Supplemental Material S1.

```
*This is SAS code for running the analysis described in the paper.
SAS is freely available via web computing at https://www.sas.com/en_us/software/on-demand-for-academics.html;

*** This code can be copy and pasted into a SAS program file and then run;

************** SAS data step reads the data;
data example;
      input id y  AgeCat $;
datalines;
   2      -2      50-59
   3       0      50-59
   4     -16      50-59
   5     -10      50-59
   6      -4      60-69
   7     -10      60-69
   8       0      50-59
   9      -4      50-59
  10       6      60-69
  12      -6      60-69
  13       0      50-59
  15       2      70-79
  16       0      70-79
  20     -18      70-79
;
run;



********** PROC MCMC conducts the analysis ***************;
*** There are three critical elements to the model specification:
      PARMS lists the unknown parameters in the model,
      PRIOR specifies the prior on each unknown listed in the PARMS statement,
      MODEL specifies the likelihood;

proc mcmc data=example  /* identify the dataset to be analyzed */
      nmc=50000          /* Number of MCMC iterations */
      nbi=50000          /* Number of MCMC burn-in samples */
      monitor=(_PARMS_ PercDiff)    /*Identify the parameters and variable PercDiff to show in the output*/
      init=random /*Starting values for the MCMC chains are randomly selected from the prior distributions*/
      statistics(percent=5 50 95) = (summary) /*Show posterior quantiles*/;

      parms Theta_50_59 Theta_60_69 Theta_70_79 ; /* identify the parameters in the model */
      parms TauSquared Theta_Overall SigmaSquared;    /* identify additional parameters in the model */

/*The prior on the variance components is Half-Normal(5)*/
```

```
        prior SigmaSquared TauSquared ~ normal(0, sd=5, lower=0);
/* ignorant prior on theta_overall*/
        prior Theta_Overall ~ normal(0, variance = 25/0.17);

/*priors on Theta Age is centered at Theta_Overall, with variance Tau */
        prior Theta_50_59 Theta_60_69 Theta_70_79 ~ normal(Theta_Overall, variance=TauSquared);

/*Identify which age-specific theta parameter associated with each observation in the dataset*/
        if AgeCat = "50-59" then ThetaAge = Theta_50_59;
        if AgeCat = "60-69" then ThetaAge = Theta_60_69;
        if AgeCat = "70-79" then ThetaAge = Theta_70_79;

/*compute the percent difference between 70-79 year olds and 50-59 year olds*/
        PercDiff= 100*(Theta_70_79-Theta_50_59)/Theta_50_59;

/*The likelihood for y is Normal (or Gaussian) centered at ThetaAge with variance Sigma Squared*/
        model y ~ Normal(ThetaAge, variance=SigmaSquared);
run;
```