

# 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, paste0(survey, "_", 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("data/surveys_v2.xlsx")

print(survey_names)

## [1] "0.Template"      "1.Uppsala Speaks"  "2.FNQCJ"
## [4] "3.ACP"           "4.SydCC"          "5.ForestERA"
## [7] "6.Biobanking"    "7.Fremantle_Bridge" "8.CCPS"
## [10] "9.Energy_Futures" "10.Valsamoggia"    "11.GBR_Futures"
## [13] "12.AusCJ"

# 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",
  "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/llama3.2/12.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_data_summary <- llm_data %>%
  group_by(provider, model, survey) %>%
  summarise(N = n(), .groups = 'drop')

# Print the summary
print(llm_data_summary)

## # A tibble: 30 x 4
##   provider model survey          N
##   <chr>    <chr> <chr>      <int>
## 1 google  gemma2 1.Uppsala Speaks    10
## 2 google  gemma2 10.Valsamoggia    10
## 3 google  gemma2 11.GBR_Futures    10
## 4 google  gemma2 12.AusCJ          10
## 5 google  gemma2 2.FNQCJ           10
## 6 google  gemma2 3.ACP             10
## 7 google  gemma2 4.SydCC           10
## 8 google  gemma2 5.ForestERA        8
## 9 google  gemma2 6.Biobanking        9
## 10 google  gemma2 7.Fremantle_Bridge 10
## # i 20 more rows

```

## Calculate Cronbach's Alpha

```

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

```

[illegible]

```

## 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

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

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

## Warning in alpha(policies_data, check.keys = TRUE): 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(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.

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

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

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

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

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

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

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

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

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

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

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

## Warning in alpha(policies_data, check.keys = TRUE): 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

## Warning in alpha(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.

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

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

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

## Warning in alpha(considerations_data, check.keys = TRUE): Some items were negatively correlated with
## This is indicated by a negative sign for the variable name.

## 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

```





```

## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C20 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C26 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C34 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C35 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C39 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C40 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C41 had no
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## Warning in alpha(considerations_data, check.keys = TRUE): Item = C42 had no
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## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C46 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C47 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C48 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C49 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C50 had no
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## Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done
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```



[illegible]

```

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## and was deleted but still is counted in the score

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## and was deleted but still is counted in the score

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

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

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## In smc, smcs < 0 were set to .0
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## Warning in alpha(considerations_data, check.keys = TRUE): Item = C14 had no
## variance and was deleted but still is counted in the score

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

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

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

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

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## variance and was deleted but still is counted in the score

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## variance and was deleted but still is counted in the score

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## variance and was deleted but still is counted in the score

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## variance and was deleted but still is counted in the score

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

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

## Warning in alpha(considerations_data, check.keys = TRUE): Item = C50 had no
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```



```

## In factor.stats, I could not find the RMSEA upper bound . Sorry about that
## Warning in alpha(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C37 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C38 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C39 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C40 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): Item = C49 had no
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## Warning in alpha(considerations_data, check.keys = TRUE): 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
## Warning in alpha(considerations_data, check.keys = TRUE): Some items were negatively correlated with
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## In smc, smcs < 0 were set to .0
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```





```

## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C37 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C38 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C39 had no
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## Warning in alpha(considerations_data, check.keys = TRUE): Item = C40 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C41 had no
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## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C46 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C47 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C48 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C49 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): 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
## Warning in alpha(considerations_data, check.keys = TRUE): Some items were negatively correlated with
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## In smc, smcs < 0 were set to .0
## In smc, smcs < 0 were set to .0

```



[illegible]

```

## Warning in alpha(policies_data, check.keys = TRUE): 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(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Warning in alpha(considerations_data, check.keys = TRUE): Some items were negatively correlated with
## This is indicated by a negative sign for the variable name.

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



```

## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C35 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C36 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C37 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C38 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C39 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C40 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C41 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C42 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C43 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C44 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C45 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C46 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C47 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C48 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C49 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): 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
## Warning in alpha(considerations_data, check.keys = TRUE): Some items were negatively correlated with
## This is indicated by a negative sign for the variable name.
## 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

```



[illegible]



```

## Warning in alpha(policies_data, check.keys = TRUE): Item = P10 had no variance
## and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE): Matrix was not positive
## definite, smoothing was done

## Warning in alpha(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.

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

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

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

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

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

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

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

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

## Warning in alpha(considerations_data, check.keys = TRUE): 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 for the null model either.
## The Chi square is thus based upon observed correlations.

## Warning in alpha(considerations_data, check.keys = TRUE): Some items were negatively correlated with
## This is indicated by a negative sign for the variable name.

## 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
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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

```

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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  
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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): Item = P8 had no variance  
## and was deleted but still is counted in the score  
  
## Warning in alpha(policies_data, check.keys = TRUE): Item = P9 had no variance  
## and was deleted but still is counted in the score  
  
## Warning in alpha(policies_data, check.keys = TRUE): 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  
  
## Warning in alpha(policies_data, check.keys = TRUE): Some items were negatively correlated with the f  
## This is indicated by a negative sign for the variable name.  
  
## In smc, smcs < 0 were set to .0  
## In smc, smcs < 0 were set to .0  
  
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C43 had no  
## variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C44 had no  
## variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C45 had no  
## variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C46 had no  
## variance and was deleted but still is counted in the score  
  
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C47 had no
```

[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

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

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

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

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

## Warning in alpha(policies_data, check.keys = TRUE): 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(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.

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

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

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

## Warning in alpha(considerations_data, check.keys = TRUE): Some items were negatively correlated with
## This is indicated by a negative sign for the variable name.

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

```



```

## and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE): Item = P9 had no variance
## and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE): 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(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C5 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C39 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C40 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C41 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C42 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C43 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C44 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C45 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C46 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C47 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C48 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C49 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): 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
## Warning in alpha(considerations_data, check.keys = TRUE): Some items were negatively correlated with
## This is indicated by a negative sign for the variable name.
## 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
## 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

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

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

## Warning in alpha(policies_data, check.keys = TRUE): 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(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.

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

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

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

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

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

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

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

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

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

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

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

## Warning in alpha(considerations_data, check.keys = TRUE): Item = C50 had no

```

[illegible]

```

## 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(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C37 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C38 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C39 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C40 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C41 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C42 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C43 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C44 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C45 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C46 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C47 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C48 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C49 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): 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
## Warning in alpha(considerations_data, check.keys = TRUE): Some items were negatively correlated with
## This is indicated by a negative sign for the variable name.
## 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

```



```

## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C36 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C37 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C38 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C39 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C40 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C41 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C42 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C43 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C44 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C45 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C46 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C47 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C48 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C49 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): 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
## Warning in alpha(considerations_data, check.keys = TRUE): Some items were negatively correlated with
## This is indicated by a negative sign for the variable name.
## 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
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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
## 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): Item = P8 had no variance
## and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE): Item = P9 had no variance
## and was deleted but still is counted in the score
## Warning in alpha(policies_data, check.keys = TRUE): 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(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.
## 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): Item = C46 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C47 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C48 had no
## variance and was deleted but still is counted in the score
## Warning in alpha(considerations_data, check.keys = TRUE): Item = C49 had no
```

[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

## Warning in alpha(policies_data, check.keys = TRUE): 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(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.

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

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

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

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

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

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

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

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

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

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

```





```

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

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

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

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

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

## Warning in alpha(policies_data, check.keys = TRUE): 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

## Warning in alpha(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.

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

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

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

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

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

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

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

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

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

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

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

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

## Warning in alpha(considerations_data, check.keys = TRUE): Item = C47 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
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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

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

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

## Warning in alpha(policies_data, check.keys = TRUE): 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

## Warning in alpha(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.

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

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

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

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

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

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

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

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

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

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

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

## Warning in alpha(policies_data, check.keys = TRUE): 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(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.

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

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

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

## Warning in alpha(considerations_data, check.keys = TRUE): Some items were negatively correlated with
## This is indicated by a negative sign for the variable name.

## 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 factor.stats, I could not find the RMSEA upper bound . Sorry about that
## Warning in alpha(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Warning in alpha(considerations_data, check.keys = TRUE): Some items were negatively correlated with
## This is indicated by a negative sign for the variable name.

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

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

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

## Warning in alpha(policies_data, check.keys = TRUE): 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(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.

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

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

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

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

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

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

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

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

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

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

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

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

```

[illegible][illegible]

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

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

```
## Warning in alpha(policies_data, check.keys = TRUE): 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(policies_data, check.keys = TRUE): Some items were negatively correlated with the f
## This is indicated by a negative sign for the variable name.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Warning in alpha(considerations_data, check.keys = TRUE): Some items were negatively correlated with
## This is indicated by a negative sign for the variable name.

## 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

```



```
##      <chr>          <chr>          <int>          <dbl>          <dbl>
## 1 google/gemma2 1.Uppsala Speaks      10      0.882      0.671
## 2 google/gemma2 2.FNQCJ              10      0.913      0.407
## 3 google/gemma2 3.ACP                10      0.859      0.668
## 4 google/gemma2 4.SydCC              10      0.880      0.672
## 5 google/gemma2 5.ForestERA          8       0.883      0.782
## 6 google/gemma2 6.Biobanking         9       0.873      0.724
## 7 google/gemma2 7.Fremantle_Bridge  10      0.831      0.742
## 8 google/gemma2 8.CCPS              9       0.818      0.727
## 9 google/gemma2 9.Energy_Futures    10      0.850      0.686
## 10 google/gemma2 10.Valsamoggia      10      0.830      0.750
## # i 20 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 0.818          0.913
## 2 meta/llama3.2 0.836          0.930
## 3 microsoft/phi4 0.844          0.935
## # 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>
```

## Aggregate considerations and preferences

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

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
  mean_considerations <- considerations %>%
    summarise(across(everything(), calculate_mode))

  return(mean_considerations)
}

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

  # Calculate the mode for each column
  mean_policies <- policies %>%
    summarise(across(everything(), calculate_mode))

  return(mean_policies)
}

# Iterate over each unique provider/model combination
for (provider_model in unique(paste(llm_data$provider, llm_data$model, sep = "/"))) {
  # Filter the data for the current provider/model
  provider_model_data <- llm_data %>% filter(paste(provider, model, sep = "/") == provider_model)

  # Iterate over each survey
  for (survey_name in unique(provider_model_data$survey)) {
    # Filter the data for the current survey
    survey_data <- provider_model_data %>% filter(survey == !!survey_name)

    # 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_model = provider_model,
      survey = survey_name,

```

```

    N = nrow(considerations_data)
  )

  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)

rm(aggregation_result)
rm(considerations_data)
rm(policies_data)
rm(provider_model)
rm(aggregated_considerations)
rm(aggregated_policies)

print(aggregation_results)

## # A tibble: 30 x 63
##   provider_model survey      N    C1    C2    C3    C4    C5    C6    C7    C8
##   <chr>          <chr> <int> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
## 1 google/gemma2 1.Uppsala 10     6     6     4     5     5     3     4     7
## 2 google/gemma2 2.FNQ CJ 10     1     5     6     7     4     8     9     9
## 3 google/gemma2 3.ACP 10     3     8     9     6     6     7    10     9
## 4 google/gemma2 4.SydCC 10     6     6     1     1     1     2     7     6
## 5 google/gemma2 5.Fores~ 8     3     6     6     7     7     4     9     3
## 6 google/gemma2 6.Bioba~ 9     7     6     3     9    11     7     2     9
## 7 google/gemma2 7.Frema~ 10    11     2     3     9     7     6     2     3
## 8 google/gemma2 8.CCPS 9     1     4     2     8     3     2     4     8
## 9 google/gemma2 9.Energ~ 10     8     9    10     8     9     7     7     2
## 10 google/gemma2 10.Vals~ 10     6     7     6     8     3     9     3     6
## # i 20 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>, ...

```

## Calculate DRI