

Annex E

PhD completion propensity models

Modified versions of the models used in the original HEFCE 2005/02 report to include variables of ethnicity and disability

Full-time model

$$\text{phdaward}_{ijk} \sim \text{Binomial}(n_{ijk}, \pi_{ijk})$$

$$\begin{aligned} \text{logit}(\pi_{ijk}) = & \beta_{0jk} \text{cons} + 0.002(0.000)\text{Age}_{ijk} + 0.065(0.045)\text{Male}_{ijk} + 0.024(0.265)\text{S_agrc}_{jk} + 1.600(0.480)\text{S_amed}_{jk} + \\ & -0.577(0.187)\text{S_arch}_{jk} + 0.736(0.117)\text{S_biol}_{jk} + -0.127(0.141)\text{S_busn}_{jk} + 0.360(0.245)\text{S_comb}_{jk} + -0.439(0.132)\text{S_comp}_{jk} + \\ & -0.241(0.193)\text{S_cart}_{jk} + -0.037(0.165)\text{S_ed}_{jk} + -0.097(0.135)\text{S_hum}_{jk} + 3.240(1.288)\text{S_lang}_{jk} + 0.255(0.142)\text{S_math}_{jk} + 0.319(0.132)\text{S_med}_{jk} + \\ & -0.502(0.152)\text{S_ll}_{jk} + 1.385(0.301)\text{S_phys}_{jk} + -0.276(0.107)\text{S_sstd}_{jk} + 0.779(0.109)\text{R_char}_{ijk} + 1.948(0.494)\text{R_govn}_{ijk} + 0.229(0.093)\text{R_inst}_{ijk} + \\ & -2.939(1.584)\text{R_other}_{ijk} + 0.512(0.081)\text{R_ovsa}_{ijk} + 0.516(0.080)\text{R_resc}_{ijk} + 0.330(0.125)\text{R_inds}_{ijk} + 0.443(0.080)\text{D_eu}_{ijk} + \\ & -3.147(0.769)\text{D_nneu}_{ijk} + 0.280(0.094)\text{SFirst}_{ijk} + 0.166(0.126)\text{DFirst}_{ijk} + -0.230(0.083)\text{SUpperOther}_{ijk} + -0.147(0.092)\text{DUpperOther}_{ijk} + \\ & 0.022(0.082)\text{SMasters}_{ijk} + 0.015(0.098)\text{DMasters}_{ijk} + -0.220(0.103)\text{E_asian}_{ijk} + 5.702(2.612)\text{E_black}_{ijk} + 0.905(0.394)\text{E_chinese}_{ijk} + \\ & -0.013(0.072)\text{E_nknng}_{ijk} + -0.269(0.134)\text{E_other}_{ijk} + -0.121(0.372)\text{D_nknng}_{ijk} + 0.025(0.395)\text{D_rdis}_{ijk} + -0.182(0.170)\text{D_urdis}_{ijk} + \\ & -0.043(0.016)\text{Age.S_amed}_{ijk} + -0.209(0.077)\text{Age.S_lang}_{ijk} + -0.035(0.011)\text{Age.S_phys}_{ijk} + -0.052(0.017)\text{Age.R_govn}_{ijk} + \\ & 0.204(0.101)\text{Age.R_other}_{ijk} + 0.222(0.046)\text{Age.D_nneu}_{ijk} + -0.349(0.145)\text{Age.E_black}_{ijk} + 0.003(0.001)\text{Age.Age.S_lang}_{ijk} + \\ & -0.003(0.002)\text{Age.Age.R_other}_{ijk} + -0.003(0.001)\text{Age.Age.D_nneu}_{ijk} + 0.005(0.002)\text{Age.Age.E_black}_{ijk} + 0.710(0.314)\text{Male.S_agrc}_{ijk} + \\ & -1.187(0.656)\text{DUpperOther.S_comb}_{ijk} + -0.583(0.453)\text{SMasters.S_med}_{ijk} + 0.832(0.399)\text{DMasters.S_busn}_{ijk} + -0.489(0.207)\text{D_eu.S_lang}_{ijk} + \\ & -0.542(0.172)\text{D_nneu.S_hum}_{ijk} + -0.449(0.206)\text{D_nneu.DMasters}_{ijk} + -1.455(0.426)\text{D_nneu.E_chinese}_{ijk} + -0.160(0.111)\text{D_nneu.E_nknng}_{ijk} + \\ & -0.834(0.435)\text{R_govn.S_amed}_{ijk} + 1.239(0.365)\text{R_govn.S_biol}_{ijk} + -1.425(0.476)\text{R_govn.DFirst}_{ijk} + -3.086(0.951)\text{R_govn.D_urdis}_{ijk} + \\ & 0.570(0.217)\text{R_inst.SMasters}_{ijk} + 0.763(0.348)\text{R_inst.DFirst}_{ijk} + 0.115(0.124)\text{R_inst.E_nknng}_{ijk} + 0.522(0.388)\text{R_other.S_busn}_{ijk} + \\ & 0.668(0.337)\text{R_other.S_med}_{ijk} + 0.853(0.359)\text{R_ovsa.E_chinese}_{ijk} + -0.684(0.206)\text{R_ovsa.D_eu}_{ijk} + 1.160(0.645)\text{R_resc.S_comb}_{ijk} + \\ & 0.638(0.252)\text{R_resc.S_sstd}_{ijk} + 0.245(0.195)\text{R_inds.E_nknng}_{ijk} + 1.157(0.507)\text{E_asian.S_amed}_{ijk} + 1.192(0.658)\text{E_chinese.S_phys}_{ijk} + \\ & 2.093(1.107)\text{E_black.S_ed}_{ijk} + -0.330(0.142)\text{E_nknng.S_biol}_{ijk} + -0.656(0.356)\text{E_nknng.S_comb}_{ijk} \end{aligned}$$

$$\beta_{0jk} = 2.492(0.465) + v_{0k} + u_{0jk}$$

$$\begin{bmatrix} v_{0k} \end{bmatrix} \sim N(0, \Omega_v) : \Omega_v = \begin{bmatrix} 0.510(0.082) \end{bmatrix}$$

$$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim N(0, \Omega_u) : \Omega_u = \begin{bmatrix} 0.062(0.020) \end{bmatrix}$$

$$\text{var}(\text{phdaward}_{ijk} | \pi_{ijk}) = \pi_{ijk}(1 - \pi_{ijk})/n_{ijk}$$

Part-time model

$$\text{phdaward}_{ijk} \sim \text{Binomial}(n_{ijk}, \pi_{ijk})$$

$$\begin{aligned} \text{logit}(\pi_{ijk}) = & \beta_{0jk} \text{cons} + -0.160(0.027)\text{Age} + 0.002(0.000)\text{Age.Age}_{ijk} + -0.050(0.074)\text{Male}_{ijk} + 0.156(0.372)\text{S_agrc}_{ijk} + 0.033(0.201)\text{S_amed}_{ijk} + \\ & -0.600(0.291)\text{S_arch}_{ijk} + 0.102(0.186)\text{S_biol}_{ijk} + -0.328(0.202)\text{S_busn}_{ijk} + -6.692(2.408)\text{S_comb}_{ijk} + -0.678(0.278)\text{S_comp}_{ijk} + \\ & -11.038(3.191)\text{S_cart}_{ijk} + -0.254(0.186)\text{S_ed}_{ijk} + -0.525(0.210)\text{S_hum}_{ijk} + -6.000(1.721)\text{S_lang}_{ijk} + -0.239(0.364)\text{S_math}_{ijk} + 0.824(0.198)\text{S_med}_{ijk} + \\ & -8.187(3.165)\text{S_ll}_{ijk} + -0.199(0.215)\text{S_phys}_{ijk} + -0.304(0.175)\text{S_sstd}_{ijk} + 0.146(0.325)\text{R_char}_{ijk} + 0.162(0.156)\text{R_govn}_{ijk} + 0.023(0.126)\text{R_inst}_{ijk} + \\ & -0.419(0.162)\text{R_other}_{ijk} + 0.219(0.441)\text{R_ovsa}_{ijk} + 0.247(0.417)\text{R_resc}_{ijk} + -0.266(0.121)\text{R_inds}_{ijk} + 0.167(0.136)\text{D_eu}_{ijk} + \\ & 0.455(0.174)\text{D_neu}_{ijk} + 0.359(0.318)\text{SFirst}_{ijk} + 0.400(0.339)\text{DFirst}_{ijk} + -0.030(0.195)\text{SUpperOther}_{ijk} + -0.080(0.275)\text{DUpperOther}_{ijk} + \\ & 0.250(0.141)\text{SMasters}_{ijk} + 0.315(0.151)\text{DMasters}_{ijk} + -0.535(0.229)\text{E_asian}_{ijk} + -0.851(0.333)\text{E_black}_{ijk} + -0.390(0.297)\text{E_chinese}_{ijk} + \\ & 0.049(0.086)\text{E_nkngr}_{ijk} + 0.048(0.230)\text{E_other}_{ijk} + -0.738(0.689)\text{D_nkngr}_{ijk} + -0.959(1.028)\text{D_rdis}_{ijk} + 0.012(0.327)\text{D_urdis}_{ijk} + \\ & 0.318(0.124)\text{Age.S_comb}_{ijk} + 0.562(0.179)\text{Age.S_cart}_{ijk} + 0.272(0.091)\text{Age.S_lang}_{ijk} + 0.399(0.169)\text{Age.S_ll}_{ijk} + \\ & -0.004(0.002)\text{Age.Age.S_comb}_{ijk} + -0.007(0.002)\text{Age.Age.S_cart}_{ijk} + -0.003(0.001)\text{Age.Age.S_lang}_{ijk} + -0.005(0.002)\text{Age.Age.S_ll}_{ijk} + \\ & 0.803(0.400)\text{Male.S_cart}_{ijk} + 1.497(0.597)\text{Male.R_ovsa}_{ijk} + -0.380(0.210)\text{Male.D_neu}_{ijk} + 0.641(0.469)\text{R_other.S_biol}_{ijk} + \\ & 0.821(0.378)\text{R_other.S_busn}_{ijk} + 1.144(0.550)\text{R_inst.S_hum}_{ijk} + -0.777(0.272)\text{R_inst.S_med}_{ijk} + 1.520(0.742)\text{R_inst.E_chinese}_{ijk} + \\ & 1.551(0.529)\text{D_neu.S_phys}_{ijk} + 0.938(0.674)\text{D_neu.S_hum}_{ijk} + 0.858(0.366)\text{SMasters.S_ed}_{ijk} + -2.192(1.085)\text{SMasters.E_other}_{ijk} + \\ & -1.187(0.591)\text{DUpperOther.S_med}_{ijk} + 0.896(0.476)\text{DUpperOther.E_nkngr}_{ijk} + 1.362(0.748)\text{SFirst.E_nkngr}_{ijk} \end{aligned}$$

$$\beta_{0jk} = 2.721(0.529) + v_{0jk} + u_{0jk}$$

$$\begin{bmatrix} v_{0jk} \end{bmatrix} \sim N(0, \Omega_v) : \Omega_v = \begin{bmatrix} 0.201(0.052) \end{bmatrix}$$

$$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim N(0, \Omega_u) : \Omega_u = \begin{bmatrix} 0.157(0.052) \end{bmatrix}$$

$$\text{var}(\text{phdaward}_{ijk} | \pi_{ijk}) = \pi_{ijk}(1 - \pi_{ijk})/n_{ijk}$$

Propensity models for the analysis of the extended ten year period from PhD start in 1996-97 through to 2005-06

Full-time model

$$\text{phdaward}_{ijk} \sim \text{Binomial}(n_{ijk}, \pi_{ijk})$$

$$\begin{aligned} \text{logit}(\pi_{ijk}) = & \beta_{0jk} \text{cons} + -0.131(0.026)\text{Age}_{ijk} + 0.001(0.000)\text{Age.Age}_{ijk} + 0.026(0.047)\text{Male}_{ijk} + 0.487(0.211)\text{S_agrc}_{jk} + 0.545(0.150)\text{S_amed}_{jk} + \\ & 0.020(0.273)\text{S_arch}_{jk} + 0.749(0.127)\text{S_biol}_{jk} + 0.110(0.148)\text{S_busn}_{jk} + 0.571(0.266)\text{S_comb}_{jk} + -0.115(0.174)\text{S_comp}_{jk} + \\ & -0.120(0.202)\text{S_cart}_{jk} + -0.104(0.177)\text{S_ed}_{jk} + 0.063(0.148)\text{S_hum}_{jk} + 0.105(0.149)\text{S_lang}_{jk} + 0.172(0.152)\text{S_math}_{jk} + \\ & 0.252(0.141)\text{S_med}_{jk} + -0.430(0.160)\text{S_ll}_{jk} + 1.161(0.312)\text{S_phys}_{jk} + -0.167(0.114)\text{S_sstd}_{jk} + 0.694(0.118)\text{R_char}_{ijk} + \\ & 1.959(0.489)\text{R_govn}_{ijk} + 0.286(0.097)\text{R_inst}_{ijk} + 0.197(0.105)\text{R_other}_{ijk} + -1.261(1.298)\text{R_ovsa}_{ijk} + 0.453(0.084)\text{R_resc}_{ijk} + \\ & 0.319(0.133)\text{R_inds}_{ijk} + 0.344(0.084)\text{D_eu}_{ijk} + -1.979(0.868)\text{D_nneu}_{ijk} + 0.343(0.109)\text{SFirst}_{ijk} + 0.185(0.122)\text{DFirst}_{ijk} + \\ & -0.282(0.086)\text{SUpperOther}_{ijk} + -0.031(0.101)\text{DUpperOther}_{ijk} + 0.050(0.087)\text{SMasters}_{ijk} + -0.045(0.091)\text{DMasters}_{ijk} + \\ & -0.147(0.107)\text{E_asian}_{ijk} + -0.212(0.182)\text{E_black}_{ijk} + 1.077(0.419)\text{E_chinese}_{ijk} + 0.031(0.072)\text{E_nkg}_{ijk} + -0.484(0.203)\text{E_other}_{ijk} + \\ & -0.259(0.387)\text{D_nkg}_{ijk} + 0.836(0.511)\text{D_rdis}_{ijk} + -0.084(0.194)\text{D_urdis}_{ijk} + -0.029(0.011)\text{Age.S_phys}_{ijk} + -0.059(0.017)\text{Age.R_govn}_{ijk} + \\ & 0.153(0.076)\text{Age.R_ovsa}_{ijk} + 0.140(0.051)\text{Age.D_nneu}_{ijk} + -0.002(0.001)\text{Age.Age.R_ovsa}_{ijk} + -0.002(0.001)\text{Age.Age.D_nneu}_{ijk} + \\ & -1.327(0.655)\text{DUpperOther.S_comb}_{ijk} + -0.901(0.452)\text{DUpperOther.S_hum}_{ijk} + -1.066(0.372)\text{SFirst.S_comp}_{ijk} + \\ & 2.236(1.081)\text{SFirst.E_asian}_{ijk} + -0.551(0.470)\text{SMasters.S_med}_{ijk} + 1.662(0.790)\text{DMasters.S_ed}_{ijk} + -0.854(0.299)\text{D_nneu.S_comp}_{ijk} + \\ & -0.543(0.181)\text{D_nneu.S_hum}_{ijk} + -1.017(0.444)\text{D_nneu.E_chinese}_{ijk} + 0.671(0.271)\text{D_nneu.E_other}_{ijk} + 0.392(0.313)\text{E_asian.S_sstd}_{ijk} + \\ & -1.082(0.548)\text{E_chinese.S_amed}_{ijk} + -0.970(0.356)\text{E_nkg.S_arch}_{ijk} + -0.337(0.155)\text{E_nkg.S_biol}_{ijk} + -1.038(0.373)\text{E_nkg.S_comb}_{ijk} + \\ & -0.348(0.181)\text{E_nkg.S_lang}_{ijk} + 1.219(0.378)\text{R_govn.S_biol}_{ijk} + -2.721(0.851)\text{R_govn.D_urdis}_{ijk} + 0.433(0.235)\text{R_inst.SMasters}_{ijk} + \\ & 0.071(0.131)\text{R_inst.E_nkg}_{ijk} + 0.487(0.427)\text{R_other.S_busn}_{ijk} + 0.624(0.369)\text{R_ovsa.S_comp}_{ijk} + -1.213(0.324)\text{R_ovsa.D_eu}_{ijk} + \\ & -0.609(0.264)\text{R_ovsa.D_nneu}_{ijk} + -0.904(0.459)\text{R_ovsa.SFirst}_{ijk} + -1.053(0.534)\text{R_ovsa.D_urdis}_{ijk} + 1.410(0.741)\text{R_resc.S_comb}_{ijk} + \\ & 0.667(0.321)\text{R_resc.D_eu}_{ijk} + 0.336(0.210)\text{R_inds.E_nkg}_{ijk} + -0.671(0.340)\text{R_inds.SFirst}_{ijk} \end{aligned}$$

$$\beta_{0jk} = 2.680(0.459) + v_{0jk} + \mu_{0jk}$$

$$\begin{bmatrix} v_{0jk} \end{bmatrix} \sim N(0, \Omega_v) : \Omega_v = \begin{bmatrix} 0.521(0.085) \end{bmatrix}$$

$$\begin{bmatrix} \mu_{0jk} \end{bmatrix} \sim N(0, \Omega_\mu) : \Omega_\mu = \begin{bmatrix} 0.088(0.024) \end{bmatrix}$$

$$\text{var}(\text{phdaward}_{ijk} | \pi_{ijk}) = \pi_{ijk}(1 - \pi_{ijk})/n_{ijk}$$

Part-time model

$$\text{phdaward}_{ijk} \sim \text{Binomial}(n_{ijk}, \pi_{ijk})$$

$$\begin{aligned} \text{logit}(\pi_{ijk}) = & \beta_{0jk} \text{cons} + -0.105(0.023)\text{Age}_{ijk} + 0.001(0.000)\text{Age.Age}_{ijk} + -0.106(0.068)\text{Male}_{ijk} + 0.304(0.372)\text{S_agrc}_{jk} + \\ & 0.089(0.192)\text{S_amed}_{jk} + -0.368(0.256)\text{S_arch}_{jk} + 0.152(0.176)\text{S_biol}_{jk} + 0.259(0.254)\text{S_busn}_{jk} + \\ & -0.321(0.237)\text{S_comb}_{jk} + -0.337(0.248)\text{S_comp}_{jk} + -8.323(2.740)\text{S_cart}_{jk} + -0.271(0.175)\text{S_ed}_{jk} + \\ & -0.150(0.186)\text{S_hum}_{jk} + -0.221(0.184)\text{S_lang}_{jk} + 0.270(0.337)\text{S_math}_{jk} + 0.840(0.232)\text{S_med}_{jk} + \\ & -0.100(0.240)\text{S_ll}_{jk} + -0.139(0.226)\text{S_phys}_{jk} + -0.149(0.165)\text{S_sstd}_{jk} + 0.253(0.322)\text{R_char}_{ijk} + \\ & 0.153(0.147)\text{R_govn}_{ijk} + -0.106(0.108)\text{R_inst}_{ijk} + -0.156(0.138)\text{R_other}_{ijk} + 1.120(0.322)\text{R_ovsa}_{ijk} + \\ & 0.058(0.420)\text{R_resc}_{ijk} + -0.102(0.110)\text{R_inds}_{ijk} + 0.028(0.131)\text{D_eu}_{ijk} + 0.299(0.110)\text{D_nneu}_{ijk} + \\ & 0.336(0.267)\text{SFirst}_{ijk} + 0.584(0.362)\text{DFirst}_{ijk} + 0.038(0.184)\text{SUpperOther}_{ijk} + -0.134(0.210)\text{DUpperOther}_{ijk} + \\ & 0.116(0.170)\text{SMasters}_{ijk} + 0.072(0.145)\text{DMasters}_{ijk} + -7.109(3.718)\text{E_asian}_{ijk} + -0.630(0.291)\text{E_black}_{ijk} + \\ & 0.155(0.424)\text{E_chinese}_{ijk} + 0.066(0.088)\text{E_nkng}_{ijk} + 0.251(0.214)\text{E_other}_{ijk} + -0.467(0.566)\text{D_nkng}_{ijk} + \\ & -0.703(0.795)\text{D_rdis}_{ijk} + -0.137(0.312)\text{D_urdis}_{ijk} + -0.572(0.257)\text{Male.S_busn}_{ijk} + \\ & -1.436(0.572)\text{Male.E_chinese}_{ijk} + 0.442(0.155)\text{Age.S_cart}_{ijk} + 0.408(0.214)\text{Age.E_asian}_{ijk} + \\ & -0.005(0.002)\text{Age.Age.S_cart}_{ijk} + -0.006(0.003)\text{Age.Age.E_asian}_{ijk} + 1.235(0.709)\text{E_black.R_other}_{ijk} + \\ & 2.387(0.904)\text{E_chinese.R_inst}_{ijk} + 1.456(0.639)\text{E_chinese.S_ed}_{ijk} + -0.443(0.232)\text{E_nkng.S_med}_{ijk} + \\ & 0.607(0.339)\text{E_nkng.S_phys}_{ijk} + 0.696(0.371)\text{SMasters.S_ed}_{ijk} + 0.506(0.260)\text{SMasters.E_nkng}_{ijk} + \\ & -1.543(0.715)\text{SMasters.E_other}_{ijk} \end{aligned}$$

$$\beta_{0jk} = 2.039(0.467) + v_{0k} + u_{0jk}$$

$$\begin{bmatrix} v_{0k} \end{bmatrix} \sim N(0, \Omega_v) : \Omega_v = \begin{bmatrix} 0.210(0.051) \end{bmatrix}$$

$$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim N(0, \Omega_u) : \Omega_u = \begin{bmatrix} 0.146(0.047) \end{bmatrix}$$

$$\text{var}(\text{phdaward}_{ijk} | \pi_{ijk}) = \pi_{ijk}(1 - \pi_{ijk})/n_{ijk}$$

Propensity models for the analysis of the 1999-2000 cohort of PhD starters for the seven year period to 2005-06

Full-time model

$$\text{phdaward}_{ijk} \sim \text{Binomial}(n_{ijk}, \pi_{ijk})$$

$$\begin{aligned} \text{logit}(\pi_{ijk}) = & \beta_{0jk} \text{cons} + -0.172(0.028)\text{Age}_{ijk} + 0.002(0.000)\text{Age.Age}_{ijk} + -0.070(0.048)\text{Male}_{ijk} + 0.742(0.279)\text{S_agrc}_{ijk} + 0.560(0.129)\text{S_amed}_{ijk} + \\ & -0.366(0.193)\text{S_arch}_{ijk} + 0.503(0.099)\text{S_biol}_{ijk} + -0.368(0.126)\text{S_busn}_{ijk} + 0.461(0.227)\text{S_comb}_{ijk} + -4.521(1.694)\text{S_comp}_{ijk} + \\ & -0.194(0.181)\text{S_cart}_{ijk} + 0.191(0.165)\text{S_ed}_{ijk} + -4.024(1.156)\text{S_hum}_{ijk} + -0.054(0.134)\text{S_lang}_{ijk} + 0.406(0.161)\text{S_math}_{ijk} + 0.463(0.125)\text{S_med}_{ijk} + \\ & -0.441(0.152)\text{S_ll}_{ijk} + 0.585(0.095)\text{S_phys}_{ijk} + -0.281(0.098)\text{S_sstd}_{ijk} + 0.724(0.133)\text{R_char}_{ijk} + 0.562(0.141)\text{R_govn}_{ijk} + 0.574(0.070)\text{R_inst}_{ijk} + \\ & 0.388(0.120)\text{R_other}_{ijk} + 0.637(0.083)\text{R_ovsa}_{ijk} + 0.977(0.077)\text{R_resc}_{ijk} + 0.306(0.108)\text{R_inds}_{ijk} + 0.501(0.074)\text{D_eu}_{ijk} + 0.527(0.070)\text{D_nneu}_{ijk} + \\ & 1.317(0.370)\text{SFirst}_{ijk} + 0.178(0.123)\text{DFirst}_{ijk} + -0.214(0.085)\text{SUpperOther}_{ijk} + -0.388(0.112)\text{DUpperOther}_{ijk} + 0.010(0.073)\text{SMasters}_{ijk} + \\ & 4.623(1.619)\text{DMasters}_{ijk} + 0.029(0.096)\text{E_asian}_{ijk} + -0.138(0.153)\text{E_black}_{ijk} + 0.325(0.128)\text{E_chinese}_{ijk} + -1.756(0.754)\text{E_nkng}_{ijk} + \\ & 0.056(0.107)\text{E_other}_{ijk} + -0.149(0.205)\text{D_nkng}_{ijk} + -1.460(0.995)\text{D_rdis}_{ijk} + -0.169(0.186)\text{D_urdis}_{ijk} + 0.246(0.106)\text{Age.S_comp}_{ijk} + \\ & 0.209(0.069)\text{Age.S_hum}_{ijk} + -0.283(0.100)\text{Age.DMasters}_{ijk} + -0.044(0.013)\text{Age.SFirst}_{ijk} + 0.111(0.046)\text{Age.E_nkng}_{ijk} + \\ & -0.003(0.002)\text{Age.Age.S_comp}_{ijk} + -0.003(0.001)\text{Age.Age.S_hum}_{ijk} + 0.004(0.001)\text{Age.Age.DMasters}_{ijk} + -0.002(0.001)\text{Age.Age.E_nkng}_{ijk} + \\ & 0.339(0.162)\text{Male.S_hum}_{ijk} + 0.336(0.145)\text{Male.R_other}_{ijk} + -0.460(0.255)\text{R_char.D_nneu}_{ijk} + 0.546(0.265)\text{R_govn.E_nkng}_{ijk} + \\ & -0.641(0.372)\text{R_inst.S_arch}_{ijk} + -0.680(0.364)\text{R_inst.S_cart}_{ijk} + 0.859(0.384)\text{R_other.DUpperOther}_{ijk} + -0.967(0.354)\text{R_other.S_busn}_{ijk} + \\ & -0.989(0.451)\text{R_other.S_cart}_{ijk} + -0.673(0.256)\text{R_resc.E_asian}_{ijk} + 1.166(0.558)\text{R_inds.S_med}_{ijk} + -0.837(0.387)\text{D_eu.SFirst}_{ijk} + \\ & -1.127(0.484)\text{D_eu.S_ed}_{ijk} + -0.476(0.217)\text{D_eu.S_lang}_{ijk} + -0.411(0.178)\text{D_mneu.S_hum}_{ijk} + -0.380(0.180)\text{D_nneu.S_lang}_{ijk} + \\ & -1.066(0.485)\text{SMasters.D_nkng}_{ijk} + -1.552(0.588)\text{SMasters.D_urdis}_{ijk} + -0.881(0.313)\text{SMasters.S_med}_{ijk} + -0.704(0.258)\text{SMasters.S_phys}_{ijk} + \\ & 0.634(0.300)\text{DMasters.S_biol}_{ijk} + 1.042(0.326)\text{DMasters.S_busn}_{ijk} + 0.665(0.334)\text{DMasters.S_hum}_{ijk} + 0.959(0.350)\text{SFirst.S_biol}_{ijk} + \\ & -2.106(0.689)\text{DUpperOther.S_math}_{ijk} + 0.383(0.210)\text{DUpperOther.E_nkng}_{ijk} + -0.791(0.362)\text{E_nkng.S_agrc}_{ijk} + -1.175(0.396)\text{E_nkng.S_comb}_{ijk} \end{aligned}$$

$$\beta_{0jk} = 3.226(0.473) + v_{0jk} + u_{0jk}$$

$$\begin{bmatrix} v_{0jk} \end{bmatrix} \sim N(0, \Omega_v) : \Omega_v = \begin{bmatrix} 0.312(0.055) \end{bmatrix}$$

$$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim N(0, \Omega_u) : \Omega_u = \begin{bmatrix} 0.027(0.017) \end{bmatrix}$$

$$\text{var}(\text{phdaward}_{ijk} | \pi_{ijk}) = \pi_{ijk}(1 - \pi_{ijk})/n_{ijk}$$

Part-time model

$$\text{phdaward}_{ijk} \sim \text{Binomial}(n_{ijk}, \pi_{ijk})$$

$$\begin{aligned} \text{logit}(\pi_{ijk}) = & \beta_{0jk} \text{cons} + -0.121(0.029)\text{Age}_{ijk} + 0.001(0.000)\text{Age.Age}_{ijk} + -0.216(0.076)\text{Male}_{ijk} + 0.454(0.401)\text{S_agrc}_{jk} + -0.015(0.210)\text{S_amed}_{jk} + \\ & -0.069(0.326)\text{S_arch}_{jk} + 4.750(1.856)\text{S_biol}_{jk} + -0.300(0.206)\text{S_busn}_{jk} + -0.013(0.321)\text{S_comb}_{jk} + 0.082(0.264)\text{S_comp}_{jk} + \\ & -0.390(0.258)\text{S_cart}_{jk} + -0.378(0.191)\text{S_ed}_{jk} + -0.831(0.276)\text{S_hum}_{jk} + -0.362(0.255)\text{S_lang}_{jk} + 0.428(0.372)\text{S_math}_{jk} + 0.826(0.201)\text{S_med}_{jk} + \\ & -0.585(0.317)\text{S_ll}_{jk} + 0.325(0.233)\text{S_phys}_{jk} + -0.090(0.200)\text{S_sstd}_{jk} + -0.504(0.423)\text{R_char}_{ijk} + -5.938(3.988)\text{R_govn}_{ijk} + 0.295(0.110)\text{R_inst}_{ijk} + \\ & 0.073(0.142)\text{R_other}_{ijk} + 0.526(0.243)\text{R_ovsa}_{ijk} + 0.888(0.441)\text{R_resc}_{ijk} + 0.114(0.127)\text{R_inds}_{ijk} + 0.247(0.145)\text{D_eu}_{ijk} + 2.906(1.485)\text{D_mneu}_{ijk} + \\ & 0.030(0.248)\text{SFirst}_{ijk} + 0.491(0.466)\text{DFirst}_{ijk} + -0.191(0.225)\text{SUpperOther}_{ijk} + -0.110(0.299)\text{DUpperOther}_{ijk} + 0.438(0.144)\text{SMasters}_{ijk} + \\ & -0.023(0.172)\text{DMasters}_{ijk} + -0.025(0.182)\text{E_asian}_{ijk} + -0.778(0.299)\text{E_black}_{ijk} + -11.476(6.520)\text{E_chinese}_{ijk} + 0.035(0.089)\text{E_nkng}_{ijk} + \\ & -10.615(3.515)\text{E_other}_{ijk} + 0.297(0.318)\text{D_nkng}_{ijk} + -0.661(0.388)\text{D_urdis}_{ijk} + 0.668(0.280)\text{Male.S_hum}_{ijk} + 0.794(0.290)\text{Male.S_lang}_{ijk} + \\ & -0.252(0.104)\text{Age.S_biol}_{ijk} + 0.387(0.215)\text{Age.R_govn}_{ijk} + -0.135(0.077)\text{Age.D_mneu}_{ijk} + 0.691(0.376)\text{Age.E_chinese}_{ijk} + \\ & 0.595(0.196)\text{Age.E_other}_{ijk} + 0.003(0.001)\text{Age.Age.S_biol}_{ijk} + -0.006(0.003)\text{Age.Age.R_govn}_{ijk} + 0.002(0.001)\text{Age.Age.D_mneu}_{ijk} + \\ & -0.010(0.005)\text{Age.Age.E_chinese}_{ijk} + -0.008(0.003)\text{Age.Age.E_other}_{ijk} + 1.436(0.711)\text{R_govn.DMasters}_{ijk} + -1.457(0.581)\text{R_inds.SMasters}_{ijk} + \\ & -3.092(1.161)\text{SMasters.S_biol}_{ijk} + -0.936(0.456)\text{SMasters.S_med}_{ijk} + -0.201(0.381)\text{D_eu.S_sstd}_{ijk} \end{aligned}$$

$$\beta_{0jk} = 1.883(0.583) + v_{0jk} + u_{0jk}$$

$$\begin{bmatrix} v_{0jk} \end{bmatrix} \sim N(0, \Omega_v) : \Omega_v = \begin{bmatrix} 0.111(0.041) \end{bmatrix}$$

$$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim N(0, \Omega_u) : \Omega_u = \begin{bmatrix} 0.181(0.056) \end{bmatrix}$$

$$\text{var}(\text{phdaward}_{ijk} | \pi_{ijk}) = \pi_{ijk}(1 - \pi_{ijk})/n_{ijk}$$

Model variable definitions

Type	Variable	Description
	Age	Student's age
	Male	Whether the student was male (1) or female (0)
Subject	S_agrc S_amed S_arch S_biol S_busn S_comb S_comp S_cart S_ed BASELINE S_hum S_lang S_math S_med S_ll S_phys S_sstd	Agriculture Allied to medicine Architecture Biological sciences Business Combined subjects Computing Creative arts Education Engineering Humanities Languages Mathematics Medicine/veterinary sciences Law/librarianship Physical sciences Social studies
Funding source	R_char R_govn R_inst BASELINE R_other R_ovsa R_resc R_inds	Charity / British Academy Government Institution No financial backing Other Overseas Research Council UK industry
Domicile	D_eu BASELINE D_nneu	European Union (EU) UK Non-EU
Prior qualifications	Masters First UpperOther BASELINE Sxxx,Dxxx	Masters degree in previous year First class degree in previous year Upper second class or other class of degree in previous year No masters or degree award in previous year S - attended same HEI, D - attended different HEI
Ethnicity	E_asian E_black E_chinese E_nkng E_other BASELINE	Asian / Asian British Black / Black British Chinese Not known / not given Other White
Disability status	BASELINE D_nkng D_rdis D_urdis	None Not known / not given Disability – registered / receives DSA Disability – unregistered / no DSA