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Supplement for "Partisan differences in risk taking in a simulated pandemic": Simulations and Code (C)

Jan K. Woike
Max Planck Institute for Human Development, Berlin, Germany; University of Plymouth, United Kingdom

Sebastian Hafenbrädl
IESE Business School, Barcelona, Spain

Patricia Kanngiesser
Freie Universität Berlin, Germany; University of Plymouth, United Kingdom

Ralph Hertwig
Max Planck Institute for Human Development, Berlin, Germany

Abstract

Simulations and Code (C)

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Jan K. Woike https://orcid.org/0000-0002-6816-121X, Sebastian Hafenbrädl https://orcid.org/0000-0002-5148-766X, Patricia Kanngiesser https://orcid.org/0000-0003-1068-3725, Ralph Hertwig https://orcid.org/0000-0002-9908-9556
Correspondence e-mail: woike@mpib-berlin.mpg.de

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C1 Contents of this document

This documents presents the results of Matlab simulations, presenting theoretical implications of the game rules and the consequences of empirical choices made by participants. The document is structured as follows:

- Description of the general procedure used for simulations, and the definition of decision strategies and conditions (section SIM-2)
- Explanation of figure types used to visualize results (section SIM-3)
- Simulations based on the empirical data for each of the eight experimental conditions (section SIM-4)
- Simulations based on the empirical data for framing and intervention combinations joining the two partisan samples (section SIM-5)
- Comparison of results between conditions (section SIM-6)
- A full collection of the simulation code used to generate the presented results (section SIM-7)

C2 Simulation procedure

C2.1 Number of trials

If not otherwise specified, reported data are based on 1,000,000 trials per condition or level of the parameter at interest. The simulation code document lists all codes used to generate the data that is used as input for the calculations below.

C2.2 Decision strategies

As in our previous publication Woike et al., 2022, we classify participant behavior during the game into four exclusive qualitative behavioral strategies. The Matlab code

classifies each set of a player's actions into one of these four types:

1. **AllG**: AllG-patterns consist of G-choices from the first to the last round.
2. **HthenG**: H(then)G patterns start with H and from some round on switch to G for the rest of the game.
3. **Switch**: Switch-patterns also alternate between H and G. They either start with G, switch between actions more than once, or have both features.
4. **AllH** : AllH-patterns consist of H-choices from the first to the last round.

Note that the AllG-player chooses the safer option throughout the game, and the AllH-player chooses the riskier option throughout the game. As discussed in the Supplementary Material for the Transmission Game, a pattern of choosing H-actions before switching to G for the rest of the game leads to better expected outcomes than a pattern of switching repeatedly between G and H (or starting with G and switching to H).

For each of these patterns and each game the Matlab code records:

- the number of players with the pattern (can be 0)
- the proportion of blue ("healthy") players among those that play the pattern at the end of the game
- the average outcome for players with this pattern (a purple player scores 0)

This results in 12 collected values per game, with information available in the output files on mean, standard deviation, and percentiles.

C2.3 Simulation conditions

We simulate games for a total of 12 conditions, split into two different sets. The first set of eight conditions is based on mutually exclusive samples of participants. The eight groups are formed by the combination of three binary factors: voter group (2016 presidential election), intervention type and framing.

- **Condition 1:** Trump voters — injunctive norms intervention — Mask framing ($n_1 = 101$)
- **Condition 2:** Trump voters — injunctive norms intervention — Color framing ($n_2 = 99$)
- **Condition 3:** Trump voters — no intervention — Mask framing ($n_3 = 105$)
- **Condition 4:** Trump voters — no intervention — Color framing ($n_4 = 93$)
- **Condition 5:** Clinton voters — injunctive norms intervention — Mask framing ($n_5 = 103$)
- **Condition 6:** Clinton voters — injunctive norms intervention — Color framing ($n_6 = 108$)

- **Condition 7:** Clinton voters — no intervention — Mask framing ($n_7 = 103$)
- **Condition 8:** Clinton voters — no intervention — Color framing ($n_8 = 107$)

The second set of conditions only uses two factors to create four non-overlapping groups of participants: intervention type and framing. Trump voters and Clinton voters are part of the same simulation in each condition.

- **Condition 9:** injunctive norms intervention — Mask framing ($n_9 = 204$)
- **Condition 10:** injunctive norms intervention — Color framing ($n_{10} = 207$)
- **Condition 11:** no intervention — Mask framing ($n_{11} = 208$)
- **Condition 12:** no intervention — Color framing ($n_{12} = 200$)

In practice, this means that, for example, Condition 1 and Condition 5 are collapsed into Condition 9.

C2.4 Sample selection

The differences in sample size required a procedure to select a player group of $n = 100$ in each simulation run. This was achieved by taking a random subsample of the eligible participants in each condition. For conditions, in which the number of eligible participants was below 100 (conditions 2 and 4) this was done with replacement (participants' choice vectors could be selected more than once into the population), for all other conditions this was done without replacement.

C2.5 Data preparation

This document was prepared in Overleaf, as an Rtex file implementing knitr. Any output is generated by R during compilation, and can thus be replicated by entering the same commands referencing the same dataset. Simulation results obtained in Matlab were produced prior to the compilation of this document. Overleaf's R version and selection and versions of packages are not under the user's control. This section demonstrates the R version and the list of packages used for calculations and output generation.

C2.5.1 R Libraries

```
library(foreign)

library(formatR)
library(ggplot2)
library(dplyr)

##
## Attaching package:  'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union

library(tidyr)
library("purrr")
library("tidyverse")

## Warning in system("timedatectl", intern = TRUE): running command
'timedatectl' had status 1
## - Attaching packages --------------------- tidyverse 1.3.1 -
## v tibble  3.1.7     v stringr 1.4.0
## v readr   2.1.2     v forcats 0.5.1
## - Conflicts ---------------------- tidyverse_conflicts() -
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()

library("psych", verbose=TRUE)

##
## Attaching package:  'psych'
## The following objects are masked from 'package:ggplot2':
##
##     %+%, alpha

library("rmarkdown",verbose=TRUE)
#library("ggfan")

library("viridis")

## Loading required package:  viridisLite

library("viridisLite")

library("car")

## Loading required package:  carData
##
## Attaching package:  'car'
## The following object is masked from 'package:psych':
##
##     logit
## The following object is masked from 'package:purrr':
##
##     some
```

```
## The following object is masked from 'package:dplyr':
##
##     recode

library("data.table")

##
## Attaching package:  'data.table'
## The following object is masked from 'package:purrr':
##
##     transpose
## The following objects are masked from 'package:dplyr':
##
##     between, first, last

library("patchwork")
#library("ggthemes")
R.version

##                _
## platform       x86_64-pc-linux-gnu
## arch           x86_64
## os             linux-gnu
## system         x86_64, linux-gnu
## status
## major          4
## minor          1.2
## year           2021
## month          11
## day            01
## svn rev        81115
## language       R
## version.string R version 4.1.2 (2021-11-01)
## nickname       Bird Hippie

sessionInfo()

## R version 4.1.2 (2021-11-01)
## Platform: x86_64-pc-linux-gnu (64-bit)
## Running under: Ubuntu 22.04 LTS
##
## Matrix products: default
## BLAS:   /usr/lib/x86_64-linux-gnu/blas/libblas.so.3.10.0
## LAPACK: /usr/lib/x86_64-linux-gnu/lapack/liblapack.so.3.10.0
##
## locale:
```

```
##  [1] LC_CTYPE=C.UTF-8       LC_NUMERIC=C           LC_TIME=C.UTF-8
##  [4] LC_COLLATE=C.UTF-8     LC_MONETARY=C.UTF-8    LC_MESSAGES=C.UTF-8
##  [7] LC_PAPER=C.UTF-8       LC_NAME=C              LC_ADDRESS=C
## [10] LC_TELEPHONE=C         LC_MEASUREMENT=C.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
##  [1] patchwork_1.1.1   data.table_1.14.2 car_3.1-0         carData_3.0-5
##  [5] viridis_0.6.2     viridisLite_0.4.0 rmarkdown_2.14    psych_2.2.5
##  [9] forcats_0.5.1     stringr_1.4.0     readr_2.1.2       tibble_3.1.7
## [13] tidyverse_1.3.1   purrr_0.3.4       tidyr_1.2.0       dplyr_1.0.9
## [17] ggplot2_3.3.6     formatR_1.12      foreign_0.8-82    knitr_1.39
##
## loaded via a namespace (and not attached):
##  [1] lubridate_1.8.0  lattice_0.20-45  assertthat_0.2.1 digest_0.6.29
##  [5] utf8_1.2.2       R6_2.5.1         cellranger_1.1.0 backports_1.4.1
##  [9] reprex_2.0.1     evaluate_0.15    httr_1.4.3       pillar_1.7.0
## [13] rlang_1.0.2      readxl_1.4.0     rstudioapi_0.13  munsell_0.5.0
## [17] broom_0.8.0      compiler_4.1.2   modelr_0.1.8     xfun_0.31
## [21] pkgconfig_2.0.3  mnormt_2.1.0     htmltools_0.5.2  tidyselect_1.1.2
## [25] gridExtra_2.3    fansi_1.0.3      crayon_1.5.1     tzdb_0.3.0
## [29] dbplyr_2.2.0     withr_2.5.0      grid_4.1.2       nlme_3.1-158
## [33] jsonlite_1.8.0   gtable_0.3.0     lifecycle_1.0.1  DBI_1.1.2
## [37] magrittr_2.0.3   scales_1.2.0     cli_3.3.0        stringi_1.7.6
## [41] fs_1.5.2         xml2_1.3.3       ellipsis_0.3.2   generics_0.1.2
## [45] vctrs_0.4.1      tools_4.1.2      glue_1.6.2       hms_1.1.1
## [49] abind_1.4-5      parallel_4.1.2   fastmap_1.1.0    colorspace_2.0-3
## [53] rvest_1.0.2      haven_2.5.0
```

C2.5.2 ggfan

The library ggfan was inserted manually in this document by copying the code from https://github.com/jasonhilton/ggfan/tree/master/R for "ggfan" and "stat_interval" on 01.09.2023 in version v0.1.3. The code is no echoed into this document but it is executed at this point.

C2.5.3 ggthemes

Parts of the library ggthemes were inserted manually in this document by copying the code from https://github.com/jrnold/ggthemes for "economist" and "theme_foundation" on 06.09.2023 in version v4.2.4. Calls to load The code is no echoed into this document but it is executed at this point.

```
## NULL
## [1] ".data"
```

C3 Plot types in this document

C3.1 Percentile plots of "infection" rates

The plot calculated below summarizes the data from simulated games using artificial data. In a first example, we simulated 1,000,000 games with a population of 50 All-H players and 50 All-G players. These results were obtained when preparing the supplementary materials for our previous study.

The Matlab code outputs files with percentile summaries of roundwise rates of purple or infected players (henceforth interchangeably also called "infection rates" in analogy to the spread of a virus). Each row corresponds to a value marking the output of the "prctile"-function with the parameter varying from 0 to 1 in 200 increments of 0.5% (including 0 and 1, thus 201 rows). Each column corresponds to the state after each round, with the first column describing the initial state (named "After round 0" to stay consistent). The data is given in wide format. It is reshaped into long format below. The percentile parameters are added to the data set and used as quantile values to the ggfan-command. Columns names are manually assigned, but ultimately transformed into numbers.

```
dataRaw=read.delim(
  file="res/PropStable-10----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))

dataRaw$percentile=0:200;

dataLong<-dataRaw%>%
gather(key="AfterRound",value="PercPurple",-percentile)


dataLong$AfterRound<-parse_number(dataLong$AfterRound);
dataLong$percentile<-dataLong$percentile/200


sintervals=c(0.1,0.25,0.67,0.95)
slabels=c("10%","25%","67%","95%")

ggplot(data=dataLong, aes(x=AfterRound,y=PercPurple,quantile=percentile))+
  geom_fan(intervals=sintervals)+
```

```
  theme_dark()+
   scale_fill_viridis_c(option="viridis",direction=-1,breaks=sintervals,
                        labels=slabels,
                        name = "PI")+
  stat_summary(fun=median,geom="line",lwd=0.5,aes(color="Median"))+
  scale_color_manual(values=c("lightgray","black","lightgray"),name="")+
  stat_summary(fun=max,geom="line",lwd=0.5,aes(color="Min"),
               linetype="dashed")+
  stat_summary(fun=min,geom="line",lwd=0.5,aes(color="Max"),
               linetype="dashed")+
  ylim(0,1)+
  theme(legend.position="left")+
  ylab("Proportion Purple")+
  xlab("After round")+
  ggtitle("50% H-players and 50% G-players")+
  theme(axis.text=element_text(size=20),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))

## `summarise()` has grouped output by 'Interval'.  You can override using
the
## `.groups` argument.
```

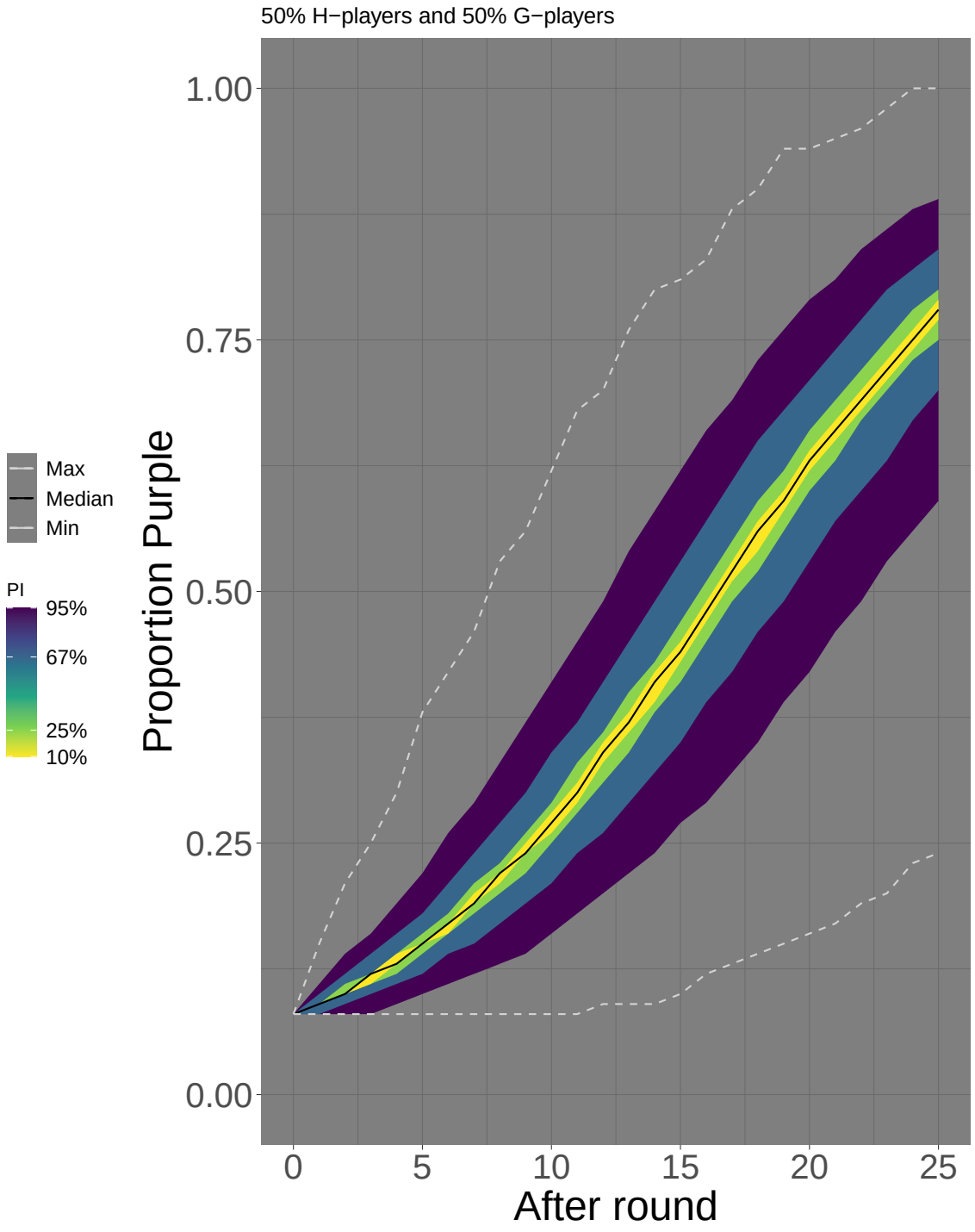

Figure C1

Percentile plot for games with 50% AllG-players and 50% AllH-players. Shaded areas mark intervals (prediction intervals, PI) that contain the specified inner percentage of results (number of purple players in the beginning and after each of the 25 rounds). For example, the 95% encompasses the are between the percentile values for 2.5% and 97.5 %. On each side, 2.5% of the observed simulation results were more extreme. The dashed line mark the maximum and minimum value observed across 1,000,000 simulations runs.

Figure C1 shows the variability and central tendency (median) of simulation outcomes. Median, maximum, and minimum are shown as lines (connecting the 26 valid values; the lines between rounds are connected for illustration purposes, even if they are technically meaningless).

Areas correspond to certain percentages of simulated results in the middle of the observed distribution. Specifically, "10%" corresponds to the inner 10% of values, between 45% and 55% of the ordered distribution. In the same vein, 25% corresponds to the inner 25% of the distribution, other values shown are 67% and 95%. This means, that 2.5% of the total distribution lie between the outline of the colored area and the extreme values (on either side).

Not surprisingly, due to path dependency the spread increases over time. Given an infinite number of trials, the minima would be expected to form a straight line, the maxima a rectangular shape. Given the large number of trials, the median line would not change substantially in all likelihood.

These PI-intervals should not be confused with confidence intervals. The 95%-CI for the mean proportion (not shown in the figure) corresponds to an absolute deviation smaller than 0.1% for 1,000,000 trials (with a maximum for an observed proportion of 0.5). The PI intervals estimate the distribution of single results, not mean results.

The median is not always in the middle of the 10% interval, but it obviously could never escape it. This is due to the fact that each trial generates outcomes in 1% increments. Typical values are very compressed at the beginning of the game, so there are relatively many identical outcomes after the first rounds. All games are initialized with 8 purple players, thus all lines start at point (0,0.08). The figure shows the expected rate of infected players (as proportion) throughout the simulated games. The majority of players is infected by round 20 and most games reach infection rates between 60% and 70% at the end of the game. Most players would not receive any bonus money.

C3.2 Results for player types

Two more diagram types illustrate strategy-specific outcomes. We describe outcomes on two main dimensions: The first dimension is the probability of survival, that is, the chance to end the game in a blue or healthy state. Only surviving players earn bonus money. The second dimension is the expected number of points that are translated into payoffs. This dimension is not independent of survival, as non-surviving players score zero points.

C3.2.1 Survival rate

Figure C2 presents results for the simulated data with 50% AllG and 50% AllH players. In this simulation, only two strategy types occur. The figure demonstrates the distribution of survival rates split by strategy type, showing mean, minimum and maximum survival rates across 1,000,000 games and three percentile ranges bracketing the inner 25%, 67% and 95% of results. It is evident that AllG-players have a higher "survival rate" (proportion of staying blue till the end of the game) than All-H players, reflecting the smaller risk taken in each interaction.

```
dataRaw1=read.delim(
  file="res/PropStable-10----HalfPercentileConditionalOutcomes.txt",
         header=FALSE,col.names=c("countH","countS","countF","countG",
                                  "survH","survS","survF","survG","expH",
                                  "expS","expF","expG"))


dataRaw2=read.delim(
  file="res/PropStable-10--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))


dataRaw3=read.delim(
  file="res/PropStable-10----HalfPercentileSumOutcome.txt",
                   header=FALSE,col.names=c("expAll"))

dataRaw4=read.delim(
  file="res/PropStable-10--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))



dataRaw5=read.delim(
  file="res/PropStable-10--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))



dataRaw6=read.delim(
  file="res/PropStable-10----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
```

```
dataCombined=data.frame(
  survH=c(dataRaw2$survH,dataRaw1$survH),
  survG=c(dataRaw2$survG,dataRaw1$survG),
  expH=c(dataRaw2$expH,dataRaw1$expH),
  expG=c(dataRaw2$expG,dataRaw1$expG),
  survAll=c(1-dataRaw5$R25,rev(1-dataRaw6$R25)),
  expAll=c(dataRaw4$expAll/100,dataRaw3$expAll/100)
)

chooseRows=c(1,2,3,7, 35, 77,  102, 127, 169, 197,201,202)

dataCombined=dataCombined[chooseRows,]
dataCombined$statType=c("Mean","Min","P0.5","P2.5","P16.5","P37.5","Median",
                        "P62.5","P83.5","P97.5","P99.5","Max")

dataTransformed<-dataCombined%>%
  select(c(survG,survH,survAll,statType))%>%
  rename(AllG=survG,
         AllH=survH,
         Population=survAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")

colorsPal=viridis(option="magma",12)

ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,
                    ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,
                    ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,
                    ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,
                    ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",
                      ymin=Min,ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal[[12]],colorsPal[[10]],
                             colorsPal[[8]],colorsPal[[6]]),name="")+
```

```
  theme_dark()+
  ylab("Proportion blue")+
  xlab("Player type")
```

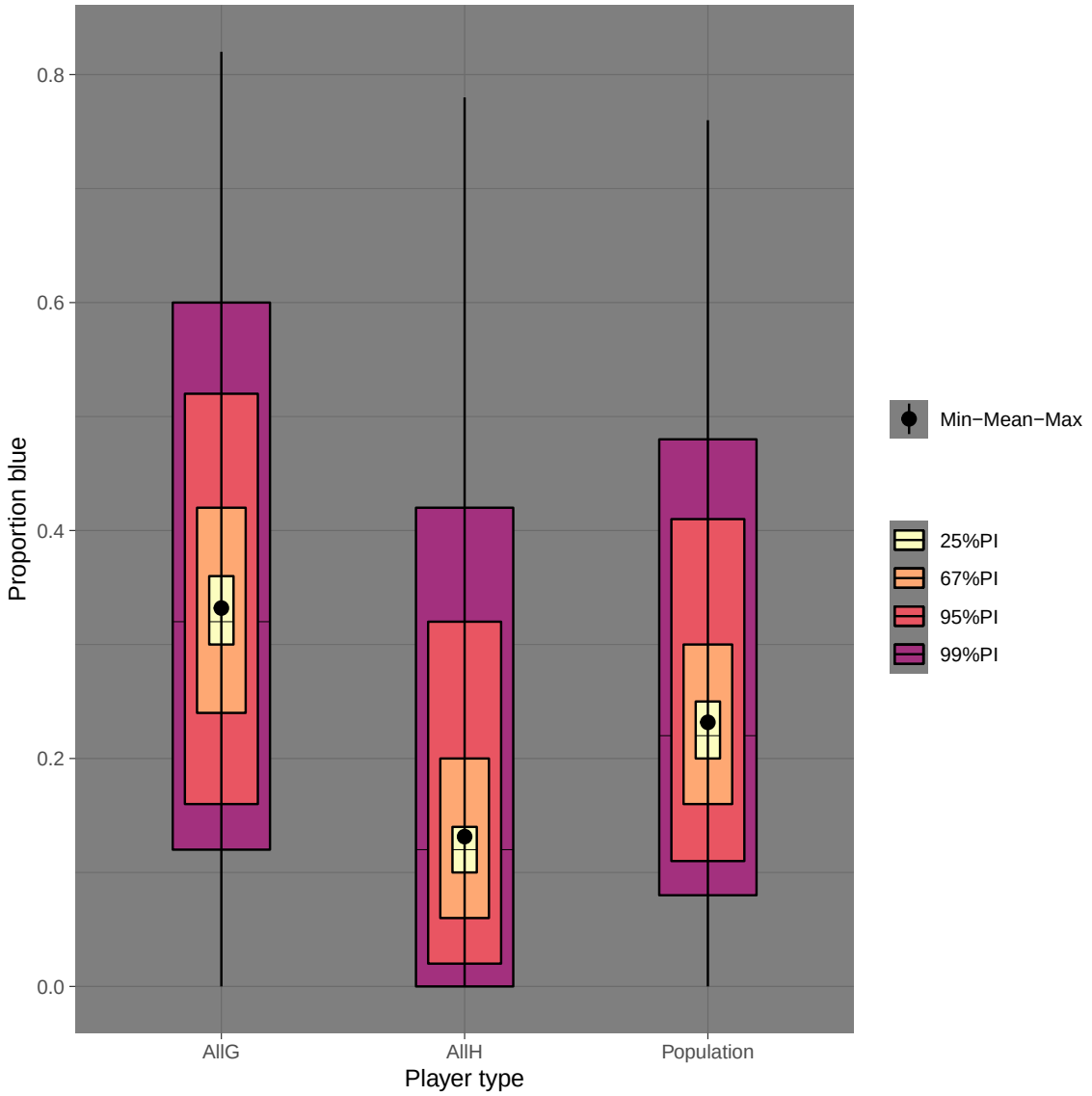

Figure C2

Distribution of the proportion of blue players at the end of the game ("survival rate" for both player types and the whole population).

C3.2.2 Expected outcome

Figure C3 offers an analogous presentation for average point outcomes. Note that non-surviving players lose all of their points. Their scores are thus counted as zero. The two specific strategy types accumulate 200 and 1,000 points, respectively. The average outcome in each game is equivalent to the product of these numbers with strategy-specific survival rates. Even when considering this difference in surival rates, AllH-players have still a higher expected outcome compared to AllG-players.

```
dataTransformed<-dataCombined%>%
  select(c(expG,expH,expAll,statType))%>%
  rename(AllG=expG,
         AllH=expH,
         Population=expAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")


colorsPal2=viridis(option="inferno",12)

ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",ymin=Min,
                      ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal2[[12]],colorsPal2[[9]],
                             colorsPal2[[6]],
                             colorsPal2[[4]]),name="")+
  theme_dark()+
  ylab("Expected outcome")+
  xlab("Player type")
```

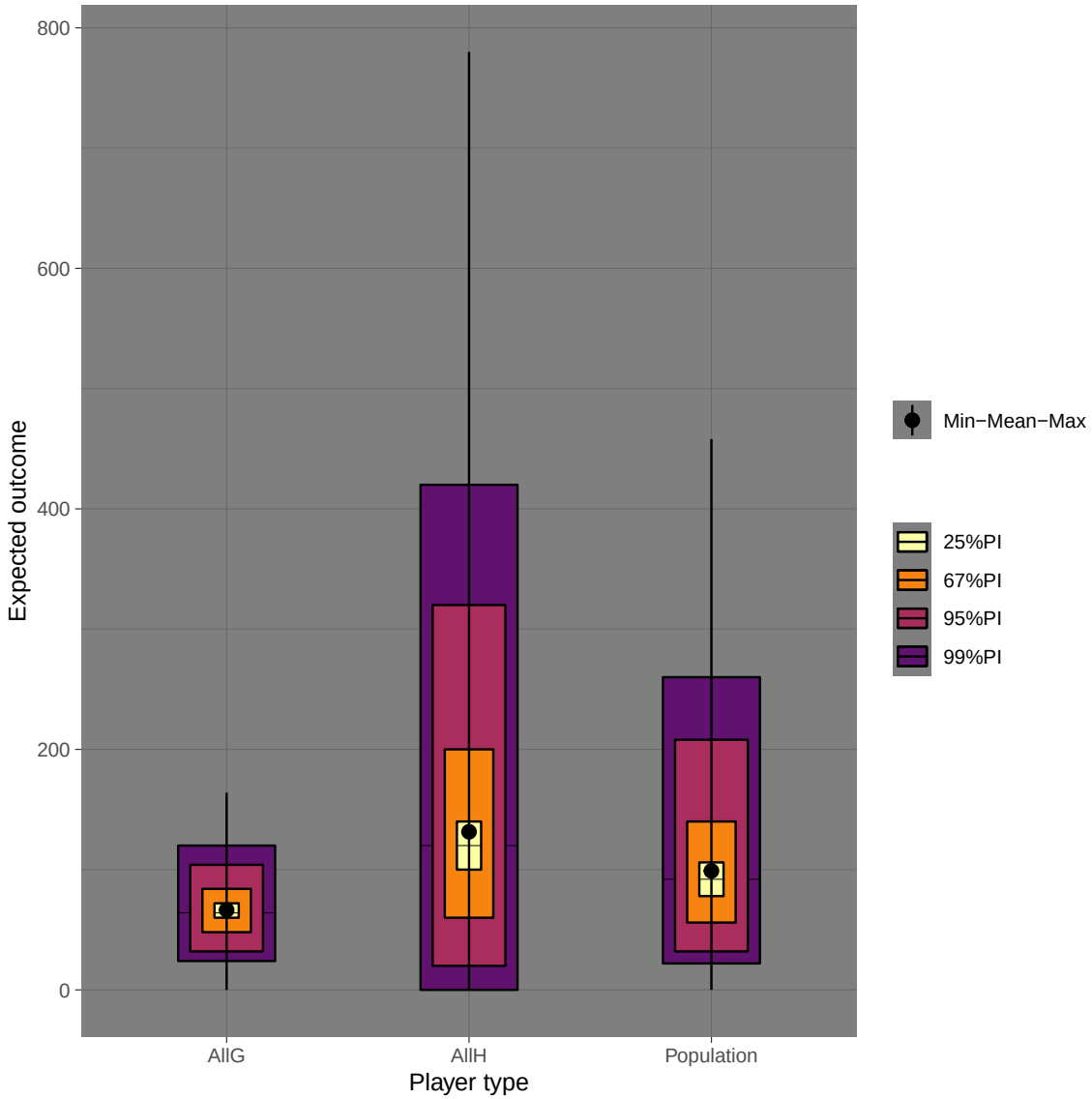

Figure C3

Distribution of final scores for both player types and the whole population: These numbers reflect that purple players score zero points at the end of the game. Using the incentive structures in the studies, the average result translates into average payments in pence by dividing final scores by 2.

In monetary terms, AllG players stand to win £1.00, because they invariably score 200 points. AllH players, in contrast, stand to win £5.00, and their survival rate is more than a fifth of the rate for AllG-players. The individual gain in expected outcomes comes at the cost of a reduction of both individual and population survival chance. The supplementary materials accompanying our previous article demonstrates this in a series of simulations.

C4 Results for the eight experimental conditions

C4.1 Condition 1: Trump voters/Norms intervention/Mask framing

C4.1.1 Calculations

```
dataRaw=read.delim(file="res/StudyPolitical-1----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03",
                                            "R04","R05","R06","R07",
                                            "R08","R09","R10","R11",
                                            "R12", "R13","R14","R15",
                                            "R16","R17","R18","R19","R20",
                                            "R21","R22","R23","R24","R25"))

dataRaw$percentile=0:200;

dataLong<-dataRaw%>%
gather(key="AfterRound",value="PercPurple",-percentile)


dataLong$AfterRound<-parse_number(dataLong$AfterRound);
dataLong$percentile<-dataLong$percentile/200


sintervals=c(0.1,0.25,0.67,0.95)
slabels=c("10%","25%","67%","95%")

cond1Roundwise <- ggplot(data=dataLong, aes(x=AfterRound,y=PercPurple,quantile=percentile))+
  geom_fan(intervals=sintervals)+
  theme_dark()+
   scale_fill_viridis_c(option="viridis",direction=-1,
                        breaks=sintervals,labels=slabels,
                        name = "PI")+
  stat_summary(fun=median,geom="line",lwd=0.5,aes(color="Median"))+
  scale_color_manual(values=c("lightgray","black","lightgray"),name="")+
  stat_summary(fun=max,geom="line",lwd=0.5,aes(color="Min"),
               linetype="dashed")+
  stat_summary(fun=min,geom="line",lwd=0.5,aes(color="Max"),
               linetype="dashed")+
```

```
  ylim(0,1)+
  theme(legend.position="left")+
  ylab("Proportion Purple")+
  xlab("After round")+
  ggtitle(label="Condition 1: Trump voters/Norms intervention/Mask framing",subtitle="Avera
  theme(axis.text=element_text(size=20),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12),
        title=element_text(size=20))
```

```
dataRaw1=read.delim(
  file="res/StudyPolitical-1----HalfPercentileConditionalOutcomes.txt",
         header=FALSE,col.names=c("countH","countS","countF","countG",
                                  "survH","survS","survF","survG","expH",
                                  "expS","expF","expG"))


dataRaw2=read.delim(
  file="res/StudyPolitical-1--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))


dataRaw3=read.delim(
  file="res/StudyPolitical-1----HalfPercentileSumOutcome.txt",
                   header=FALSE,col.names=c("expAll"))

dataRaw4=read.delim(
  file="res/StudyPolitical-1--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))



dataRaw5=read.delim(
  file="res/StudyPolitical-1--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
```

```
dataRaw6=read.delim(
  file="res/StudyPolitical-1----HalfPercentileInfectionRate.txt",
                  header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                           "R05","R06","R07","R08","R09",
                                           "R10","R11","R12","R13","R14",
                                           "R15","R16","R17","R18","R19",
                                           "R20","R21","R22","R23","R24",
                                           "R25"))


dataCombined=data.frame(
  survH=c(dataRaw2$survH,dataRaw1$survH),
  survG=c(dataRaw2$survG,dataRaw1$survG),
   survF=c(dataRaw2$survF,dataRaw1$survF),
   survS=c(dataRaw2$survS,dataRaw1$survS),
  expH=c(dataRaw2$expH,dataRaw1$expH),
  expG=c(dataRaw2$expG,dataRaw1$expG),
  expS=c(dataRaw2$expS,dataRaw1$expS),
  expF=c(dataRaw2$expF,dataRaw1$expF),
  survAll=c(1-dataRaw5$R25,rev(1-dataRaw6$R25)),
  expAll=c(dataRaw4$expAll/100,dataRaw3$expAll/100)
)

chooseRows=c(1,2,3,7, 35, 77,  102, 127, 169, 197,201,202)

dataCombined=dataCombined[chooseRows,]
dataCombined$statType=c("Mean","Min","P0.5","P2.5","P16.5","P37.5","Median",
                        "P62.5","P83.5","P97.5","P99.5","Max")



dataTransformed<-dataCombined%>%
  select(c(survG,survH,survAll,survS,survF,statType))%>%
  rename(AllG=survG,
         HthenG=survF,
         Switch=survS,
         AllH=survH,
         Population=survAll
  )%>%
 gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome") %>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))
```

```
colorsPal=viridis(option="magma",12)



cond1Infection <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,
                    ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,
                    ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,
                    ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,
                    ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",
                      ymin=Min,ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal[[12]],colorsPal[[10]],
                             colorsPal[[8]],colorsPal[[6]]),name="")+
  theme_dark()+
  ylab("Proportion blue")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
dataTransformed<-dataCombined%>%
  select(c(expG,expH,expF,expS,expAll,statType))%>%
  rename(AllG=expG,
         AllH=expH,
         HthenG=expF,
         Switch=expS,
         Population=expAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")%>%
```

```
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))

colorsPal2=viridis(option="inferno",12)

cond1Outcome <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",ymin=Min,
                      ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal2[[12]],colorsPal2[[9]],
                             colorsPal2[[6]],
                             colorsPal2[[4]]),name="")+
  theme_dark()+
  ylab("Expected outcome")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
print("Mean expected outcome in population:")

## [1] "Mean expected outcome in population:"

dataCombined$expAll[1]

## [1] 180.03
```

C4.1.2 Figure

```
(cond1Roundwise/
  (cond1Infection/ cond1Outcome))+
  plot_annotation(tag_levels = 'A')

## `summarise()` has grouped output by 'Interval'.  You can override using
the
## `.groups` argument.
```

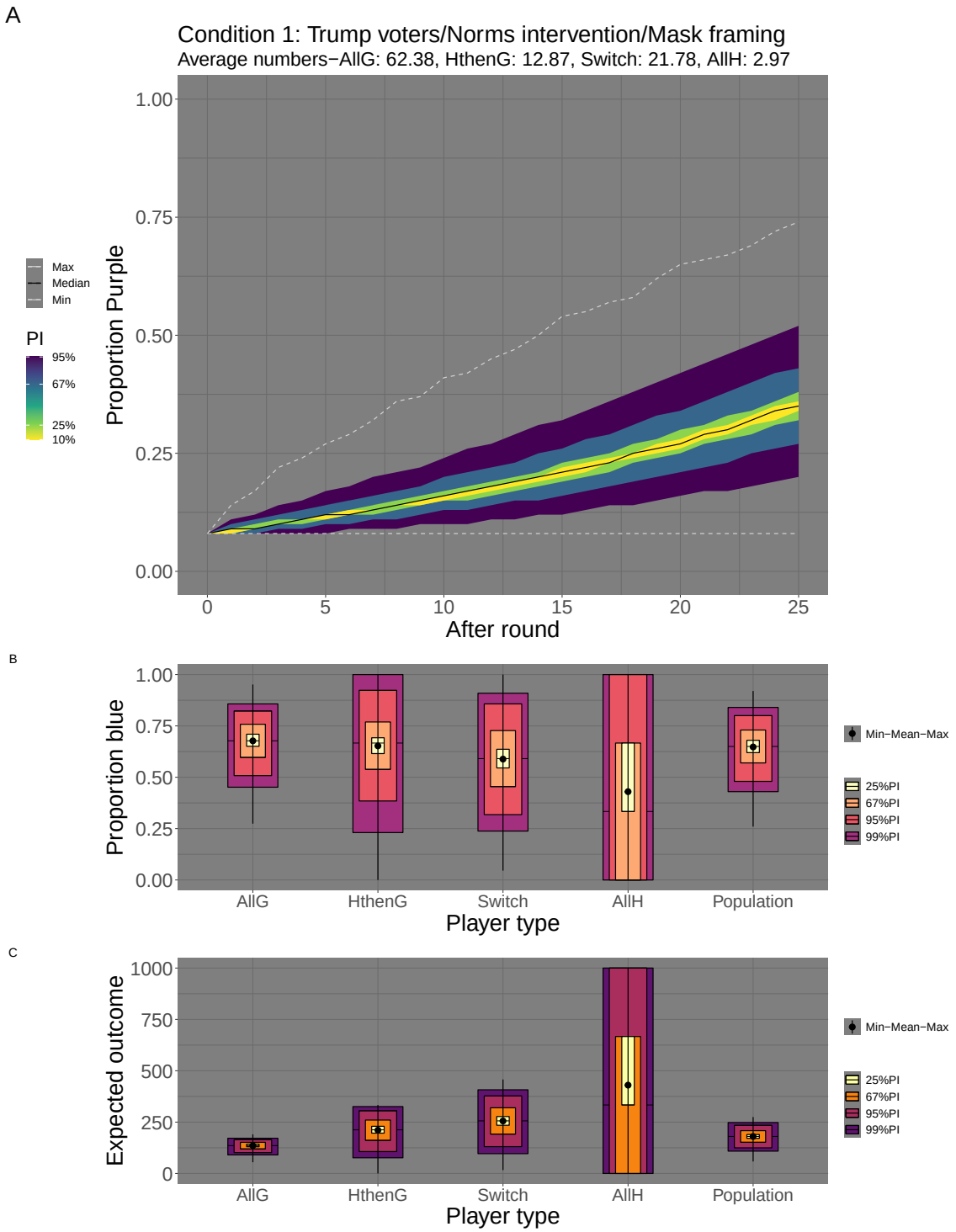

Figure C4

A) Percentile plot of roundwise purple/infection rates across 1,000,000 simulations for condition 1. B) Distribution of the proportion of blue/healthy players at the end of the game for all player types and the whole population. C) Distribution of final scores for all player types and the whole population.

C4.2 Condition 2: Trump voters/Norms intervention/Color framing

C4.2.1 Calculations

```
dataRaw=read.delim(file="res/StudyPolitical-2----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03",
                                            "R04","R05","R06","R07",
                                            "R08","R09","R10","R11",
                                            "R12", "R13","R14","R15",
                                            "R16","R17","R18","R19","R20",
                                            "R21","R22","R23","R24","R25"))

dataRaw$percentile=0:200;

dataLong<-dataRaw%>%
gather(key="AfterRound",value="PercPurple",-percentile)


dataLong$AfterRound<-parse_number(dataLong$AfterRound);
dataLong$percentile<-dataLong$percentile/200


sintervals=c(0.1,0.25,0.67,0.95)
slabels=c("10%","25%","67%","95%")

condRoundwise <- ggplot(data=dataLong, aes(x=AfterRound,y=PercPurple,quantile=percentile))+
  geom_fan(intervals=sintervals)+
  theme_dark()+
   scale_fill_viridis_c(option="viridis",direction=-1,
                        breaks=sintervals,labels=slabels,
                        name = "PI")+
  stat_summary(fun=median,geom="line",lwd=0.5,aes(color="Median"))+
  scale_color_manual(values=c("lightgray","black","lightgray"),name="")+
  stat_summary(fun=max,geom="line",lwd=0.5,aes(color="Min"),
               linetype="dashed")+
  stat_summary(fun=min,geom="line",lwd=0.5,aes(color="Max"),
               linetype="dashed")+
  ylim(0,1)+
  theme(legend.position="left")+
  ylab("Proportion Purple")+
  xlab("After round")+
    ggtitle(label="Condition 2: Trump voters/Norms intervention/Color framing",subtitle="Av
  theme(axis.text=element_text(size=20),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12),
        title=element_text(size=20))
```

```
dataRaw1=read.delim(
  file="res/StudyPolitical-2----HalfPercentileConditionalOutcomes.txt",
         header=FALSE,col.names=c("countH","countS","countF","countG",
                                  "survH","survS","survF","survG","expH",
                                  "expS","expF","expG"))


dataRaw2=read.delim(
  file="res/StudyPolitical-2--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))


dataRaw3=read.delim(
  file="res/StudyPolitical-2----HalfPercentileSumOutcome.txt",
                   header=FALSE,col.names=c("expAll"))

dataRaw4=read.delim(
  file="res/StudyPolitical-2--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))



dataRaw5=read.delim(
  file="res/StudyPolitical-2--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))



dataRaw6=read.delim(
  file="res/StudyPolitical-2----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
```

```
dataCombined=data.frame(
  survH=c(dataRaw2$survH,dataRaw1$survH),
  survG=c(dataRaw2$survG,dataRaw1$survG),
   survF=c(dataRaw2$survF,dataRaw1$survF),
   survS=c(dataRaw2$survS,dataRaw1$survS),
  expH=c(dataRaw2$expH,dataRaw1$expH),
  expG=c(dataRaw2$expG,dataRaw1$expG),
  expS=c(dataRaw2$expS,dataRaw1$expS),
  expF=c(dataRaw2$expF,dataRaw1$expF),
  survAll=c(1-dataRaw5$R25,rev(1-dataRaw6$R25)),
  expAll=c(dataRaw4$expAll/100,dataRaw3$expAll/100)
)

chooseRows=c(1,2,3,7, 35, 77,  102, 127, 169, 197,201,202)

dataCombined=dataCombined[chooseRows,]
dataCombined$statType=c("Mean","Min","P0.5","P2.5","P16.5","P37.5","Median",
                        "P62.5","P83.5","P97.5","P99.5","Max")



dataTransformed<-dataCombined%>%
  select(c(survG,survH,survAll,survS,survF,statType))%>%
  rename(AllG=survG,
         HthenG=survF,
         Switch=survS,
         AllH=survH,
         Population=survAll
  )%>%
 gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome") %>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))



colorsPal=viridis(option="magma",12)



condInfection <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,
```

```
                    ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,
                    ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,
                    ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,
                    ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",
                      ymin=Min,ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal[[12]],colorsPal[[10]],
                             colorsPal[[8]],colorsPal[[6]]),name="")+
  theme_dark()+
  ylab("Proportion blue")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
dataTransformed<-dataCombined%>%
  select(c(expG,expH,expF,expS,expAll,statType))%>%
  rename(AllG=expG,
         AllH=expH,
         HthenG=expF,
         Switch=expS,
         Population=expAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")%>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))

colorsPal2=viridis(option="inferno",12)

condOutcome <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,ymax=P83.5,y=P16.5),
```

```
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",ymin=Min,
                      ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal2[[12]],colorsPal2[[9]],
                             colorsPal2[[6]],
                             colorsPal2[[4]]),name="")+
  theme_dark()+
  ylab("Expected outcome")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
print("Mean expected outcome in population:")
```

```
## [1] "Mean expected outcome in population:"
```

```
dataCombined$expAll[1]
```

```
## [1] 174.3
```

C4.2.2 Figure

```
(condRoundwise/
  (condInfection/ condOutcome))+
  plot_annotation(tag_levels = 'A')
```

```
## `summarise()` has grouped output by 'Interval'.  You can override using
the
## `.groups` argument.
```

C4.3 Condition 3: Trump voters/No intervention/Mask framing

C4.3.1 Calculations

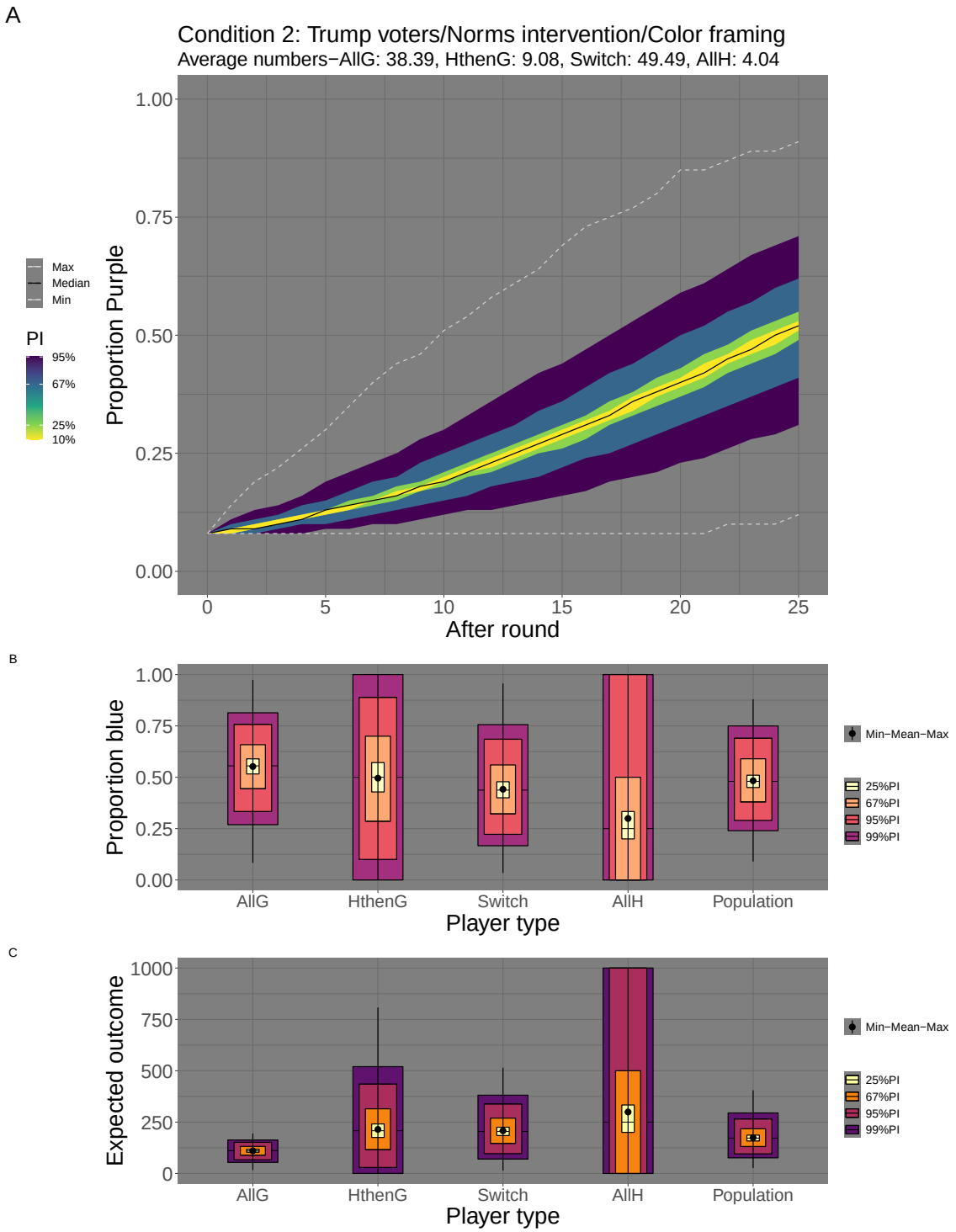

Figure C5

A) Percentile plot of roundwise purple/infection rates across 1,000,000 simulations for condition 2. B) Distribution of the proportion of blue/healthy players at the end of the game for all player types and the whole population. C) Distribution of final scores for all player types and the whole population.

```
dataRaw=read.delim(file="res/StudyPolitical-3----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03",
                                            "R04","R05","R06","R07",
                                            "R08","R09","R10","R11",
                                            "R12", "R13","R14","R15",
                                            "R16","R17","R18","R19","R20",
                                            "R21","R22","R23","R24","R25"))

dataRaw$percentile=0:200;

dataLong<-dataRaw%>%
gather(key="AfterRound",value="PercPurple",-percentile)


dataLong$AfterRound<-parse_number(dataLong$AfterRound);
dataLong$percentile<-dataLong$percentile/200


sintervals=c(0.1,0.25,0.67,0.95)
slabels=c("10%","25%","67%","95%")

condRoundwise <- ggplot(data=dataLong, aes(x=AfterRound,y=PercPurple,quantile=percentile))+
  geom_fan(intervals=sintervals)+
  theme_dark()+
   scale_fill_viridis_c(option="viridis",direction=-1,
                        breaks=sintervals,labels=slabels,
                        name = "PI")+
  stat_summary(fun=median,geom="line",lwd=0.5,aes(color="Median"))+
  scale_color_manual(values=c("lightgray","black","lightgray"),name="")+
  stat_summary(fun=max,geom="line",lwd=0.5,aes(color="Min"),
               linetype="dashed")+
  stat_summary(fun=min,geom="line",lwd=0.5,aes(color="Max"),
               linetype="dashed")+
  ylim(0,1)+
  theme(legend.position="left")+
  ylab("Proportion Purple")+
  xlab("After round")+
    ggtitle(label="Condition 3: Trump voters/No intervention/Mask framing",subtitle="Averag
  theme(axis.text=element_text(size=20),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12),
        title=element_text(size=20))
```

```
dataRaw1=read.delim(
  file="res/StudyPolitical-3----HalfPercentileConditionalOutcomes.txt",
         header=FALSE,col.names=c("countH","countS","countF","countG",
                                  "survH","survS","survF","survG","expH",
                                  "expS","expF","expG"))


dataRaw2=read.delim(
  file="res/StudyPolitical-3--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))


dataRaw3=read.delim(
  file="res/StudyPolitical-3----HalfPercentileSumOutcome.txt",
                   header=FALSE,col.names=c("expAll"))

dataRaw4=read.delim(
  file="res/StudyPolitical-3--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))



dataRaw5=read.delim(
  file="res/StudyPolitical-3--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))



dataRaw6=read.delim(
  file="res/StudyPolitical-3----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
```

```
dataCombined=data.frame(
  survH=c(dataRaw2$survH,dataRaw1$survH),
  survG=c(dataRaw2$survG,dataRaw1$survG),
   survF=c(dataRaw2$survF,dataRaw1$survF),
   survS=c(dataRaw2$survS,dataRaw1$survS),
  expH=c(dataRaw2$expH,dataRaw1$expH),
  expG=c(dataRaw2$expG,dataRaw1$expG),
  expS=c(dataRaw2$expS,dataRaw1$expS),
  expF=c(dataRaw2$expF,dataRaw1$expF),
  survAll=c(1-dataRaw5$R25,rev(1-dataRaw6$R25)),
  expAll=c(dataRaw4$expAll/100,dataRaw3$expAll/100)
)

chooseRows=c(1,2,3,7, 35, 77,  102, 127, 169, 197,201,202)

dataCombined=dataCombined[chooseRows,]
dataCombined$statType=c("Mean","Min","P0.5","P2.5","P16.5","P37.5","Median",
                        "P62.5","P83.5","P97.5","P99.5","Max")



dataTransformed<-dataCombined%>%
  select(c(survG,survH,survAll,survS,survF,statType))%>%
  rename(AllG=survG,
         HthenG=survF,
         Switch=survS,
         AllH=survH,
         Population=survAll
  )%>%
 gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome") %>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))



colorsPal=viridis(option="magma",12)



condInfection <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,
```

```
                    ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,
                    ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,
                    ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,
                    ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",
                      ymin=Min,ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal[[12]],colorsPal[[10]],
                             colorsPal[[8]],colorsPal[[6]]),name="")+
  theme_dark()+
  ylab("Proportion blue")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
dataTransformed<-dataCombined%>%
  select(c(expG,expH,expF,expS,expAll,statType))%>%
  rename(AllG=expG,
         AllH=expH,
         HthenG=expF,
         Switch=expS,
         Population=expAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")%>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))

colorsPal2=viridis(option="inferno",12)

condOutcome <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,ymax=P83.5,y=P16.5),
```

```
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",ymin=Min,
                      ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal2[[12]],colorsPal2[[9]],
                             colorsPal2[[6]],
                             colorsPal2[[4]]),name="")+
  theme_dark()+
  ylab("Expected outcome")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
print("Mean expected outcome in population:")
```

```
## [1] "Mean expected outcome in population:"
```

```
dataCombined$expAll[1]
```

```
## [1] 184.22
```

C4.3.2 Figure

```
(condRoundwise/
  (condInfection/ condOutcome))+
  plot_annotation(tag_levels = 'A')
```

```
## `summarise()` has grouped output by 'Interval'.  You can override using
the
## `.groups` argument.
```

C4.4 Condition 4: Trump voters/No intervention/Color framing

C4.4.1 Calculations

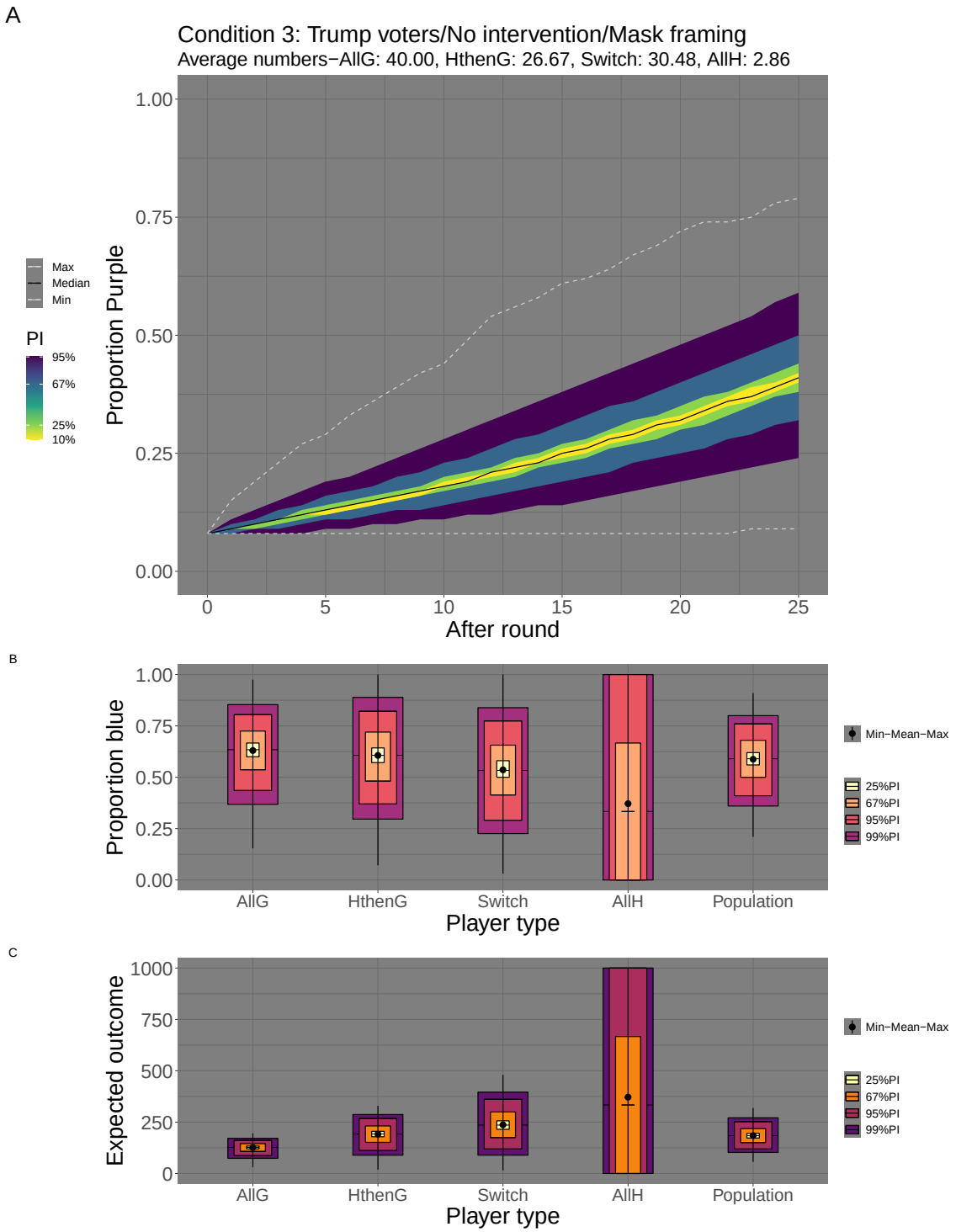

Figure C6

A) Percentile plot of roundwise purple/infection rates across 1,000,000 simulations for condition 3. B) Distribution of the proportion of blue/healthy players at the end of the game for all player types and the whole population. C) Distribution of final scores for all player types and the whole population.

```
dataRaw=read.delim(file="res/StudyPolitical-4----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03",
                                            "R04","R05","R06","R07",
                                            "R08","R09","R10","R11",
                                            "R12", "R13","R14","R15",
                                            "R16","R17","R18","R19","R20",
                                            "R21","R22","R23","R24","R25"))

dataRaw$percentile=0:200;

dataLong<-dataRaw%>%
gather(key="AfterRound",value="PercPurple",-percentile)


dataLong$AfterRound<-parse_number(dataLong$AfterRound);
dataLong$percentile<-dataLong$percentile/200


sintervals=c(0.1,0.25,0.67,0.95)
slabels=c("10%","25%","67%","95%")

condRoundwise <- ggplot(data=dataLong, aes(x=AfterRound,y=PercPurple,quantile=percentile))+
  geom_fan(intervals=sintervals)+
  theme_dark()+
   scale_fill_viridis_c(option="viridis",direction=-1,
                        breaks=sintervals,labels=slabels,
                        name = "PI")+
  stat_summary(fun=median,geom="line",lwd=0.5,aes(color="Median"))+
  scale_color_manual(values=c("lightgray","black","lightgray"),name="")+
  stat_summary(fun=max,geom="line",lwd=0.5,aes(color="Min"),
               linetype="dashed")+
  stat_summary(fun=min,geom="line",lwd=0.5,aes(color="Max"),
               linetype="dashed")+
  ylim(0,1)+
  theme(legend.position="left")+
  ylab("Proportion Purple")+
  xlab("After round")+
   ggtitle(label="Condition 4: Trump voters/No intervention/Color framing",subtitle="Averag
  theme(axis.text=element_text(size=20),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12),
        title=element_text(size=20))
```

```
dataRaw1=read.delim(
  file="res/StudyPolitical-4----HalfPercentileConditionalOutcomes.txt",
         header=FALSE,col.names=c("countH","countS","countF","countG",
                                  "survH","survS","survF","survG","expH",
                                  "expS","expF","expG"))


dataRaw2=read.delim(
  file="res/StudyPolitical-4--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))


dataRaw3=read.delim(
  file="res/StudyPolitical-4----HalfPercentileSumOutcome.txt",
                   header=FALSE,col.names=c("expAll"))

dataRaw4=read.delim(
  file="res/StudyPolitical-4--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))



dataRaw5=read.delim(
  file="res/StudyPolitical-4--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))



dataRaw6=read.delim(
  file="res/StudyPolitical-4----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
```

```
dataCombined=data.frame(
  survH=c(dataRaw2$survH,dataRaw1$survH),
  survG=c(dataRaw2$survG,dataRaw1$survG),
   survF=c(dataRaw2$survF,dataRaw1$survF),
   survS=c(dataRaw2$survS,dataRaw1$survS),
  expH=c(dataRaw2$expH,dataRaw1$expH),
  expG=c(dataRaw2$expG,dataRaw1$expG),
  expS=c(dataRaw2$expS,dataRaw1$expS),
  expF=c(dataRaw2$expF,dataRaw1$expF),
  survAll=c(1-dataRaw5$R25,rev(1-dataRaw6$R25)),
  expAll=c(dataRaw4$expAll/100,dataRaw3$expAll/100)
)

chooseRows=c(1,2,3,7, 35, 77,  102, 127, 169, 197,201,202)

dataCombined=dataCombined[chooseRows,]
dataCombined$statType=c("Mean","Min","P0.5","P2.5","P16.5","P37.5","Median",
                        "P62.5","P83.5","P97.5","P99.5","Max")



dataTransformed<-dataCombined%>%
  select(c(survG,survH,survAll,survS,survF,statType))%>%
  rename(AllG=survG,
         HthenG=survF,
         Switch=survS,
         AllH=survH,
         Population=survAll
  )%>%
 gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome") %>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))



colorsPal=viridis(option="magma",12)



condInfection <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,
```

```
                    ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,
                    ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,
                    ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,
                    ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",
                      ymin=Min,ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal[[12]],colorsPal[[10]],
                             colorsPal[[8]],colorsPal[[6]]),name="")+
  theme_dark()+
  ylab("Proportion blue")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
dataTransformed<-dataCombined%>%
  select(c(expG,expH,expF,expS,expAll,statType))%>%
  rename(AllG=expG,
         AllH=expH,
         HthenG=expF,
         Switch=expS,
         Population=expAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")%>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))

colorsPal2=viridis(option="inferno",12)

condOutcome <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,ymax=P83.5,y=P16.5),
```

```
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",ymin=Min,
                      ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal2[[12]],colorsPal2[[9]],
                             colorsPal2[[6]],
                             colorsPal2[[4]]),name="")+
  theme_dark()+
  ylab("Expected outcome")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
print("Mean expected outcome in population:")
```

```
## [1] "Mean expected outcome in population:"
```

```
dataCombined$expAll[1]
```

```
## [1] 107.62
```

C4.4.2 Figure

```
(condRoundwise/
  (condInfection/ condOutcome))+
  plot_annotation(tag_levels = 'A')
```

```
## `summarise()` has grouped output by 'Interval'.  You can override using
the
## `.groups` argument.
```

C4.5 Condition 5: Clinton voters/Norms intervention/Mask framing

Please note that no player chose to play the All-H strategy in this condition. Some of the figures in this section therefore have fewer bars than corresponding figures in other sections.

C4.5.1 Calculations

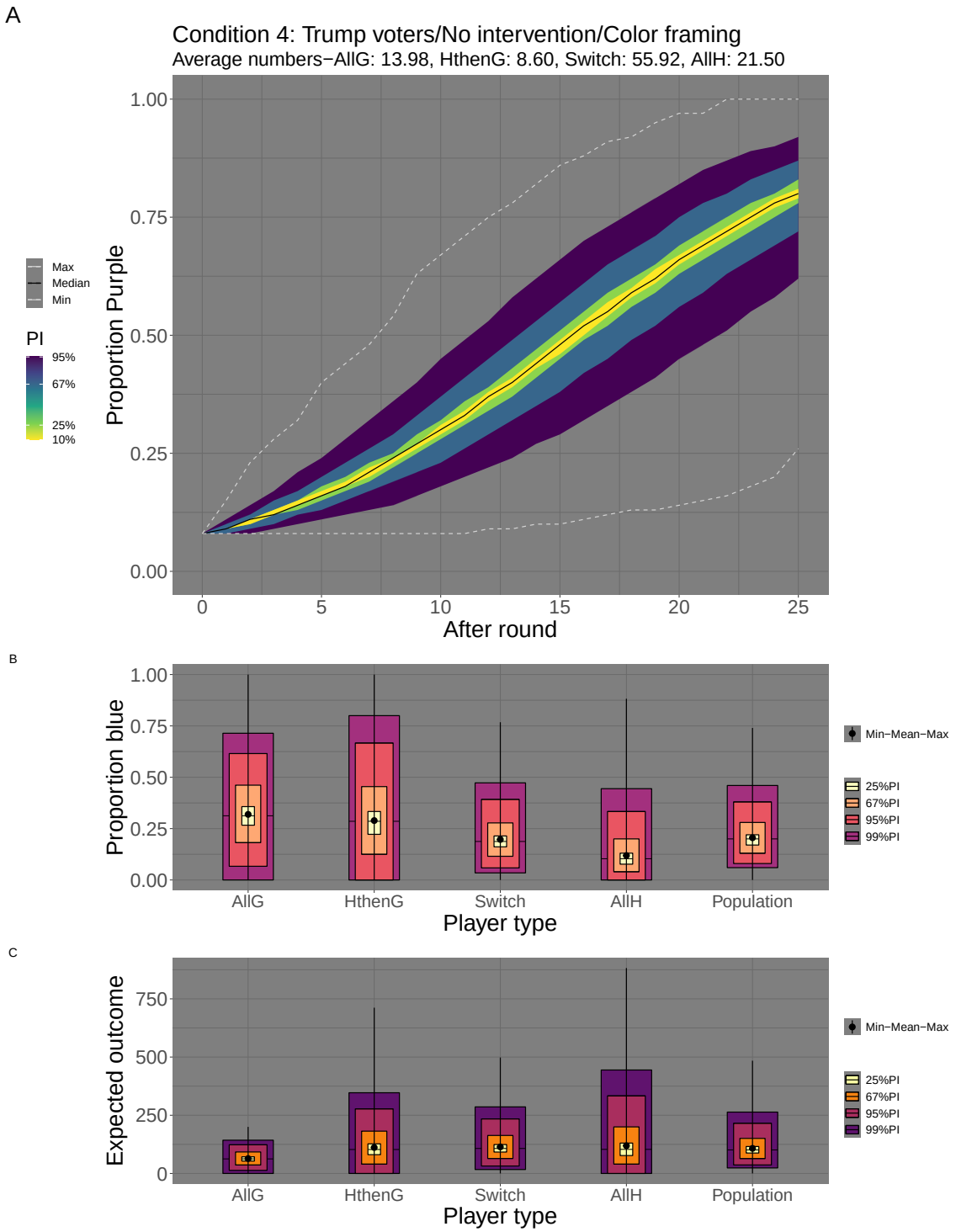

Figure C7

A) Percentile plot of roundwise purple/infection rates across 1,000,000 simulations for condition 4. B) Distribution of the proportion of blue/healthy players at the end of the game for all player types and the whole population. C) Distribution of final scores for all player types and the whole population.

```
dataRaw=read.delim(file="res/StudyPolitical-5----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03",
                                            "R04","R05","R06","R07",
                                            "R08","R09","R10","R11",
                                            "R12", "R13","R14","R15",
                                            "R16","R17","R18","R19","R20",
                                            "R21","R22","R23","R24","R25"))

dataRaw$percentile=0:200;

dataLong<-dataRaw%>%
gather(key="AfterRound",value="PercPurple",-percentile)


dataLong$AfterRound<-parse_number(dataLong$AfterRound);
dataLong$percentile<-dataLong$percentile/200


sintervals=c(0.1,0.25,0.67,0.95)
slabels=c("10%","25%","67%","95%")

condRoundwise <- ggplot(data=dataLong, aes(x=AfterRound,y=PercPurple,quantile=percentile))+
  geom_fan(intervals=sintervals)+
  theme_dark()+
   scale_fill_viridis_c(option="viridis",direction=-1,
                        breaks=sintervals,labels=slabels,
                        name = "PI")+
  stat_summary(fun=median,geom="line",lwd=0.5,aes(color="Median"))+
  scale_color_manual(values=c("lightgray","black","lightgray"),name="")+
  stat_summary(fun=max,geom="line",lwd=0.5,aes(color="Min"),
               linetype="dashed")+
  stat_summary(fun=min,geom="line",lwd=0.5,aes(color="Max"),
               linetype="dashed")+
  ylim(0,1)+
  theme(legend.position="left")+
  ylab("Proportion Purple")+
  xlab("After round")+
   ggtitle(label="Condition 5: Clinton voters/Norms intervention/Mask framing",subtitle="Av
  theme(axis.text=element_text(size=20),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12),
        title=element_text(size=20))
```

```
dataRaw1=read.delim(
  file="res/StudyPolitical-5----HalfPercentileConditionalOutcomes.txt",
         header=FALSE,col.names=c("countH","countS","countF","countG",
                                  "survH","survS","survF","survG","expH",
                                  "expS","expF","expG"))


dataRaw2=read.delim(
  file="res/StudyPolitical-5--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))


dataRaw3=read.delim(
  file="res/StudyPolitical-5----HalfPercentileSumOutcome.txt",
                   header=FALSE,col.names=c("expAll"))

dataRaw4=read.delim(
  file="res/StudyPolitical-2--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))



dataRaw5=read.delim(
  file="res/StudyPolitical-5--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))



dataRaw6=read.delim(
  file="res/StudyPolitical-5----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
```

```
dataCombined=data.frame(
  survH=c(dataRaw2$survH,dataRaw1$survH),
  survG=c(dataRaw2$survG,dataRaw1$survG),
   survF=c(dataRaw2$survF,dataRaw1$survF),
   survS=c(dataRaw2$survS,dataRaw1$survS),
  expH=c(dataRaw2$expH,dataRaw1$expH),
  expG=c(dataRaw2$expG,dataRaw1$expG),
  expS=c(dataRaw2$expS,dataRaw1$expS),
  expF=c(dataRaw2$expF,dataRaw1$expF),
  survAll=c(1-dataRaw5$R25,rev(1-dataRaw6$R25)),
  expAll=c(dataRaw4$expAll/100,dataRaw3$expAll/100)
)

chooseRows=c(1,2,3,7, 35, 77,  102, 127, 169, 197,201,202)

dataCombined=dataCombined[chooseRows,]
dataCombined$statType=c("Mean","Min","P0.5","P2.5","P16.5","P37.5","Median",
                        "P62.5","P83.5","P97.5","P99.5","Max")



dataTransformed<-dataCombined%>%
  select(c(survG,survH,survAll,survS,survF,statType))%>%
  rename(AllG=survG,
         HthenG=survF,
         Switch=survS,
         AllH=survH,
         Population=survAll
  )%>%
 gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome") %>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))



colorsPal=viridis(option="magma",12)



condInfection <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,
```

```
                    ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,
                    ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,
                    ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,
                    ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",
                      ymin=Min,ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal[[12]],colorsPal[[10]],
                             colorsPal[[8]],colorsPal[[6]]),name="")+
  theme_dark()+
  ylab("Proportion blue")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
dataTransformed<-dataCombined%>%
  select(c(expG,expH,expF,expS,expAll,statType))%>%
  rename(AllG=expG,
         AllH=expH,
         HthenG=expF,
         Switch=expS,
         Population=expAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")%>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))

colorsPal2=viridis(option="inferno",12)

condOutcome <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,ymax=P83.5,y=P16.5),
```

```
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",ymin=Min,
                      ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal2[[12]],colorsPal2[[9]],
                             colorsPal2[[6]],
                             colorsPal2[[4]]),name="")+
  theme_dark()+
  ylab("Expected outcome")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
print("Mean expected outcome in population:")
```

```
## [1] "Mean expected outcome in population:"
```

```
dataCombined$expAll[1]
```

```
## [1] 174.3
```

C4.5.2 Figure

```
(condRoundwise/
  (condInfection/ condOutcome))+
  plot_annotation(tag_levels = 'A')
```

```
## `summarise()` has grouped output by 'Interval'.  You can override using
the
## `.groups` argument.
## Warning:  Removed 1 rows containing missing values (geom_crossbar).
## Removed 1 rows containing missing values (geom_crossbar).
## Removed 1 rows containing missing values (geom_crossbar).
## Removed 1 rows containing missing values (geom_crossbar).
## Warning:  Removed 1 rows containing missing values (geom_pointrange).
## Warning:  Removed 1 rows containing missing values (geom_crossbar).
## Removed 1 rows containing missing values (geom_crossbar).
## Removed 1 rows containing missing values (geom_crossbar).
## Removed 1 rows containing missing values (geom_crossbar).
## Warning:  Removed 1 rows containing missing values (geom_pointrange).
```

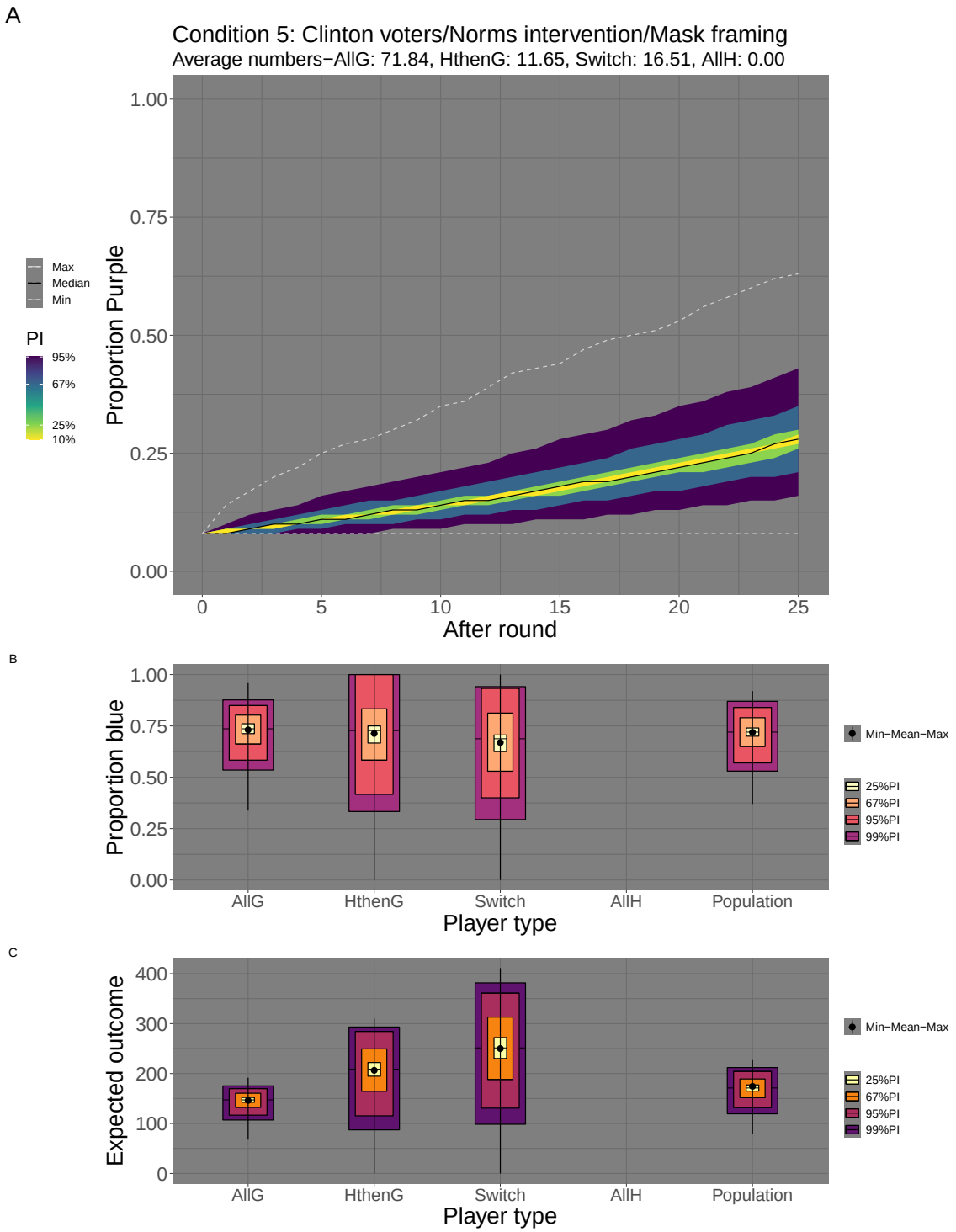

Figure C8

A) Percentile plot of roundwise purple/infection rates across 1,000,000 simulations for condition 5. B) Distribution of the proportion of blue/healthy players at the end of the game for all player types and the whole population. C) Distribution of final scores for all player types and the whole population.

C4.6 Condition 6: Clinton voters/Norms intervention/Color framing

C4.6.1 Calculations

```
dataRaw=read.delim(file="res/StudyPolitical-6----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03",
                                            "R04","R05","R06","R07",
                                            "R08","R09","R10","R11",
                                            "R12", "R13","R14","R15",
                                            "R16","R17","R18","R19","R20",
                                            "R21","R22","R23","R24","R25"))

dataRaw$percentile=0:200;

dataLong<-dataRaw%>%
gather(key="AfterRound",value="PercPurple",-percentile)


dataLong$AfterRound<-parse_number(dataLong$AfterRound);
dataLong$percentile<-dataLong$percentile/200


sintervals=c(0.1,0.25,0.67,0.95)
slabels=c("10%","25%","67%","95%")

condRoundwise <- ggplot(data=dataLong, aes(x=AfterRound,y=PercPurple,quantile=percentile))+
  geom_fan(intervals=sintervals)+
  theme_dark()+
   scale_fill_viridis_c(option="viridis",direction=-1,
                        breaks=sintervals,labels=slabels,
                        name = "PI")+
  stat_summary(fun=median,geom="line",lwd=0.5,aes(color="Median"))+
  scale_color_manual(values=c("lightgray","black","lightgray"),name="")+
  stat_summary(fun=max,geom="line",lwd=0.5,aes(color="Min"),
               linetype="dashed")+
  stat_summary(fun=min,geom="line",lwd=0.5,aes(color="Max"),
               linetype="dashed")+
  ylim(0,1)+
  theme(legend.position="left")+
  ylab("Proportion Purple")+
  xlab("After round")+
     ggtitle(label="Condition 6: Clinton voters/Norms intervention/Color framing",subtitle=
  theme(axis.text=element_text(size=20),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12),
        title=element_text(size=20))
```

```
dataRaw1=read.delim(
  file="res/StudyPolitical-6----HalfPercentileConditionalOutcomes.txt",
         header=FALSE,col.names=c("countH","countS","countF","countG",
                                  "survH","survS","survF","survG","expH",
                                  "expS","expF","expG"))


dataRaw2=read.delim(
  file="res/StudyPolitical-6--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))


dataRaw3=read.delim(
  file="res/StudyPolitical-6----HalfPercentileSumOutcome.txt",
                   header=FALSE,col.names=c("expAll"))

dataRaw4=read.delim(
  file="res/StudyPolitical-6--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))



dataRaw5=read.delim(
  file="res/StudyPolitical-6--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))



dataRaw6=read.delim(
  file="res/StudyPolitical-6----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
```

```
dataCombined=data.frame(
  survH=c(dataRaw2$survH,dataRaw1$survH),
  survG=c(dataRaw2$survG,dataRaw1$survG),
   survF=c(dataRaw2$survF,dataRaw1$survF),
   survS=c(dataRaw2$survS,dataRaw1$survS),
  expH=c(dataRaw2$expH,dataRaw1$expH),
  expG=c(dataRaw2$expG,dataRaw1$expG),
  expS=c(dataRaw2$expS,dataRaw1$expS),
  expF=c(dataRaw2$expF,dataRaw1$expF),
  survAll=c(1-dataRaw5$R25,rev(1-dataRaw6$R25)),
  expAll=c(dataRaw4$expAll/100,dataRaw3$expAll/100)
)

chooseRows=c(1,2,3,7, 35, 77,  102, 127, 169, 197,201,202)

dataCombined=dataCombined[chooseRows,]
dataCombined$statType=c("Mean","Min","P0.5","P2.5","P16.5","P37.5","Median",
                        "P62.5","P83.5","P97.5","P99.5","Max")



dataTransformed<-dataCombined%>%
  select(c(survG,survH,survAll,survS,survF,statType))%>%
  rename(AllG=survG,
         HthenG=survF,
         Switch=survS,
         AllH=survH,
         Population=survAll
  )%>%
 gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome") %>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))



colorsPal=viridis(option="magma",12)



condInfection <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,
```

```
                    ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,
                    ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,
                    ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,
                    ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",
                      ymin=Min,ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal[[12]],colorsPal[[10]],
                             colorsPal[[8]],colorsPal[[6]]),name="")+
  theme_dark()+
  ylab("Proportion blue")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
dataTransformed<-dataCombined%>%
  select(c(expG,expH,expF,expS,expAll,statType))%>%
  rename(AllG=expG,
         AllH=expH,
         HthenG=expF,
         Switch=expS,
         Population=expAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")%>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))

colorsPal2=viridis(option="inferno",12)

condOutcome <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,ymax=P83.5,y=P16.5),
```

```
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",ymin=Min,
                      ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal2[[12]],colorsPal2[[9]],
                             colorsPal2[[6]],
                             colorsPal2[[4]]),name="")+
  theme_dark()+
  ylab("Expected outcome")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
print("Mean expected outcome in population:")
```

```
## [1] "Mean expected outcome in population:"
```

```
dataCombined$expAll[1]
```

```
## [1] 182.28
```

C4.6.2 Figure

```
(condRoundwise/
  (condInfection/ condOutcome))+
  plot_annotation(tag_levels = 'A')
```

```
## `summarise()` has grouped output by 'Interval'.  You can override using
the
## `.groups` argument.
```

C4.7 Condition 7: Clinton voters/No intervention/Mask framing

Please note that few players chose to play the All-H strategy in this condition. Some of the represented quantiles therefore coincide in this condition.

C4.7.1 Calculations

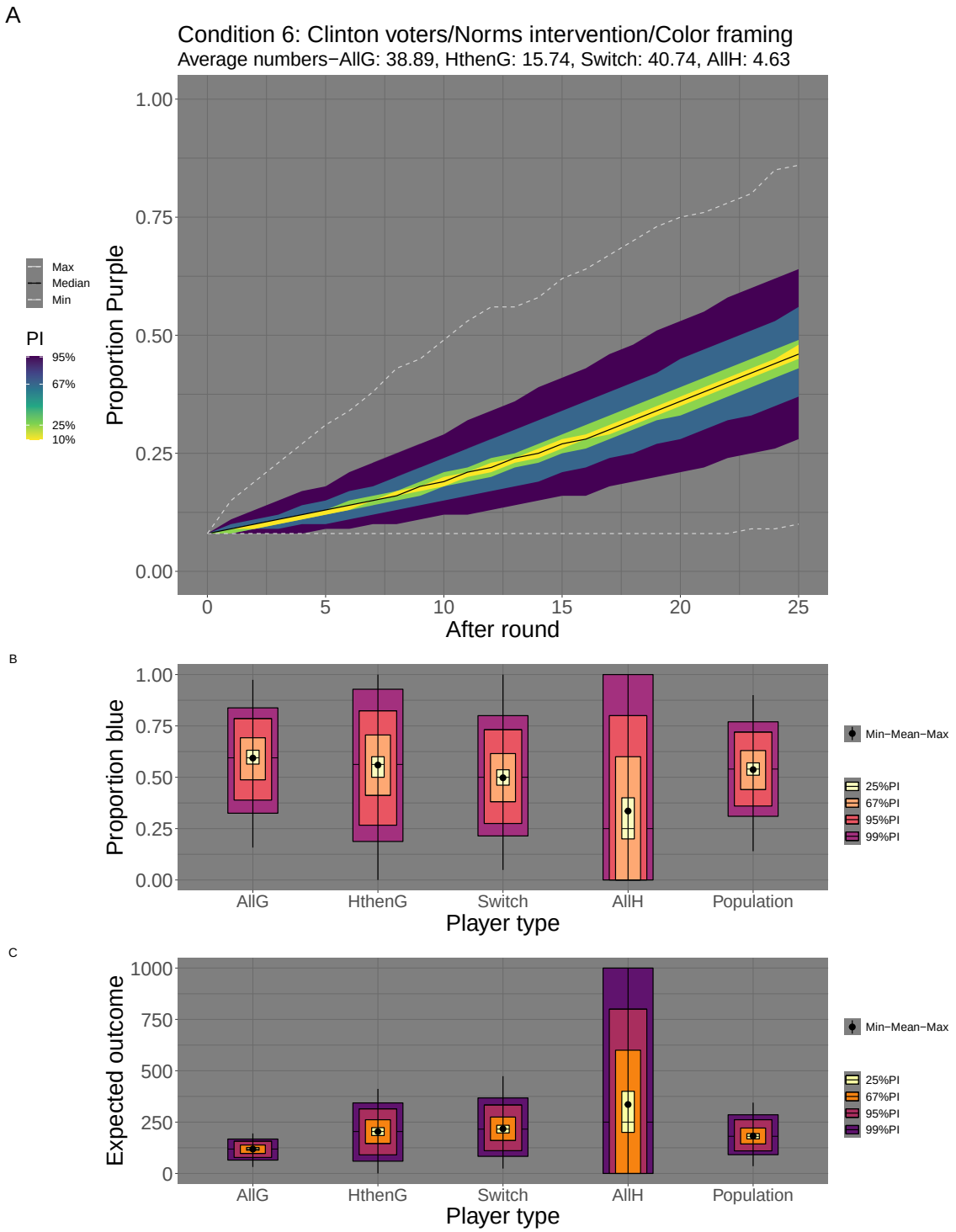

Figure C9

A) Percentile plot of roundwise purple/infection rates across 1,000,000 simulations for condition 6. B) Distribution of the proportion of blue/healthy players at the end of the game for all player types and the whole population. C) Distribution of final scores for all player types and the whole population.

```
dataRaw=read.delim(file="res/StudyPolitical-7----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03",
                                            "R04","R05","R06","R07",
                                            "R08","R09","R10","R11",
                                            "R12", "R13","R14","R15",
                                            "R16","R17","R18","R19","R20",
                                            "R21","R22","R23","R24","R25"))

dataRaw$percentile=0:200;

dataLong<-dataRaw%>%
gather(key="AfterRound",value="PercPurple",-percentile)


dataLong$AfterRound<-parse_number(dataLong$AfterRound);
dataLong$percentile<-dataLong$percentile/200


sintervals=c(0.1,0.25,0.67,0.95)
slabels=c("10%","25%","67%","95%")

condRoundwise <- ggplot(data=dataLong, aes(x=AfterRound,y=PercPurple,quantile=percentile))+
  geom_fan(intervals=sintervals)+
  theme_dark()+
   scale_fill_viridis_c(option="viridis",direction=-1,
                        breaks=sintervals,labels=slabels,
                        name = "PI")+
  stat_summary(fun=median,geom="line",lwd=0.5,aes(color="Median"))+
  scale_color_manual(values=c("lightgray","black","lightgray"),name="")+
  stat_summary(fun=max,geom="line",lwd=0.5,aes(color="Min"),
               linetype="dashed")+
  stat_summary(fun=min,geom="line",lwd=0.5,aes(color="Max"),
               linetype="dashed")+
  ylim(0,1)+
  theme(legend.position="left")+
  ylab("Proportion Purple")+
  xlab("After round")+
       ggtitle(label="Condition 7: Clinton voters/No intervention/Mask framing",subtitle="A
  theme(axis.text=element_text(size=20),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12),
        title=element_text(size=20))
```

```
dataRaw1=read.delim(
  file="res/StudyPolitical-7----HalfPercentileConditionalOutcomes.txt",
         header=FALSE,col.names=c("countH","countS","countF","countG",
                                  "survH","survS","survF","survG","expH",
                                  "expS","expF","expG"))


dataRaw2=read.delim(
  file="res/StudyPolitical-7--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))


dataRaw3=read.delim(
  file="res/StudyPolitical-7----HalfPercentileSumOutcome.txt",
                   header=FALSE,col.names=c("expAll"))

dataRaw4=read.delim(
  file="res/StudyPolitical-7--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))



dataRaw5=read.delim(
  file="res/StudyPolitical-7--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))



dataRaw6=read.delim(
  file="res/StudyPolitical-7----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
```

```
dataCombined=data.frame(
  survH=c(dataRaw2$survH,dataRaw1$survH),
  survG=c(dataRaw2$survG,dataRaw1$survG),
   survF=c(dataRaw2$survF,dataRaw1$survF),
   survS=c(dataRaw2$survS,dataRaw1$survS),
  expH=c(dataRaw2$expH,dataRaw1$expH),
  expG=c(dataRaw2$expG,dataRaw1$expG),
  expS=c(dataRaw2$expS,dataRaw1$expS),
  expF=c(dataRaw2$expF,dataRaw1$expF),
  survAll=c(1-dataRaw5$R25,rev(1-dataRaw6$R25)),
  expAll=c(dataRaw4$expAll/100,dataRaw3$expAll/100)
)

chooseRows=c(1,2,3,7, 35, 77,  102, 127, 169, 197,201,202)

dataCombined=dataCombined[chooseRows,]
dataCombined$statType=c("Mean","Min","P0.5","P2.5","P16.5","P37.5","Median",
                        "P62.5","P83.5","P97.5","P99.5","Max")



dataTransformed<-dataCombined%>%
  select(c(survG,survH,survAll,survS,survF,statType))%>%
  rename(AllG=survG,
         HthenG=survF,
         Switch=survS,
         AllH=survH,
         Population=survAll
  )%>%
 gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome") %>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))



colorsPal=viridis(option="magma",12)



condInfection <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,
```

```
                    ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,
                    ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,
                    ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,
                    ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",
                      ymin=Min,ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal[[12]],colorsPal[[10]],
                             colorsPal[[8]],colorsPal[[6]]),name="")+
  theme_dark()+
  ylab("Proportion blue")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
dataTransformed<-dataCombined%>%
  select(c(expG,expH,expF,expS,expAll,statType))%>%
  rename(AllG=expG,
         AllH=expH,
         HthenG=expF,
         Switch=expS,
         Population=expAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")%>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))

colorsPal2=viridis(option="inferno",12)

condOutcome <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,ymax=P83.5,y=P16.5),
```

```
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",ymin=Min,
                      ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal2[[12]],colorsPal2[[9]],
                             colorsPal2[[6]],
                             colorsPal2[[4]]),name="")+
  theme_dark()+
  ylab("Expected outcome")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
print("Mean expected outcome in population:")
```

```
## [1] "Mean expected outcome in population:"
```

```
dataCombined$expAll[1]
```

```
## [1] 177.07
```

C4.7.2 Figure

```
(condRoundwise/
  (condInfection/ condOutcome))+
  plot_annotation(tag_levels = 'A')
```

```
## `summarise()` has grouped output by 'Interval'.  You can override using
the
## `.groups` argument.
```

C4.8 Condition 8: Clinton voters/No intervention/Color framing

C4.8.1 Calculations

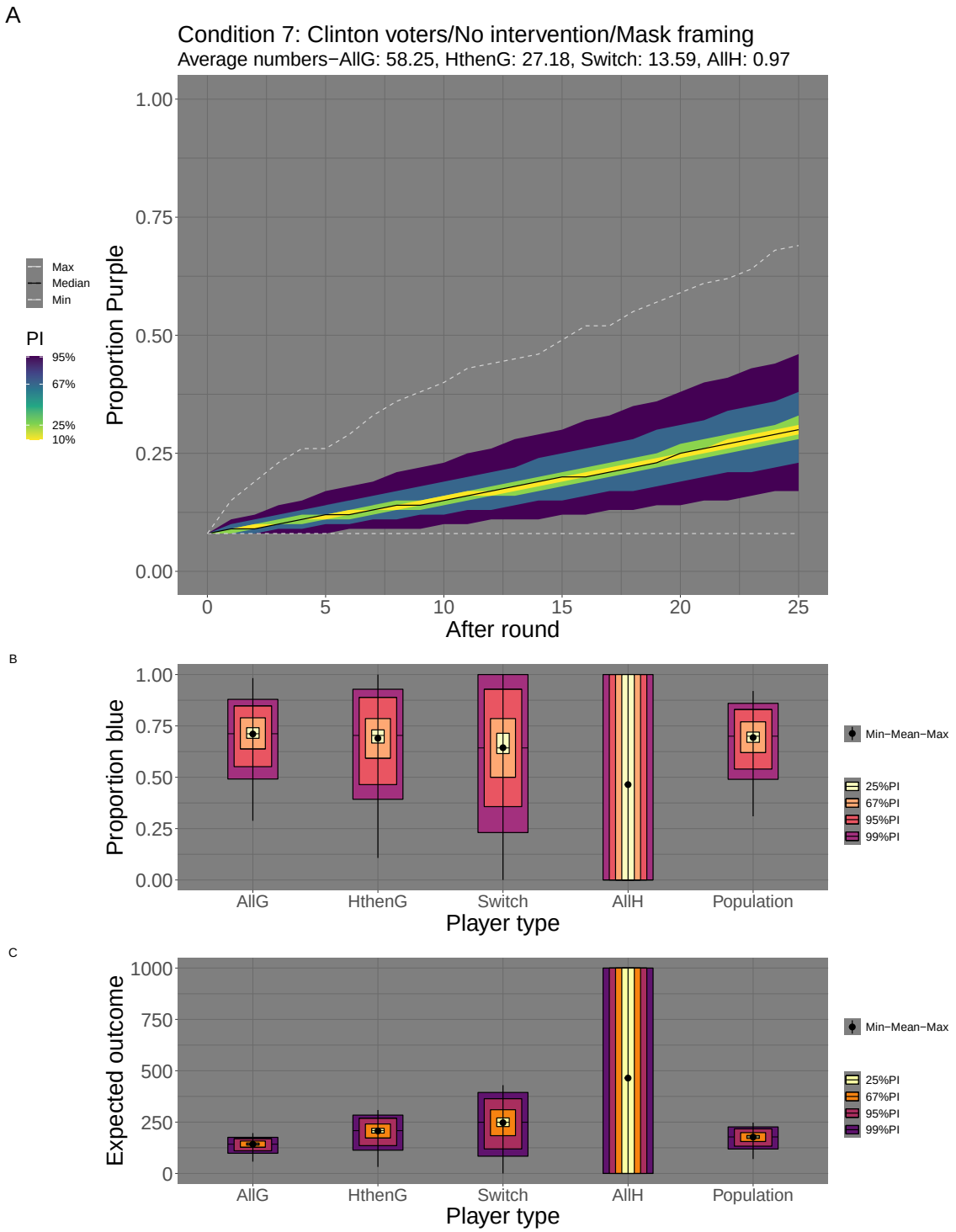

Figure C10

A) Percentile plot of roundwise purple/infection rates across 1,000,000 simulations for condition 7. B) Distribution of the proportion of blue/healthy players at the end of the game for all player types and the whole population. C) Distribution of final scores for all player types and the whole population.

```
dataRaw=read.delim(file="res/StudyPolitical-8----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03",
                                            "R04","R05","R06","R07",
                                            "R08","R09","R10","R11",
                                            "R12", "R13","R14","R15",
                                            "R16","R17","R18","R19","R20",
                                            "R21","R22","R23","R24","R25"))

dataRaw$percentile=0:200;

dataLong<-dataRaw%>%
gather(key="AfterRound",value="PercPurple",-percentile)


dataLong$AfterRound<-parse_number(dataLong$AfterRound);
dataLong$percentile<-dataLong$percentile/200


sintervals=c(0.1,0.25,0.67,0.95)
slabels=c("10%","25%","67%","95%")

condRoundwise <- ggplot(data=dataLong, aes(x=AfterRound,y=PercPurple,quantile=percentile))+
  geom_fan(intervals=sintervals)+
  theme_dark()+
   scale_fill_viridis_c(option="viridis",direction=-1,
                        breaks=sintervals,labels=slabels,
                        name = "PI")+
  stat_summary(fun=median,geom="line",lwd=0.5,aes(color="Median"))+
  scale_color_manual(values=c("lightgray","black","lightgray"),name="")+
  stat_summary(fun=max,geom="line",lwd=0.5,aes(color="Min"),
               linetype="dashed")+
  stat_summary(fun=min,geom="line",lwd=0.5,aes(color="Max"),
               linetype="dashed")+
  ylim(0,1)+
  theme(legend.position="left")+
  ylab("Proportion Purple")+
  xlab("After round")+
        ggtitle(label="Condition 8: Clinton voters/No intervention/Color framing",subtitle=
  theme(axis.text=element_text(size=20),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12),
        title=element_text(size=20))
```

```
dataRaw1=read.delim(
  file="res/StudyPolitical-8----HalfPercentileConditionalOutcomes.txt",
         header=FALSE,col.names=c("countH","countS","countF","countG",
                                  "survH","survS","survF","survG","expH",
                                  "expS","expF","expG"))


dataRaw2=read.delim(
  file="res/StudyPolitical-8--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))


dataRaw3=read.delim(
  file="res/StudyPolitical-8----HalfPercentileSumOutcome.txt",
                   header=FALSE,col.names=c("expAll"))

dataRaw4=read.delim(
  file="res/StudyPolitical-8--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))



dataRaw5=read.delim(
  file="res/StudyPolitical-8--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))



dataRaw6=read.delim(
  file="res/StudyPolitical-8----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
```

```
dataCombined=data.frame(
  survH=c(dataRaw2$survH,dataRaw1$survH),
  survG=c(dataRaw2$survG,dataRaw1$survG),
   survF=c(dataRaw2$survF,dataRaw1$survF),
   survS=c(dataRaw2$survS,dataRaw1$survS),
  expH=c(dataRaw2$expH,dataRaw1$expH),
  expG=c(dataRaw2$expG,dataRaw1$expG),
  expS=c(dataRaw2$expS,dataRaw1$expS),
  expF=c(dataRaw2$expF,dataRaw1$expF),
  survAll=c(1-dataRaw5$R25,rev(1-dataRaw6$R25)),
  expAll=c(dataRaw4$expAll/100,dataRaw3$expAll/100)
)

chooseRows=c(1,2,3,7, 35, 77,  102, 127, 169, 197,201,202)

dataCombined=dataCombined[chooseRows,]
dataCombined$statType=c("Mean","Min","P0.5","P2.5","P16.5","P37.5","Median",
                        "P62.5","P83.5","P97.5","P99.5","Max")



dataTransformed<-dataCombined%>%
  select(c(survG,survH,survAll,survS,survF,statType))%>%
  rename(AllG=survG,
         HthenG=survF,
         Switch=survS,
         AllH=survH,
         Population=survAll
  )%>%
 gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome") %>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))



colorsPal=viridis(option="magma",12)



condInfection <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,
```

```
                    ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,
                    ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,
                    ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,
                    ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",
                      ymin=Min,ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal[[12]],colorsPal[[10]],
                             colorsPal[[8]],colorsPal[[6]]),name="")+
  theme_dark()+
  ylab("Proportion blue")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
dataTransformed<-dataCombined%>%
  select(c(expG,expH,expF,expS,expAll,statType))%>%
  rename(AllG=expG,
         AllH=expH,
         HthenG=expF,
         Switch=expS,
         Population=expAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")%>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))

colorsPal2=viridis(option="inferno",12)

condOutcome <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,ymax=P83.5,y=P16.5),
```

```
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",ymin=Min,
                      ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal2[[12]],colorsPal2[[9]],
                             colorsPal2[[6]],
                             colorsPal2[[4]]),name="")+
  theme_dark()+
  ylab("Expected outcome")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
print("Mean expected outcome in population:")
```

```
## [1] "Mean expected outcome in population:"
```

```
dataCombined$expAll[1]
```

```
## [1] 139.58
```

C4.8.2 Figure

```
(condRoundwise/
  (condInfection/ condOutcome))+
  plot_annotation(tag_levels = 'A')
```

```
## `summarise()` has grouped output by 'Interval'.  You can override using
the
## `.groups` argument.
```

C5 Results for intervention and framing combining both partisan samples

C5.1 Condition 9: Norms intervention/Mask framing

C5.1.1 Calculations

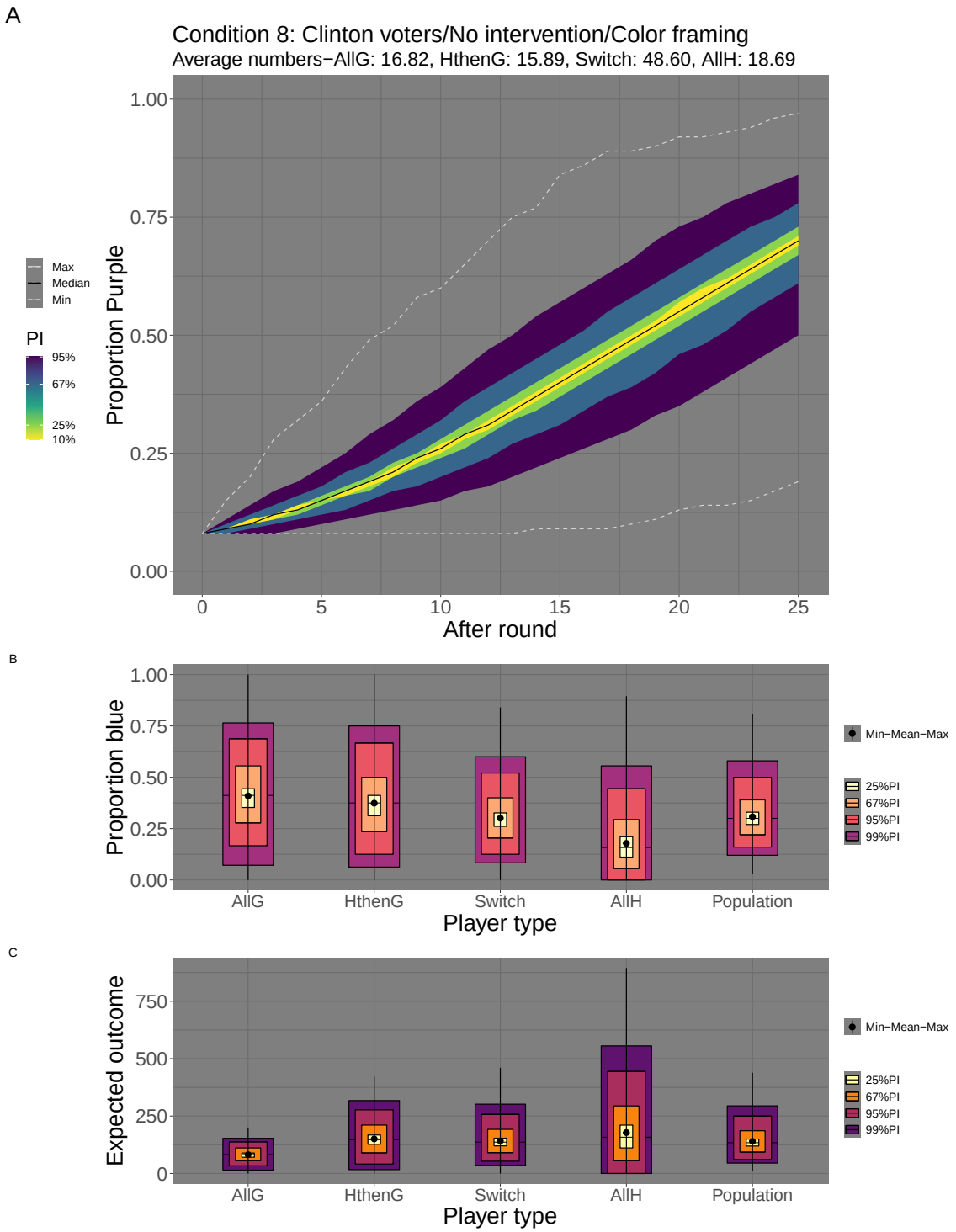

Figure C11

A) Percentile plot of roundwise purple/infection rates across 1,000,000 simulations for condition 8. B) Distribution of the proportion of blue/healthy players at the end of the game for all player types and the whole population. C) Distribution of final scores for all player types and the whole population.

```
dataRaw=read.delim(file="res/StudyPolitical-9----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03",
                                            "R04","R05","R06","R07",
                                            "R08","R09","R10","R11",
                                            "R12", "R13","R14","R15",
                                            "R16","R17","R18","R19","R20",
                                            "R21","R22","R23","R24","R25"))

dataRaw$percentile=0:200;

dataLong<-dataRaw%>%
gather(key="AfterRound",value="PercPurple",-percentile)


dataLong$AfterRound<-parse_number(dataLong$AfterRound);
dataLong$percentile<-dataLong$percentile/200


sintervals=c(0.1,0.25,0.67,0.95)
slabels=c("10%","25%","67%","95%")

condRoundwise <- ggplot(data=dataLong, aes(x=AfterRound,y=PercPurple,quantile=percentile))+
  geom_fan(intervals=sintervals)+
  theme_dark()+
   scale_fill_viridis_c(option="viridis",direction=-1,
                        breaks=sintervals,labels=slabels,
                        name = "PI")+
  stat_summary(fun=median,geom="line",lwd=0.5,aes(color="Median"))+
  scale_color_manual(values=c("lightgray","black","lightgray"),name="")+
  stat_summary(fun=max,geom="line",lwd=0.5,aes(color="Min"),
               linetype="dashed")+
  stat_summary(fun=min,geom="line",lwd=0.5,aes(color="Max"),
               linetype="dashed")+
  ylim(0,1)+
  theme(legend.position="left")+
  ylab("Proportion Purple")+
  xlab("After round")+
        ggtitle(label="Condition 9: Norms intervention/Mask framing",subtitle="Average numb
  theme(axis.text=element_text(size=20),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12),
        title=element_text(size=20))
```

```
dataRaw1=read.delim(
  file="res/StudyPolitical-9----HalfPercentileConditionalOutcomes.txt",
         header=FALSE,col.names=c("countH","countS","countF","countG",
                                  "survH","survS","survF","survG","expH",
                                  "expS","expF","expG"))


dataRaw2=read.delim(
  file="res/StudyPolitical-9--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))


dataRaw3=read.delim(
  file="res/StudyPolitical-9----HalfPercentileSumOutcome.txt",
                   header=FALSE,col.names=c("expAll"))

dataRaw4=read.delim(
  file="res/StudyPolitical-9--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))



dataRaw5=read.delim(
  file="res/StudyPolitical-9--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))



dataRaw6=read.delim(
  file="res/StudyPolitical-9----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
```

```
dataCombined=data.frame(
  survH=c(dataRaw2$survH,dataRaw1$survH),
  survG=c(dataRaw2$survG,dataRaw1$survG),
   survF=c(dataRaw2$survF,dataRaw1$survF),
   survS=c(dataRaw2$survS,dataRaw1$survS),
  expH=c(dataRaw2$expH,dataRaw1$expH),
  expG=c(dataRaw2$expG,dataRaw1$expG),
  expS=c(dataRaw2$expS,dataRaw1$expS),
  expF=c(dataRaw2$expF,dataRaw1$expF),
  survAll=c(1-dataRaw5$R25,rev(1-dataRaw6$R25)),
  expAll=c(dataRaw4$expAll/100,dataRaw3$expAll/100)
)

chooseRows=c(1,2,3,7, 35, 77,  102, 127, 169, 197,201,202)

dataCombined=dataCombined[chooseRows,]
dataCombined$statType=c("Mean","Min","P0.5","P2.5","P16.5","P37.5","Median",
                        "P62.5","P83.5","P97.5","P99.5","Max")



dataTransformed<-dataCombined%>%
  select(c(survG,survH,survAll,survS,survF,statType))%>%
  rename(AllG=survG,
         HthenG=survF,
         Switch=survS,
         AllH=survH,
         Population=survAll
  )%>%
 gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome") %>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))



colorsPal=viridis(option="magma",12)



condInfection <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,
```

```
                    ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,
                    ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,
                    ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,
                    ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",
                      ymin=Min,ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal[[12]],colorsPal[[10]],
                             colorsPal[[8]],colorsPal[[6]]),name="")+
  theme_dark()+
  ylab("Proportion blue")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
dataTransformed<-dataCombined%>%
  select(c(expG,expH,expF,expS,expAll,statType))%>%
  rename(AllG=expG,
         AllH=expH,
         HthenG=expF,
         Switch=expS,
         Population=expAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")%>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))

colorsPal2=viridis(option="inferno",12)

condOutcome <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,ymax=P83.5,y=P16.5),
```

```
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",ymin=Min,
                      ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal2[[12]],colorsPal2[[9]],
                             colorsPal2[[6]],
                             colorsPal2[[4]]),name="")+
  theme_dark()+
  ylab("Expected outcome")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
print("Mean expected outcome in population:")
```

```
## [1] "Mean expected outcome in population:"
```

```
dataCombined$expAll[1]
```

```
## [1] 175.92
```

C5.1.2 Figure

```
(condRoundwise/
  (condInfection/ condOutcome))+
  plot_annotation(tag_levels = 'A')
```

```
## `summarise()` has grouped output by 'Interval'.  You can override using
the
## `.groups` argument.
```

C5.2 Condition 10: Norms intervention/Color framing

C5.2.1 Calculations

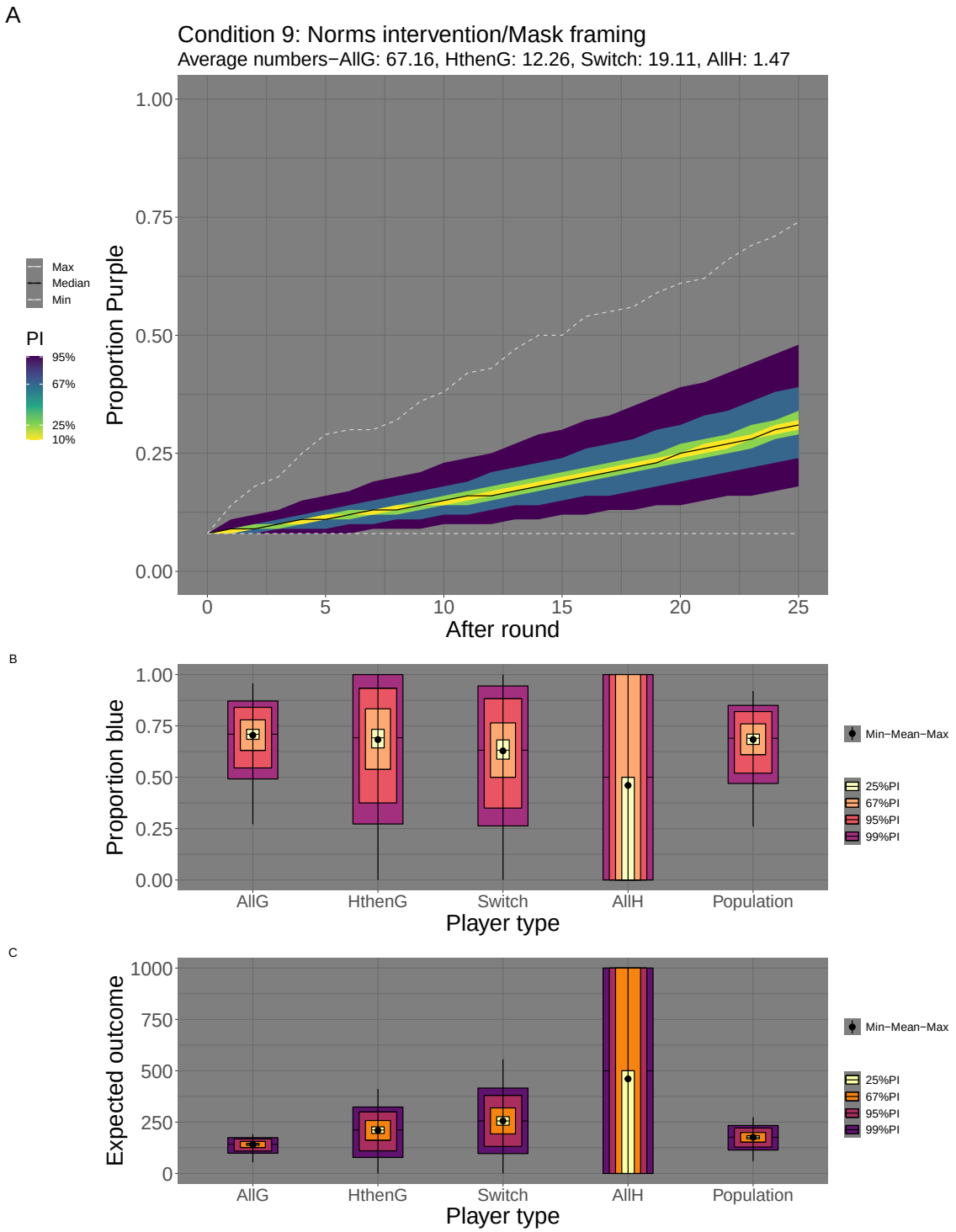

Figure C12

A) Percentile plot of roundwise purple/infection rates across 1,000,000 simulations for condition 9. B) Distribution of the proportion of blue/healthy players at the end of the game for all player types and the whole population. C) Distribution of final scores for all player types and the whole population.

```
dataRaw=read.delim(file="res/StudyPolitical-10----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03",
                                            "R04","R05","R06","R07",
                                            "R08","R09","R10","R11",
                                            "R12", "R13","R14","R15",
                                            "R16","R17","R18","R19","R20",
                                            "R21","R22","R23","R24","R25"))

dataRaw$percentile=0:200;

dataLong<-dataRaw%>%
gather(key="AfterRound",value="PercPurple",-percentile)


dataLong$AfterRound<-parse_number(dataLong$AfterRound);
dataLong$percentile<-dataLong$percentile/200


sintervals=c(0.1,0.25,0.67,0.95)
slabels=c("10%","25%","67%","95%")

condRoundwise <- ggplot(data=dataLong, aes(x=AfterRound,y=PercPurple,quantile=percentile))+
  geom_fan(intervals=sintervals)+
  theme_dark()+
   scale_fill_viridis_c(option="viridis",direction=-1,
                        breaks=sintervals,labels=slabels,
                        name = "PI")+
  stat_summary(fun=median,geom="line",lwd=0.5,aes(color="Median"))+
  scale_color_manual(values=c("lightgray","black","lightgray"),name="")+
  stat_summary(fun=max,geom="line",lwd=0.5,aes(color="Min"),
               linetype="dashed")+
  stat_summary(fun=min,geom="line",lwd=0.5,aes(color="Max"),
               linetype="dashed")+
  ylim(0,1)+
  theme(legend.position="left")+
  ylab("Proportion Purple")+
  xlab("After round")+
      ggtitle(label="Condition 10: Norms intervention/Color framing",subtitle="Average numb
  theme(axis.text=element_text(size=20),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12),
        title=element_text(size=20))
```

```
dataRaw1=read.delim(
  file="res/StudyPolitical-10----HalfPercentileConditionalOutcomes.txt",
         header=FALSE,col.names=c("countH","countS","countF","countG",
                                  "survH","survS","survF","survG","expH",
                                  "expS","expF","expG"))


dataRaw2=read.delim(
  file="res/StudyPolitical-10--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))


dataRaw3=read.delim(
  file="res/StudyPolitical-10----HalfPercentileSumOutcome.txt",
                   header=FALSE,col.names=c("expAll"))

dataRaw4=read.delim(
  file="res/StudyPolitical-10--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))



dataRaw5=read.delim(
  file="res/StudyPolitical-10--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))



dataRaw6=read.delim(
  file="res/StudyPolitical-10----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
```

```
dataCombined=data.frame(
  survH=c(dataRaw2$survH,dataRaw1$survH),
  survG=c(dataRaw2$survG,dataRaw1$survG),
   survF=c(dataRaw2$survF,dataRaw1$survF),
   survS=c(dataRaw2$survS,dataRaw1$survS),
  expH=c(dataRaw2$expH,dataRaw1$expH),
  expG=c(dataRaw2$expG,dataRaw1$expG),
  expS=c(dataRaw2$expS,dataRaw1$expS),
  expF=c(dataRaw2$expF,dataRaw1$expF),
  survAll=c(1-dataRaw5$R25,rev(1-dataRaw6$R25)),
  expAll=c(dataRaw4$expAll/100,dataRaw3$expAll/100)
)

chooseRows=c(1,2,3,7, 35, 77,  102, 127, 169, 197,201,202)

dataCombined=dataCombined[chooseRows,]
dataCombined$statType=c("Mean","Min","P0.5","P2.5","P16.5","P37.5","Median",
                        "P62.5","P83.5","P97.5","P99.5","Max")



dataTransformed<-dataCombined%>%
  select(c(survG,survH,survAll,survS,survF,statType))%>%
  rename(AllG=survG,
         HthenG=survF,
         Switch=survS,
         AllH=survH,
         Population=survAll
  )%>%
 gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome") %>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))



colorsPal=viridis(option="magma",12)



condInfection <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,
```

```
                    ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,
                    ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,
                    ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,
                    ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",
                      ymin=Min,ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal[[12]],colorsPal[[10]],
                             colorsPal[[8]],colorsPal[[6]]),name="")+
  theme_dark()+
  ylab("Proportion blue")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
dataTransformed<-dataCombined%>%
  select(c(expG,expH,expF,expS,expAll,statType))%>%
  rename(AllG=expG,
         AllH=expH,
         HthenG=expF,
         Switch=expS,
         Population=expAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")%>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))

colorsPal2=viridis(option="inferno",12)

condOutcome <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,ymax=P83.5,y=P16.5),
```

```
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",ymin=Min,
                      ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal2[[12]],colorsPal2[[9]],
                             colorsPal2[[6]],
                             colorsPal2[[4]]),name="")+
  theme_dark()+
  ylab("Expected outcome")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
print("Mean expected outcome in population:")
```

```
## [1] "Mean expected outcome in population:"
```

```
dataCombined$expAll[1]
```

```
## [1] 178.72
```

C5.2.2 Figure

```
(condRoundwise/
  (condInfection/ condOutcome))+
  plot_annotation(tag_levels = 'A')
```

```
## `summarise()` has grouped output by 'Interval'.  You can override using
the
## `.groups` argument.
```

C5.3 Condition 11: No intervention/Mask framing

C5.3.1 Calculations

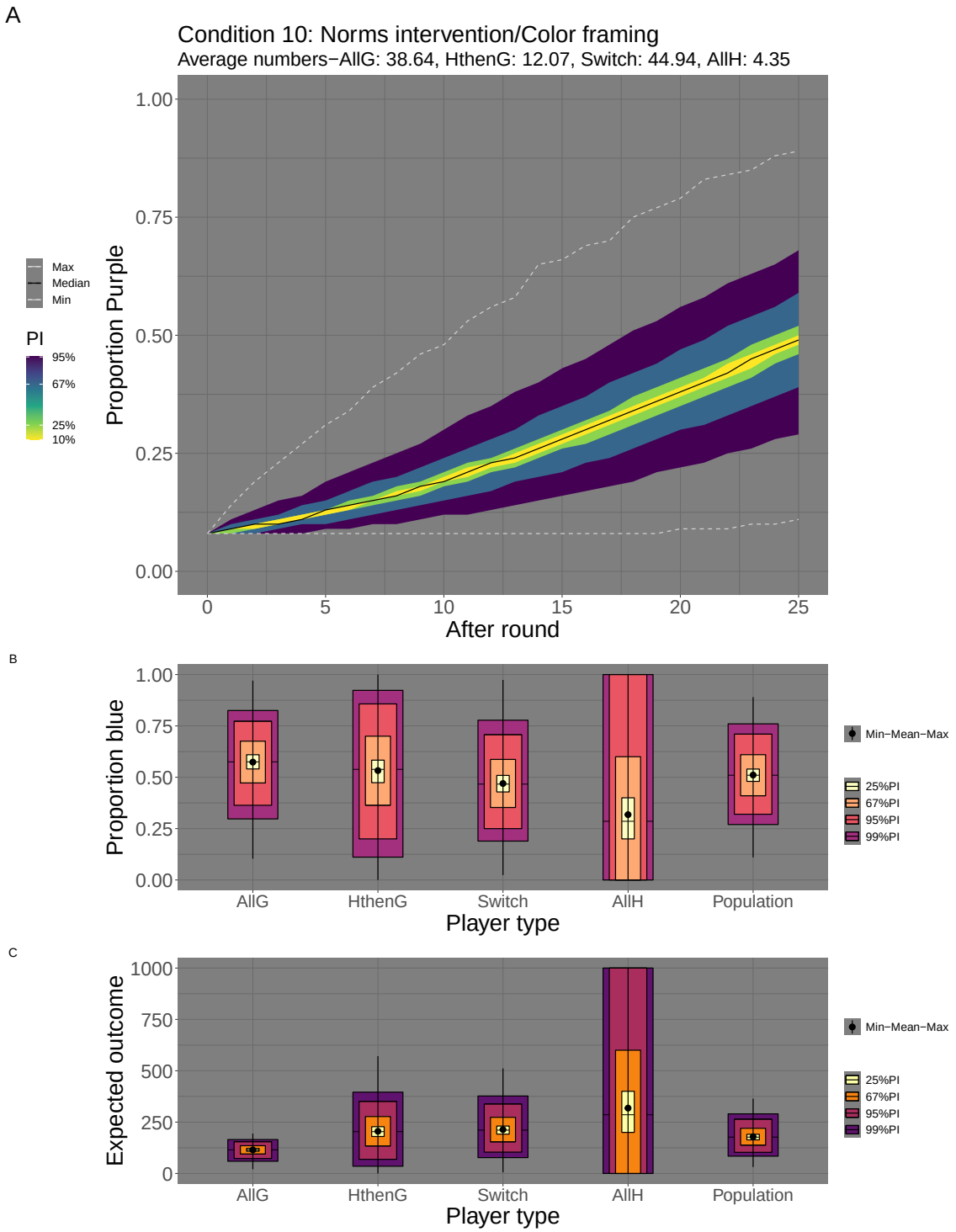

Figure C13

A) Percentile plot of roundwise purple/infection rates across 1,000,000 simulations for condition 10. B) Distribution of the proportion of blue/healthy players at the end of the game for all player types and the whole population. C) Distribution of final scores for all player types and the whole population.

```
dataRaw=read.delim(file="res/StudyPolitical-11----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03",
                                            "R04","R05","R06","R07",
                                            "R08","R09","R10","R11",
                                            "R12", "R13","R14","R15",
                                            "R16","R17","R18","R19","R20",
                                            "R21","R22","R23","R24","R25"))

dataRaw$percentile=0:200;

dataLong<-dataRaw%>%
gather(key="AfterRound",value="PercPurple",-percentile)


dataLong$AfterRound<-parse_number(dataLong$AfterRound);
dataLong$percentile<-dataLong$percentile/200


sintervals=c(0.1,0.25,0.67,0.95)
slabels=c("10%","25%","67%","95%")

condRoundwise <- ggplot(data=dataLong, aes(x=AfterRound,y=PercPurple,quantile=percentile))+
  geom_fan(intervals=sintervals)+
  theme_dark()+
   scale_fill_viridis_c(option="viridis",direction=-1,
                        breaks=sintervals,labels=slabels,
                        name = "PI")+
  stat_summary(fun=median,geom="line",lwd=0.5,aes(color="Median"))+
  scale_color_manual(values=c("lightgray","black","lightgray"),name="")+
  stat_summary(fun=max,geom="line",lwd=0.5,aes(color="Min"),
               linetype="dashed")+
  stat_summary(fun=min,geom="line",lwd=0.5,aes(color="Max"),
               linetype="dashed")+
  ylim(0,1)+
  theme(legend.position="left")+
  ylab("Proportion Purple")+
  xlab("After round")+
  ggtitle(label="Condition 11: No intervention/Mask framing",subtitle="Average numbers-AllG
  theme(axis.text=element_text(size=20),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12),
        title=element_text(size=20))
```

```
dataRaw1=read.delim(
  file="res/StudyPolitical-11----HalfPercentileConditionalOutcomes.txt",
         header=FALSE,col.names=c("countH","countS","countF","countG",
                                  "survH","survS","survF","survG","expH",
                                  "expS","expF","expG"))


dataRaw2=read.delim(
  file="res/StudyPolitical-11--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))


dataRaw3=read.delim(
  file="res/StudyPolitical-11----HalfPercentileSumOutcome.txt",
                   header=FALSE,col.names=c("expAll"))

dataRaw4=read.delim(
  file="res/StudyPolitical-11--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))



dataRaw5=read.delim(
  file="res/StudyPolitical-11--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))



dataRaw6=read.delim(
  file="res/StudyPolitical-11----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
```

```
dataCombined=data.frame(
  survH=c(dataRaw2$survH,dataRaw1$survH),
  survG=c(dataRaw2$survG,dataRaw1$survG),
   survF=c(dataRaw2$survF,dataRaw1$survF),
   survS=c(dataRaw2$survS,dataRaw1$survS),
  expH=c(dataRaw2$expH,dataRaw1$expH),
  expG=c(dataRaw2$expG,dataRaw1$expG),
  expS=c(dataRaw2$expS,dataRaw1$expS),
  expF=c(dataRaw2$expF,dataRaw1$expF),
  survAll=c(1-dataRaw5$R25,rev(1-dataRaw6$R25)),
  expAll=c(dataRaw4$expAll/100,dataRaw3$expAll/100)
)

chooseRows=c(1,2,3,7, 35, 77,  102, 127, 169, 197,201,202)

dataCombined=dataCombined[chooseRows,]
dataCombined$statType=c("Mean","Min","P0.5","P2.5","P16.5","P37.5","Median",
                        "P62.5","P83.5","P97.5","P99.5","Max")



dataTransformed<-dataCombined%>%
  select(c(survG,survH,survAll,survS,survF,statType))%>%
  rename(AllG=survG,
         HthenG=survF,
         Switch=survS,
         AllH=survH,
         Population=survAll
  )%>%
 gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome") %>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))



colorsPal=viridis(option="magma",12)



condInfection <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,
```

```
                    ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,
                    ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,
                    ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,
                    ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",
                      ymin=Min,ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal[[12]],colorsPal[[10]],
                             colorsPal[[8]],colorsPal[[6]]),name="")+
  theme_dark()+
  ylab("Proportion blue")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
dataTransformed<-dataCombined%>%
  select(c(expG,expH,expF,expS,expAll,statType))%>%
  rename(AllG=expG,
         AllH=expH,
         HthenG=expF,
         Switch=expS,
         Population=expAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")%>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))

colorsPal2=viridis(option="inferno",12)

condOutcome <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,ymax=P83.5,y=P16.5),
```

```
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",ymin=Min,
                      ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal2[[12]],colorsPal2[[9]],
                             colorsPal2[[6]],
                             colorsPal2[[4]]),name="")+
  theme_dark()+
  ylab("Expected outcome")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
print("Mean expected outcome in population:")
```

```
## [1] "Mean expected outcome in population:"
```

```
dataCombined$expAll[1]
```

```
## [1] 182.27
```

C5.3.2 Figure

```
(condRoundwise/
  (condInfection/ condOutcome))+
  plot_annotation(tag_levels = 'A')
```

```
## `summarise()` has grouped output by 'Interval'.  You can override using
the
## `.groups` argument.
```

C5.4 Condition 12: No intervention/Color framing

C5.4.1 Calculations

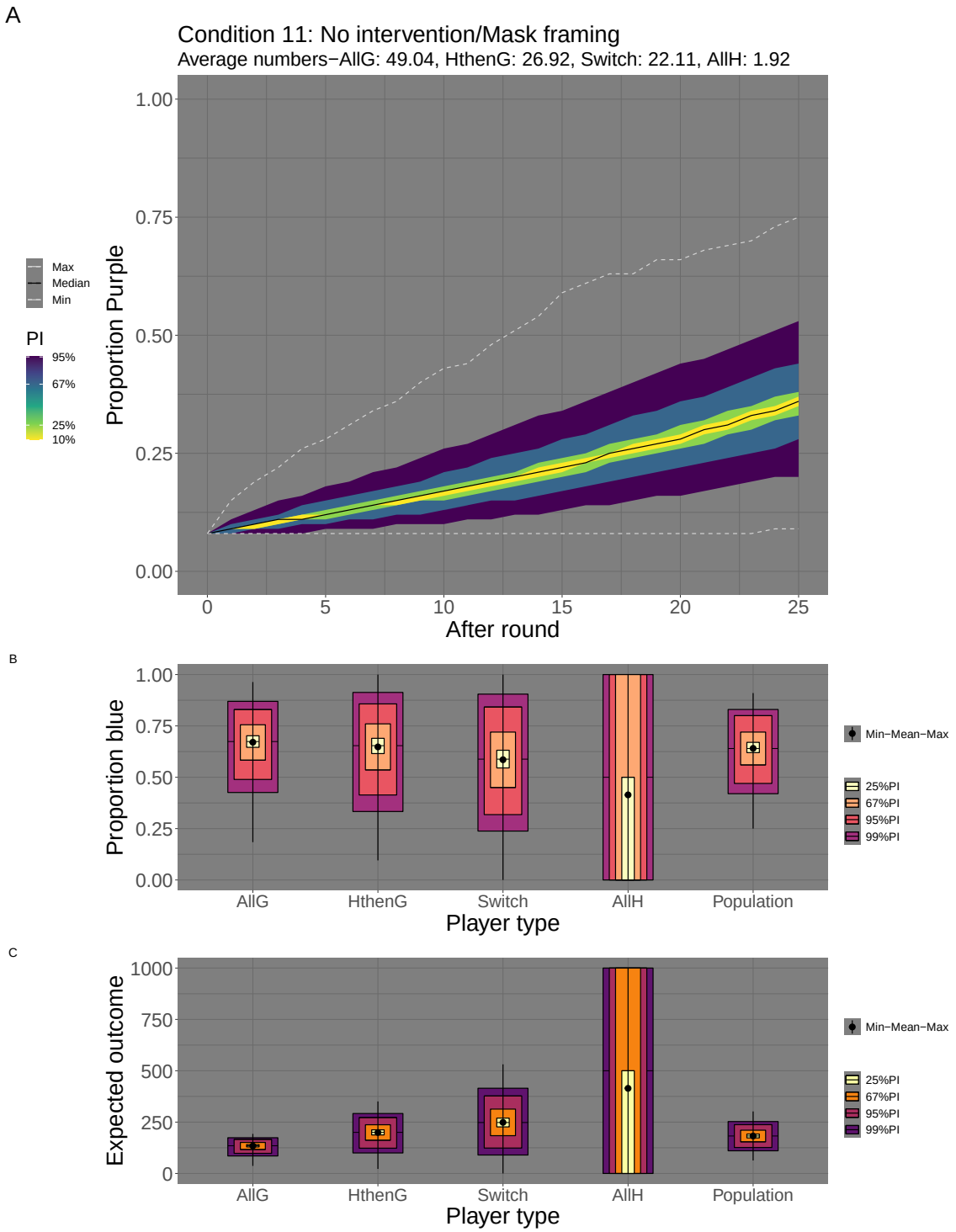

Figure C14

A) Percentile plot of roundwise purple/infection rates across 1,000,000 simulations for condition 11. B) Distribution of the proportion of blue/healthy players at the end of the game for all player types and the whole population. C) Distribution of final scores for all player types and the whole population.

```
dataRaw=read.delim(file="res/StudyPolitical-12----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03",
                                            "R04","R05","R06","R07",
                                            "R08","R09","R10","R11",
                                            "R12", "R13","R14","R15",
                                            "R16","R17","R18","R19","R20",
                                            "R21","R22","R23","R24","R25"))

dataRaw$percentile=0:200;

dataLong<-dataRaw%>%
gather(key="AfterRound",value="PercPurple",-percentile)


dataLong$AfterRound<-parse_number(dataLong$AfterRound);
dataLong$percentile<-dataLong$percentile/200


sintervals=c(0.1,0.25,0.67,0.95)
slabels=c("10%","25%","67%","95%")

condRoundwise <- ggplot(data=dataLong, aes(x=AfterRound,y=PercPurple,quantile=percentile))+
  geom_fan(intervals=sintervals)+
  theme_dark()+
   scale_fill_viridis_c(option="viridis",direction=-1,
                        breaks=sintervals,labels=slabels,
                        name = "PI")+
  stat_summary(fun=median,geom="line",lwd=0.5,aes(color="Median"))+
  scale_color_manual(values=c("lightgray","black","lightgray"),name="")+
  stat_summary(fun=max,geom="line",lwd=0.5,aes(color="Min"),
               linetype="dashed")+
  stat_summary(fun=min,geom="line",lwd=0.5,aes(color="Max"),
               linetype="dashed")+
  ylim(0,1)+
  theme(legend.position="left")+
  ylab("Proportion Purple")+
  xlab("After round")+
  ggtitle(label="Condition 12: No intervention/Color framing",subtitle="Average numbers-All
  theme(axis.text=element_text(size=20),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12),
        title=element_text(size=20))
```

```
dataRaw1=read.delim(
  file="res/StudyPolitical-12----HalfPercentileConditionalOutcomes.txt",
         header=FALSE,col.names=c("countH","countS","countF","countG",
                                  "survH","survS","survF","survG","expH",
                                  "expS","expF","expG"))


dataRaw2=read.delim(
  file="res/StudyPolitical-12--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))


dataRaw3=read.delim(
  file="res/StudyPolitical-12----HalfPercentileSumOutcome.txt",
                   header=FALSE,col.names=c("expAll"))

dataRaw4=read.delim(
  file="res/StudyPolitical-12--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))



dataRaw5=read.delim(
  file="res/StudyPolitical-12--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))



dataRaw6=read.delim(
  file="res/StudyPolitical-12----HalfPercentileInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
```

```
dataCombined=data.frame(
  survH=c(dataRaw2$survH,dataRaw1$survH),
  survG=c(dataRaw2$survG,dataRaw1$survG),
   survF=c(dataRaw2$survF,dataRaw1$survF),
   survS=c(dataRaw2$survS,dataRaw1$survS),
  expH=c(dataRaw2$expH,dataRaw1$expH),
  expG=c(dataRaw2$expG,dataRaw1$expG),
  expS=c(dataRaw2$expS,dataRaw1$expS),
  expF=c(dataRaw2$expF,dataRaw1$expF),
  survAll=c(1-dataRaw5$R25,rev(1-dataRaw6$R25)),
  expAll=c(dataRaw4$expAll/100,dataRaw3$expAll/100)
)

chooseRows=c(1,2,3,7, 35, 77,  102, 127, 169, 197,201,202)

dataCombined=dataCombined[chooseRows,]
dataCombined$statType=c("Mean","Min","P0.5","P2.5","P16.5","P37.5","Median",
                        "P62.5","P83.5","P97.5","P99.5","Max")



dataTransformed<-dataCombined%>%
  select(c(survG,survH,survAll,survS,survF,statType))%>%
  rename(AllG=survG,
         HthenG=survF,
         Switch=survS,
         AllH=survH,
         Population=survAll
  )%>%
 gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome") %>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))



colorsPal=viridis(option="magma",12)



condInfection <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,
```

```
                    ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,
                    ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,
                    ymax=P83.5,y=P16.5),
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,
                    ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",
                      ymin=Min,ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal[[12]],colorsPal[[10]],
                             colorsPal[[8]],colorsPal[[6]]),name="")+
  theme_dark()+
  ylab("Proportion blue")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
dataTransformed<-dataCombined%>%
  select(c(expG,expH,expF,expS,expAll,statType))%>%
  rename(AllG=expG,
         AllH=expH,
         HthenG=expF,
         Switch=expS,
         Population=expAll
  )%>%
gather(key="condition",value="Outcome",-statType) %>%
spread(key=statType,value="Outcome")%>%
  mutate(condition=factor(condition,levels=c("AllG","HthenG","Switch","AllH","Population"))

colorsPal2=viridis(option="inferno",12)

condOutcome <- ggplot(data=dataTransformed)+
  geom_crossbar(aes(x=condition,fill="99%PI",ymin=P0.5,ymax=P99.5,y=Median),
                width = 0.4,fatten=0)+
  geom_crossbar(aes(x=condition,fill="95%PI",ymin=P2.5,ymax=P97.5,y=P97.5),
                width = 0.3,fatten=0)+
  geom_crossbar(aes(x=condition,fill="67%PI",ymin=P16.5,ymax=P83.5,y=P16.5),
```

```
                width = 0.2,fatten=0)+
  geom_crossbar(aes(x=condition,fill="25%PI",ymin=P37.5,ymax=P62.5,y=Median),
                width = 0.1,fatten=0)+
  geom_pointrange(aes(x=condition,color="Min-Mean-Max",ymin=Min,
                      ymax=Max,y=Mean))+
  scale_color_manual(values=c("black","blue"),name="")+
  scale_fill_manual(values=c(colorsPal2[[12]],colorsPal2[[9]],
                             colorsPal2[[6]],
                             colorsPal2[[4]]),name="")+
  theme_dark()+
  ylab("Expected outcome")+
  xlab("Player type")+
  theme(axis.text.y=element_text(size=20),
        axis.text.x=element_text(size=18),
        axis.title=element_text(size=24),
        legend.text=element_text(size=12))
```

```
print("Mean expected outcome in population:")
```

```
## [1] "Mean expected outcome in population:"
```

```
dataCombined$expAll[1]
```

```
## [1] 124.64
```

C5.4.2 Figure

```
(condRoundwise/
  (condInfection/ condOutcome))+
  plot_annotation(tag_levels = 'A')
```

```
## `summarise()` has grouped output by 'Interval'.  You can override using
the
## `.groups` argument.
```

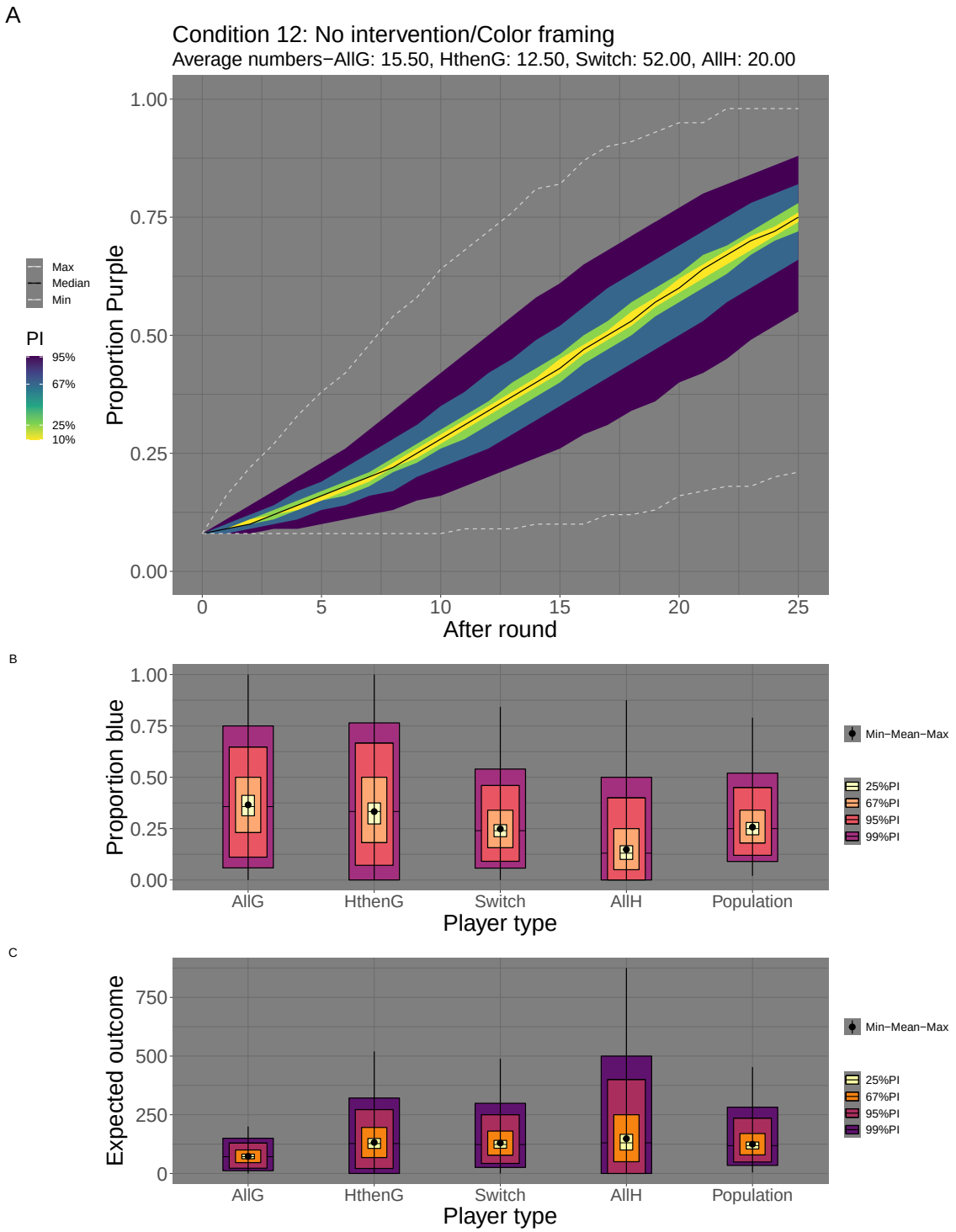

Figure C15

A) Percentile plot of roundwise purple/infection rates across 1,000,000 simulations for condition 12. B) Distribution of the proportion of blue/healthy players at the end of the game for all player types and the whole population. C) Distribution of final scores for all player types and the whole population.

C6 Comparison of simulation conditions

C6.1 Data preparation

C6.1.1 Collecting all relevant data

```
roundDataFrame=data.frame(
  R00=0,
  R01=0,
  R02=0,
  R03=0,
  R04=0,
  R05=0,
  R06=0,
  R07=0,
  R08=0,
  R09=0,
  R10=0,
  R11=0,
  R12=0,
  R13=0,
  R14=0,
  R15=0,
  R16=0,
  R17=0,
  R18=0,
  R19=0,
  R20=0,
  R21=0,
  R22=0,
  R23=0,
  R24=0,
  R25=0
)

saveInfectionrates=list(
  cond01=data.frame(
       roundDataFrame
       ),
  cond02=data.frame(
       roundDataFrame
       ),
  cond03=data.frame(
       roundDataFrame
       ),
```

```
  cond04=data.frame(
       roundDataFrame
       ),
  cond05=data.frame(
       roundDataFrame
       ),
  cond06=data.frame(
       roundDataFrame
       ),
  cond07=data.frame(
       roundDataFrame
       ),
  cond08=data.frame(
       roundDataFrame
       ),
  cond09=data.frame(
       roundDataFrame
       ),
  cond10=data.frame(
       roundDataFrame
       ),
  cond11=data.frame(
       roundDataFrame
       ),
  cond12=data.frame(
       roundDataFrame
       )
)

saveInfectionrates$cond01=read.delim(
  file="res/StudyPolitical-1--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
                                            "R25"))
saveInfectionrates$cond02=read.delim(
  file="res/StudyPolitical-2--MeanInfectionRate.txt",
                   header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                            "R05","R06","R07","R08","R09",
                                            "R10","R11","R12","R13","R14",
                                            "R15","R16","R17","R18","R19",
                                            "R20","R21","R22","R23","R24",
```

```
                                              "R25"))
saveInfectionrates$cond03=read.delim(
  file="res/StudyPolitical-3--MeanInfectionRate.txt",
                    header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                             "R05","R06","R07","R08","R09",
                                             "R10","R11","R12","R13","R14",
                                             "R15","R16","R17","R18","R19",
                                             "R20","R21","R22","R23","R24",
                                             "R25"))
saveInfectionrates$cond04=read.delim(
  file="res/StudyPolitical-4--MeanInfectionRate.txt",
                    header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                             "R05","R06","R07","R08","R09",
                                             "R10","R11","R12","R13","R14",
                                             "R15","R16","R17","R18","R19",
                                             "R20","R21","R22","R23","R24",
                                             "R25"))
saveInfectionrates$cond05=read.delim(
  file="res/StudyPolitical-5--MeanInfectionRate.txt",
                    header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                             "R05","R06","R07","R08","R09",
                                             "R10","R11","R12","R13","R14",
                                             "R15","R16","R17","R18","R19",
                                             "R20","R21","R22","R23","R24",
                                             "R25"))
saveInfectionrates$cond06=read.delim(
  file="res/StudyPolitical-6--MeanInfectionRate.txt",
                    header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                             "R05","R06","R07","R08","R09",
                                             "R10","R11","R12","R13","R14",
                                             "R15","R16","R17","R18","R19",
                                             "R20","R21","R22","R23","R24",
                                             "R25"))
saveInfectionrates$cond07=read.delim(
  file="res/StudyPolitical-7--MeanInfectionRate.txt",
                    header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                             "R05","R06","R07","R08","R09",
                                             "R10","R11","R12","R13","R14",
                                             "R15","R16","R17","R18","R19",
                                             "R20","R21","R22","R23","R24",
                                             "R25"))
saveInfectionrates$cond08=read.delim(
  file="res/StudyPolitical-8--MeanInfectionRate.txt",
                    header=FALSE,col.names=c("R00","R01","R02","R03","R04",
```

```
                                          "R05","R06","R07","R08","R09",
                                          "R10","R11","R12","R13","R14",
                                          "R15","R16","R17","R18","R19",
                                          "R20","R21","R22","R23","R24",
                                          "R25"))
saveInfectionrates$cond09=read.delim(
  file="res/StudyPolitical-9--MeanInfectionRate.txt",
                  header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                          "R05","R06","R07","R08","R09",
                                          "R10","R11","R12","R13","R14",
                                          "R15","R16","R17","R18","R19",
                                          "R20","R21","R22","R23","R24",
                                          "R25"))
saveInfectionrates$cond10=read.delim(
  file="res/StudyPolitical-10--MeanInfectionRate.txt",
                  header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                          "R05","R06","R07","R08","R09",
                                          "R10","R11","R12","R13","R14",
                                          "R15","R16","R17","R18","R19",
                                          "R20","R21","R22","R23","R24",
                                          "R25"))
saveInfectionrates$cond11=read.delim(
  file="res/StudyPolitical-11--MeanInfectionRate.txt",
                  header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                          "R05","R06","R07","R08","R09",
                                          "R10","R11","R12","R13","R14",
                                          "R15","R16","R17","R18","R19",
                                          "R20","R21","R22","R23","R24",
                                          "R25"))
saveInfectionrates$cond12=read.delim(
  file="res/StudyPolitical-12--MeanInfectionRate.txt",
                  header=FALSE,col.names=c("R00","R01","R02","R03","R04",
                                          "R05","R06","R07","R08","R09",
                                          "R10","R11","R12","R13","R14",
                                          "R15","R16","R17","R18","R19",
                                          "R20","R21","R22","R23","R24",
                                          "R25"))



strategyFrame=data.frame(
  AllG=0,
  HthenG=0,
  Switch=0,
```

```
  AllH=0,
  Pop=0)

saveConditionalSurvival=list(
    cond01=data.frame(
        strategyFrame
        ),
  cond02=data.frame(
        strategyFrame
        ),
  cond03=data.frame(
        strategyFrame
        ),
  cond04=data.frame(
        strategyFrame
        ),
  cond05=data.frame(
        strategyFrame
        ),
  cond06=data.frame(
        strategyFrame
        ),
  cond07=data.frame(
        strategyFrame
        ),
  cond08=data.frame(
        strategyFrame
        ),
  cond09=data.frame(
        strategyFrame
        ),
  cond10=data.frame(
        strategyFrame
        ),
  cond11=data.frame(
        strategyFrame
        ),
  cond12=data.frame(
        strategyFrame
        )
)


saveConditionalOutcome=list(
```

```
    cond01=data.frame(
       strategyFrame
       ),
  cond02=data.frame(
       strategyFrame
       ),
  cond03=data.frame(
       strategyFrame
       ),
  cond04=data.frame(
       strategyFrame
       ),
  cond05=data.frame(
       strategyFrame
       ),
  cond06=data.frame(
       strategyFrame
       ),
  cond07=data.frame(
       strategyFrame
       ),
  cond08=data.frame(
       strategyFrame
       ),
  cond09=data.frame(
       strategyFrame
       ),
  cond10=data.frame(
       strategyFrame
       ),
  cond11=data.frame(
       strategyFrame
       ),
  cond12=data.frame(
       strategyFrame
       )
)

dataRaw2=read.delim(
  file="res/StudyPolitical-1--MeanConditionalOutcomes.txt",
                    header=FALSE,col.names=c("countH","countS","countF",
                                             "countG","survH","survS",
                                             "survF","survG","expH","expS",
                                             "expF","expG"))
```

```
dataRaw4=read.delim(
  file="res/StudyPolitical-1--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))


saveConditionalOutcome$cond01$AllG=dataRaw2$expG
saveConditionalOutcome$cond01$AllH=dataRaw2$expH
saveConditionalOutcome$cond01$HthenG=dataRaw2$expF
saveConditionalOutcome$cond01$Switch=dataRaw2$expS
saveConditionalOutcome$cond01$Pop=dataRaw4$expAll/100

saveConditionalSurvival$cond01$AllG=dataRaw2$survG
saveConditionalSurvival$cond01$AllH=dataRaw2$survH
saveConditionalSurvival$cond01$HthenG=dataRaw2$survF
saveConditionalSurvival$cond01$Switch=dataRaw2$survS
saveConditionalSurvival$cond01$Pop=1-saveInfectionrates$cond01$R25


dataRaw2=read.delim(
  file="res/StudyPolitical-2--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))

dataRaw4=read.delim(
  file="res/StudyPolitical-2--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))


saveConditionalOutcome$cond02$AllG=dataRaw2$expG
saveConditionalOutcome$cond02$AllH=dataRaw2$expH
saveConditionalOutcome$cond02$HthenG=dataRaw2$expF
saveConditionalOutcome$cond02$Switch=dataRaw2$expS
saveConditionalOutcome$cond02$Pop=dataRaw4$expAll/100

saveConditionalSurvival$cond02$AllG=dataRaw2$survG
saveConditionalSurvival$cond02$AllH=dataRaw2$survH
saveConditionalSurvival$cond02$HthenG=dataRaw2$survF
saveConditionalSurvival$cond02$Switch=dataRaw2$survS
saveConditionalSurvival$cond02$Pop=1-saveInfectionrates$cond02$R25
```

```
dataRaw2=read.delim(
  file="res/StudyPolitical-3--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))

dataRaw4=read.delim(
  file="res/StudyPolitical-3--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))


saveConditionalOutcome$cond03$AllG=dataRaw2$expG
saveConditionalOutcome$cond03$AllH=dataRaw2$expH
saveConditionalOutcome$cond03$HthenG=dataRaw2$expF
saveConditionalOutcome$cond03$Switch=dataRaw2$expS
saveConditionalOutcome$cond03$Pop=dataRaw4$expAll/100

saveConditionalSurvival$cond03$AllG=dataRaw2$survG
saveConditionalSurvival$cond03$AllH=dataRaw2$survH
saveConditionalSurvival$cond03$HthenG=dataRaw2$survF
saveConditionalSurvival$cond03$Switch=dataRaw2$survS
saveConditionalSurvival$cond03$Pop=1-saveInfectionrates$cond03$R25



dataRaw2=read.delim(
  file="res/StudyPolitical-4--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))

dataRaw4=read.delim(
  file="res/StudyPolitical-4--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))


saveConditionalOutcome$cond04$AllG=dataRaw2$expG
saveConditionalOutcome$cond04$AllH=dataRaw2$expH
saveConditionalOutcome$cond04$HthenG=dataRaw2$expF
saveConditionalOutcome$cond04$Switch=dataRaw2$expS
saveConditionalOutcome$cond04$Pop=dataRaw4$expAll/100
```

```
saveConditionalSurvival$cond04$AllG=dataRaw2$survG
saveConditionalSurvival$cond04$AllH=dataRaw2$survH
saveConditionalSurvival$cond04$HthenG=dataRaw2$survF
saveConditionalSurvival$cond04$Switch=dataRaw2$survS
saveConditionalSurvival$cond04$Pop=1-saveInfectionrates$cond04$R25


dataRaw2=read.delim(
  file="res/StudyPolitical-5--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))

dataRaw4=read.delim(
  file="res/StudyPolitical-5--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))


saveConditionalOutcome$cond05$AllG=dataRaw2$expG
saveConditionalOutcome$cond05$AllH=dataRaw2$expH
saveConditionalOutcome$cond05$HthenG=dataRaw2$expF
saveConditionalOutcome$cond05$Switch=dataRaw2$expS
saveConditionalOutcome$cond05$Pop=dataRaw4$expAll/100

saveConditionalSurvival$cond05$AllG=dataRaw2$survG
saveConditionalSurvival$cond05$AllH=dataRaw2$survH
saveConditionalSurvival$cond05$HthenG=dataRaw2$survF
saveConditionalSurvival$cond05$Switch=dataRaw2$survS
saveConditionalSurvival$cond05$Pop=1-saveInfectionrates$cond05$R25


dataRaw2=read.delim(
  file="res/StudyPolitical-6--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))

dataRaw4=read.delim(
  file="res/StudyPolitical-6--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))
```

```
saveConditionalOutcome$cond06$AllG=dataRaw2$expG
saveConditionalOutcome$cond06$AllH=dataRaw2$expH
saveConditionalOutcome$cond06$HthenG=dataRaw2$expF
saveConditionalOutcome$cond06$Switch=dataRaw2$expS
saveConditionalOutcome$cond06$Pop=dataRaw4$expAll/100

saveConditionalSurvival$cond06$AllG=dataRaw2$survG
saveConditionalSurvival$cond06$AllH=dataRaw2$survH
saveConditionalSurvival$cond06$HthenG=dataRaw2$survF
saveConditionalSurvival$cond06$Switch=dataRaw2$survS
saveConditionalSurvival$cond06$Pop=1-saveInfectionrates$cond06$R25


dataRaw2=read.delim(
  file="res/StudyPolitical-7--MeanConditionalOutcomes.txt",
                  header=FALSE,col.names=c("countH","countS","countF",
                                           "countG","survH","survS",
                                           "survF","survG","expH","expS",
                                           "expF","expG"))

dataRaw4=read.delim(
  file="res/StudyPolitical-7--MeanSumOutcomes.txt",
                  header=FALSE,col.names=c("expAll"))


saveConditionalOutcome$cond07$AllG=dataRaw2$expG
saveConditionalOutcome$cond07$AllH=dataRaw2$expH
saveConditionalOutcome$cond07$HthenG=dataRaw2$expF
saveConditionalOutcome$cond07$Switch=dataRaw2$expS
saveConditionalOutcome$cond07$Pop=dataRaw4$expAll/100

saveConditionalSurvival$cond07$AllG=dataRaw2$survG
saveConditionalSurvival$cond07$AllH=dataRaw2$survH
saveConditionalSurvival$cond07$HthenG=dataRaw2$survF
saveConditionalSurvival$cond07$Switch=dataRaw2$survS
saveConditionalSurvival$cond07$Pop=1-saveInfectionrates$cond07$R25


dataRaw2=read.delim(
  file="res/StudyPolitical-8--MeanConditionalOutcomes.txt",
                  header=FALSE,col.names=c("countH","countS","countF",
                                           "countG","survH","survS",
                                           "survF","survG","expH","expS",
                                           "expF","expG"))
```

```
dataRaw4=read.delim(
  file="res/StudyPolitical-8--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))


saveConditionalOutcome$cond08$AllG=dataRaw2$expG
saveConditionalOutcome$cond08$AllH=dataRaw2$expH
saveConditionalOutcome$cond08$HthenG=dataRaw2$expF
saveConditionalOutcome$cond08$Switch=dataRaw2$expS
saveConditionalOutcome$cond08$Pop=dataRaw4$expAll/100

saveConditionalSurvival$cond08$AllG=dataRaw2$survG
saveConditionalSurvival$cond08$AllH=dataRaw2$survH
saveConditionalSurvival$cond08$HthenG=dataRaw2$survF
saveConditionalSurvival$cond08$Switch=dataRaw2$survS
saveConditionalSurvival$cond08$Pop=1-saveInfectionrates$cond08$R25


dataRaw2=read.delim(
  file="res/StudyPolitical-9--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))

dataRaw4=read.delim(
  file="res/StudyPolitical-9--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))


saveConditionalOutcome$cond09$AllG=dataRaw2$expG
saveConditionalOutcome$cond09$AllH=dataRaw2$expH
saveConditionalOutcome$cond09$HthenG=dataRaw2$expF
saveConditionalOutcome$cond09$Switch=dataRaw2$expS
saveConditionalOutcome$cond09$Pop=dataRaw4$expAll/100

saveConditionalSurvival$cond09$AllG=dataRaw2$survG
saveConditionalSurvival$cond09$AllH=dataRaw2$survH
saveConditionalSurvival$cond09$HthenG=dataRaw2$survF
saveConditionalSurvival$cond09$Switch=dataRaw2$survS
saveConditionalSurvival$cond09$Pop=1-saveInfectionrates$cond09$R25


dataRaw2=read.delim(
```

```
  file="res/StudyPolitical-10--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))

dataRaw4=read.delim(
  file="res/StudyPolitical-10--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))


saveConditionalOutcome$cond10$AllG=dataRaw2$expG
saveConditionalOutcome$cond10$AllH=dataRaw2$expH
saveConditionalOutcome$cond10$HthenG=dataRaw2$expF
saveConditionalOutcome$cond10$Switch=dataRaw2$expS
saveConditionalOutcome$cond10$Pop=dataRaw4$expAll/100

saveConditionalSurvival$cond10$AllG=dataRaw2$survG
saveConditionalSurvival$cond10$AllH=dataRaw2$survH
saveConditionalSurvival$cond10$HthenG=dataRaw2$survF
saveConditionalSurvival$cond10$Switch=dataRaw2$survS
saveConditionalSurvival$cond10$Pop=1-saveInfectionrates$cond10$R25

dataRaw2=read.delim(
  file="res/StudyPolitical-11--MeanConditionalOutcomes.txt",
                   header=FALSE,col.names=c("countH","countS","countF",
                                            "countG","survH","survS",
                                            "survF","survG","expH","expS",
                                            "expF","expG"))

dataRaw4=read.delim(
  file="res/StudyPolitical-11--MeanSumOutcomes.txt",
                   header=FALSE,col.names=c("expAll"))


saveConditionalOutcome$cond11$AllG=dataRaw2$expG
saveConditionalOutcome$cond11$AllH=dataRaw2$expH
saveConditionalOutcome$cond11$HthenG=dataRaw2$expF
saveConditionalOutcome$cond11$Switch=dataRaw2$expS
saveConditionalOutcome$cond11$Pop=dataRaw4$expAll/100

saveConditionalSurvival$cond11$AllG=dataRaw2$survG
saveConditionalSurvival$cond11$AllH=dataRaw2$survH
saveConditionalSurvival$cond11$HthenG=dataRaw2$survF
```

```
saveConditionalSurvival$cond11$Switch=dataRaw2$survS
saveConditionalSurvival$cond11$Pop=1-saveInfectionrates$cond11$R25

dataRaw2=read.delim(
  file="res/StudyPolitical-12--MeanConditionalOutcomes.txt",
                  header=FALSE,col.names=c("countH","countS","countF",
                                           "countG","survH","survS",
                                           "survF","survG","expH","expS",
                                           "expF","expG"))

dataRaw4=read.delim(
  file="res/StudyPolitical-12--MeanSumOutcomes.txt",
                  header=FALSE,col.names=c("expAll"))

saveConditionalOutcome$cond12$AllG=dataRaw2$expG
saveConditionalOutcome$cond12$AllH=dataRaw2$expH
saveConditionalOutcome$cond12$HthenG=dataRaw2$expF
saveConditionalOutcome$cond12$Switch=dataRaw2$expS
saveConditionalOutcome$cond12$Pop=dataRaw4$expAll/100

saveConditionalSurvival$cond12$AllG=dataRaw2$survG
saveConditionalSurvival$cond12$AllH=dataRaw2$survH
saveConditionalSurvival$cond12$HthenG=dataRaw2$survF
saveConditionalSurvival$cond12$Switch=dataRaw2$survS
saveConditionalSurvival$cond12$Pop=1-saveInfectionrates$cond12$R25
```

C6.1.2 Preparing roundwise data

```
roundwiseDataFrame=rbind(
  cond1=saveInfectionrates$cond01,
  cond2=saveInfectionrates$cond02,
  cond3=saveInfectionrates$cond03,
  cond4=saveInfectionrates$cond04,
  cond5=saveInfectionrates$cond05,
  cond6=saveInfectionrates$cond06,
  cond7=saveInfectionrates$cond07,
  cond8=saveInfectionrates$cond08

)


roundwiseDataFrame$conditionNumber=1:8
```

```
roundwiseDataFrame$Frame=c("Masks","Color","Masks","Color",
           "Masks","Color","Masks","Color")
roundwiseDataFrame$Voter=c("Trump","Trump","Trump","Trump",
          "Clinton","Clinton","Clinton","Clinton")
roundwiseDataFrame$Intervention=c("Norms","Norms","None",
             "None","Norms","Norms","None","None")


roundwisedf<-pivot_longer(roundwiseDataFrame,
              -c(conditionNumber,Frame,Voter,Intervention),
              values_to="InfectionRate", names_to="Round")


roundwisedf$Round<-dplyr::recode(roundwisedf$Round,
"R00"=0,"R01"=1,"R02"=2,"R03"=3,"R04"=4,"R05"=5,"R06"=6,
"R07"=7,"R08"=8,"R09"=9,"R10"=10,"R11"=11,"R12"=12,
"R13"=13,"R14"=14,"R15"=15,"R16"=16,"R17"=17,"R18"=18,
"R19"=19,"R20"=20,"R21"=21,"R22"=22,"R23"=23,
"R24"=24,"R25"=25)
```

C6.2 Comparison figures for the eight experimental conditions

C6.2.1 Comparison of roundwise infection rates (in main manuscript)

```
ggplot(data=roundwisedf, aes(x=Round, y=InfectionRate, group=conditionNumber,
color=Voter,shape=Intervention,linetype=Intervention)) +   facet_wrap(~Frame)+
  geom_line()+
  geom_point(size=2)+
  theme_economist()+
  scale_color_manual(values=c("#6699CC", "#661100"))+
  scale_fill_manual(values=c("#6699CC", "#661100"))+
  scale_linetype_manual(values=c("solid","dotted"))+
  labs(title='Roundwise infection rates',
  subtitle="Split by framing, intervention and voter type")+
  theme(axis.title.y =element_text(vjust=3) ,
  axis.title.x =element_text(vjust=-2))
```

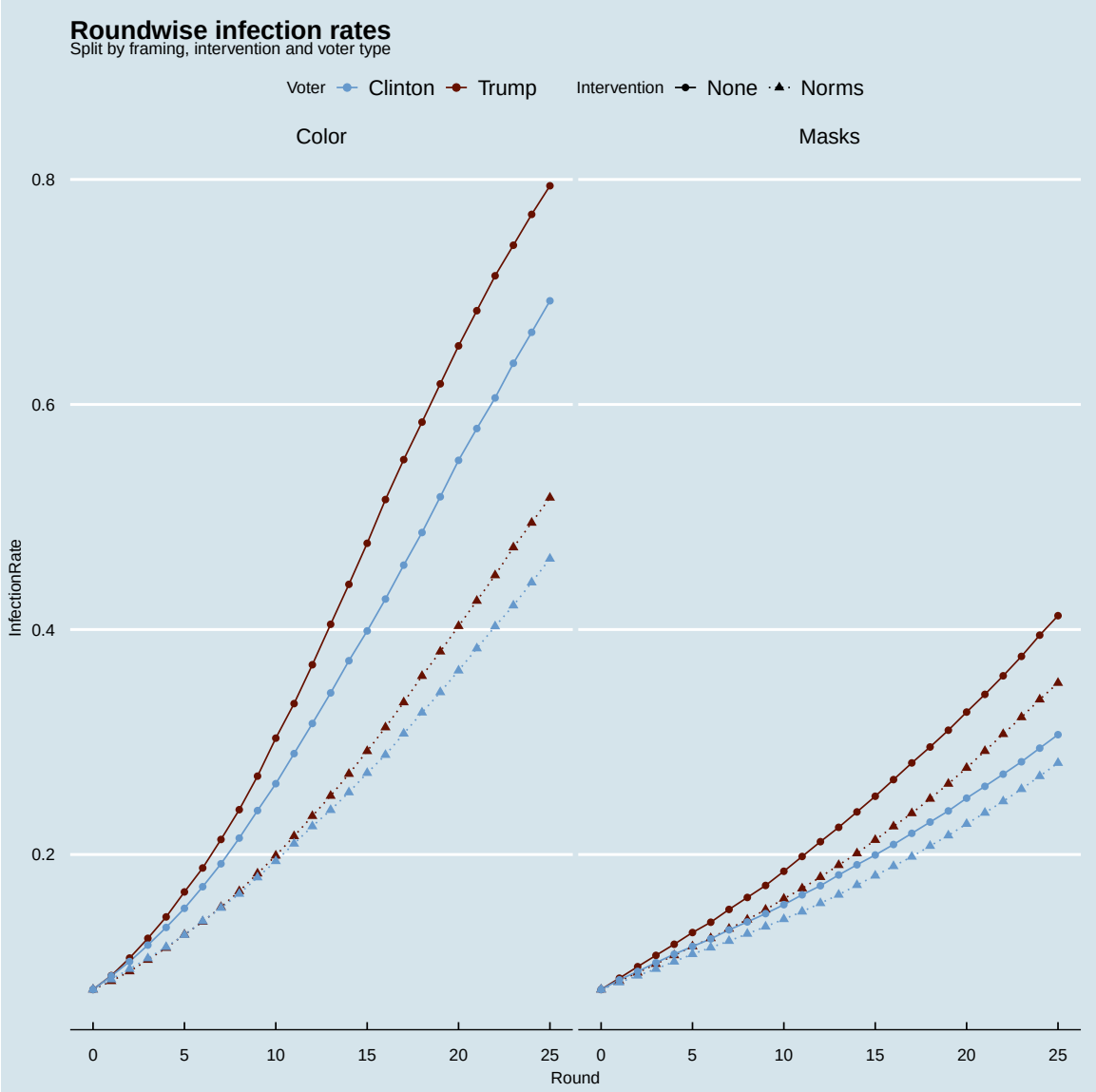

Figure C16

Comparison of roundwise infection rates across the eight experimental conditions. Each point represents the average infection rate across 1,000,000 simulations after each round of the game. The leftmost point represents the initial state of the population (8% infection), and individual curves are shown for each combination of voter group, frame, and intervention condition.

C6.2.2 Comparison of overall survival rates

```
condSurvivalFrame=rbind(
  cond1=saveConditionalSurvival$cond01,
  cond2=saveConditionalSurvival$cond02,
  cond3=saveConditionalSurvival$cond03,
  cond4=saveConditionalSurvival$cond04,
  cond5=saveConditionalSurvival$cond05,
  cond6=saveConditionalSurvival$cond06,
  cond7=saveConditionalSurvival$cond07,
  cond8=saveConditionalSurvival$cond08
)


condSurvivalFrame$conditionNumber=1:8

condSurvivalFrame$Frame=c("Masks","Color","Masks","Color",
"Masks","Color","Masks","Color")

condSurvivalFrame$Voter=c("Trump","Trump","Trump","Trump",
"Clinton","Clinton","Clinton","Clinton")

condSurvivalFrame$Intervention=c("Norms","Norms","None","None",
"Norms","Norms","None","None")


condSurvivaldf<-pivot_longer(condSurvivalFrame, -c(conditionNumber,Frame,Voter,Intervention
values_to="Outcome", names_to="Strategy")


condSurvivalPopdf<-condSurvivaldf %>% filter(Strategy=="Pop")



ggplot(data=condSurvivalPopdf, aes(x=Intervention, y=Outcome, fill=Voter)) +
    geom_bar(stat="identity",      position="dodge")+
  facet_wrap(Frame~Strategy)+
  theme_economist()+
  scale_color_manual(values=c("#6699CC", "#661100"))+
  scale_fill_manual(values=c("#6699CC", "#661100"))+
  scale_linetype_manual(values=c("solid","dotted"))+
  labs(title='Survival rates',
  subtitle="Split by  framing, intervention and voter type")+
  theme(axis.title.y =element_text(vjust=3) ,
```

```
  axis.title.x =element_text(vjust=-2))
```

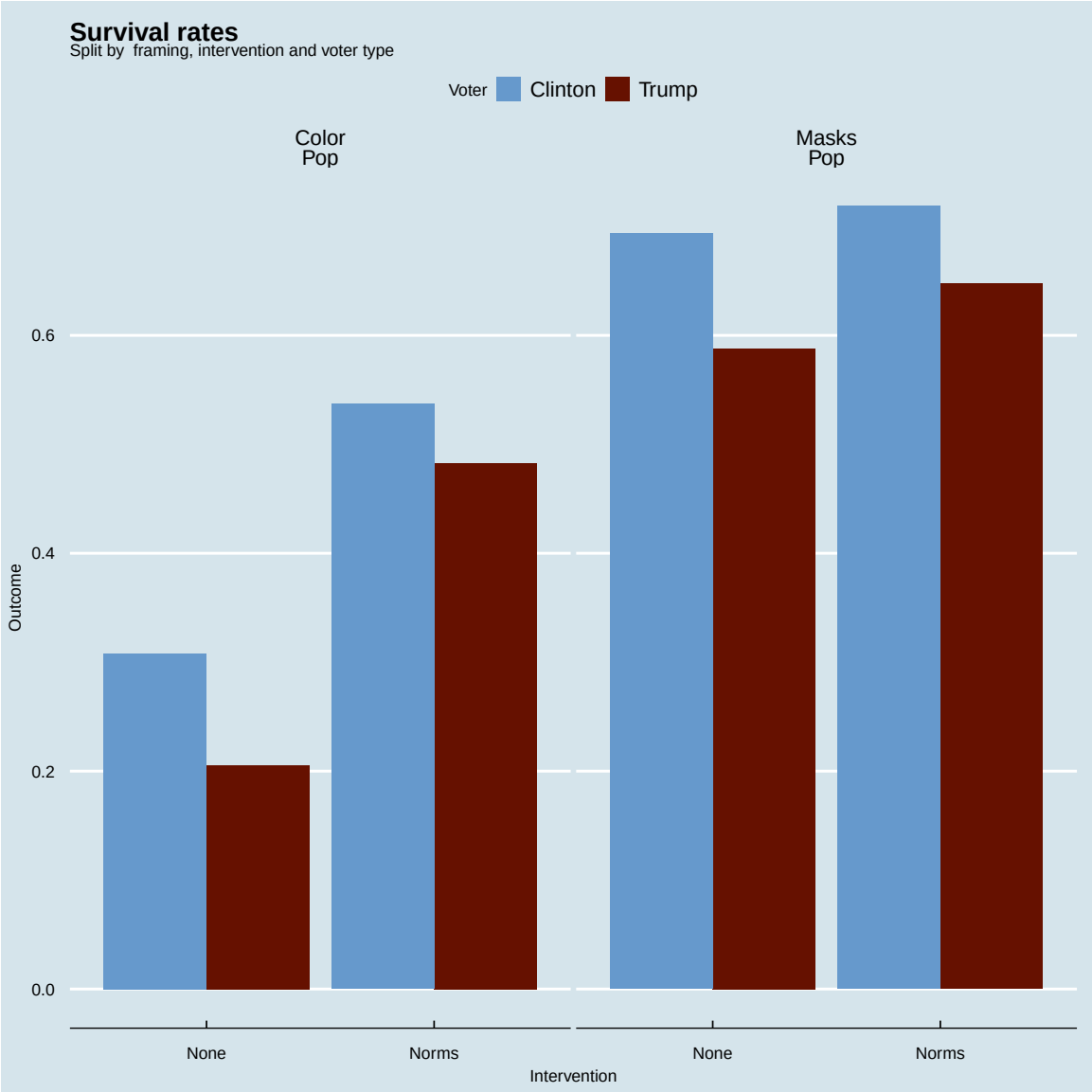

Figure C17

Comparison of survival rates across the eight experimental conditions. Each bar represents the average survival rate after the game across 1,000,000 simulations. Bars correspond to the eight experimental conditions based on voter sample, frame, and intervention condition.

C6.2.3 Comparison of expected outcomes

```
condOutcomeFrame=rbind(
  cond1=saveConditionalOutcome$cond01,
  cond2=saveConditionalOutcome$cond02,
  cond3=saveConditionalOutcome$cond03,
  cond4=saveConditionalOutcome$cond04,
  cond5=saveConditionalOutcome$cond05,
  cond6=saveConditionalOutcome$cond06,
  cond7=saveConditionalOutcome$cond07,
  cond8=saveConditionalOutcome$cond08

)

condOutcomeFrame$conditionNumber=1:8

condOutcomeFrame$Frame=c("Masks","Color","Masks","Color",
"Masks","Color","Masks","Color")

condOutcomeFrame$Voter=c("Trump","Trump","Trump","Trump",
"Clinton","Clinton","Clinton","Clinton")

condOutcomeFrame$Intervention=c("Norms","Norms","None","None",
"Norms","Norms","None","None")


condOutcomedf<-pivot_longer(condOutcomeFrame,
-c(conditionNumber,Frame,Voter,Intervention),
values_to="Outcome", names_to="Strategy")


condOutcomePopdf<-condOutcomedf %>% filter(Strategy=="Pop")


ggplot(data=condOutcomePopdf, aes(x=Intervention, y=Outcome, fill=Voter)) +
    geom_bar(stat="identity",      position="dodge")+
  facet_wrap(~Frame)+
  theme_economist()+
  scale_color_manual(values=c("#6699CC", "#661100"))+
  scale_fill_manual(values=c("#6699CC", "#661100"))+
  scale_linetype_manual(values=c("solid","dotted"))+
  labs(title='Expected outcome',
  subtitle="Split by  framing, intervention and voter type")+
  theme(axis.title.y =element_text(vjust=3) ,
```

```
  axis.title.x =element_text(vjust=-2))
```

C6.3 Comparison figures split by behavioral strategy

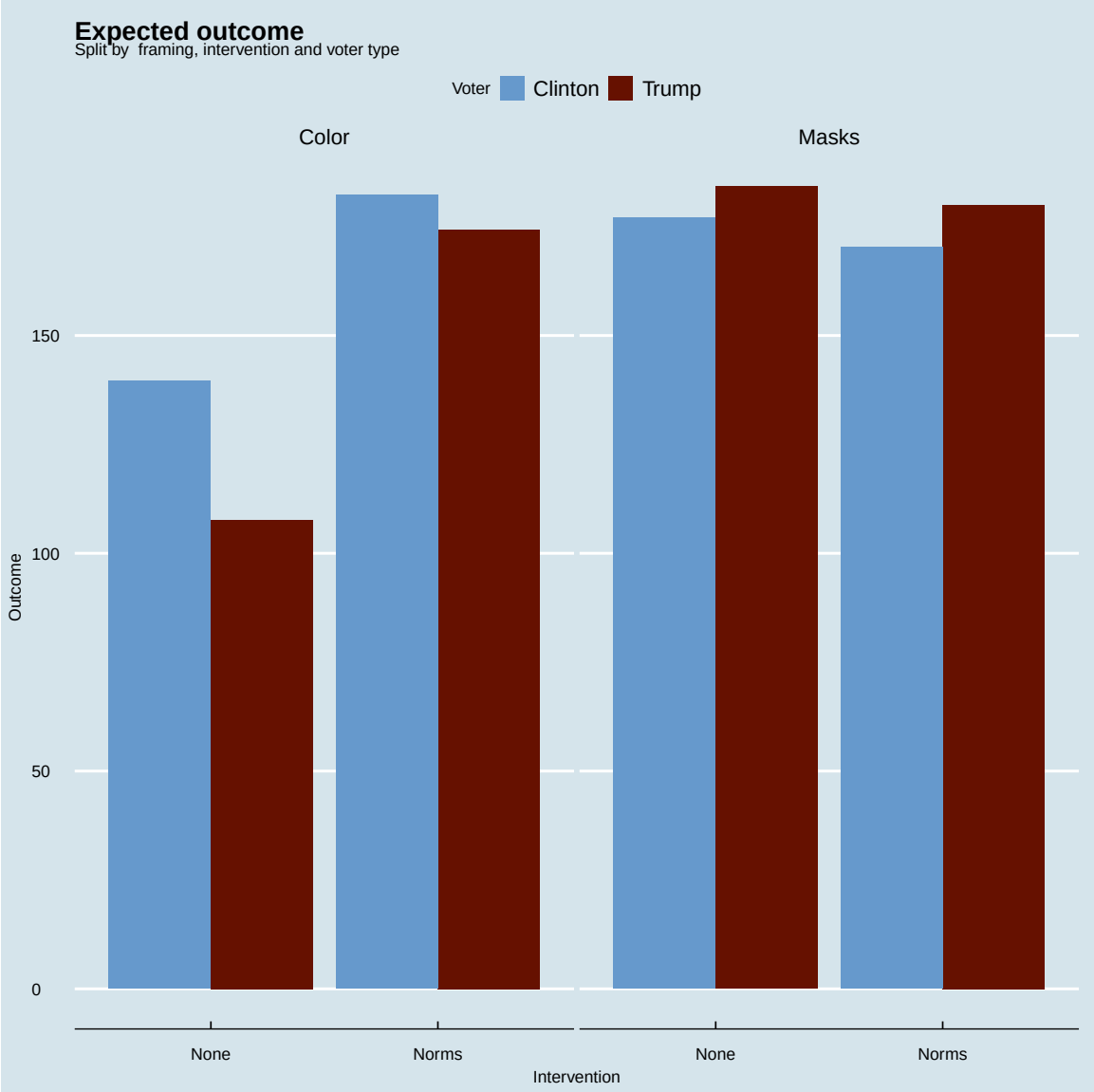

Figure C18

Comparison of expected outcomes across the eight experimental conditions. Each bar represents the average expected outcome across 1,000,000 simulations. Purple/infected participants are scored with 0 points. Bars correspond to the eight experimental conditions based on voter sample, frame, and intervention condition.

C6.3.1 Comparison of overall survival rates

```
condSurvivalFrame=rbind(
  cond1=saveConditionalSurvival$cond01,
  cond2=saveConditionalSurvival$cond02,
  cond3=saveConditionalSurvival$cond03,
  cond4=saveConditionalSurvival$cond04,
  cond5=saveConditionalSurvival$cond05,
  cond6=saveConditionalSurvival$cond06,
  cond7=saveConditionalSurvival$cond07,
  cond8=saveConditionalSurvival$cond08

)



condSurvivalFrame$conditionNumber=1:8

condSurvivalFrame$Frame=c("Masks","Color","Masks","Color",
"Masks","Color","Masks","Color")

condSurvivalFrame$Voter=c("Trump","Trump","Trump","Trump",
"Clinton","Clinton","Clinton","Clinton")

condSurvivalFrame$Intervention=c("Norms","Norms","None","None",
"Norms","Norms","None","None")

condSurvivaldf<-pivot_longer(condSurvivalFrame, -c(conditionNumber,Frame,Voter,Intervention
values_to="Outcome", names_to="Strategy")

ggplot(data=condSurvivaldf, aes(x=Intervention, y=Outcome, fill=Voter)) +
    geom_bar(stat="identity",      position="dodge")+
  facet_wrap(Frame~Strategy)+
  theme_economist()+
  scale_color_manual(values=c("#6699CC", "#661100"))+
  scale_fill_manual(values=c("#6699CC", "#661100"))+
  scale_linetype_manual(values=c("solid","dotted"))+
  labs(title='Survival rates',
  subtitle="Split by strategy, framing, intervention and voter type")+
  theme(axis.title.y =element_text(vjust=-1) ,
  axis.title.x =element_text(vjust=-2))

## Warning:  Removed 1 rows containing missing values (geom_bar).
```

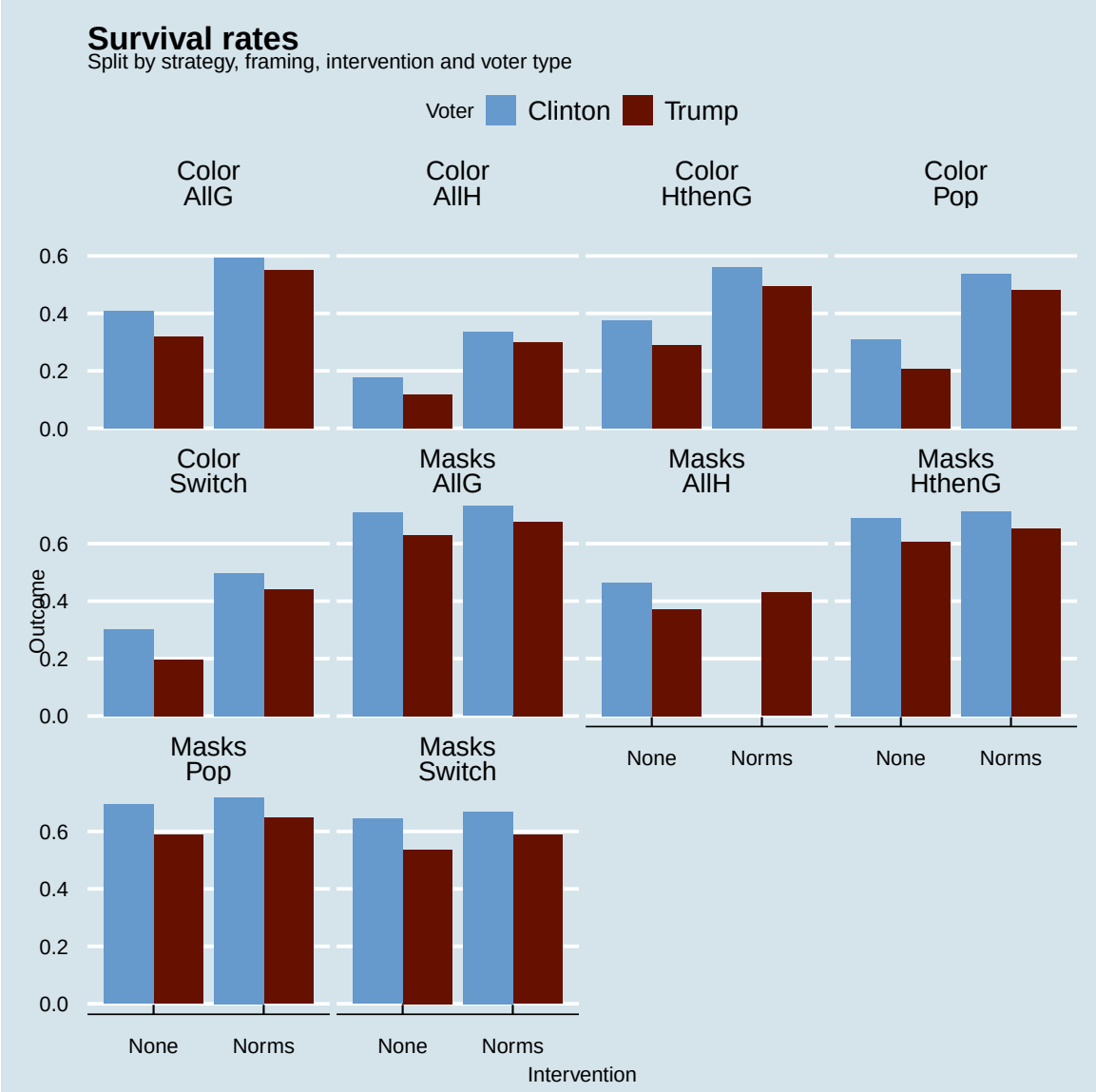

Figure C19

Comparison of survival rates across the eight experimental conditions split by strategy: Each bar represents the average survival rate after the game across 1,000,000 simulations. Bars correspond to the survival rate for those playing a specific strategy in a specific combination of voter sample, frame, and intervention condition. Red bars correspond to Trump voters, blue bars to Clinton voters. The two leftmost bars in each group correspond to conditions without intervention, the two rightmost bars to condition with intervention. Each group is marked by the respective combination of frame and strategy. 'Pop' refers to results for the entire population in the given frame.

C6.3.2 Comparison of expected outcomes

```
condOutcomeFrame=rbind(
  cond1=saveConditionalOutcome$cond01,
  cond2=saveConditionalOutcome$cond02,
  cond3=saveConditionalOutcome$cond03,
  cond4=saveConditionalOutcome$cond04,
  cond5=saveConditionalOutcome$cond05,
  cond6=saveConditionalOutcome$cond06,
  cond7=saveConditionalOutcome$cond07,
  cond8=saveConditionalOutcome$cond08

)

condOutcomeFrame$conditionNumber=1:8

condOutcomeFrame$Frame=c("Masks","Color","Masks","Color",
"Masks","Color","Masks","Color")

condOutcomeFrame$Voter=c("Trump","Trump","Trump","Trump",
"Clinton","Clinton","Clinton","Clinton")

condOutcomeFrame$Intervention=c("Norms","Norms","None","None",
"Norms","Norms","None","None")


condOutcomedf<-pivot_longer(condOutcomeFrame,
-c(conditionNumber,Frame,Voter,Intervention),
values_to="Outcome", names_to="Strategy")

ggplot(data=condOutcomedf, aes(x=Intervention, y=Outcome, fill=Voter)) +
    geom_bar(stat="identity",      position="dodge")+
  facet_wrap(Frame~Strategy)+
 # geom_point(size=2)+
  theme_economist()+
  scale_color_manual(values=c("#6699CC", "#661100"))+
  scale_fill_manual(values=c("#6699CC", "#661100"))+
  scale_linetype_manual(values=c("solid","dotted"))+
  labs(title='Expected outcome',
  subtitle="Split by framing, intervention, voter type, and behavioral strategy")+
  theme(axis.title.y =element_text(vjust=3) ,
  axis.title.x =element_text(vjust=-2))

## Warning:  Removed 1 rows containing missing values (geom_bar).
```

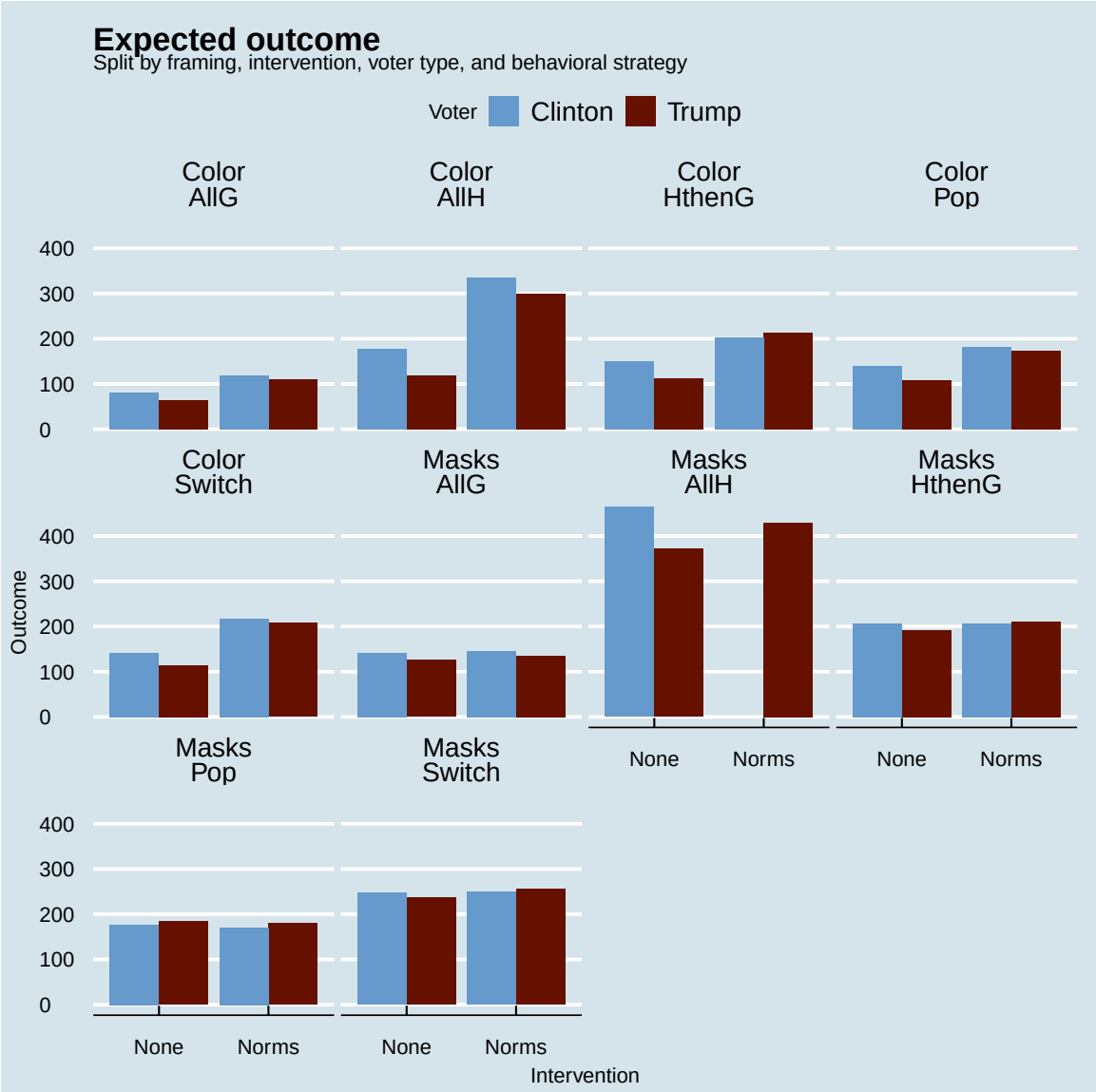

Figure C20

Comparison of expected outcomes across the eight experimental conditions split by strategy: Each bar represents the average expected outcome after the game across 1,000,000 simulations (with purple/infected participants scored as 0). Bars correspond to the expected outcome for those playing a specific strategy in a specific combination of voter sample, frame, and intervention condition. Red bars correspond to Trump voters, blue bars to Clinton voters. The two leftmost bars in each group correspond to conditions without intervention, the two rightmost bars to condition with intervention. Each group is marked by the respective combination of frame and strategy. 'Pop' refers to results for the entire population in the given frame.

C6.4 Comparison figures for bipartisan groups

C6.4.1 Comparison of roundwise infection rates

```
roundwiseDataFrameGroups=rbind(
  cond09=saveInfectionrates$cond09,
  cond10=saveInfectionrates$cond10,
  cond11=saveInfectionrates$cond11,
  cond12=saveInfectionrates$cond12
)

roundwiseDataFrameGroups$conditionNumber=1:4

roundwiseDataFrameGroups$Frame=c("Masks","Color","Masks","Color")
roundwiseDataFrameGroups$Intervention=c("Norms","Norms","None","None")

roundwise2df<-pivot_longer(roundwiseDataFrameGroups,
-c(conditionNumber,Frame,Intervention),
values_to="InfectionRate", names_to="Round")

roundwise2df$Round<-dplyr::recode(roundwise2df$Round,"R00"=0,"R01"=1,"R02"=2,
"R03"=3,"R04"=4,
"R05"=5,"R06"=6,"R07"=7,"R08"=8,"R09"=9,"R10"=10,"R11"=11,"R12"=12,
"R13"=13,"R14"=14,"R15"=15,"R16"=16,"R17"=17,"R18"=18,"R19"=19,"R20"=20,
"R21"=21,"R22"=22,"R23"=23,"R24"=24,"R25"=25)

ggplot(data=roundwise2df, aes(x=Round, y=InfectionRate,
group=conditionNumber, color=Frame,shape=Intervention,linetype=Intervention)) +
  geom_line()+
  geom_point(size=3)+
  theme_economist()+
  scale_linetype_manual(values=c("solid","dotted"))+
  labs(title='Roundwise infection rates (mixed voter groups)',
  subtitle="Split by framing and intervention")+
  theme(axis.title.y =element_text(vjust=3) ,
  axis.title.x =element_text(vjust=-2))
```

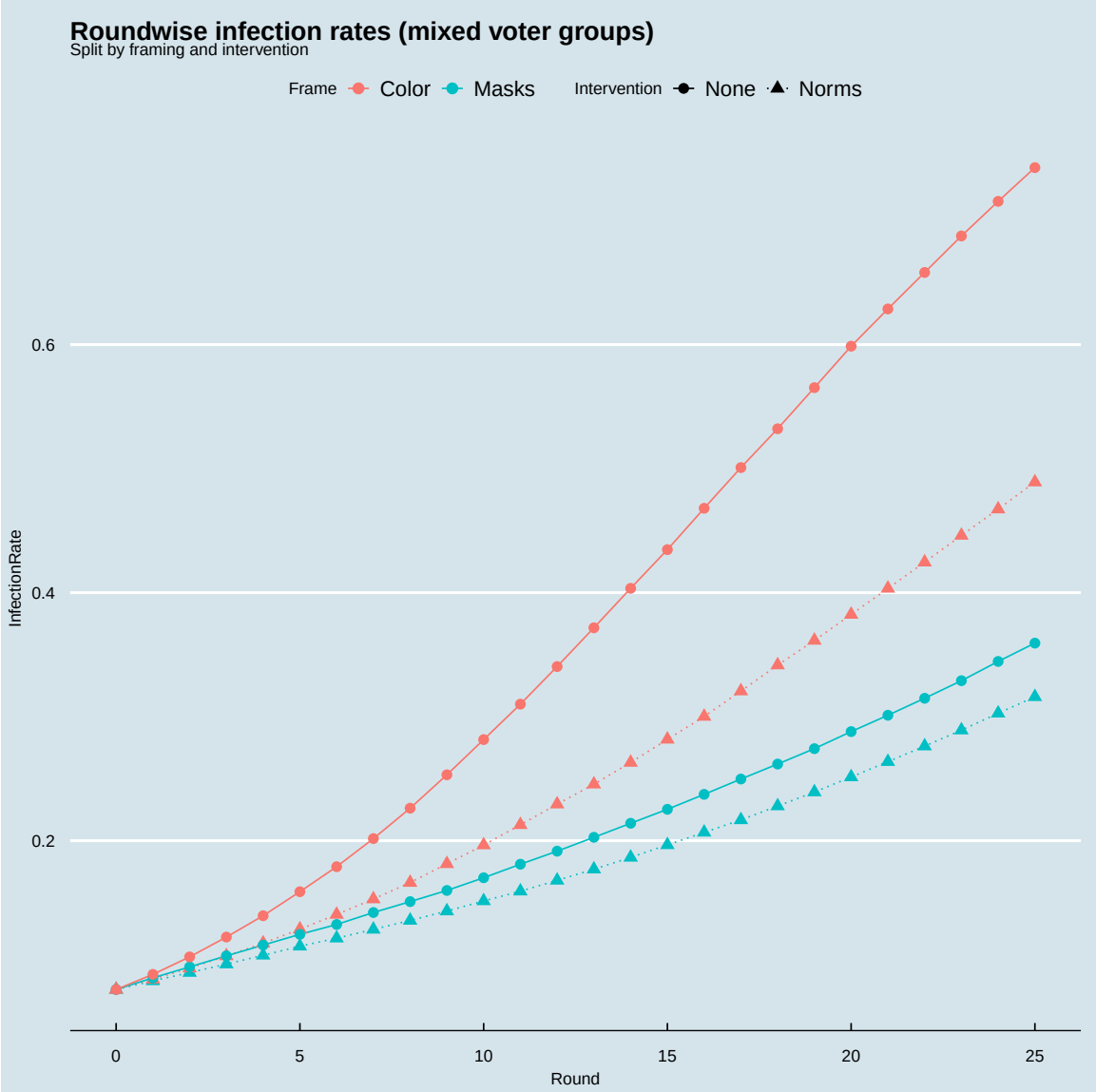

Figure C21

Comparison of roundwise infection rates for populations combining Trump and Clinton voters across four experimental conditions defined by frame and intervention. Each point represents the average infection rate across 1,000,000 simulations after each round of the game. For each simulation, 100 participants were randomly chosen from the joint sample. The leftmost point represents the initial state of the population (8% infection), and individual curves are shown for each combination of frame and intervention condition.

C6.4.2 Comparison of expected outcome

```
condOutcomeFrame=rbind(
  cond1=saveConditionalOutcome$cond09,
  cond2=saveConditionalOutcome$cond10,
  cond3=saveConditionalOutcome$cond11,
  cond4=saveConditionalOutcome$cond12
)


condOutcomeFrame$conditionNumber=1:4


condOutcomeFrame$Frame=c("Masks","Color","Masks","Color")

condOutcomeFrame$Intervention=c("Norms","Norms","None","None")


condOutcomedf<-pivot_longer(condOutcomeFrame,
-c(conditionNumber,Frame,Intervention),
values_to="Outcome", names_to="Strategy")

condOutcomePopdf<-condOutcomedf %>% filter(Strategy=="Pop")

ggplot(data=condOutcomePopdf, aes(x=Intervention, y=Outcome, fill=Frame)) +
    geom_bar(stat="identity",      position="dodge")+
 # geom_point(size=2)+
  theme_economist()+
  scale_color_manual(values=c("blue", "black"))+
  scale_fill_manual(values=c("blue", "black"))+
  scale_linetype_manual(values=c("solid","dotted"))+
  labs(title='Expected outcome',
  subtitle="Split by  framing and intervention")+
  theme(axis.title.y =element_text(vjust=3) ,
  axis.title.x =element_text(vjust=-2))
```

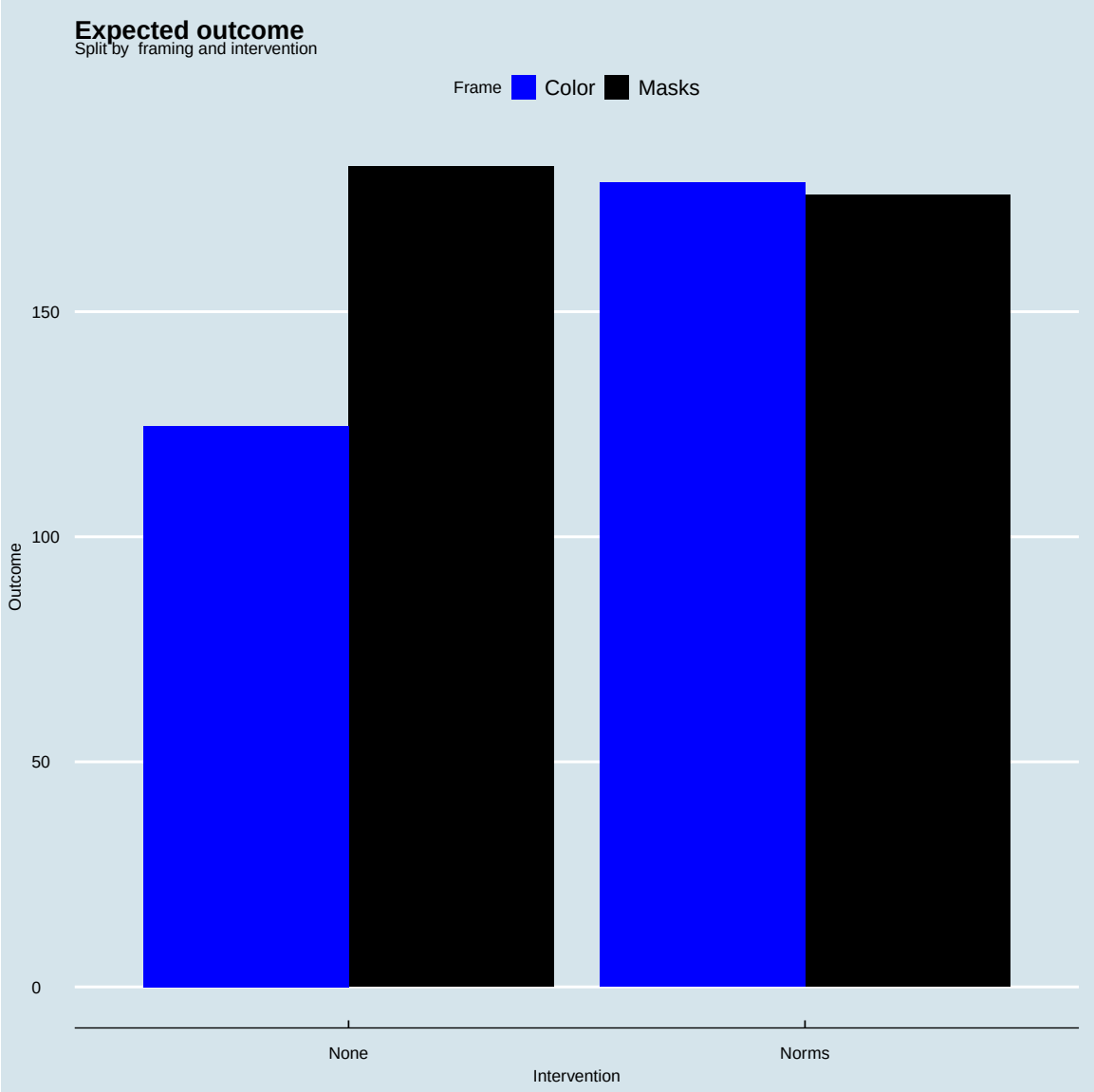

Figure C22

Comparison of expected outcomes for bipartisan groups across four experimental conditions defined by frame and intervention condition. Each bar represents the average expected outcome across 1,000,000 simulations (with players sampled randomly from both Clinton and Trump voters). Purple/infected participants are scored with 0 points. Bars correspond to the four experimental conditions based on frame and intervention condition.

C6.4.3 Comparison of expected outcome split by strategy

```
condOutcomeFrame=rbind(
  cond1=saveConditionalOutcome$cond09,
  cond2=saveConditionalOutcome$cond10,
  cond3=saveConditionalOutcome$cond11,
  cond4=saveConditionalOutcome$cond12
)


condOutcomeFrame$conditionNumber=1:4

condOutcomeFrame$Frame=c("Masks","Color","Masks","Color")
condOutcomeFrame$Intervention=c("Norms","Norms","None","None")


condOutcomedf<-pivot_longer(condOutcomeFrame,
-c(conditionNumber,Frame,Intervention),
values_to="Outcome", names_to="Strategy")


condOutcomePopdf<-condOutcomedf

ggplot(data=condOutcomePopdf, aes(x=Intervention, y=Outcome, fill=Frame)) +
    geom_bar(stat="identity",      position="dodge")+
   facet_wrap(~Strategy)+
 # geom_point(size=2)+
  theme_economist()+
  scale_color_manual(values=c("blue", "black"))+
  scale_fill_manual(values=c("blue", "black"))+
  scale_linetype_manual(values=c("solid","dotted"))+
  labs(title='Expected outcome',
  subtitle="Split by strategy, framing and intervention")+
  theme(axis.title.y =element_text(vjust=3) ,
  axis.title.x =element_text(vjust=-2))
```

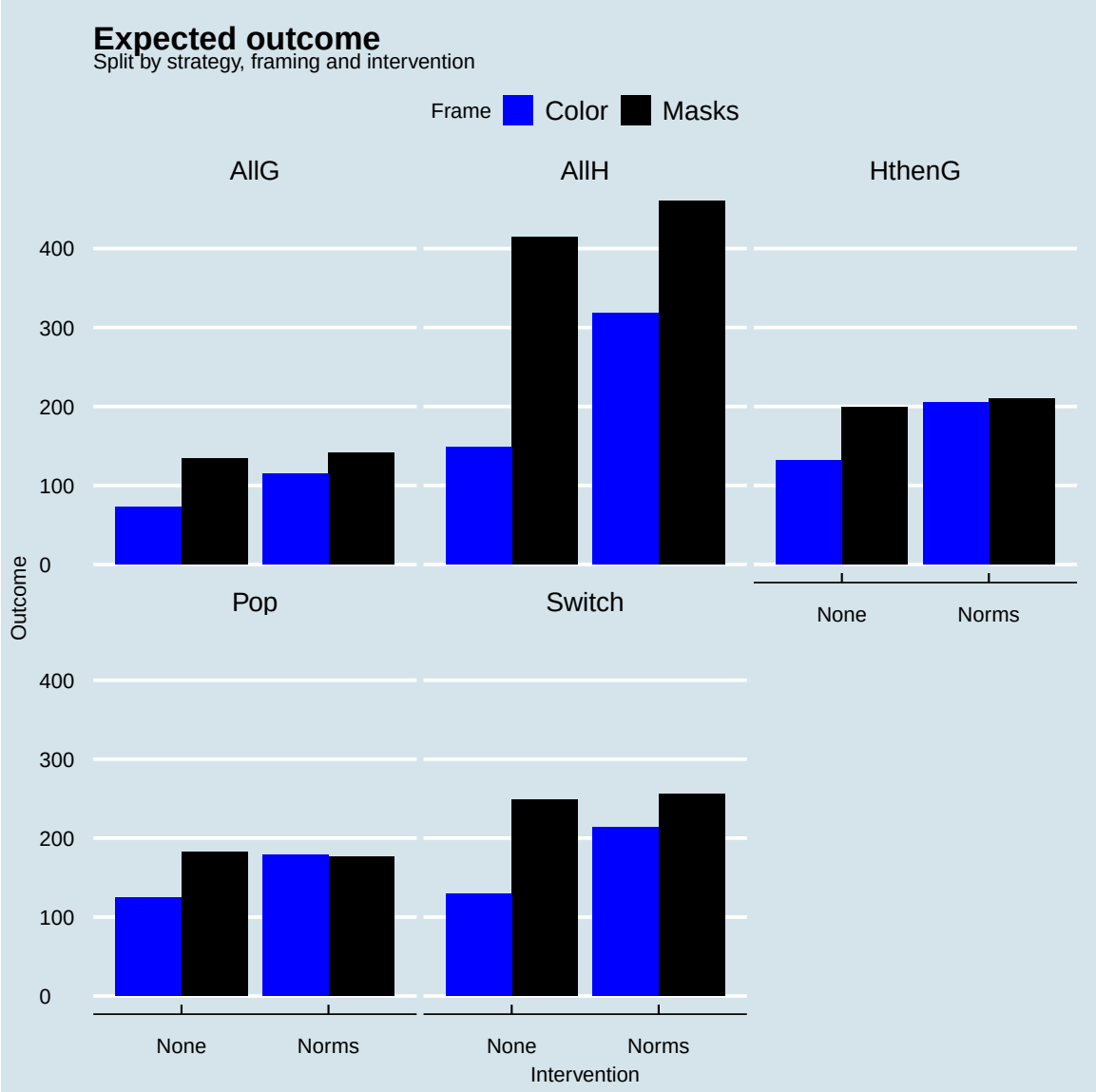

Figure C23

Comparison of expected outcomes across four experimental conditions split by strategy for bipartisan groups: Each bar represents the average expected outcome after the game across 1,000,000 simulations (with purple/infected participants scored as 0). Bars correspond to the expected outcome for those playing a specific strategy in a specific combination of frame and intervention condition (with groups sampled randomly from both Clinto and Trump voters in each simulation. Blue bars correspond to the color frame, black bars to a mask frame. The two leftmost bars in each group correspond to conditions without intervention, the two rightmost bars to condition with intervention. Each group is marked by the respective combination of frame and strategy. 'Pop' refers to results for the entire population in the given frame.

C7 Simulation Code

The following Matlab listing contain the simulation code used for producing the input for the preceding figures. The original code underwent minor modifications here. The following changes were made for readability:

- A Matlab prettifier was used for formatting of the code.
- Function names had some version information in the function name in the original code that was eliminated in this representation.
- A legacy element that was rendered redundant through parameter settings was taken out of the original code. In a variant of the game preceding the original study, a constant round risk was implemented for every population member. This was set to 0 in the original code and therefore had no impact on the results.
- A local foldername was replaced by a variable that stays undefined in the top level routine.
- The routine for loading in the empirical data contained several thousand lines of numbers that were abbreviated in the reproduction below.

C7.1 Top level routine

Noe that the variable saveFolderRoot is not defined in this code, it refers to a local file folder.

Listing 1: Top level routine

```
 tic;
% ------------------------------
% SET BASIC GAME PARAMETERS
% ------------------------------
popSize=100;
numberRounds=25; % Number of game rounds (25)
interactionRisks=[0.05,0.15,0.25];  % Probability of switching colors for
            % G-G / H-G or G-H / H-H interactions if colors are mixed
            % (0.05 / 0.15 /0.25)
bfixedPerc=1; % initial percentage (value 1, standard) vs. initial individual
              % probability (value 0)
initialPerc=8; % X% of the population are swittched to purple before R1
               % or X% chance for each individual (standard: 8)

bonusG=8;  % generated points for each G action (8)
bonusH=40; % generated points for each H action (40)
% ------------------------------


% ------------------------------
```

```
% SET BASIC SIMULATION PARAMETERS
% ------------------------------
numTrials=1000000;
%numRiskTests=25;
% ------------------------------


% ------------------------------
% DETERMINE SIM TYPE
% ------------------------------
simType="StudyPolitical";

bconditionalOutcomes=1; %save information on behavioral patterns
bSingleSave=0; %save trial-wise results
bMeanSave=1; % save average results
bStandardDeviationSave=1; %save standard deviations
bPercentileSave=1;  %save percentiles
bDecileSave=1; %save deciles

% ------------------------------

for simParameter =1:12
  disp(int2str(simParameter))

  saveFolder=strcat(saveFolderRoot,"\res\");
  saveName=strcat("StudyPolitical-", int2str(simParameter));

  [savePopState,saveOutcomeState,saveSumOutcomes,...
    saveInfectionRate,saveActionRate,saveConditionalOutcomes]=...
    transmissionPlaySimulationBase(...
   popSize,numberRounds,interactionRisks,bfixedPerc,...
   initialPerc,bonusG,bonusH,numTrials,simType,simParameter,...
   bconditionalOutcomes);


  complete = saveSimulationResults(...
     saveFolder,saveName,numberRounds,...
     savePopState,saveOutcomeState,saveSumOutcomes,saveInfectionRate,...
     saveActionRate,saveConditionalOutcomes,...
     bconditionalOutcomes,bSingleSave,bMeanSave,bStandardDeviationSave,...
     bPercentileSave,bDecileSave);
 toc
end
toc
```

C7.2 Functions

C7.2.1 Simulation loop

Listing 2: Function transmissionPlaySimulationBase

```
function [savePopState,saveOutcomeState,saveSumOutcomes,...
    saveInfectionRate,saveActionRate,savePatternOutcomes]=...
    transmissionPlaySimulationBase(...
   popSize,numberRounds,interactionRisks,bfixedPerc,...
   initialPerc,bonusG,bonusH,numTrials,simType,simParameter,
      bconditionalOutcomes)

%CONVENTIONS
%for individual states: 0 signifies blue and 1 signifies purple
% for actions: 0 signifies G and 1 signifies H

% ------------------------
% INITIALIZE SAVE ARRAYS
% ------------------------
 savePopState=zeros(popSize,numTrials);
 saveOutcomeState=zeros(popSize,numTrials);
 saveSumOutcomes=zeros(numTrials,1);
 saveInfectionRate=zeros(numberRounds+1,numTrials);
 saveActionRate=zeros(numberRounds,numTrials);
 savePatternOutcomes=zeros(12,numTrials);
%----------------------------------

stable=0;

 for trials=1:numTrials

    % at the beginning (or for each trial):
    % determine all player choices for the game
    % based on chosen simulation type (see function)
    if (trials==1 || ~stable)
      [popChoices,popTypes]=determineChoices_v3(simType,simParameter,...
    popSize,numberRounds,bconditionalOutcomes);
      potentialOutcome=(bonusG*numberRounds+sum(popChoices*(bonusH-bonusG),2)
          );
    end

    %set all players to blue
    population=zeros(popSize,1);

    %initialize trial-based save arrays
```

```
    saveTrialInfectionRate=zeros(numberRounds+1,1);
    saveTrialActionRate=zeros(numberRounds,1);
    saveTrialInfectionRate(1,1)=mean(population,1);

    if (bfixedPerc)
        %fixed percentage switched to purple
        infectionRand=randperm(popSize);
        population(infectionRand(1,1:initialPerc),1)=1;
    else
        %each player switched with same probability
        infectionRand = rand(popSize,1)*100 < initialPerc;
        population(infectionRand)=1;
    end


    % repeat transmission rounds and save relevant statistics
    for ri=1:numberRounds
        saveTrialInfectionRate(ri,1)=mean(population,1);
        saveTrialActionRate(ri,1)=mean(popChoices(1:popSize,ri),1);

        [population]= transmissionRound(...
            population,popChoices(1:popSize,ri),...
            interactionRisks);
    end

    saveTrialInfectionRate(numberRounds+1,1)=mean(population,1);


    %save statistics for the trial in output variables
    savePopState(1:popSize, trials)=  (1-population(1:popSize,1));
    saveOutcomeState(1:popSize, trials)= ...
                   (1- population(1:popSize,1)).*potentialOutcome;
    saveSumOutcomes(trials,1)=sum(saveOutcomeState(1:popSize,trials));
    saveInfectionRate(1:numberRounds+1,trials)= ...
                         saveTrialInfectionRate(1:numberRounds+1,1);
    saveActionRate(1:numberRounds,trials)= ...
                         saveTrialActionRate(1:numberRounds,1);
    if (bconditionalOutcomes)
     % save number count, proportion blue (survival rate), and
     % average outcome
     savePatternOutcomes(1,trials)= sum(popTypes==1);
     savePatternOutcomes(2,trials)= sum(popTypes==2);
     savePatternOutcomes(3,trials)= sum(popTypes==3);
     savePatternOutcomes(4,trials)= sum(popTypes==4);
     savePatternOutcomes(5,trials)=sum(savePopState(popTypes==1,...
```

```
            trials)) /savePatternOutcomes(1,trials);
    savePatternOutcomes(6,trials)=sum(savePopState(popTypes==2,...
            trials)) /savePatternOutcomes(2,trials);
    savePatternOutcomes(7,trials)=sum(savePopState(popTypes==3,...
            trials)) /savePatternOutcomes(3,trials);
    savePatternOutcomes(8,trials)=sum(savePopState(popTypes==4,...
            trials)) /savePatternOutcomes(4,trials);
    savePatternOutcomes(9,trials)=sum(saveOutcomeState(popTypes==1,...
            trials)) /savePatternOutcomes(1,trials);
    savePatternOutcomes(10,trials)=sum(saveOutcomeState(popTypes==2,...
            trials)) /savePatternOutcomes(2,trials);
    savePatternOutcomes(11,trials)=sum(saveOutcomeState(popTypes==3,...
            trials)) /savePatternOutcomes(3,trials);
    savePatternOutcomes(12,trials)=sum(saveOutcomeState(popTypes==4,...
            trials)) /savePatternOutcomes(4,trials);

   end
 end % end trials
end
```

C7.2.2 Loading the empirical data

NOTE: XXX dataFile codes voter This routine is reproduced in shortened form: For each round, data for each participant was entered in separate lines. The variable "condition" codes framing and intervention conditions, the variable "datafile" the group of voters (the survey data was stored in two different source files, originally). The code below skips thousands of lines containing roundwise information for choices.

Listing 3: Function loadStudyPolitical

```

function [ popChoices ] = loadStudyPolitical(conditionNr, gameNr, resampling,
    replacement)


%conditionNr=ceil(param/2);
%gameNr=param - (conditionNr-1)*2;

%conditionNr: 1   MASKS   INJUNCTIVE    TRUMP
%conditionNr: 2   NEUTRAL INJUNCTIVE    TRUMP
%conditionNr: 3    MASKS   CONTROL    TRUMP
%conditionNr: 4    NEUTRAL CONTROL    TRUMP
%conditionNr: 5   MASKS   INJUNCTIVE   CLINTON
%conditionNr: 6   NEUTRAL INJUNCTIVE   CLINTON
%conditionNr: 7    MASKS   CONTROLE   CLINTON
%conditionNr: 8    NEUTRAL CONTROL   CLINTON
```

```
%conditionNr: 9   MASKS   INJUNCTIVE  (BOTH)
%conditionNr: 10   NEUTRAL INJUNCTIVE  (BOTH)
%conditionNr: 11    MASKS   CONTROLE  (BOTH)
%conditionNr: 12    NEUTRAL CONTROL  (BOTH)



condition=[1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00

[....]

4.00
4.00
4.00
4.00 ];


dataFile=[1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00

[...]

2.00
```

```
2.00
2.00
2.00
2.00 ];

round1=[8.00
8.00
8.00
8.00
40.00
40.00

[...]

40.00
8.00
40.00
8.00
8.00
    ];

round2=[8.00
8.00
8.00
8.00
40.00
8.00
8.00

[...]
[...]

8.00
40.00
8.00
8.00
8.00 ];




popChoicesFull=[round1,round2,round3,round4,round5,round6,round7,round8,...
    round9,round10,round11,round12,round13,round14,round15,round16,round17,
        ...
```

```
    round18,round19,round20,round21,round22,round23,round24,round25];


popChoicesA=popChoicesFull( (condition==1)&(dataFile==1),:);
popChoicesB=popChoicesFull((condition==2)&(dataFile==1),:);
popChoicesC=popChoicesFull((condition==3)&(dataFile==1),:);
popChoicesD=popChoicesFull((condition==4)&(dataFile==1),:);
popChoicesE=popChoicesFull((condition==1)&(dataFile==2),:);
popChoicesF=popChoicesFull((condition==2)&(dataFile==2),:);
popChoicesG=popChoicesFull((condition==3)&(dataFile==2),:);
popChoicesH=popChoicesFull((condition==4)&(dataFile==2),:);

popChoicesI=popChoicesFull(condition==1,:);
popChoicesJ=popChoicesFull(condition==2,:);
popChoicesK=popChoicesFull(condition==3,:);
popChoicesL=popChoicesFull(condition==4,:);


%popChoicses=zeros(100,25);

if (~resampling)
    switch conditionNr

        case 1

            popChoices=popChoicesA((gameNr-1)*100+1:gameNr*100,1:25);

        case 2
            popChoices=popChoicesB((gameNr-1)*100+1:gameNr*100,1:25);

        case 3
            popChoices=popChoicesC((gameNr-1)*100+1:gameNr*100,1:25);

        case 4
          popChoices=popChoicesD((gameNr-1)*100+1:gameNr*100,1:25);

         case 5
          popChoices=popChoicesE((gameNr-1)*100+1:gameNr*100,1:25);

           case 6
          popChoices=popChoicesF((gameNr-1)*100+1:gameNr*100,1:25);

           case 7
          popChoices=popChoicesG((gameNr-1)*100+1:gameNr*100,1:25);

```

```
150             case 8
151            popChoices=popChoicesH((gameNr-1)*100+1:gameNr*100,1:25);
152
153             case 9
154            popChoices=popChoicesI((gameNr-1)*100+1:gameNr*100,1:25);
155
156             case 10
157            popChoices=popChoicesJ((gameNr-1)*100+1:gameNr*100,1:25);
158
159             case 11
160            popChoices=popChoicesK((gameNr-1)*100+1:gameNr*100,1:25);
161
162             case 12
163            popChoices=popChoicesL((gameNr-1)*100+1:gameNr*100,1:25);
164    end
165 else
166
167    if (replacement==1)
168        setReplace=true;
169    else
170        setReplace=false;
171    end
172
173    switch conditionNr
174         case 1
175           popChoices=popChoicesA;
176         case 2
177            popChoices=popChoicesB;
178
179         case 3
180            popChoices=popChoicesC;
181        case 4
182            popChoices=popChoicesD;
183         case 5
184            popChoices=popChoicesE;
185            case 6
186            popChoices=popChoicesF;
187            case 7
188            popChoices=popChoicesG;
189            case 8
190            popChoices=popChoicesH;
191            case 9
192            popChoices=popChoicesI;
193            case 10
194            popChoices=popChoicesJ;
```

```
            case 11
            popChoices=popChoicesK;
            case 12
            popChoices=popChoicesL;


    end

    sizePop=size(popChoices,1);
    if (sizePop<100)
       setReplace=true;
    end

           resamplePop=randsample(sizePop,100,setReplace);
           popChoices=popChoices(resamplePop,:);


end


popChoices=(popChoices-8)/32;


end
```

C7.2.3 Simulation of a game round

Listing 4: Function transmissionRound

```
function [ population] = transmissionRound( population,actionTypes,
    interactionRisks)
%REQUIREMENTS
%population size has to be even
%action Types must have the same size as population
%interactioRisks is an array of three numbers
%passiveRisk is a single number (default: set to0)


  %determine population size
  numPop=size(population,1);

  %initialize individual risk
  indivRisk=zeros(numPop,1);

  %create random permutation to determine the random pairing
```

```
%   (the random sequence is considered as n/2 pairs in sequence)
pairings=randperm(numPop)';


%the same procedure is applied to each pair
for pairi=1:numPop/2
  %treat each pair depending on action type combination
  %the first step does not take color into account

  if actionTypes(pairings( (pairi-1)*2+1,1))==0 &&...
          actionTypes(pairings( pairi*2,1),1)==0

     %G-G pair: both individuals are ssigned the lowes risk
     indivRisk(pairings( (pairi-1)*2+1,1),1)=interactionRisks(1,1)...
          .*population(pairings( pairi*2,1),1);
     indivRisk(pairings( pairi*2,1),1)=interactionRisks(1,1)...
         .*population(pairings( (pairi-1)*2+1,1),1);


  elseif   actionTypes(pairings( (pairi-1)*2+1,1))==1 &&...
          actionTypes(pairings( pairi*2,1),1)==0

      %G-H pair: both individuals are ssigned the intermeidate risk
      indivRisk(pairings( (pairi-1)*2+1,1),1)=interactionRisks(1,2)...
          .*population(pairings( pairi*2,1),1);
     indivRisk(pairings( pairi*2,1),1)=interactionRisks(1,2)...
         .*population(pairings( (pairi-1)*2+1,1),1);

  elseif actionTypes(pairings( (pairi-1)*2+1,1))==0 &&...
          actionTypes(pairings( pairi*2,1),1)==1
      %H-G pair: both individuals are ssigned the intermediate risk
      indivRisk(pairings( (pairi-1)*2+1,1),1)=interactionRisks(1,2)...
           .*population(pairings( pairi*2,1),1);
     indivRisk(pairings( pairi*2,1),1)=interactionRisks(1,2)...
        .*population(pairings( (pairi-1)*2+1,1),1);

  elseif actionTypes(pairings( (pairi-1)*2+1,1))==1 &&...
          actionTypes(pairings( pairi*2,1),1)==1
     %H-H pair: both individuals are ssigned the highest risk
      indivRisk(pairings( (pairi-1)*2+1,1),1)=interactionRisks(1,3)...
           .*population(pairings( pairi*2,1),1);
     indivRisk(pairings( pairi*2,1),1)=interactionRisks(1,3)...
        .*population(pairings( (pairi-1)*2+1,1),1);

  else
```

```
        assert(1==-1);
        %program will stop, as this point will be only reached given a data
        %problem
    end


  end

  %A purple individual has a 100% chance of staying purple
  indivRisk=max(population,indivRisk);

  %determine new colors for each individual by comparing random number from
  %U(0,1) with the risk factor (1 for individuals who were already purple)
  %the new population array is the fucntion output
  randNumbers=rand(numPop,1);
  population=randNumbers<=indivRisk;
end
```

C7.2.4 Saving simulation results

Listing 5: Function saveSimulationResults

```
function [ complete ] = saveSimulationResults(...
     saveFolder,saveName,numberRounds,...
     savePopState,saveOutcomeState,saveSumOutcomes,saveInfectionRate,...
     saveActionRate,saveConditionalOutcomes,...
     bconditionalOutcomes,bSingleSave,bMeanSave,bStandardDeviationSave,...
     bPercentileSave,bDecileSave,bAreaSave)

 %save simulation results to saveFolder
 %each filename starts with saveName
 %Boolean variables determine whether:
 %
 %bconditionalOutcomes: saves outcomes for four behaviroal types:
 %AllH, Switch,H-G, AllG: 1-4: counts
 %                        5-8: survival rate
 %                       9-12: average outcome
 %
 %bSingleSave: save trial-wise information, bMeanSave: save averages,
 %bStandardDeviationSave: save standard deviation
 %bPercentileSaves: save percentiles, bDecileSae: save deciles

 bPercentileOldSave=0;

if bSingleSave
```

```
    %save information on every trial
    %creates large results files
    fn=strcat(saveFolder,saveName,"—PopState.txt");
    dlmwrite(fn,savePopState','delimiter','\t');
    fn=strcat(saveFolder,saveName,"—IndivOutcomes.txt");
    dlmwrite(fn,saveOutcomeState','delimiter','\t');
    fn=strcat(saveFolder,saveName,"—SumOutcomes.txt");
    dlmwrite(fn,saveSumOutcomes,'delimiter','\t');
    fn=strcat(saveFolder,saveName,"—InfectionRate.txt");
    dlmwrite(fn,saveInfectionRate','delimiter','\t');
    fn=strcat(saveFolder,saveName,"—ActionRate.txt");
    dlmwrite(fn,saveActionRate','delimiter','\t');
    if (bconditionalOutcomes)
        fn=strcat(saveFolder,saveName,"—ConditionalOutcomes.txt");
        dlmwrite(fn,saveConditionalOutcomes','delimiter','\t');
    end

end


if bMeanSave
    %save average results

    fn=strcat(saveFolder,saveName,"——MeanPopState.txt");
    dlmwrite(fn,mean(savePopState',1),'delimiter','\t');
    fn=strcat(saveFolder,saveName,"——MeanIndivOutcomes.txt");
    dlmwrite(fn,mean(saveOutcomeState',1),'delimiter','\t');
    fn=strcat(saveFolder,saveName,"——MeanSumOutcomes.txt");
    dlmwrite(fn,mean(saveSumOutcomes,1),'delimiter','\t');
    fn=strcat(saveFolder,saveName,"——MeanInfectionRate.txt");
    dlmwrite(fn,mean(saveInfectionRate',1),'delimiter','\t');
    fn=strcat(saveFolder,saveName,"——MeanActionRate.txt");
    dlmwrite(fn,mean(saveActionRate',1),'delimiter','\t');
    if (bconditionalOutcomes)
        fn=strcat(saveFolder,saveName,"——MeanConditionalOutcomes.txt");
        dlmwrite(fn,mean(saveConditionalOutcomes',1,'omitnan'),'delimiter','\
            t');
    end
end


if bStandardDeviationSave
    %save standard deviations

    fn=strcat(saveFolder,saveName,"———SDPopState.txt");
```

```
    dlmwrite(fn,std(savePopState'),'delimiter','\t');
    fn=strcat(saveFolder,saveName,"---SDIndivOutcomes.txt");
    dlmwrite(fn,std(saveOutcomeState'),'delimiter','\t');
    fn=strcat(saveFolder,saveName,"---SDSumOutcomes.txt");
    dlmwrite(fn,std(saveSumOutcomes),'delimiter','\t');
    fn=strcat(saveFolder,saveName,"---SDInfectionRate.txt");
    dlmwrite(fn,std(saveInfectionRate'),'delimiter','\t');
    fn=strcat(saveFolder,saveName,"---SDActionRate.txt");
    dlmwrite(fn,std(saveActionRate'),'delimiter','\t');
    if (bconditionalOutcomes)
        fn=strcat(saveFolder,saveName,"---SDConditionalOutcomes.txt");
        dlmwrite(fn,std(saveConditionalOutcomes','omitnan'),'delimiter','\t')
            ;
    end
end


if bPercentileOldSave
    %save selected percentiles (including Min and Max)

    percInfection=zeros(101,numberRounds);
    percSumOutcomes=zeros(101,1);
    percCondOutcomes=zeros(101,12);

    for ci=0:100

      percInfection(ci+1,1:numberRounds+1)=...
           prctile(saveInfectionRate',ci);

      percSumOutcomes(ci+1,1)=...
           prctile(saveSumOutcomes,ci);


      if (bconditionalOutcomes)
         percCondOutcomes(ci+1,1:12)=...
              prctile(saveConditionalOutcomes',ci);
      end
    end
    fn=strcat(saveFolder,saveName,"----PercentileInfectionRate.txt");
    dlmwrite(fn,percInfection,'delimiter','\t');

    fn=strcat(saveFolder,saveName,"----PercentileSumOutcome.txt");
    dlmwrite(fn,percSumOutcomes,'delimiter','\t');

    if (bconditionalOutcomes)
```

```
112         fn=strcat(saveFolder,saveName,"-----PercentileConditionalOutcomes.txt
                ");
113         dlmwrite(fn,percCondOutcomes,'delimiter','\t');
114     end
115 end
116
117
118
119
120 if bDecileSave
121     %save selected deciles (including Min and Max)
122
123     decInfection=zeros(11,numberRounds);
124     decSumOutcomes=zeros(11,1);
125     decCondOutcomes=zeros(11,12);
126     for ci=0:10
127
128       decInfection(ci+1,1:numberRounds+1)=...
129            prctile(saveInfectionRate',ci*10);
130
131       decSumOutcomes(ci+1,1)=...
132            prctile(saveSumOutcomes,ci*10);
133
134
135       if (bconditionalOutcomes)
136          decCondOutcomes(ci+1,1:12)=...
137               prctile(saveConditionalOutcomes',ci*10);
138       end
139     end
140     fn=strcat(saveFolder,saveName,"-----DecileInfectionRate.txt");
141     dlmwrite(fn,decInfection,'delimiter','\t');
142
143     fn=strcat(saveFolder,saveName,"-----DecileSumOutcome.txt");
144     dlmwrite(fn,decSumOutcomes,'delimiter','\t');
145
146     if (bconditionalOutcomes)
147         fn=strcat(saveFolder,saveName,"-----DecileConditionalOutcomes.txt");
148         dlmwrite(fn,decCondOutcomes,'delimiter','\t');
149     end
150
151 end
152 complete=1;
153
154
155
```

```
156 if bPercentileSave
157     %save selected half-percentiles (including Min and Max)
158
159     percInfection=zeros(201,numberRounds);
160     percSumOutcomes=zeros(201,1);
161     percCondOutcomes=zeros(201,12);
162
163     for ci=0:200
164
165       percInfection(ci+1,1:numberRounds+1)=...
166            prctile(saveInfectionRate',ci/2);
167
168       percSumOutcomes(ci+1,1)=...
169            prctile(saveSumOutcomes,ci/2);
170
171
172       if (bconditionalOutcomes)
173          percCondOutcomes(ci+1,1:12)=...
174               prctile(saveConditionalOutcomes',ci/2);
175       end
176     end
177     fn=strcat(saveFolder,saveName,"-----HalfPercentileInfectionRate.txt");
178     dlmwrite(fn,percInfection,'delimiter','\t');
179
180     fn=strcat(saveFolder,saveName,"-----HalfPercentileSumOutcome.txt");
181     dlmwrite(fn,percSumOutcomes,'delimiter','\t');
182
183     if (bconditionalOutcomes)
184         fn=strcat(saveFolder,saveName,"-----HalfPercentileConditionalOutcomes.
               txt");
185         dlmwrite(fn,percCondOutcomes,'delimiter','\t');
186     end
187 end
188
189 end
```

References

Woike, J. K., Hafenbrädl, S., Kanngiesser, P., & Hertwig, R. (2022). The transmission game: Testing behavioral interventions in a pandemic-like simulation. *Science Advances*, *8*(8), eabk0428. https://doi.org/10.1126/sciadv.abk0428