Twin Research and Human Genetics

Education in twins and their parents across birth cohorts over 100 years: an individual-level pooled analysis of 42 twin cohorts

Karri Silventoinen, Aline Jelenkovic, Antti Latvala, Reijo Sund, Yoshie Yokoyama, Vilhelmina Ullemar, Catarina Almqvist, Catherine A Derom, Robert F Vlietinck, Ruth JF Loos, Christian Kandler, Chika Honda, Fujio Inui, Yoshinori Iwatani, Mikio Watanabe, Esther Rebato, Maria A Stazi, Corrado Fagnani, Sonia Brescianini, Yoon-Mi Hur, Hoe-Uk Jeong, Tessa L Cutler, John L Hopper, Andreas Busjahn, Kimberly J Saudino, Fuling Ji, Feng Ning, Zengchang Pang, Richard J Rose, Markku Koskenvuo, Kauko Heikkilä, Wendy Cozen, Amie E Hwang, Thomas M Mack, Sisira H Siribaddana, Matthew Hotopf, Athula Sumathipala, Fruhling Rijsdijk, Joohon Sung, Jina Kim, Jooyeon Lee, Sooji Lee, Tracy L Nelson, Keith E Whitfield, Qihua Tan, Dongfeng Zhang, Clare H Llewellyn, Abigail Fisher, S Alexandra Burt, Kelly L Klump, Ariel Knafo-Noam, David Mankuta, Lior Abramson, Sarah E Medland, Nicholas G Martin, Grant W Montgomery, Patrik KE Magnusson, Nancy L Pedersen, Anna K Dahl Aslan, Robin P Corley, Brooke M Huibregtse, Sevgi Y Öncel, Fazil Aliev, Robert F Krueger, Matt McGue, Shandell Pahlen, Gonneke Willemsen, Meike Bartels, Catharina EM van Beijsterveldt, Judy L Silberg, Lindon J Eaves, Hermine H Maes, Jennifer R Harris, Ingunn Brandt, Thomas S Nilsen, Finn Rasmussen, Per Tynelius, Laura A Baker, Catherine Tuvblad, Juan R Ordoñana, Juan F Sánchez-Romera, Lucia Colodro-Conde, Margaret Gatz, David A Butler, Paul Lichtenstein, Jack H Goldberg, K Paige Harden, Elliot M Tucker-Drob, Glen E Duncan, Dedra Buchwald, Adam D Tarnoki, David L Tarnoki, Carol E Franz, William S Kremen, Michael J Lyons, José Antonio Maia, Duarte L Freitas, Eric Turkheimer, Thorkild IA Sørensen, Dorret I Boomsma, Jaakko Kaprio

Supplementary table S1. Original classifications of individual education, the corresponding numbers of education years and the proportions of twin individuals by education categories and zygosity by twin cohort.1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Original label | Number of years | Males (%) | | | Females (%) | | |
| MZ | SSDZ | OSDZ | MZ | SSDZ | OSDZ |
| **Australian Twin Registry** |  |  |  |  |  |  |  |
| Did not go to school | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 years or below | 8 | 0 | 0 | 1 | 1 | 1 | 0 |
| 9 years or equivalent | 9 | 1 | 0 | 0 | 3 | 2 | 3 |
| 10 years or equivalent | 10 | 2 | 3 | 4 | 8 | 10 | 6 |
| 11 years or equivalent | 11 | 3 | 4 | 3 | 3 | 3 | 3 |
| 12 years or equivalent | 12 | 6 | 15 | 10 | 8 | 8 | 6 |
| VET certificate I or II | 13 | 2 | 0 | 0 | 3 | 3 | 5 |
| VET certificate III or IV or trade certificate | 14 | 14 | 19 | 20 | 10 | 8 | 6 |
| VET Diploma or advanced diploma | 15 | 10 | 10 | 7 | 8 | 7 | 16 |
| Bachelor degree | 16 | 30 | 25 | 23 | 26 | 22 | 23 |
| Graduate diploma or graduate certificate | 17 | 17 | 14 | 15 | 18 | 20 | 25 |
| Postgraduate degree (masters / PhD) | 18 | 16 | 11 | 17 | 14 | 16 | 8 |
| N of twin individuals | |  | | --- | |  | | |  | | --- | | 352 | | |  | | --- | | 80 | | |  | | --- | | 109 | | |  | | --- | | 1361 | | |  | | --- | | 374 | | |  | | --- | | 110 | |
| **Berlin Twin Register Health TwiSt** |  |  |  |  |  |  |  |
| 9 years of below | 8 | 13 | 15 | 8 | 8 | 0 | 8 |
| 10 years | 10 | 43 | 46 | 62 | 43 | 64 | 62 |
| 13 years | 13 | 14 | 8 | 15 | 22 | 29 | 15 |
| Professional School | 14 | 10 | 31 | 8 | 11 | 7 | 8 |
| College/University | 18 | 20 | 0 | 8 | 16 | 0 | 8 |
| N of twin individuals |  | 84 | 13 | 13 | 76 | 14 | 13 |
| **Bielefeld Longitudinal Study of Adult Twins** |  |  |  |  |  |  |  |
| None | 0 | 3 | 0 | 6 | 4 | 1 | 4 |
| Elementary school | 4 | 5 | 4 | 6 | 10 | 7 | 1 |
| Secondary school I | 9 | 5 | 7 | 9 | 8 | 9 | 7 |
| Secondary school II | 10 | 17 | 15 | 17 | 29 | 25 | 32 |
| High school or Technical high school | 13 | 38 | 41 | 34 | 32 | 36 | 31 |
| Technical college | 17 | 12 | 15 | 14 | 7 | 8 | 8 |
| University | 18 | 21 | 18 | 14 | 11 | 15 | 17 |
| N of twin individuals |  | |  | | --- | | 213 | | |  | | --- | | 68 | | |  | | --- | | 65 | | |  | | --- | | 823 | | |  | | --- | | 307 | | |  | | --- | | 75 | |
| **California Twin Program** |  |  |  |  |  |  |  |
| 8 years or less | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9-11 years | 10 | 3 | 4 | 5 | 2 | 3 | 3 |
| 12 years | 12 | 20 | 21 | 22 | 21 | 22 | 24 |
| 13-15 years | 14 | 31 | 32 | 33 | 37 | 36 | 37 |
| 16 years | 16 | 17 | 16 | 15 | 15 | 15 | 14 |
| 17 years or more | 18 | 29 | 25 | 25 | 24 | 24 | 22 |
| N of twin individuals |  | 4052 | 3809 | 3425 | 6200 | 5683 | 3428 |
| **Carolina African American Twin Study of Aging2** |  |  |  |  |  |  |  |
| 9 years or less | exact years | 15 | 7 | 3 | 13 | 5 | 2 |
| 10 years | 10 | 2 | 3 | 6 | 1 | 3 | 3 |
| 11 years | 11 | 11 | 8 | 6 | 4 | 7 | 5 |
| 12 years | 12 | 40 | 32 | 36 | 27 | 36 | 39 |
| 13 years | 13 | 3 | 3 | 5 | 4 | 3 | 8 |
| 14 years | 14 | 10 | 14 | 14 | 13 | 15 | 9 |
| 15 years | 15 | 3 | 9 | 3 | 2 | 2 | 8 |
| 16 years | 16 | 15 | 15 | 15 | 20 | 15 | 20 |
| 17 years | 17 | 0 | 0 | 6 | 2 | 0 | 0 |
| 18 years | 18 | 2 | 3 | 3 | 7 | 8 | 8 |
| 19 years | 19 | 0 | 4 | 0 | 1 | 3 | 0 |
| 20 years | 20 | 0 | 3 | 3 | 6 | 3 | 0 |
| N of twin individuals |  | 62 | 72 | 66 | 111 | 118 | 66 |
| **Colorado Twin Registry** |  |  |  |  |  |  |  |
| None | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Elementary/Junior High School | 9 | 1 | 1 | 0 | 1 | 2 | 1 |
| GED or High School Diploma | 12 | 47 | 51 | 36 | 39 | 43 | 28 |
| Vocational or Technical Diploma | 13 | 3 | 2 | 8 | 5 | 8 | 7 |
| Associate degree or R.N. Diploma | 14 | 9 | 10 | 8 | 9 | 9 | 7 |
| Bachelor Degree | 16 | 34 | 33 | 40 | 40 | 34 | 48 |
| Master’s Degree | 18 | 5 | 3 | 8 | 5 | 4 | 8 |
| Doctorate: M.D., Ph.D., J.D., etc. | 20 | 1 | 1 | 0 | 1 | 1 | 1 |
| N of twin individuals |  | 507 | 370 | 237 | 686 | 412 | 241 |
| **Finnish Older Twin Cohort** |  |  |  |  |  |  |  |
| Less than Primary School | 3 | 3 | 3 | 1 | 3 | 4 | 0 |
| Primary School | 6 | 40 | 44 | 70 | 40 | 42 | 62 |
| Primary School and at least 1 year of education such as vocational training | 7 | 31 | 30 | 5 | 22 | 24 | 4 |
| Upper Primary School | 9 | 4 | 4 | 10 | 8 | 7 | 16 |
| Junior High School and at least 1 year of education such as vocational training | 10 | 9 | 9 | 2 | 11 | 10 | 3 |
| High School graduate | 12 | 1 | 1 | 13 | 2 | 2 | 15 |
| High School graduate and at least 1 year of education | 13 | 5 | 4 | 0 | 9 | 7 | 0 |
| University degree | 18 | 7 | 6 | 0 | 5 | 5 | 0 |
| N of twin individuals |  | 3378 | 8022 | 1445 | 4082 | 8380 | 1455 |
| **FinnTwin12** |  |  |  |  |  |  |  |
| No Primary School | 6 | 0 | 0 | 1 | 0 | 0 | 0 |
| Primary School | 9 | 6 | 8 | 6 | 4 | 5 | 6 |
| Vocational School | 11 | 39 | 35 | 38 | 24 | 26 | 23 |
| Matriculation examination | 12 | 43 | 46 | 39 | 52 | 42 | 43 |
| Diploma from University of Applied Sciences | 16 | 7 | 7 | 7 | 12 | 17 | 19 |
| University Graduate | 18 | 5 | 4 | 8 | 9 | 11 | 9 |
| N of twin individuals |  | |  | | --- | | 478 | | |  | | --- | | 443 | | |  | | --- | | 462 | | |  | | --- | | 658 | | |  | | --- | | 551 | | |  | | --- | | 577 | |
| **FinnTwin16** |  |  |  |  |  |  |  |
| Primary School | 9 | 4 | 3 | 4 | 2 | 2 | 3 |
| Vocational School | 11 | 23 | 32 | 31 | 15 | 18 | 17 |
| Community College degree or matriculation examination | 12 | 19 | 20 | 22 | 24 | 21 | 23 |
| Diploma from University of Applied Sciences | 16 | 26 | 22 | 20 | 29 | 27 | 27 |
| University graduate | 18 | 29 | 23 | 23 | 30 | 31 | 30 |
| N of twin individuals |  | 506 | 611 | 621 | 794 | 671 | 765 |
| **East Flanders Prospective Twin Survey** |  |  |  |  |  |  |  |
| No diploma | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Primary education or special primary education | 6 | 1 | 0 | 2 | 1 | 0 | 2 |
| Special secondary education or lower secondary general or lower secondary technical | 9 | 8 | 7 | 12 | 5 | 3 | 7 |
| Lower secondary professionals or higher secondary general or higher secondary technical or higher secondary professionals | 12 | 57 | 59 | 60 | 54 | 50 | 51 |
| Non-university higher education: short type | 14 | 17 | 16 | 16 | 25 | 34 | 33 |
| Non-university higher education: long type | 16 | 8 | 7 | 5 | 5 | 4 | 2 |
| University and post-university | 18 | 10 | 12 | 5 | 9 | 9 | 5 |
| N of twin individuals |  | 226 | 92 | 43 | 256 | 98 | 43 |
| **Hungarian Twin Registry** |  |  |  |  |  |  |  |
| Less than 8 years (below lower secondary, no vocational education) | 6 | 6 | 6 | 13 | 9 | 8 | 12 |
| 9-10 years (lower secondary, no vocational education) | 9 | 15 | 6 | 6 | 12 | 14 | 0 |
| 11-12 years (lower secondary plus vocational school) | 11 | 19 | 44 | 25 | 14 | 28 | 35 |
| 13-16 years (upper secondary, vocational college) | 14 | 20 | 0 | 19 | 17 | 20 | 6 |
| University level or equivalent (e.g. university of applied sciences) | 18 | 41 | 44 | 38 | 48 | 30 | 47 |
| Doctoral degree | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| N of twin individuals |  | 18 | 16 | 146 | 50 | 17 | 54 |
| **Italian Twin Registry** |  |  |  |  |  |  |  |
| None | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Elementary School (5 years) | 5 | 3 | 3 | 3 | 3 | 3 | 4 |
| Middle School (3 years) | 8 | 18 | 21 | 20 | 13 | 14 | 15 |
| High School (5 years) | 13 | 65 | 64 | 64 | 66 | 69 | 67 |
| University (4/5 years) | 16 | 14 | 12 | 13 | 18 | 14 | 14 |
| N of twin individuals |  | 2054 | 1271 | 1377 | 3421 | 1910 | 1381 |
| **Korean Twin-Family Register** |  |  |  |  |  |  |  |
| Did not go to school | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dropped out of Elementary School | 3 | 0 | 0 | 0 | 1 | 0 | 0 |
| Graduated Elementary School or dropped out of Middle School | 6 | 5 | 8 | 0 | 4 | 9 | 0 |
| Graduated Middle School or dropped out of High School | 9 | 8 | 8 | 0 | 6 | 5 | 0 |
| Graduated High School | 12 | 28 | 27 | 0 | 37 | 46 | 0 |
| Graduated Community College | 13 | 11 | 13 | 0 | 8 | 10 | 0 |
| Dropped out of University | 14 | 3 | 3 | 0 | 3 | 2 | 0 |
| Graduated University | 18 | 35 | 34 | 0 | 34 | 27 | 0 |
| Graduate School or more | 20 | 11 | 6 | 0 | 7 | 2 | 0 |
| N of twin individuals |  | 397 | 106 | 0 | 699 | 133 | 0 |
| **Mid-Atlantic Twin Registry** |  |  |  |  |  |  |  |
| Elementary School (0-7 years) | 6 | 1 | 2 | 2 | 1 | 1 | 0 |
| Elementary School (8 years) | 8 | 2 | 3 | 3 | 3 | 3 | 3 |
| High School (1-3 years) | 10 | 7 | 7 | 10 | 8 | 9 | 8 |
| High School (4 years) | 12 | 27 | 29 | 29 | 36 | 36 | 36 |
| College (1-3 years) | 15 | 24 | 25 | 24 | 28 | 27 | 25 |
| College (4+ years) | 18 | 39 | 36 | 33 | 25 | 24 | 27 |
| N of twin individuals |  | |  | | --- | | 1537 | | |  | | --- | | 1142 | | |  | | --- | | 1317 | | |  | | --- | | 3643 | | |  | | --- | | 2316 | | |  | | --- | | 1322 | |
| **Minnesota Twin Family Study2** |  |  |  |  |  |  |  |
| 9 years or less | exact years | 16 | 20 | 13 | 18 | 21 | 14 |
| 10 years | 10 | 1 | 1 | 1 | 0 | 1 | 1 |
| 11 years | 11 | 1 | 2 | 1 | 1 | 1 | 1 |
| 12 years | 12 | 25 | 27 | 30 | 33 | 32 | 35 |
| 13 years | 13 | 7 | 5 | 7 | 11 | 11 | 13 |
| 14 years | 14 | 13 | 12 | 11 | 9 | 8 | 9 |
| 15 years | 15 | 3 | 4 | 4 | 4 | 4 | 5 |
| 16 years | 16 | 18 | 17 | 18 | 15 | 15 | 16 |
| 17 years | 17 | 6 | 5 | 5 | 3 | 3 | 3 |
| 18 years | 18 | 5 | 4 | 4 | 3 | 3 | 3 |
| 19 years | 19 | 3 | 2 | 2 | 1 | 1 | 1 |
| 20 years | 20 | 2 | 1 | 2 | 1 | 1 | 0 |
| 21 years | 21 | 2 | 1 | 2 | 1 | 1 | 1 |
| N of twin individuals |  | |  | | --- | | 1145 | | |  | | --- | | 979 | | |  | | --- | | 815 | | |  | | --- | | 1530 | | |  | | --- | | 1393 | | |  | | --- | | 794 | |
| **Murcia Twin Registry** |  |  |  |  |  |  |  |
| Illiterate | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| No studies (just reading and writing) | 3 | 0 | 2 | 1 | 0 | 0 | 2 |
| Primary studies | 4 | 4 | 3 | 9 | 9 | 13 | 10 |
| General secondary education | 6 | 26 | 33 | 34 | 31 | 39 | 40 |
| Professional education (FP1) | 7 | 28 | 27 | 24 | 27 | 26 | 22 |
| Superior secondary education | 9 | 9 | 7 | 4 | 12 | 7 | 6 |
| Professional education (FP2) or | 12 | 20 | 17 | 15 | 10 | 8 | 12 |
| University – medium degree | 15 | 6 | 7 | 5 | 8 | 4 | 3 |
| University – high degree | 17 | 6 | 4 | 8 | 3 | 3 | 4 |
| N of twin individuals |  | 250 | 315 | 269 | 431 | 435 | 267 |
| **NASC-NRC Twin Cohort2** |  |  |  |  |  |  |  |
| 9 years or less | exact years | 8 | 10 | 0 | 0 | 0 | 0 |
| 10 years | 10 | 5 | 5 | 0 | 0 | 0 | 0 |
| 11 years | 11 | 4 | 4 | 0 | 0 | 0 | 0 |
| 12 years | 12 | 30 | 29 | 0 | 0 | 0 | 0 |
| 13 years | 13 | 11 | 11 | 0 | 0 | 0 | 0 |
| 14 years | 14 | 7 | 9 | 0 | 0 | 0 | 0 |
| 15 years | 15 | 3 | 3 | 0 | 0 | 0 | 0 |
| 16 years | 16 | 17 | 15 | 0 | 0 | 0 | 0 |
| 17 years | 17 | 3 | 2 | 0 | 0 | 0 | 0 |
| 18 years | 18 | 6 | 5 | 0 | 0 | 0 | 0 |
| 19 years | 19 | 2 | 2 | 0 | 0 | 0 | 0 |
| 20 years | 20 | 5 | 5 | 0 | 0 | 0 | 0 |
| N of twin individuals |  | 4885 | 4965 | 0 | 0 | 0 | 0 |
| **Netherlands Twin cohort** |  |  |  |  |  |  |  |
| Primary School only | 9 | 2 | 3 | 3 | 2 | 2 | 2 |
| Lower Vocational School or Lower Secondary School | 11 | 14 | 13 | 10 | 14 | 16 | 12 |
| Intermediate Vocational School or Intermediate/Higher Secondary School | 13 | 37 | 50 | 47 | 25 | 34 | 46 |
| Higher Vocational School | 14 | 25 | 23 | 26 | 31 | 28 | 26 |
| University | 18 | 22 | 11 | 14 | 29 | 20 | 14 |
| N of twin individuals |  | 851 | 540 | 655 | 2064 | 1061 | 655 |
| **Norwegian Twin Registry** |  |  |  |  |  |  |  |
| Compulsory School | 9 | 30 | 32 | 0 | 32 | 31 | 0 |
| Secondary School, low level | 11 | 37 | 38 | 0 | 45 | 43 | 0 |
| Secondary School, high level | 14 | 12 | 12 | 0 | 13 | 14 | 0 |
| University | 18 | 21 | 19 | 0 | 10 | 11 | 0 |
| N of twin individuals |  | 1893 | 2262 | 0 | 2480 | 2786 | 0 |
| **Osaka University Aged Twin Registry2** |  |  |  |  |  |  |  |
| 12 years or less | 12 | 49 | 64 | 20 | 33 | 38 | 40 |
| 13 | 13 | 8 | 2 | 0 | 1 | 8 | 0 |
| 14 | 14 | 3 | 5 | 20 | 18 | 31 | 0 |
| 15 | 15 | 0 | 0 | 0 | 9 | 10 | 20 |
| 16 | 16 | 26 | 19 | 40 | 29 | 12 | 40 |
| 17 | 17 | 1 | 0 | 0 | 3 | 2 | 0 |
| 18 years more | 18 | 13 | 10 | 20 | 7 | 0 | 0 |
| N of twin individuals |  | |  | | --- | | 86 | | |  | | --- | | 42 | | |  | | --- | | 5 | | |  | | --- | | 234 | | |  | | --- | | 52 | | |  | | --- | | 5 | |
| **Qingdao Cohort of Adults** |  |  |  |  |  |  |  |
| Illiteracy or half-illiteracy | 0 | 2 | 2 | 1 | 2 | 1 | 4 |
| Primary School | 6 | 14 | 19 | 10 | 11 | 8 | 22 |
| Junior High School | 9 | 50 | 48 | 50 | 38 | 43 | 34 |
| Senior High School | 12 | 20 | 18 | 20 | 24 | 24 | 22 |
| Bachelor or diploma | 16 | 14 | 11 | 19 | 26 | 25 | 17 |
| Master degree and above | 18 | 0 | 2 | 0 | 0 | 0 | 0 |
| N of twin individuals |  | 292 | 96 | 94 | 328 | 102 | 94 |
| **Queensland Twin Register** |  |  |  |  |  |  |  |
| Pre-primary education | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Primary education or first stage of basic education | 9 | 2 | 2 | 3 | 4 | 4 | 2 |
| Lower secondary or second stage of basic education | 12 | 13 | 14 | 14 | 20 | 19 | 16 |
| Upper secondary education | 13 | 16 | 20 | 20 | 21 | 21 | 22 |
| Post-secondary non-tertiary education | 14 | 30 | 30 | 29 | 23 | 24 | 25 |
| First stage of tertiary education | 16 | 23 | 19 | 19 | 21 | 21 | 22 |
| Second stage of tertiary education | 18 | 15 | 15 | 15 | 11 | 11 | 11 |
| N of twin individuals |  | |  | | --- | | 3028 | | |  | | --- | | 2200 | | |  | | --- | | 2213 | | |  | | --- | | 5489 | | |  | | --- | | 3830 | | |  | | --- | | 2240 | |
| **Sri Lanka Twin Study** |  |  |  |  |  |  |  |
| Not had school education | 0 | 1 | 0 | 1 | 1 | 1 | 2 |
| From grade 1 up to grade 5 | 5 | 4 | 6 | 5 | 5 | 8 | 4 |
| From grade 6 up to O/LS | 9 | 42 | 50 | 49 | 43 | 42 | 45 |
| Passed O/LS | 12 | 17 | 17 | 14 | 16 | 15 | 15 |
| Up to A/LS or passed A/L | 14 | 27 | 19 | 27 | 27 | 26 | 25 |
| University or higher | 18 | 10 | 8 | 4 | 8 | 8 | 9 |
| N of twin individuals |  | 344 | 212 | 253 | 487 | 302 | 253 |
| **Swedish Twin Cohort** |  |  |  |  |  |  |  |
| Elementary school | 9 | 81 | 84 | 36 | 81 | 85 | 37 |
| Secondary School | 12 | 12 | 10 | 40 | 10 | 9 | 35 |
| Bachelor degree | 14 | 2 | 2 | 8 | 3 | 2 | 9 |
| Master degree | 18 | 5 | 4 | 16 | 5 | 4 | 19 |
| N of twin individuals |  | |  | | --- | | 4311 | | |  | | --- | | 6664 | | |  | | --- | | 5374 | | |  | | --- | | 5159 | | |  | | --- | | 7420 | | |  | | --- | | 5177 | |
| **Swedish Young Male Twins Study** |  |  |  |  |  |  |  |
| Primary School < 9 years | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Primary School 9 years | 9 | 4 | 4 | 0 | 0 | 0 | 0 |
| Secondary School 10-11 years | 11 | 10 | 9 | 0 | 0 | 0 | 0 |
| Secondary School >= 12 years | 13 | 36 | 39 | 0 | 0 | 0 | 0 |
| Post-secondary School < 15 years | 14 | 17 | 16 | 0 | 0 | 0 | 0 |
| Post-secondary School >= 15 years | 16 | 34 | 31 | 0 | 0 | 0 | 0 |
| PhD >= 19 years | 19 | 1 | 1 | 0 | 0 | 0 | 0 |
| N of twin individuals |  | 1218 | 912 | 0 | 0 | 0 | 0 |
| **Vietnam Era Twin Study of Aging2** |  |  |  |  |  |  |  |
| 9 years or less | exact years | 0 | 1 | 0 | 0 | 0 | 0 |
| 10 years | 10 | 1 | 1 | 0 | 0 | 0 | 0 |
| 11 years | 11 | 2 | 1 | 0 | 0 | 0 | 0 |
| 12 years | 12 | 38 | 40 | 0 | 0 | 0 | 0 |
| 13 years | 13 | 5 | 7 | 0 | 0 | 0 | 0 |
| 14 years | 14 | 22 | 20 | 0 | 0 | 0 | 0 |
| 15 years | 15 | 3 | 2 | 0 | 0 | 0 | 0 |
| 16 years | 16 | 21 | 18 | 0 | 0 | 0 | 0 |
| 17 years | 17 | 2 | 1 | 0 | 0 | 0 | 0 |
| 18 years | 18 | 5 | 7 | 0 | 0 | 0 | 0 |
| 19 years | 19 | 1 | 0 | 0 | 0 | 0 | 0 |
| 20 years | 20 | 1 | 2 | 0 | 0 | 0 | 0 |
| N of twin individuals |  | 698 | 530 | 0 | 0 | 0 | 0 |
| **Washington State Twin Registry** |  |  |  |  |  |  |  |
| Never attended school or only attended kindergarten | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grade 1-8 | 7 | 5 | 4 | 5 | 5 | 4 | 5 |
| Grade 9-11 | 10 | 8 | 8 | 8 | 5 | 4 | 5 |
| Grade 12/ High School Graduate/GED | 12 | 24 | 26 | 25 | 21 | 24 | 24 |
| Some College | 13 | 22 | 21 | 24 | 25 | 25 | 26 |
| Associate’s degree | 14 | 7 | 8 | 7 | 9 | 9 | 8 |
| Bachelor’s degree | 16 | 20 | 19 | 19 | 21 | 20 | 19 |
| Graduate or professional degree | 18 | 15 | 15 | 12 | 14 | 14 | 13 |
| N of twin individuals |  | 3057 | 1394 | 1770 | 5372 | 2441 | 1772 |

1Only twin individuals with information on the sex of co-twins are included to separate same-sex and opposite sex pairs.

2Education reported as exact number of years

Supplementary table S2. Original classifications of maternal and paternal education, the corresponding number of education years and the proportions of twin individuals by parental education categories and zygosity in participating twin cohorts.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Original label | Number of years | Maternal education (%) | | Paternal education (%) | |
| MZ twins | DZ twins | MZ twins | DZ twins |
| **Australian Twin Registry1** |  |  |  |  |  |
| 11 years or less | exact years | 48 | 48 | 43 | 44 |
| 12 | 12 | 10 | 12 | 10 | 11 |
| 13 | 13 | 4 | 4 | 2 | 3 |
| 13 | 14 | 5 | 3 | 8 | 6 |
| 15 | 15 | 9 | 6 | 9 | 7 |
| 16 | 16 | 12 | 12 | 14 | 15 |
| 17 | 17 | 8 | 9 | 7 | 8 |
| 18 | 18 | 4 | 4 | 7 | 5 |
| N of twin individuals |  | 1577 | 602 | 1554 | 594 |
| **Boston University Twin Project** |  |  |  |  |  |
| Less than 7th grade | 6 | 0 | 0 | 0 | 1 |
| Junior High School | 9 | 1 | 1 | 1 | 1 |
| Some High School (10th/11th grade) | 10 | 0 | 1 | 2 | 2 |
| High School graduate | 12 | 8 | 2 | 10 | 7 |
| Trade School | 13 | 3 | 2 | 4 | 1 |
| Some College | 14 | 9 | 14 | 14 | 16 |
| College graduate | 16 | 36 | 45 | 36 | 40 |
| Some graduate study | 17 | 8 | 5 | 5 | 6 |
| Graduate degree | 18 | 36 | 32 | 29 | 26 |
| N of twin individuals |  | 284 | 326 | 280 | 319 |
| **California Twin Program** |  |  |  |  |  |
| 8 years or less | 8 | 8 | 8 | 11 | 13 |
| 9-11 years | 10 | 9 | 9 | 9 | 10 |
| 12 years | 12 | 38 | 38 | 29 | 30 |
| 13-15 years | 14 | 25 | 24 | 22 | 21 |
| 16 years | 16 | 10 | 10 | 12 | 11 |
| 17 years of more | 18 | 10 | 10 | 16 | 15 |
| N of twin individuals |  | 10202 | 16205 | 9935 | 15884 |
| **Carolina African American Twin Study of Aging1** |  |  |  |  |  |
| 11 years or less | exact years | 42 | 44 | 56 | 52 |
| 12 years | 12 | 40 | 34 | 25 | 29 |
| 13 years | 13 | 2 | 1 | 1 | 3 |
| 14 years | 14 | 5 | 4 | 5 | 2 |
| 15 years | 15 | 1 | 0 | 1 | 1 |
| 16 years | 16 | 6 | 11 | 8 | 9 |
| 18 years | 18 | 2 | 4 | 2 | 2 |
| 19 years | 19 | 1 | 0 | 1 | 0 |
| 20 years or more | exact years | 0 | 1 | 2 | 1 |
| N of twin individuals |  | 139 | 276 | 117 | 217 |
| **Child and Adolescent Twin Study in Sweden** |  |  |  |  |  |
| Basic education (year 0-9) or equivalent | 9 | 4 | 5 | 12 | 11 |
| High School or equivalent | 12 | 48 | 44 | 52 | 52 |
| University or college level | 18 | 48 | 51 | 36 | 37 |
| N of twin individuals |  | 1040 | 1921 | 1018 | 1874 |
| **Colorado Twin Registry1** |  |  |  |  |  |
| 11 years or less | exact years | 2 | 3 | 4 | 2 |
| 12 years | 12 | 24 | 21 | 21 | 18 |
| 13 years | 13 | 15 | 12 | 14 | 9 |
| 14 years | 14 | 17 | 13 | 13 | 15 |
| 15 years | 15 | 5 | 5 | 5 | 4 |
| 16 years | 16 | 24 | 28 | 26 | 30 |
| 17 years | 17 | 1 | 4 | 3 | 3 |
| 18 years | 18 | 9 | 12 | 9 | 13 |
| 19 years | 19 | 1 | 1 | 2 | 2 |
| 20 years or more | exact years | 1 | 1 | 4 | 3 |
| N of twin individuals |  | |  | | --- | | 1018 | | |  | | --- | | 982 | | |  | | --- | | 901 | | |  | | --- | | 884 | |
| **East Flanders Prospective Twin Survey** |  |  |  |  |  |
| No diploma | 3 | 6 | 6 | 4 | 3 |
| Primary or  special primary education | 6 | 19 | 21 | 12 | 15 |
| Special secondary or lower secondary general or lower secondary technical education | 9 | 14 | 13 | 15 | 21 |
| Lower secondary professional or higher secondary general or  higher secondary technical or higher secondary professional education | 12 | 33 | 32 | 32 | 25 |
| Non-university higher education: short type | 14 | 25 | 21 | 18 | 12 |
| Non-university higher education: long type | 16 | 0 | 1 | 6 | 6 |
| University and post-university education | 18 | 4 | 5 | 12 | 19 |
| N of twin individuals |  | 447 | 300 | 432 | 291 |
| **FinnTwin12** |  |  |  |  |  |
| Less than Lower Primary School | 3 | 0 | 0 | 0 | 0 |
| Less than Lower Primary School+ maximum of two years of vocational training | 4 | 0 | 0 | 0 | 0 |
| Less than Lower Primary School+ more than two years of vocational training | 5 | 0 | 0 | 0 | 0 |
| Lower Primary School | 6 | 12 | 15 | 22 | 26 |
| Lower Primary School+ maximum of two years of vocational training | 7 | 8 | 8 | 12 | 12 |
| Lower Primary School+ more than two years of vocational training | 8 | 7 | 9 | 14 | 14 |
| Primary School | 9 | 10 | 7 | 7 | 5 |
| Primary School+ maximum of two years of vocational training | 10 | 9 | 11 | 7 | 6 |
| Primary School+ more than two years of vocational training | 11 | 17 | 14 | 13 | 13 |
| Matriculation examination | 12 | 3 | 3 | 2 | 1 |
| Matriculation examination + maximum of two years of vocational training | 13 | 0 | 0 | 0 | 0 |
| Matriculation examination + more than two years of vocational training | 14 | 8 | 6 | 2 | 2 |
| Matriculation examination + more than two years of vocational training | 16 | 11 | 11 | 7 | 8 |
| University degree | 18 | 13 | 15 | 14 | 14 |
| N of twin individuals |  | |  | | --- | | 1646 | | |  | | --- | | 3153 | | 1464 | 2838 |
| **FinnTwin16** |  |  |  |  |  |
| Primary education or  other education | 9 | 26 | 25 | 22 | 20 |
| Primary education and at least one year of high school or vocational school | 10 | 44 | 50 | 55 | 57 |
| Matriculation examination | 12 | 4 | 4 | 4 | 5 |
| Matriculation examination and one year or education | 13 | 23 | 18 | 15 | 14 |
| University degree | 18 | 2 | 3 | 5 | 4 |
| N of twin individuals |  | 914 | 1908 | 844 | 1736 |
| **Gemini study** |  |  |  |  |  |
| No qualification | 4 | 3 | 5 | 10 | 8 |
| CSE, GCSE, O level | 9 | 15 | 13 | 22 | 19 |
| Vocational qualification (GNVQ, BTEC | 10 | 16 | 13 | 15 | 15 |
| A or AS level | 12 | 13 | 10 | 7 | 8 |
| HNC or HND | 14 | 11 | 10 | 10 | 10 |
| Undergraduate | 16 | 28 | 29 | 26 | 24 |
| Postgraduate | 18 | 14 | 19 | 11 | 18 |
| N of twin individuals |  | 1160 | 2335 | 1112 | 2249 |
| **Italian Twin Registry** |  |  |  |  |  |
| None | 0 | 0 | 0 | 0 | 0 |
| Elementary School (5 years) | 5 | 2 | 2 | 3 | 2 |
| Middle School (3 years) | 8 | 19 | 18 | 25 | 19 |
| High School (5 years) | 13 | 50 | 49 | 45 | 45 |
| University (4/5 years) | 18 | 29 | 32 | 28 | 34 |
| N of twin individuals |  | 2009 | 3758 | 1985 | 3701 |
| **Korean Twin-Family Register** |  |  |  |  |  |
| Did not go to school | 0 | 12 | 20 | 5 | 10 |
| Dropped out of elementary school | 3 | 12 | 10 | 6 | 8 |
| Graduated elementary school or dropped out of middle school. | 6 | 32 | 36 | 29 | 25 |
| Graduated middle school or dropped out of high school | 9 | 12 | 8 | 11 | 14 |
| Graduated high school | 12 | 25 | 18 | 26 | 19 |
| Graduated community college | 13 | 1 | 0 | 1 | 3 |
| Dropped out of university | 14 | 1 | 0 | 4 | 5 |
| Graduated university | 18 | 6 | 7 | 14 | 14 |
| Graduate school or more | 20 | 0 | 0 | 3 | 2 |
| N of twin individuals |  | 771 | 155 | 771 | 155 |
| **Longitudinal Israeli Study of Twins1** |  |  |  |  |  |
| 11 years or less | exact years | 0 | 1 | 1 | 4 |
| 12 years | 12 | 24 | 17 | 28 | 26 |
| 13 years | 13 | 3 | 4 | 4 | 5 |
| 14 years | 14 | 3 | 8 | 9 | 9 |
| 15 years | 15 | 10 | 18 | 16 | 13 |
| 16 years | 16 | 17 | 22 | 13 | 17 |
| 17 years | 17 | 17 | 8 | 6 | 8 |
| 18 years | 18 | 16 | 12 | 9 | 8 |
| 19 years | 19 | 2 | 2 | 3 | 3 |
| 20 years or more | exact years | 7 | 8 | 11 | 8 |
| N of twin individuals |  | 175 | 568 | 159 | 519 |
| **Michigan Twins Study** |  |  |  |  |  |
| 8th grade or less | 8 | 1 | 0 | 1 | 1 |
| 9th grade | 10 | 0 | 1 | 1 | 1 |
| 10th grade | 11 | 1 | 1 | 1 | 1 |
| 11th grade | 12 | 1 | 1 | 2 | 2 |
| 12th grade | 13 | 17 | 14 | 24 | 21 |
| 1 year of college | 14 | 11 | 10 | 10 | 9 |
| 2 years of college | 15 | 15 | 15 | 13 | 14 |
| 3 years of college | 16 | 7 | 7 | 4 | 4 |
| 4 years of college | 17 | 22 | 23 | 20 | 20 |
| 5 years of college | 18 | 7 | 6 | 4 | 4 |
| 6 years of college | 19 | 6 | 7 | 6 | 6 |
| Post graduate | 22 | 14 | 16 | 14 | 17 |
| N of twin individuals |  | 5228 | 12155 | 5082 | 11877 |
| **Mid-Atlantic Twin Registry** |  |  |  |  |  |
| Elementary School (0-7 years) | 6 | 12 | 13 | 16 | 18 |
| Elementary School (8 years) | 8 | 16 | 16 | 19 | 18 |
| High School (1-3 years) | 10 | 14 | 13 | 14 | 14 |
| High School (4 years) | 12 | 32 | 30 | 23 | 21 |
| College (1-3 years) | 15 | 15 | 16 | 13 | 13 |
| College (4+ years) | 18 | 10 | 12 | 16 | 17 |
| N of twin individuals |  | |  | | --- | | 4553 | | |  | | --- | | 5303 | | |  | | --- | | 4372 | | |  | | --- | | 5118 | |
| **Minnesota Twin Family Study (adults)1** |  |  |  |  |  |
| 9 years or less | exact years | 22 | 28 | 38 | 45 |
| 10 years | 10 | 4 | 4 | 4 | 4 |
| 11 years | 11 | 3 | 3 | 2 | 2 |
| 12 years | 12 | 38 | 37 | 27 | 26 |
| 13 years | 13 | 7 | 6 | 4 | 3 |
| 14 years | 14 | 11 | 9 | 7 | 6 |
| 15 years | 15 | 3 | 3 | 2 | 1 |
| 16 years | 16 | 11 | 9 | 10 | 8 |
| 17 years | 17 | 1 | 1 | 1 | 1 |
| 18 years | 18 | 1 | 1 | 2 | 1 |
| 19 years | 19 | 0 | 0 | 1 | 0 |
| 20 years | 20 | 0 | 0 | 3 | 2 |
| N of twin individuals |  | 2324 | 4177 | 2326 | 4138 |
| **NAS-NRC Twin Cohort** |  |  |  |  |  |
| 11 years or less | exact years | 51 | 57 | 63 | 64 |
| 12 | 12 | 34 | 26 | 20 | 19 |
| 13 | 13 | 2 | 3 | 2 | 1 |
| 14 | 14 | 5 | 6 | 4 | 3 |
| 15 | 15 | 1 | 1 | 1 | 1 |
| 16 | 16 | 6 | 8 | 7 | 7 |
| 17 | 17 | 0 | 0 | 0 | 1 |
| 18 or more | exact years | 0 | 1 | 3 | 4 |
| N of twin individuals |  | 1962 | 1815 | 1969 | 1846 |
| **Netherlands Twin cohort (children)** |  |  |  |  |  |
| Primary education | 9 | 4 | 5 | 6 | 6 |
| Pre-vocational secondary education | 12 | 29 | 30 | 29 | 28 |
| Secondary vocational education | 14 | 42 | 41 | 35 | 35 |
| Higher professional education | 16 | 18 | 16 | 17 | 18 |
| University | 18 | 7 | 7 | 13 | 13 |
| N of twin individuals |  | 11453 | 22885 | 11168 | 22356 |
| **Norwegian Twin Registry** |  |  |  |  |  |
| Compulsory School | 9 | 75 | 76 | 72 | 72 |
| Secondary School, low level | 11 | 19 | 18 | 17 | 17 |
| Secondary School, high level | 14 | 4 | 4 | 5 | 6 |
| University | 18 | 2 | 2 | 6 | 6 |
| N of twin individuals |  | |  | | --- | | 4743 | | |  | | --- | | 6177 | | |  | | --- | | 4648 | | |  | | --- | | 6084 | |
| **Portugal Twin Cohort** |  |  |  |  |  |
| Incomplete Primary School | 3 | 2 | 5 | 6 | 7 |
| 1st cycle | 6 | 47 | 36 | 45 | 37 |
| 2nd cycle | 9 | 9 | 19 | 15 | 20 |
| 3rd cycle | 12 | 14 | 11 | 15 | 10 |
| Secondary education | 14 | 22 | 14 | 13 | 21 |
| Bachelor’s or equivalent level | 16 | 0 | 4 | 1 | 2 |
| Master’s or equivalent level | 18 | 6 | 10 | 4 | 3 |
| Doctoral or equivalent level | 20 | 0 | 1 | 0 | 0 |
| N of twin individuals |  | 172 | 258 | 168 | 250 |
| **Qingdao Twin Cohort of Children** |  |  |  |  |  |
| Illiteracy | 3 | 4 | 4 | 1 | 1 |
| Primary School | 6 | 17 | 20 | 9 | 7 |
| Junior School | 9 | 46 | 44 | 44 | 54 |
| Senior School | 12 | 16 | 15 | 25 | 19 |
| Secondary School | 13 | 6 | 7 | 8 | 6 |
| Junior College | 14 | 7 | 5 | 9 | 6 |
| College | 18 | 4 | 5 | 5 | 8 |
| N of twin individuals |  | 500 | 443 | 470 | 399 |
| **Southern California Twin Register** |  |  |  |  |  |
| Less than 7th grade | 6 | 0 | 0 | 0 | 0 |
| Junior high school | 9 | 0 | 0 | 0 | 0 |
| Partial high school 10th or 11th grade | 10 | 19 | 13 | 22 | 16 |
| High school graduate | 12 | 18 | 17 | 26 | 24 |
| Partial college, at least one year of specialized training | 14 | 30 | 32 | 19 | 25 |
| Standard college or university graduation | 16 | 23 | 25 | 21 | 23 |
| Graduate/professional training | 18 | 10 | 13 | 12 | 13 |
| N of twin individuals |  | 665 | 858 | 640 | 822 |
| **South Korea Twin Registry** |  |  |  |  |  |
| Elementary School | 6 | 3 | 2 | 2 | 2 |
| Junior High School | 9 | 5 | 5 | 4 | 4 |
| Senior High School | 12 | 56 | 48 | 46 | 31 |
| University | 16 | 32 | 42 | 41 | 53 |
| Graduate level and above | 18 | 3 | 4 | 6 | 9 |
| N of twin individuals |  | 1337 | 932 | 1337 | 932 |
| **TCHAD-study** |  |  |  |  |  |
| Compulsory (9-year comprehensive) school | 9 | 16 | 13 | 22 | 20 |
| 2 years in upper secondary school | 11 | 46 | 42 | 37 | 35 |
| 3-4 years in upper secondary school | 13 | 9 | 13 | 17 | 16 |
| University degree | 18 | 29 | 32 | 24 | 29 |
| N of twin individuals |  | 962 | 1387 | 878 | 1216 |
| **Texas Twin Project1** |  |  |  |  |  |
| 11 years or less | exact years | 9 | 4 | 5 | 4 |
| 12 years | 12 | 1 | 1 | 3 | 1 |
| 13 years | 13 | 5 | 7 | 11 | 11 |
| 14 years | 14 | 1 | 2 | 0 | 2 |
| 15 years | 15 | 3 | 6 | 2 | 2 |
| 16 years | 16 | 18 | 15 | 15 | 17 |
| 17 years | 17 | 2 | 6 | 4 | 5 |
| 18 years | 18 | 30 | 28 | 37 | 30 |
| 19 years | 19 | 5 | 5 | 3 | 5 |
| 20 years or more | exact years | 25 | 27 | 19 | 24 |
| N of twin individuals |  | 185 | 344 | 185 | 336 |
| **Turkish Twin Study** |  |  |  |  |  |
| Illiterate | 3 | 15 | 20 | 5 | 3 |
| Primary | 6 | 47 | 53 | 30 | 45 |
| Secondary | 9 | 11 | 12 | 12 | 19 |
| High | 12 | 18 | 8 | 28 | 22 |
| University | 16 | 8 | 6 | 21 | 11 |
| Graduate | 18 | 1 | 0 | 3 | 1 |
| N of twin individuals |  | 213 | 371 | 211 | 371 |
| **Vietnam Era Twin Registry1** |  |  |  |  |  |
| 11 years or less | exact years | 29 | 32 | 44 | 48 |
| 12 | 12 | 51 | 55 | 34 | 36 |
| 13 | 13 | 7 | 5 | 6 | 6 |
| 14 | 14 | 4 | 3 | 5 | 3 |
| 15 | 15 | 1 | 2 | 1 | 2 |
| 16 | 16 | 5 | 2 | 5 | 3 |
| 17 | 17 | 1 | 0 | 1 | 1 |
| 18 years or more | exact years | 1 | 1 | 3 | 1 |
| N of twin individuals |  | 693 | 528 | 679 | 524 |
| **West Japan Twins and Higher Order Multiple Births Registry** |  |  |  |  |  |
| Junior High School | 9 | 0 | 0 | 1 | 0 |
| Senior High School | 12 | 23 | 15 | 23 | 14 |
| Junior College | 14 | 21 | 29 | 1 | 1 |
| Technical School | 15 | 15 | 14 | 9 | 4 |
| University | 16 | 36 | 37 | 55 | 66 |
| Graduate School | 18 | 4 | 5 | 10 | 14 |
| N of twin individuals |  | 414 | 407 | 414 | 407 |

1Education reported as exact number of years

Supplementary table S3. The regression coefficients of individual education for same-sex and opposite-sex dizygotic twins as compared to monozygotic twins by sex and birth year.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Birth year | Same-sex DZ twins1 | | Opposite-sex DZ twins1 | | P-value of zygosity1 |
| β | 95% CI | β | 95% CI |
| Men |  |  |  |  |  |
| 1890-1899 | -0.15 | -3.71, 3.41 | -3.29 | -7.69, 1.10 | 0.1707 |
| 1900-1909 | -0.39 | -1.10, 0.31 | -1.57 | -2.93, -0.20 | 0.0563 |
| 1910-1919 | -0.36 | -0.64, -0.07 | -0.55 | -1.03, -.06 | 0.0144 |
| 1920-1929 | -0.25 | -0.39, -0.11 | -0.27 | -0.55, 0.01 | 0.0013 |
| 1930-1939 | -0.11 | -0.32, 0.11 | -0.09 | -0.33, 0.15 | 0.6013 |
| 1940-1949 | -0.37 | -0.53, -0.22 | -0.60 | -0.75, -0.45 | <0.0001 |
| 1950-1959 | -0.29 | -0.42, -0.18 | -0.24 | -0.36, -0.11 | <0.0001 |
| 1960-1969 | 0.03 | -0.13, 0.20 | -0.06 | -0.21, 0.10 | 0.5065 |
| 1970-1979 | -0.16 | -0.29, -0.02 | -0.25 | -0.40, -0.10 | 0.0026 |
| 1980-1989 | -0.13 | -0.27, 0.01 | -0.13 | -0.26, 0.00 | 0.0885 |
| 1990-1999 | -0.40 | -0.78, -0.02 | 0.14 | -0.14, 0.43 | 0.0178 |
| Women |  |  |  |  |  |
| 1890-1899 | -0.56 | -2.28, 1.16 | -1.71 | -4.11, 0.68 | 0.3399 |
| 1900-1909 | -0.05 | -0.54, 0.45 | -0.59 | -1.70, 0.52 | 0.5784 |
| 1910-1919 | -0.06 | -0.33, 0.20 | 0.24 | -0.16, 0.65 | 0.3447 |
| 1920-1929 | -0.22 | -0.41, -0.02 | -0.03 | -0.30, 0.25 | 0.0774 |
| 1930-1939 | -0.26 | -0.45, -0.07 | -0.09 | -0.32, 0.13 | 0.0241 |
| 1940-1949 | -0.13 | -0.26, 0.00 | -0.22 | -0.36, -0.08 | 0.0067 |
| 1950-1959 | -0.17 | -0.27, -0.06 | -0.02 | -0.13, 0.10 | 0.0028 |
| 1960-1969 | -0.14 | -0.26, -0.01 | -0.13 | -0.26, 0.00 | 0.0459 |
| 1970-1979 | -0.12 | -0.24, 0.01 | -0.15 | -0.28, -0.01 | 0.0585 |
| 1980-1989 | -0.15 | -0.27, -0.03 | -0.14 | -0.26, -0.03 | 0.0142 |
| 1990-1999 | 0.33 | 0.05, 0.62 | 0.10 | -0.16, 0.36 | 0.0642 |

1Adjusted for twin cohort