**Allegiance, Ability, and Achievement in the American Civil War: Commander Traits and Battlefield Military Effectiveness**

Instructions and description of code and data files

**Instructions:** To recover all regression tables and figures in the main paper and appendices, all you need to do is run **ACH-MainCode.R**, with the directory structure as indicated in the lists below, with the code and data files in the appropriate folders (the files listed as “output files” do not need to be included for replication purposes, as they are generated by the replication process itself). Make sure the working directory is where ACH-MainCode.R is located. Further note that ACH-MainCode.R needs to be edited to set the user’s path to his or her Stata application (line 48).

**IMPORTANT:** The main R script sends commands to both Stata and Mplus. This has only been tested on Mplus 8 and it does not seem to work on versions other than Stata 15 (though the user can attempt other versions of Stata by editing line 477 of the ACH-MainCode.R file).

***Code Files***

* **ACH-MainCode.R**
  + This performs all analyses in the paper and appendices. It outputs all tables and figures to the “out” directory, creates some additional data files and places them in the “data” and “code” directories, and **is the only code that needs to be run.**
* /code/ACH-BattleImputations.R
  + This file generates the imputed strength and casualty estimates when the data are missing. It is called by ACH-MainCode.R **and does not need to be run directly.**
* /code/ACH-MovingAverages.R
  + This file generates the estimated averages of loyalty and competence over time, and also generates Figure 1. It is called by ACH-MainCode.R **and does not need to be run directly.**
* /code/ACH-UpdatingBattles.R
  + This file merges the imputed battle-level data with some commander-level data. Useful if one wants to change the imputation procedure in ACH-BattleImputations.R without breaking the workflow. It is automatically called by ACH-MainCode.R **and does not need to be run directly.**
* /code/ACH-Utilities.R
  + This file contains various utility scripts used by ACH-MainCode.R (e.g., scripts for formatting the tables to be more readable, etc.). It is called by ACH-MainCode.R **and does not need to be run directly.**
* ACH-MIMIC-Bootstrap-NoDir.inp; ACH-MIMIC-NoBootstrap-NoDir.inp; ACH-MIMIC-BootstrapMin-NoDir.inp; ACH-MIMIC-NoBootstrapMin-NoDir.inp; ACH-MIMIC-BootstrapMax-NoDir.inp; ACH-MIMIC-NoBootstrapMax-NoDir.inp
  + These are files that contain the code needed to estimate the MIMIC models in Mplus. Because Mplus requires that .inp files have directory information, they are edited by ACH-MainCode.R to have the proper directory information. **These files are not to be run directly.**

***Data Files***

* /data/ACH.dat
  + This is created by ACH-MainCode.R (by calling the stata2mplus module within within Stata via an outside call) and is used by Mplus to estimate the MIMIC models.
* /data/ACH-Generals.dta
  + This file contains a large amount of commander-level biographical information, largely drawn from Eicher and Eicher’s *Civil War High Commands* and the American Civil War Research Database (<http://www.civilwardata.com>)
* /data/ACH-StaticCommanders.csv
  + This file contains additional commander-level biographical information, largely drawn from Eicher and Eicher’s *Civil War High Commands* and the American Civil War Research Database (<http://www.civilwardata.com>)
* /data/ACH-GeneralsMerged.dta
  + This file is created by ACH-MainCode.R, and includes the both general-level and battle-level data used by Mplus to estimate the MIMIC models. It is converted to ACH.dat by Stata (via stata2mplus) so it can be read by Mplus.
* /data/ACH-BattleCommanders.dta
  + This file includes information regarding who served as commanders in each battle.
* /data/ACH-BattlesImputed.rds
  + This file is created by ACH-BattleImputations.R and, along with other battle-level information, contains (imputed) estimates of the armies’ strengths and casualties.
* /data/ACH-NewBattles.rds
  + This file is created by ACH-UpdatingBattles.R and includes merged battle-general data.
* /data/ACH-CommandersCorps.csv
  + This file is used by ACH-MovingAverages.R to create a moving average of army-level loyalty and competence over time. It consists of just the promotions/demotions and army entry/exit activities, arranged in a way to create the moving averages more easily.
* /data/ACH-military\_ranks.csv
  + This file is used by ACH-BattleImputations.R to remove those battles where the highest-ranking commander was in the Navy.
* /data/ACH-battles\_summary.csv
  + This file contains battle-level information, and is used to generate the imputed battle casualties/strength estimates (where they are missing) as well as the Grant and Lee simulations.
* /data/ACH-political\_generals.csv
  + This file contains information from Wikipedia’s article on political generals (accessed November 27, 2017) as well as David Work’s *Lincoln’s Political Generals*. It is used to complete the robustness checks in Appendix D.

***Output Files***

* ACH-Replications.out
  + This is the main log file created by sourcing R in batch mode.
* /code/ACH-MIMIC-Bootstrap-NoDir.out; /code/ACH-MIMIC-NoBootstrap-NoDir.out; /code/ACH-MIMIC-BootstrapMin-NoDir.out; /code/ACH-MIMIC-NoBootstrapMin-NoDir.out; /code/ACH-MIMIC-BootstrapMax-NoDir.out; /code/ACH-MIMIC-NoBootstrapMax-NoDir.out
  + These are the raw output files from the Mplus routines. They are manipulated by ACH-MainCode.R and do not need to be called directly.
* /code/ACH-MIMIC-Bootstrap-NoDir.sav; /code/ACH-MIMIC-NoBootstrap-NoDir.sav; /code/ACH-MIMIC-BootstrapMin-NoDir.sav; /code/ACH-MIMIC-NoBootstrapMin-NoDir.sav; /code/ACH-MIMIC-BootstrapMax-NoDir.sav; /code/ACH-MIMIC-NoBootstrapMax-NoDir.sav
  + These are the estimated loyalty and competence traits generated by the Mplus routines. They are manipulated by ACH-MainCode.R and do not need to be called directly.
* /out/ACH-Table-XX.html
  + These are the regression tables in the main paper and Appendix. They are generated by ACH-MainCode.R
* /out/ACH-Figure-XX.eps
  + These are the figures in the main paper and Appendix. They are generated by ACH-MainCode.R

***Miscellaneous***

* /code/Mplus Run Models.log
  + This is a short log file created by Mplus to show which routines were run. Not used.
* /data/ACH.inp
  + This is an auxiliary file created by ACH-MainCode.R (by calling the stata2mplus module within within Stata via an outside call) in the process of creating ACH.dat. Not used.