- **Effort/Validity**: Normal; TOMM Trial 1 = 48/50, TOMM Trial 2 = 50/50, RDS = >6, DCT = 4.3.

NEUROCOGNITIVE FINDINGS

General Cognitive Ability

Verbal Comprehension (i.e., the ability to verbalize meaningful concepts, think about verbal information, and express oneself using words) fell within the High Average and ranked at the 88th percentile. This indicates performance as good as or better than 88% of same-age peers from the general population.

A subset of intellectual functioning with reduced influences of working memory and processing speed fell within the Average and ranked at the 61th percentile. This indicates performance as good as or better than 61% of same-age peers from the general population.

Ethan's score on RBANS Total Index (composite indicator of general cognitive functioning) was Average. Fluid Reasoning (i.e., the ability to use reasoning to identify and apply solutions to problems) fell within the Average and ranked at the 42th percentile. This indicates performance as good as or better than 42% of same-age peers from the general population.

General intellectual ability fell within the Average and ranked at the 39th percentile. This indicates performance as good as or better than 39% of same-age peers from the general population.

The patient's ability to evaluate visual details understand spatial relations among objects and construct geometric design using models fell within the Low Average and ranked at the 23th percentile. This indicates performance as good as or better than 23% of same-age peers from the general population.

Working memory (i.e., the ability to consciously register maintain and manipulate auditory and visual information) fell within the Low Average and ranked at the 21th percentile. This indicates performance as good as or better than 21% of same-age peers from the general population.

General intellectual functioning that minimizes expressive language demands fell within the Low Average and ranked at the 19th percentile. This indicates performance as good as or better than 19% of same-age peers from the general population.

Index of cognitive processing proficiency that reduces crystallized knowledge verbal reasoning and fluid reasoning demands fell within the Below Average and ranked at the 8th percentile. This indicates performance as good as or better than 8% of same-age peers from the general population.

Ability to quickly use reasoning to identify and apply solutions to problems fell within the Below Average and ranked at the 6th percentile. This indicates performance as good as or better than 6% of same-age peers from the general population.

```
{r}
#| label: setup-iq
#| include: false
```

```
# Source R6 classes
source("R/DomainProcessorR6.R")
source("R/NeuropsychResultsR6.R")
source("R/DotplotR6.R")
source("R/TableGT_ModifiedR6.R")
source("R/score_type_utils.R")

# Filter by domain
domains <- c("General Cognitive Ability")

# Target phenotype
pheno <- "iq"

# Create R6 processor
processor_iq <- DomainProcessorR6$new(
  domains = domains,
  pheno = pheno,
  input_file = "data/neurocog.parquet"
)

# Load and process data
processor_iq$load_data()
processor_iq$filter_by_domain()

# Create the data object with original name for compatibility
iq <- processor_iq$data

# Process and export data using R6
processor_iq$select_columns()
processor_iq$save_data()

# Update the original object
iq <- processor_iq$data

# Load internal data to get standardized scale names
scale_var_name <- paste0("scales_", tolower(pheno))
if (!exists(scale_var_name)) {
  sysdata_path <- here::here("R", "sysdata.rda")
  if (file.exists(sysdata_path)) { load(sysdata_path, envir = .GlobalEnv) }
}
if (exists(scale_var_name)) {
  scales <- get(scale_var_name)
} else {
  warning(paste0("Scale variable '", scale_var_name, "' not found. Using empty
vector."))
  scales <- character(0)
}
```

```
# Filter the data directly without using NeurotypR
filter_data <- function(data, domain, scale) {
  # Filter by domain if provided
  if (!is.null(domain)) {
    data <- data[data$domain %in% domain, ]
  }

  # Filter by scale if provided
  if (!is.null(scale)) {
    data <- data[data$scale %in% scale, ]
  }

  return(data)
}

# Apply the filter function
data_iq <- filter_data(data = iq, domain = domains, scale = scales)
```

```
{r}
#| label: text-iq
#| cache: true
#| include: false

# Generate text using R6 class
results_processor <- NeuropsychResultsR6$new(
  data = data_iq,
  file = "_02-01_iq_text.qmd"
)
results_processor$process()
```

```
{r}
#| label: qtbl-iq
#| include: false
#|
# Table parameters
table_name <- "table_iq"
vertical_padding <- 0
multiline <- TRUE

# Get score types from the lookup table
score_type_map <- get_score_types_from_lookup(data_iq)

# Create a list of test names grouped by score type
score_types_list <- list()

# Process the score type map to group tests by score type
for (test_name in names(score_type_map)) {
```

```
  types <- score_type_map[[test_name]]
  for (type in types) {
    if (!type %in% names(score_types_list)) {
      score_types_list[[type]] <- character(0)
    }
    score_types_list[[type]] <- unique(c(score_types_list[[type]], test_name))
  }
}

# Get unique score types present
unique_score_types <- names(score_types_list)

# Define the score type footnotes
fn_list <- list()
if ("t_score" %in% unique_score_types) {
  fn_list$t_score <- "T score: Mean = 50 [50th‰], SD ± 10 [16th‰, 84th‰]"
}
if ("scaled_score" %in% unique_score_types) {
  fn_list$scaled_score <- "Scaled score: Mean = 10 [50th‰], SD ± 3 [16th‰,
84th‰]"
}
if ("standard_score" %in% unique_score_types) {
  fn_list$standard_score <- "Standard score: Mean = 100 [50th‰], SD ± 15
[16th‰, 84th‰]"
}

# Create groups based on test names that use each score type
grp_list <- score_types_list

# Define which groups support which score types (for dynamic footnotes)
dynamic_grp <- score_types_list

# Default source note if no score types are found
if (length(fn_list) == 0) {
  # Determine default based on pheno
  source_note <- "Standard score: Mean = 100 [50th‰], SD ± 15 [16th‰, 84th‰]"
} else {
  source_note <- NULL # No general source note when using footnotes
}

# Create table using our modified TableGT_ModifiedR6 R6 class
table_gt <- TableGT_ModifiedR6$new(
  data = data_iq,
  pheno = pheno,
  table_name = table_name,
  vertical_padding = vertical_padding,
  source_note = source_note,
  multiline = multiline,
```

```
  fn_list = fn_list,
  grp_list = grp_list,
  dynamic_grp = dynamic_grp
)

# Get the table object without automatic saving
tbl <- table_gt$build_table()

# Save the table using our save_table method
table_gt$save_table(tbl, dir = here::here())
```

```
{r}
#| label: fig-iq-subdomain
#| include: false

# Create subdomain plot using R6 DotplotR6
dotplot_subdomain <- DotplotR6$new(
  data = data_iq,
  x = "z_mean_subdomain",
  y = "subdomain",
  filename = here::here("fig_iq_subdomain.svg")
)
dotplot_subdomain$create_plot()

# Load plot title from sysdata.rda
plot_title_var <- "plot_title_iq"
if (!exists(plot_title_var)) {
  sysdata_path <- here::here("R", "sysdata.rda")
  if (file.exists(sysdata_path)) {
    load(sysdata_path)
  }
}

# Get the plot title or use default
if (exists(plot_title_var)) {
  plot_title_iq <- get(plot_title_var)
} else {
  plot_title_iq <- "Premorbid Ability is an estimate of an individual's
intellectual functioning prior to known or suspected onset of brain disease or
dysfunction. General Ability is the overall skill to reason, solve problems,
and gain useful knowledge. Crystallized Knowledge involves understanding the
world through language and reasoning. Fluid Reasoning is the logical analysis
and solution of new problems, identifying underlying patterns, and applying
logic."
}
```

```r
{r}
#| label: fig-iq-narrow
#| include: false

# Create narrow plot using R6 DotplotR6
dotplot_narrow <- DotplotR6$new(
  data = data_iq,
  x = "z_mean_narrow",
  y = "narrow",
  filename = here::here("fig_iq_narrow.svg")
)
dotplot_narrow$create_plot()

# Load plot title from sysdata.rda
plot_title_var <- "plot_title_iq"
if (!exists(plot_title_var)) {
  sysdata_path <- here::here("R", "sysdata.rda")
  if (file.exists(sysdata_path)) {
    load(sysdata_path)
  }
}

# Get the plot title or use default
if (exists(plot_title_var)) {
  plot_title_iq <- get(plot_title_var)
} else {
  plot_title_iq <- "Premorbid Ability is an estimate of an individual's
intellectual functioning prior to known or suspected onset of brain disease or
dysfunction. General Ability is the overall skill to reason, solve problems,
and gain useful knowledge. Crystallized Knowledge involves understanding the
world through language and reasoning. Fluid Reasoning is the logical analysis
and solution of new problems, identifying underlying patterns, and applying
logic."
}
```

Table 1: General Cognitive Ability Scores

	SCORE	‰ RANK	RANGE
RBANS[1]			
RBANS Total Index	103	58	Average
WISC-V[1,2]			
Verbal Comprehension (VCI)	118	88	High Average
Visual Spatial (VSI)	89	23	Low Average
Fluid Reasoning (FRI)	97	42	Average
Working Memory (WMI)	88	21	Low Average
Processing Speed (PSI)	77	6	Below Average
Full Scale IQ (FSIQ)	96	39	Average
Nonverbal (NVI)	87	19	Low Average
General Ability (GAI)	104	61	Average
Cognitive Proficiency (CPI)	79	8	Below Average

[1] Standard score: Mean = 100 [50th‰], SD ± 15 [16th‰, 84th‰]

[2] Scaled score: Mean = 10 [50th‰], SD ± 3 [16th‰, 84th‰]

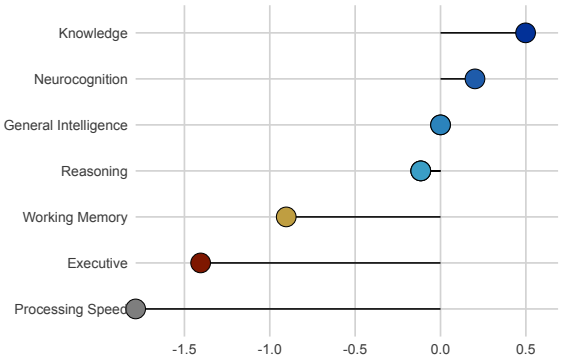

Figure 1: `{r} plot_title_iq`

Table 2: General Cognitive Ability Scores

	SCORE	‰ RANK	RANGE
RBANS[1]			
RBANS Total Index	103	58	Average
WISC-V[1,2]			
Verbal Comprehension (VCI)	118	88	High Average
Visual Spatial (VSI)	89	23	Low Average
Fluid Reasoning (FRI)	97	42	Average
Working Memory (WMI)	88	21	Low Average
Processing Speed (PSI)	77	6	Below Average
Full Scale IQ (FSIQ)	96	39	Average
Nonverbal (NVI)	87	19	Low Average
General Ability (GAI)	104	61	Average
Cognitive Proficiency (CPI)	79	8	Below Average

[1] Standard score: Mean = 100 [50th‰], SD ± 15 [16th‰, 84th‰]

[2] Scaled score: Mean = 10 [50th‰], SD ± 3 [16th‰, 84th‰]

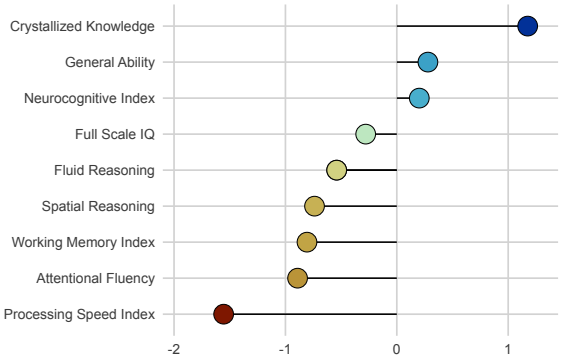

Figure 2: `{r} plot_title_iq`

Academic Skills

No data available for Academic Skills .

```
{r}
#| label: setup-academics
#| include: false

# Source R6 classes
```