

Triage Against the Machine: Can AI Reason Deliberatively?

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Define functions

Maybe move this to it's own package...

```
create_file_path <- function(provider, model, survey, file_type) {  
  file.path("llm_data", provider, model, survey, paste0(file_type, ".csv"))  
}
```

Get available LLMs

```
# Read the CSV file into a data frame and remove duplicates  
models <- read_csv("private/llms_v2.csv", show_col_types = FALSE) %>%  
  distinct(provider, model)  
  
# Initialize a vector to store the 'has_data' values  
has_data_flags <- logical(nrow(models))  
  
# Iterate over each row in the models data frame  
for (i in 1:nrow(models)) {  
  provider <- models$provider[i]  
  model <- models$model[i]  
  
  # Create the path  
  path <- paste0("llm_data/", provider, "/", model)  
  
  # Check if the path exists and set the 'has_data' flag accordingly  
  has_data_flags[i] <- file.exists(path)  
}  
  
# Add the 'has_data' column to the models data frame  
models <- models %>%  
  mutate(has_data = has_data_flags)  
  
# Print rows where has_data is TRUE  
if (any(models$has_data)) {  
  print(models %>% filter(has_data == TRUE))  
} else {  
  warn("No data available!")  
}  
  
## # A tibble: 3 x 3  
##   provider  model  has_data  
##   <chr>    <chr>  <lgl>
```

```
## 1 google      gemma2    TRUE
## 2 meta        llama3.2  TRUE
## 3 microsoft   phi4      TRUE
```

Get available surveys

```
# Read the sheet names of the Excel file
survey_names <- excel_sheets(SURVEY_FILE)

# remove invalid and "template"
survey_names <- survey_names[!grepl("^~", survey_names) & survey_names != "template"]

print(survey_names)

## [1] "upsala_speaks"      "fnqcj"              "acp"
## [4] "ccps"              "forestera"          "biobanking_mayo_ubc"
## [7] "zh_uster"          "zh_thalwil"         "zh_winterthur"
## [10] "ds_bellinzona"     "ds_aargau"          "fremantle"
## [13] "zukunft"           "bep"                "energy_futures"
## [16] "valsamoggia"       "gbr"                "auscj"
## [19] "swiss_health"

# Define the file types
file_types <- c("considerations", "policies", "reasons")
```

Read and format LLM data

```
# initialize an empty list to store the data frames
data_list <- list()
index <- 0

# iterate over each survey
for (survey_name in survey_names) {

  # iterate over each row in the models data frame where has_data is TRUE
  for (i in 1:nrow(models)) {
    if (models$has_data[i]) {
      provider <- models$provider[i]
      model <- models$model[i]

      # check if any file for the survey exists
      survey_path <- paste0("llm_data/", provider, "/", model, "/", survey_name, "/")
      if (!any(file.exists(paste0(survey_path, file_types, ".csv")))) {
        next
      }

      # Iterate over each file type
      for (file_type in file_types) {
        # Create the file path
        file_path <- create_file_path(provider, model, survey_name, file_type)
        index <- index + 1

        # Check if the file exists
        if (file.exists(file_path)) {
```

```

# Read the CSV file
temp_data <- read_csv(file_path, show_col_types = FALSE)

# Skip file if file exists but has no data
if (nrow(temp_data) == 0) {
  warn(paste0(file_path, " exists but has no data!"))
  break
}

meta <- c(
  "cuid",
  "created_at",
  "provider",
  "model",
  "temperature",
  "input_tokens",
  "output_tokens"
)

# Select the relevant columns based on file type
if (file_type == "considerations") {
  survey_data <- temp_data %>%
    rename_with( ~ paste0("C", seq_along(.)),
                 starts_with("C", ignore.case = FALSE))

  # add column "survey" to meta data
  survey_data <- survey_data %>%
    mutate(survey = survey_name) %>%
    relocate(survey, .after = model)
  meta <- c(meta, "survey")

  # Ensure survey_data has columns up to C50
  for (j in (ncol(survey_data) - length(meta) + 1):50) {
    survey_data[[paste0("C", j)]] <- as.numeric(NA)
  }

  # go to next file type
  next

} else if (file_type == "policies") {
  temp_data <- temp_data %>%
    select(cuid, starts_with("P", ignore.case = FALSE)) %>%
    rename_with( ~ paste0("P", seq_along(.)),
                 starts_with("P", ignore.case = FALSE))

  # Ensure temp_data has columns up to C50
  for (j in (ncol(temp_data)):10) {
    temp_data[[paste0("P", j)]] <- as.numeric(NA)
  }

} else if (file_type == "reasons") {
  temp_data <- temp_data %>%
    select(cuid, reason) %>%

```

```

      rename(R = reason)
    }

    # merge the data frames by 'cuid' and keep all rows
    survey_data <- full_join(survey_data, temp_data, by = c("cuid"))

  }
}

# Add the survey_data data frame to the list
if (exists("survey_data")) {
  data_list[[length(data_list) + 1]] <- survey_data

  # Remove the survey_data data frame to free up memory
  rm(survey_data)
}

}
}
}

## Warning: llm_data/meta/llama3.2/auscj/considerations.csv exists but has no
## data!

# Combine all data frames in the list into a single data frame
llm_data <- bind_rows(data_list)

# delete data_list from memory
rm(data_list)
rm(temp_data)

# Aggregate llm_data by provider, model, and survey and N the number of rows
llm_surveys <- llm_data %>%
  group_by(provider, model, survey) %>%
  summarise(N = n(), .groups = 'drop')

# Print the summary
print(llm_surveys)

## # A tibble: 56 x 4
##   provider model survey      N
##   <chr>    <chr> <chr>   <int>
## 1 google  gemma2 acp      10
## 2 google  gemma2 auscj    10
## 3 google  gemma2 bep     10
## 4 google  gemma2 biobanking_mayo_ubc 10
## 5 google  gemma2 ccps     10
## 6 google  gemma2 ds_aargau    10
## 7 google  gemma2 ds_bellinzona    10
## 8 google  gemma2 energy_futures    10
## 9 google  gemma2 fnqcj     10
## 10 google  gemma2 foresteria     9
## # i 46 more rows

```


6

[illegible]


```

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## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Number of categories should be increased in order to count frequencies.

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## The determinant of the smoothed correlation was zero.
## This means the objective function is not defined.
## Chi square is based upon observed residuals.

## The determinant of the smoothed correlation was zero.
## This means the objective function is not defined for the null model either.
## The Chi square is thus based upon observed correlations.

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[illegible]

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## P10 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
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## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C12 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C26 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C31 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C32 had no variance and was deleted but still is counted in the score

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## Item = C33 had no variance and was deleted but still is counted in the score

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## Item = C34 had no variance and was deleted but still is counted in the score

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## Item = C35 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C36 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

```

[illegible]

[illegible]


```

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## Item = C34 had no variance and was deleted but still is counted in the score

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## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
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## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
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## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
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## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C2 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C8 had no variance and was deleted but still is counted in the score

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## Item = C13 had no variance and was deleted but still is counted in the score

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## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

```



```

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## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

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## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Number of categories should be increased in order to count frequencies.

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```


[illegible]

```

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
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## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

```



```

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## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Number of categories should be increased in order to count frequencies.

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## The determinant of the smoothed correlation was zero.
## This means the objective function is not defined.
## Chi square is based upon observed residuals.

## The determinant of the smoothed correlation was zero.
## This means the objective function is not defined for the null model either.
## The Chi square is thus based upon observed correlations.

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

```



```

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P5
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P6
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P7
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C5 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C13 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C30 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C36 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

```



```

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## The determinant of the smoothed correlation was zero.
## This means the objective function is not defined.
## Chi square is based upon observed residuals.

## The determinant of the smoothed correlation was zero.
## This means the objective function is not defined for the null model either.
## The Chi square is thus based upon observed correlations.

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

```


[illegible]

```

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C33 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Number of categories should be increased in order to count frequencies.

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

```



```

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P6
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P7
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in log(det(m.inv.r)): NaNs produced

## Warning in log(det(r)): NaNs produced

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C34 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C35 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C36 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score

```



```

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C32 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C33 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C34 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C35 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C36 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score

```



```

## P10 had no variance and was deleted but still is counted in the score
## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done
## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C2 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C5 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C32 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C33 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C34 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C35 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C36 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

```


[illegible]


```
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
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## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
  
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8  
## had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9  
## had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =  
## P10 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C33 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C34 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C35 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C36 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C37 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
```



```

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## In factor.stats, I could not find the RMSEA upper bound . Sorry about that

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C2 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C34 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C35 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C36 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score

```

[illegible]

```

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Number of categories should be increased in order to count frequencies.

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

```

```
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P7
## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score
## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done
## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C21 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C22 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C23 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C24 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
```


[illegible]


```

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Number of categories should be increased in order to count frequencies.

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## The determinant of the smoothed correlation was zero.
## This means the objective function is not defined.
## Chi square is based upon observed residuals.

## The determinant of the smoothed correlation was zero.
## This means the objective function is not defined for the null model either.
## The Chi square is thus based upon observed correlations.

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

```



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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Number of categories should be increased in order to count frequencies.

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

```



```

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

```



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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## In factor.stats, I could not find the RMSEA upper bound . Sorry about that

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C25 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C26 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C27 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C28 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C29 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C30 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C31 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C32 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C33 had no variance and was deleted but still is counted in the score

```

```

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C34 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C35 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C36 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

```

```

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P7
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

```



```
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P6
## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P7
## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score
## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done
## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score
## Number of categories should be increased in order to count frequencies.
## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done
## The determinant of the smoothed correlation was zero.
## This means the objective function is not defined.
## Chi square is based upon observed residuals.
## The determinant of the smoothed correlation was zero.
```



```

## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P7
## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score
## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done
## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C34 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C35 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C36 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

```


[illegible]


```
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =  
## P10 had no variance and was deleted but still is counted in the score  
  
## In factor.stats, I could not find the RMSEA upper bound . Sorry about that  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C31 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C32 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C33 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C34 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C35 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C36 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C37 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C38 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C39 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C40 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C41 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C42 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C43 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C44 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C45 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C46 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C47 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C48 had no variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C49 had no variance and was deleted but still is counted in the score  
  
## Warning inalpha(considerations_data, check.keys = TRUE, warnings = FALSE):  
## Item = C50 had no variance and was deleted but still is counted in the score
```



```

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C34 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C35 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C36 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

```


[illegible]

```

## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C4 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C13 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C34 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C35 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C36 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

```


[illegible]

```

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P7
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in log(det(r)): NaNs produced

## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C10 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C21 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C22 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C23 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C24 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C25 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C26 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C27 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C28 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C29 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):

```

[illegible]


```

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## In factor.stats, I could not find the RMSEA upper bound . Sorry about that

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## The determinant of the smoothed correlation was zero.
## This means the objective function is not defined.
## Chi square is based upon observed residuals.

```



```

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):

```



```

## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score
## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C1 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C36 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C41 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C42 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C43 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C44 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C45 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C46 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C47 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C48 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C49 had no variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C50 had no variance and was deleted but still is counted in the score
## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

```


[illegible]


```

## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C25 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C26 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C27 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C28 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C29 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C30 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C31 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C32 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C33 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C34 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C35 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C36 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C37 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C38 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C39 had no variance and was deleted but still is counted in the score

## Warning in alpha(considerations_data, check.keys = TRUE, warnings = FALSE):
## Item = C40 had no variance and was deleted but still is counted in the score

```



```

## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P8
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item = P9
## had no variance and was deleted but still is counted in the score

## Warning in alpha(policies_data, check.keys = TRUE, warnings = FALSE): Item =
## P10 had no variance and was deleted but still is counted in the score

## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

## # A tibble: 56 x 5
##   provider_model survey          N alpha_considerations alpha_policies
##   <chr>          <chr>      <int>          <dbl>          <dbl>
## 1 google/gemma2 uppsala_speaks    10          0.842          0.698
## 2 google/gemma2 fnqcj          10          0.883          0.442
## 3 google/gemma2 acp            10          0.866          0.454
## 4 google/gemma2 ccps            10          0.857          0.555
## 5 google/gemma2 forestera         9          0.885          0.741
## 6 google/gemma2 biobanking_mayo_ubc 10          0.830          0.703
## 7 google/gemma2 zh_uster          10          0.833          0.608
## 8 google/gemma2 zh_thalwil         10          0.849          0.657
## 9 google/gemma2 zh_winterthur       10          0.771          0.459
## 10 google/gemma2 ds_bellinzona      10          0.815          0.599
## # i 46 more rows

```

Check alpha results per model

```

# Aggregate alpha_results by model and calculate summary statistics
alpha_summary <- alpha_results %>%
  group_by(provider_model) %>%
  summarise(
    min_alpha_considerations = min(alpha_considerations, na.rm = TRUE),
    max_alpha_considerations = max(alpha_considerations, na.rm = TRUE),
    mean_alpha_considerations = mean(alpha_considerations, na.rm = TRUE),
    std_alpha_considerations = sd(alpha_considerations, na.rm = TRUE),
    min_alpha_policies = min(alpha_policies, na.rm = TRUE),
    max_alpha_policies = max(alpha_policies, na.rm = TRUE),
    mean_alpha_policies = mean(alpha_policies, na.rm = TRUE),
    std_alpha_policies = sd(alpha_policies, na.rm = TRUE)
  )

# Print the summary
print(alpha_summary)

```

```

## # A tibble: 3 x 9
##   provider_model min_alpha_considerations max_alpha_considerations
##   <chr>          <dbl>          <dbl>
## 1 google/gemma2    0.771          0.908
## 2 meta/llama3.2    0.669          0.943
## 3 microsoft/phi4    0.752          0.955

```

```
## # i 6 more variables: mean_alpha_considerations <dbl>,
## #   std_alpha_considerations <dbl>, min_alpha_policies <dbl>,
## #   max_alpha_policies <dbl>, mean_alpha_policies <dbl>,
## #   std_alpha_policies <dbl>
```

Define aggregation functions

```
# Function to calculate mode of data, same as stat_function
calc_mode <- function(data) {
  as.numeric(names(sort(table(data), decreasing = TRUE)[1]))
}

bootstrap_mode <- function(data, n_bootstrap = 1000) {

  # Return NA if data contains any NA
  if (any(is.na(data))) {
    return(NA)
  }

  # Define the statistic function for bootstrapping to find mode
  stat_function <- function(data, indices) {
    as.numeric(names(sort(table(data[indices]), decreasing = TRUE)[1]))
  }

  # Perform bootstrap
  results <- boot(data = data, statistic = stat_function, R = n_bootstrap)

  # Calculate bootstrapped mode
  b_mode <- calc_mode(results$t)

  # Return the bootstrapped modes
  return(b_mode)
}

calculate_mode <- function(x) {
  if (length(x) == 0) {
    return(NA)
  }
  ux <- unique(x)
  ux[which.max(tabulate(match(x, ux)))]
}

aggregate_llm_considerations <- function(considerations) {
  # Ensure there are columns to aggregate
  if (ncol(considerations) == 0) {
    return(tibble())
  }

  # Calculate the mode for each column
  mode_considerations <- considerations %>%
    summarise(across(everything(), bootstrap_mode))

  return(mode_considerations)
}
```

```

}

aggregate_llm_policies <- function(policies) {
  # Ensure there are columns to aggregate
  if (nrow(policies) == 0) {
    return(tibble())
  } else if (nrow(policies) == 1) {
    return(policies)
  }

  # Remove columns with NAs
  valid_policies <- policies[, colSums(is.na(policies)) != nrow(policies)]

  # Convert the policies to a ranked matrix
  ranked_matrix <- as.matrix(valid_policies)

  # Define the number of winners to all - 1 policies
  # stv complains if winners == all policies
  num_winners <- ncol(valid_policies) - 1

  # Run the Single Transferable Vote algorithm
  results <- stv(ranked_matrix, num_winners, quiet = TRUE)

  # add last policy to ranked result
  last_policy <- setdiff(colnames(valid_policies), results$selected)
  ranked_policies <- c(results$selected, last_policy)

  policy_order <- colnames(valid_policies)

  order <- match(policy_order, ranked_policies)

  # Calculate the number of missing values needed to reach length 10
  missing_columns <- ncol(policies) - length(order)

  # Fill in the missing values with NA
  order <- c(order, rep(NA, missing_columns))

  # Create a new data.frame with aggregated results
  policy_ranks <- data.frame(t(order))
  colnames(policy_ranks) <- colnames(policies)

  return(policy_ranks)
}

```

Aggregate considerations and preferences

```

aggregate_llm_data <- function(data) {

  # Initialize an empty list to store the alpha results
  aggregation_results <- list()

  # Iterate over each unique provider/model/survey combination

```

```

for (row in 1:nrow(llm_surveys)) {
  provider <- llm_surveys[row, ]$provider
  model <- llm_surveys[row, ]$model
  survey <- llm_surveys[row, ]$survey
  N <- llm_surveys[row, ]$N

  # Filter the data for the current survey
  survey_data <- data %>%
    filter(provider == !!provider, model == !!model, survey == !!survey)

  # Calculate Cronbach's Alpha for considerations (C1..C50)
  considerations_data <- survey_data %>% select(starts_with("C", ignore.case = FALSE))

  aggregated_considerations <- aggregate_llm_considerations(considerations_data)

  # Calculate Cronbach's Alpha for policies (P1..P10)
  policies_data <- survey_data %>% select(starts_with("P", ignore.case = FALSE))

  aggregated_policies <- aggregate_llm_policies(policies_data)

  # store the results in the list
  aggregation_result <- tibble(
    provider = provider,
    model = model,
    survey = survey,
    N = N
  )

  aggregation_result <- aggregation_result %>%
    bind_cols(aggregated_considerations) %>%
    bind_cols(aggregated_policies)

  aggregation_results[[length(aggregation_results) + 1]] <- aggregation_result
}

# Combine all results into a single data frame
aggregation_results <- bind_rows(aggregation_results)

return(aggregation_results)
}

time_start <- Sys.time()
llm_data_aggregated <- aggregate_llm_data(llm_data)
time_end <- Sys.time()
elapsed_time <- difftime(time_end, time_start, units = "auto")

print(paste("LLM data aggregation completed in", round(as.numeric(elapsed_time),2), units(elapsed_time)))

## [1] "LLM data aggregation completed in 1.99 mins"

```

```

print(llm_data_aggregated)

## # A tibble: 56 x 64
##   provider model survey      N    C1    C2    C3    C4    C5    C6    C7    C8
##   <chr>      <chr> <chr> <int> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
## 1 google   gemma2 acp      10     4     7     9     7     6     6    11    10
## 2 google   gemma2 auscj     10     4     6     3     3     5     2     7     2
## 3 google   gemma2 bep      10     1     1     7     6     1     2     3     1
## 4 google   gemma2 bioban~   10     7     6     3     9    11     6     1     9
## 5 google   gemma2 ccps      10     1     4     2     9     3     2     5     8
## 6 google   gemma2 ds_aar~   10     1     7     7     6     2     2     3     1
## 7 google   gemma2 ds_bel~   10     1     7     6     2     3     3     1     2
## 8 google   gemma2 energy~   10     8     9    10     7    10     4     7     4
## 9 google   gemma2 fnqcj     10     1     6     5     6     4     8     9     8
## 10 google  gemma2 forest~    9     2     4     7     7     8     3    10     4
## # i 46 more rows
## # i 52 more variables: C9 <dbl>, C10 <dbl>, C11 <dbl>, C12 <dbl>, C13 <dbl>,
## #   C14 <dbl>, C15 <dbl>, C16 <dbl>, C17 <dbl>, C18 <dbl>, C19 <dbl>,
## #   C20 <dbl>, C21 <dbl>, C22 <dbl>, C23 <dbl>, C24 <dbl>, C25 <dbl>,
## #   C26 <dbl>, C27 <dbl>, C28 <dbl>, C29 <dbl>, C30 <dbl>, C31 <dbl>,
## #   C32 <dbl>, C33 <dbl>, C34 <dbl>, C35 <dbl>, C36 <dbl>, C37 <dbl>,
## #   C38 <dbl>, C39 <dbl>, C40 <dbl>, C41 <dbl>, C42 <dbl>, C43 <dbl>, ...

output_path <- paste(OUTPUT_DIR, "llm_data_aggregated.csv", sep = "/")

# write summary to file
write_csv(llm_data_aggregated, output_path)
print(paste("Results written to", output_path))

## [1] "Results written to analysis/llm_data_aggregated.csv"

```

Read and format human data

```

# Import the CSV file into a data frame
human_data <- read_csv("data/total_dataset_clean.csv", show_col_types = FALSE)

# Rename columns to be consistent with LLM data
human_data <- human_data %>%
  rename_with( ~ sub("^U0|^U", "C", .), starts_with("U", ignore.case = FALSE)) %>%
  rename_with( ~ sub("^Pref", "P", .), starts_with("Pref", ignore.case = FALSE)) %>%
  filter(Study != "Sydney CC Adaptation" & Study != "WA Biobank")

# Read the mapping file
study_survey_map <- read_csv("data/study_survey_map.csv", show_col_types = FALSE)

# Add a new column 'Survey' to human_data by matching 'Study' with 'survey'
human_data <- human_data %>%
  left_join(study_survey_map, by = c("Study" = "study")) %>%
  relocate(survey, .after = "Study")

# rename column names for consistency
# colnames(human_data) <- lapply(colnames(human_data), tolower)

human_data

```

```
## # A tibble: 984 x 70
##   Datacheck StudyID Study  survey CaseID Case  data_type StageID Stage_Analysis
##   <dbl>    <dbl> <chr>  <chr>   <dbl> <chr> <chr>         <dbl> <chr>
## 1         1        1 Uppsa~ uppsa~     1 Acti~ Likert         1 Pre-Delib
## 2         1        1 Uppsa~ uppsa~     1 Acti~ Likert         1 Pre-Delib
## 3         1        1 Uppsa~ uppsa~     1 Acti~ Likert         1 Pre-Delib
## 4         1        1 Uppsa~ uppsa~     1 Acti~ Likert         1 Pre-Delib
## 5         1        1 Uppsa~ uppsa~     1 Acti~ Likert         1 Pre-Delib
## 6         1        1 Uppsa~ uppsa~     1 Acti~ Likert         1 Pre-Delib
## 7         1        1 Uppsa~ uppsa~     1 Acti~ Likert         1 Pre-Delib
## 8         1        1 Uppsa~ uppsa~     1 Acti~ Likert         1 Pre-Delib
## 9         1        1 Uppsa~ uppsa~     1 Acti~ Likert         1 Pre-Delib
## 10        1        1 Uppsa~ uppsa~     1 Acti~ Likert         1 Pre-Delib
## # i 974 more rows
## # i 61 more variables: PNum <dbl>, C1 <dbl>, C2 <dbl>, C3 <dbl>, C4 <dbl>,
## #   C5 <dbl>, C6 <dbl>, C7 <dbl>, C8 <dbl>, C9 <dbl>, C10 <dbl>, C11 <dbl>,
## #   C12 <dbl>, C13 <dbl>, C14 <dbl>, C15 <dbl>, C16 <dbl>, C17 <dbl>,
## #   C18 <dbl>, C19 <dbl>, C20 <dbl>, C21 <dbl>, C22 <dbl>, C23 <dbl>,
## #   C24 <dbl>, C25 <dbl>, C26 <dbl>, C27 <dbl>, C28 <dbl>, C29 <dbl>,
## #   C30 <dbl>, C31 <dbl>, C32 <dbl>, C33 <dbl>, C34 <dbl>, C35 <dbl>, ...
```

Original DRI analysis

```
dri_calc <- function(data, v1, v2) {
  lambda <- 1 - (sqrt(2) / 2)
  dri <- 2 * (((1 - mean(abs((data[[v1]] - data[[v2]])) / sqrt(2)
  ))) - (lambda)) / (1 - (lambda))) - 1

  return(dri)
}

get_IC <- function(data, survey, case) {

  # loop through analysis stages (pre/post)
  for (stage in 1:max(data$StageID)) {

    # select specific data to analyse
    data_stage <- data %>% filter(StageID == stage)

    # make sure there's data to analyze
    if (nrow(data_stage) > 0) {
      # get participant numbers/ids
      PNums <- data_stage$PNum

      # variables for reading COLUMN data
      # Q is a list considerations (Likert scale)
      # - there are up to 50 questions
      # R is a list ratings (rankings)
      Q <- data_stage %>% select(C1:C50)
      R <- data_stage %>% select(P1:P10)

      # remove all NA columns (in case there are less than 50
      # consideration questions
```



```

Q <- Q[, colSums(is.na(Q)) != nrow(Q)]
R <- R[, colSums(is.na(R)) != nrow(R)]

# transpose data
Q <- t(Q)
R <- t(R)

# format data as data frame
Q <- as.data.frame(Q)
R <- as.data.frame(R)

# name columns with participant numbers
colnames(Q) <- PNums
colnames(R) <- PNums

# obtain a list of correlations without duplicates
# cor() returns a correlation matrix between Var1 and Var2
# Var1 and Var2 are the variables being correlated
# Freq is the correlation
QWrite <- subset(as.data.frame(as.table(cor(Q, method = "spearman"))),
  match(Var1, names(Q)) > match(Var2, names(Q)))

RWrite <- subset(as.data.frame(as.table(cor(R, method = "spearman"))),
  match(Var1, names(R)) > match(Var2, names(R)))

# initialize the output in the first iteration
if (stage == 1) {
  IC <- data.frame("P_P" = paste0(QWrite$Var1, '-', QWrite$Var2))
  IC$P1 <- as.numeric(as.character(QWrite$Var1))
  IC$P2 <- as.numeric(as.character(QWrite$Var2))
}

# prepare QWrite
QWrite <- as.data.frame(QWrite$Freq)
names(QWrite) <- paste0("Q", stage)

# prepare RWrite for merge
RWrite <- as.data.frame(RWrite$Freq)
names(RWrite) <- paste0('R', stage)

# merge
IC <- cbind(IC, QWrite, RWrite)
}

}

# append case & study info
IC$survey <- survey
IC$case <- case

## IC Points calculations ##
IC$IC_PRE <- 1 - abs((IC$R1 - IC$Q1) / sqrt(2))
IC$IC_POST <- 1 - abs((IC$R2 - IC$Q2) / sqrt(2))

```

```

    return(IC)
  }

get_ind_DRI <- function(IC) {

  Plist <- unique(c(IC$P1, IC$P2))

  Plist <- Plist[order(Plist)]

  DRIInd <- data.frame('participant' = Plist)
  DRIInd$survey <- survey
  DRIInd$case <- data_case_study$Case[1]

  DRIInd <- DRIInd[c("survey", "case", "participant")]

  #Add individual-level metrics
  for (i in 1:length(Plist)) {
    DRIInd$DRIPre[i] <- dri_calc(
      data = IC %>% filter(P1 == Plist[i] | P2 == Plist[i]),
      v1 = 'R1',
      v2 = 'Q1'
    )
    DRIInd$DRIPost[i] <- dri_calc(
      data = IC %>% filter(P1 == Plist[i] | P2 == Plist[i]),
      v1 = 'R2',
      v2 = 'Q2'
    )
  }

  return(DRIInd)
}

get_case_DRI <- function(IC, type="human_only") {

  ## Group DRI level ##
  DRI_PRE <- dri_calc(data = IC, v1 = 'R1', v2 = 'Q1')
  DRI_POST <- dri_calc(data = IC, v1 = 'R2', v2 = 'Q2')

  #CaseDRI Dataframe
  DRI.Case <- data.frame(
    survey = survey,
    case = case,
    type = type,
    DRI_PRE,
    DRI_POST
  )

  #Tests for groups
  DRIOverallSig <- wilcox.test(IC$IC_POST,
                               IC$IC_PRE,
                               paired = TRUE,
                               alternative = "greater")

```

```

DRIOverallSig_twoside <- wilcox.test(IC$IC_POST,
                                     IC$IC_PRE,
                                     paired = TRUE,
                                     alternative = "two.side")
#cumdist_pre_post <- cum_test(IC$IC_PRE, IC$IC_POST, nboots = 1000)not necessary

#Adding the results to case data
DRI.Case$DRI_one_tailed_p <- DRIOverallSig$p.value
DRI.Case$DRI_twoside_p <- DRIOverallSig_twoside$p.value

return(DRI.Case)
}

mini_publics <- human_data %>%
  group_by(survey, Case) %>%
  summarise(.groups = "drop")

get_llm_data <- function(provider, model, survey) {
  llm_participant <- llm_data_aggregated %>%
    filter(provider == !!provider, model == !!model, survey == !!survey)
  return(llm_participant)
}

get_ind_LLM_DRI <- function(data, provider, model) {

  human_DRI <- data %>%
    filter(participant != 0)

  llm_DRI <- data %>%
    filter(participant == 0) %>%
    select(-participant) %>%
    mutate(provider = !!provider, model = !!model) %>%
    relocate(provider, model, .before = 1)

  llm_DRI$DRIPre_mean_human <- mean(human_DRI$DRIPre)
  llm_DRI$DRIPre_min_human <- min(human_DRI$DRIPre)
  llm_DRI$DRIPost_mean_human <- mean(human_DRI$DRIPost)
  llm_DRI$DRIPost_min_human <- min(human_DRI$DRIPost)

  llm_DRI$DRIPre_better_than_average_human <- mean(human_DRI$DRIPre) < llm_DRI$DRIPre
  llm_DRI$DRIPost_better_than_average_human <- mean(human_DRI$DRIPost) < llm_DRI$DRIPost

  return(llm_DRI)
}

add_llm_participant <- function(data, provider, model, survey) {

  # print(paste("adding", paste(provider, model, survey, sep = "/"), "to human data."))

  # get llm data
  llm_participant <- llm_data_aggregated %>%
    filter(provider == !!provider, model == !!model, survey == !!survey)

```

```

# check if it exists
if (nrow(llm_participant) == 0) {
  warn(paste("No human participant found for", paste(provider, model, survey, sep = "/")))
}

# create 2 participants, PRE and POST
llm_participants <- bind_rows(llm_participant, llm_participant)
llm_participants$PNum <- 0 # PNum = 0 is LLM
  llm_participants$StageID <- c(1,2)

data_with_llm <- bind_rows(data, llm_participants)

return(data_with_llm)
}

DRIInd.LLMs <- list()

# for each study [1:N], N = 26
for (case_study in 1:nrow(mini_publics)) {

  # select study data
  survey <- mini_publics[case_study, ]$survey
  case <- mini_publics[case_study, ]$Case

  # get human data for this case study
  data_case_study <- human_data %>% filter(survey == !!survey &
                                          Case == !!case)

  # intersubject correlations (IC)
  IC <- get_IC(data_case_study, survey, case)

  ## DRI ##
  DRI.Case <- get_case_DRI(IC)

  ## INDIVIDUAL DRI ##
  DRIInd <- get_ind_DRI(IC)

  # Global dataframes for depositing results
  # initialize *.Global
  if (case_study == 1) {
    IC.Global <- IC
    DRIInd.Global <- DRIInd
    DRI.Global <- DRI.Case
  }

  # append to *.Global
  else {
    IC.Global <- rbind(IC.Global, IC)
    DRIInd.Global <- rbind(DRIInd.Global, DRIInd)
    DRI.Global <- rbind(DRI.Global, DRI.Case)
  }
}

```

```

}

# check if there are LLM data for this survey
llms <- llm_surveys %>% filter(survey == !!survey)
if (nrow(llms) == 0) {
  next
}

# TODO: skip problematic surveys for now
if (survey == "zh_winterthur") {
  next
}

for (llm in 1:nrow(llms)) {

  provider <- llms[llm,]$provider
  model <- llms[llm,]$model
  type <- paste0("human+", paste(provider, model, sep = "/"))

  data_with_llm <- add_llm_participant(data_case_study, provider, model, survey)

  IC.LLM <- get_IC(data_with_llm, survey, case)
  DRI.Case.LLM <- get_case_DRI(IC.LLM, type)
  DRIInd.LLM <- get_ind_DRI(IC.LLM)
  DRIInd.LLM.Model <- get_ind_LLM_DRI(DRIInd.LLM, provider, model)

  DRIInd.LLMs[[length(DRIInd.LLMs) + 1]] <- DRIInd.LLM.Model

  DRI.Global <- rbind(DRI.Global, DRI.Case.LLM)

}

} # end for each case study

DRIInd.LLMs <- bind_rows(DRIInd.LLMs)

# add delta column
DRI.Global <- DRI.Global %>%
  mutate(DRI_DELTA = DRI_POST - DRI_PRE)

# write summary to file
write_csv(DRIInd.LLMs, paste(OUTPUT_DIR, "DRIInd_LLMs.csv", sep = "/"))
write_csv(DRI.Global, paste(OUTPUT_DIR, "DRI_global.csv", sep = "/"))

models %>%
  group_by(provider) %>%
  summarize()

## # A tibble: 9 x 1
##   provider

```

```
## <chr>
## 1 anthropic
## 2 cohere
## 3 deepseek
## 4 google
## 5 meta
## 6 microsoft
## 7 mistralai
## 8 openai
## 9 qwen
```