0.716,-0.176] | [-0.717,-0.181] |
| + 2nd year | -0.317\*\* | -0.388\* | -0.366\* | -0.473\* | -0.224 | -0.219 |
|  | [-0.556,-0.079] | [-0.687,-0.089] | [-0.690,-0.042] | [-0.903,-0.044] | [-0.511,0.063] | [-0.517,0.079] |
| + 3rd year | -0.251\* | -0.266+ | -0.273+ | -0.307 | -0.285+ | -0.273+ |
|  | [-0.485,-0.016] | [-0.559,0.027] | [-0.590,0.044] | [-0.727,0.114] | [-0.576,0.007] | [-0.563,0.018] |
| ≥ + 4th year | -0.275\* | -0.321\* | -0.331\* | -0.415+ | -0.248+ | -0.226 |
|  | [-0.505,-0.045] | [-0.609,-0.034] | [-0.645,-0.018] | [-0.831,0.000] | [-0.526,0.030] | [-0.516,0.065] |
| *N*(Observations) | 42967 | 42967 | 21641 | 21641 | 21326 | 21326 |
| *N*(Individuals) | 8002 | 8002 | 3891 | 3891 | 4111 | 4111 |

*Note.* The 95 percent confidence intervals are in brackets. Robust standard errors were used. Time-varying controls include age (linear and squared age), marital status, household size, household income, homeownership, economic activity, region of residence, number of chronic diseases, and ADLs. FE = Fixed Effect.

+ *p* < 0.10; \* *p* < 0.05; \*\* *p* < 0.01; \*\*\* *p* < 0.001

## Table S2. Robustness check: Testing attrition bias, hearing

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (1)  Hearing | (2)  Hearing | (3)  Hearing | (4)  Hearing | (5)  Hearing | (6)  Hearing |
| Sample | Total | Total | Women | Women | Men | Men |
| Estimation model | FE | FE | FE | FE | FE | FE |
| Time-varying controls | Yes | Yes | Yes | Yes | Yes | Yes |
| IPW | No | Yes | No | Yes | No | Yes |
|  | *B*  95% CI | *B*  95% CI | *B*  95% CI | *B*  95% CI | *B*  95% CI | *B*  95% CI |
| Age | -0.032\*\*\* | -0.033\*\*\* | -0.031\*\*\* | -0.031\*\*\* | -0.033\*\*\* | -0.033\*\*\* |
|  | [-0.034,-0.030] | [-0.035,-0.030] | [-0.034,-0.028] | [-0.035,-0.028] | [-0.036,-0.029] | [-0.036,-0.030] |
| Age2 | -0.000\*\*\* | -0.000\*\*\* | -0.000\*\*\* | -0.000\*\*\* | -0.000\*\*\* | -0.000\*\*\* |
|  | [-0.001,-0.000] | [-0.001,-0.000] | [-0.000,-0.000] | [-0.000,-0.000] | [-0.001,-0.000] | [-0.001,-0.000] |
| Time to spousal loss  (ref: ≤ - 4th year) |  |  |  |  |  |  |
| - 3rd year | -0.010 | 0.003 | -0.001 | 0.017 | -0.082 | -0.096 |
|  | [-0.098,0.077] | [-0.101,0.106] | [-0.096,0.093] | [-0.096,0.129] | [-0.311,0.146] | [-0.337,0.146] |
| - 2nd year | -0.030 | -0.010 | -0.003 | 0.012 | -0.143 | -0.099 |
|  | [-0.106,0.047] | [-0.089,0.069] | [-0.084,0.078] | [-0.072,0.097] | [-0.340,0.055] | [-0.287,0.089] |
| - 1st year | -0.067 | -0.092+ | -0.103\* | -0.136\* | 0.070 | 0.052 |
|  | [-0.156,0.022] | [-0.191,0.007] | [-0.202,-0.004] | [-0.248,-0.023] | [-0.129,0.270] | [-0.142,0.246] |
| + 1st year | -0.001 | 0.099 | 0.013 | 0.192 | -0.001 | -0.027 |
|  | [-0.294,0.291] | [-0.340,0.538] | [-0.400,0.425] | [-0.433,0.818] | [-0.291,0.289] | [-0.362,0.308] |
| + 2nd year | -0.042 | 0.067 | -0.014 | 0.183 | -0.106 | -0.140 |
|  | [-0.338,0.254] | [-0.368,0.502] | [-0.436,0.408] | [-0.445,0.812] | [-0.403,0.190] | [-0.478,0.199] |
| + 3rd year | -0.092 | 0.037 | -0.051 | 0.165 | -0.198 | -0.205 |
|  | [-0.382,0.199] | [-0.387,0.461] | [-0.461,0.359] | [-0.443,0.774] | [-0.532,0.136] | [-0.568,0.157] |
| ≥ + 4th year | -0.071 | 0.060 | -0.062 | 0.157 | -0.071 | -0.110 |
|  | [-0.365,0.224] | [-0.378,0.498] | [-0.483,0.358] | [-0.474,0.789] | [-0.344,0.202] | [-0.429,0.210] |
| *N*(Observations) | 42967 | 42967 | 42967 | 42967 | 42967 | 42967 |
| *N*(Individuals) | 8002 | 8002 | 8002 | 8002 | 8002 | 8002 |

*Note.* The 95 percent confidence intervals are in brackets. Robust standard errors were used. Time-varying controls include age (linear and squared age), marital status, household size, household income, homeownership, economic activity, region of residence, number of chronic diseases, and ADLs. FE = Fixed Effect.

+ *p* < 0.10; \* *p* < 0.05; \*\* *p* < 0.01; \*\*\* *p* < 0.001

## Table S3. Robustness check: Testing attrition bias, mastication

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (1)  Mastication | (2)  Mastication | (3)  Mastication | (4)  Mastication | (5)  Mastication | (6)  Mastication |
| Sample | Total | Total | Total | Total | Total | Total |
| Estimation model | FE | FE | FE | FE | FE | FE |
| Time-varying controls | Yes | Yes | Yes | Yes | Yes | Yes |
| IPW | No | Yes | No | Yes | No | Yes |
|  | *B*  95% CI | *B*  95% CI | *B*  95% CI | *B*  95% CI | *B*  95% CI | *B*  95% CI |
| Age | -0.013\*\*\* | -0.013\*\*\* | -0.012\*\*\* | -0.013\*\*\* | -0.013\*\*\* | -0.012\*\*\* |
|  | [-0.015,-0.011] | [-0.016,-0.011] | [-0.015,-0.009] | [-0.017,-0.010] | [-0.016,-0.010] | [-0.016,-0.009] |
| Age2 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
|  | [-0.000,0.000] | [-0.000,0.000] | [-0.000,0.000] | [-0.000,0.000] | [-0.000,0.000] | [-0.000,0.000] |
| Time to spousal loss  (ref: ≤ - 4th year) |  |  |  |  |  |  |
| - 3rd year | -0.027 | -0.061 | -0.004 | -0.039 | -0.176 | -0.182 |
|  | [-0.124,0.070] | [-0.184,0.061] | [-0.111,0.102] | [-0.178,0.100] | [-0.404,0.052] | [-0.403,0.040] |
| - 2nd year | -0.001 | 0.013 | -0.006 | 0.016 | -0.012 | -0.013 |
|  | [-0.082,0.080] | [-0.088,0.114] | [-0.099,0.087] | [-0.104,0.135] | [-0.184,0.161] | [-0.201,0.174] |
| - 1st year | -0.070 | -0.092+ | -0.097+ | -0.120\* | 0.008 | 0.004 |
|  | [-0.166,0.027] | [-0.192,0.008] | [-0.204,0.010] | [-0.230,-0.011] | [-0.221,0.237] | [-0.237,0.245] |
| + 1st year | -0.044 | -0.031 | 0.096 | 0.146 | -0.379\* | -0.370\* |
|  | [-0.297,0.209] | [-0.301,0.238] | [-0.210,0.401] | [-0.160,0.452] | [-0.696,-0.063] | [-0.693,-0.047] |
| + 2nd year | -0.095 | -0.089 | 0.068 | 0.123 | -0.565\*\* | -0.594\*\* |
|  | [-0.362,0.173] | [-0.374,0.195] | [-0.256,0.392] | [-0.202,0.447] | [-0.915,-0.215] | [-0.952,-0.236] |
| + 3rd year | -0.032 | 0.003 | 0.091 | 0.189 | -0.302+ | -0.361\* |
|  | [-0.298,0.234] | [-0.280,0.286] | [-0.235,0.416] | [-0.137,0.516] | [-0.639,0.034] | [-0.703,-0.018] |
| ≥ + 4th year | -0.114 | -0.089 | 0.002 | 0.082 | -0.379\* | -0.420\* |
|  | [-0.373,0.145] | [-0.366,0.188] | [-0.316,0.320] | [-0.237,0.401] | [-0.689,-0.069] | [-0.752,-0.088] |
| *N*(Observations) | 42967 | 42967 | 42967 | 42967 | 42967 | 42967 |
| *N*(Individuals) | 8002 | 8002 | 8002 | 8002 | 8002 | 8002 |

*Note.* The 95 percent confidence intervals are in brackets. Robust standard errors were used. Time-varying controls include age (linear and squared age), marital status, household size, household income, homeownership, economic activity, region of residence, number of chronic diseases, and ADLs. FE = Fixed Effect.

+ *p* < 0.10; \* *p* < 0.05; \*\* *p* < 0.01; \*\*\* *p* < 0.001

## Table S4. Interaction effect of time to spousal loss with gender on sensory and masticatory functions

|  |  |  |  |
| --- | --- | --- | --- |
|  | (1)  Vision | (2)  Hearing | (3)  Mastication |
| Sample | Total | Total | Total |
| Estimation model | FE | FE | FE |
| Time-varying controls | Yes | Yes | Yes |
|  | *B*  95% CI | *B*  95% CI | *B*  95% CI |
| Time to spousal loss  (ref: ≤ - 4th year) |  |  |  |
| - 3rd year | 0.013 | -0.082 | -0.176 |
|  | [-0.254,0.280] | [-0.311,0.146] | [-0.404,0.052] |
| - 2nd year | -0.093 | -0.143 | -0.012 |
|  | [-0.263,0.077] | [-0.340,0.055] | [-0.184,0.161] |
| - 1st year | 0.257\*\* | 0.070 | 0.008 |
|  | [0.063,0.451] | [-0.129,0.270] | [-0.221,0.237] |
| + 1st year | -0.446\*\* | -0.001 | -0.379\* |
|  | [-0.716,-0.176] | [-0.291,0.289] | [-0.696,-0.063] |
| + 2nd year | -0.224 | -0.106 | -0.565\*\* |
|  | [-0.511,0.063] | [-0.402,0.190] | [-0.915,-0.215] |
| + 3rd year | -0.285+ | -0.198 | -0.302+ |
|  | [-0.576,0.007] | [-0.531,0.136] | [-0.639,0.034] |
| ≥ + 4th year | -0.248+ | -0.071 | -0.379\* |
|  | [-0.526,0.030] | [-0.344,0.202] | [-0.689,-0.069] |
| Interaction terms  (ref: ≤ - 4th year x women) |  |  |  |
| - 3rd year x women | -0.028 | 0.081 | 0.172 |
|  | [-0.311,0.256] | [-0.166,0.328] | [-0.080,0.423] |
| - 2nd year x women | 0.074 | 0.140 | 0.005 |
|  | [-0.117,0.265] | [-0.074,0.353] | [-0.190,0.201] |
| - 1st year x women | -0.271\* | -0.173 | -0.105 |
|  | [-0.489,-0.053] | [-0.396,0.050] | [-0.358,0.147] |
| + 1st year x women | 0.132 | 0.014 | 0.475\* |
|  | [-0.278,0.542] | [-0.490,0.518] | [0.035,0.915] |
| + 2nd year x women | -0.142 | 0.092 | 0.633\*\* |
|  | [-0.575,0.291] | [-0.423,0.608] | [0.156,1.110] |
| + 3rd year x women | 0.012 | 0.147 | 0.393+ |
|  | [-0.419,0.443] | [-0.382,0.675] | [-0.075,0.861] |
| ≥ + 4th year x women | -0.083 | 0.009 | 0.380+ |
|  | [-0.502,0.336] | [-0.493,0.510] | [-0.064,0.825] |
| *N*(Observations) | 42967 | 42967 | 42967 |
| *N*(Individuals) | 8002 | 8002 | 8002 |

*Note.* The 95 percent confidence intervals are in brackets. Robust standard errors were used. Time-varying controls include age (linear and squared age), marital status, household size, household income, homeownership, economic activity, region of residence, number of chronic diseases, and ADLs. All time-varying controls are interacted with an indicator of being a woman. FE = Fixed Effect.

+ *p* < 0.10; \* *p* < 0.05; \*\* *p* < 0.01; \*\*\* *p* < 0.001