PretendPlay_Gesture

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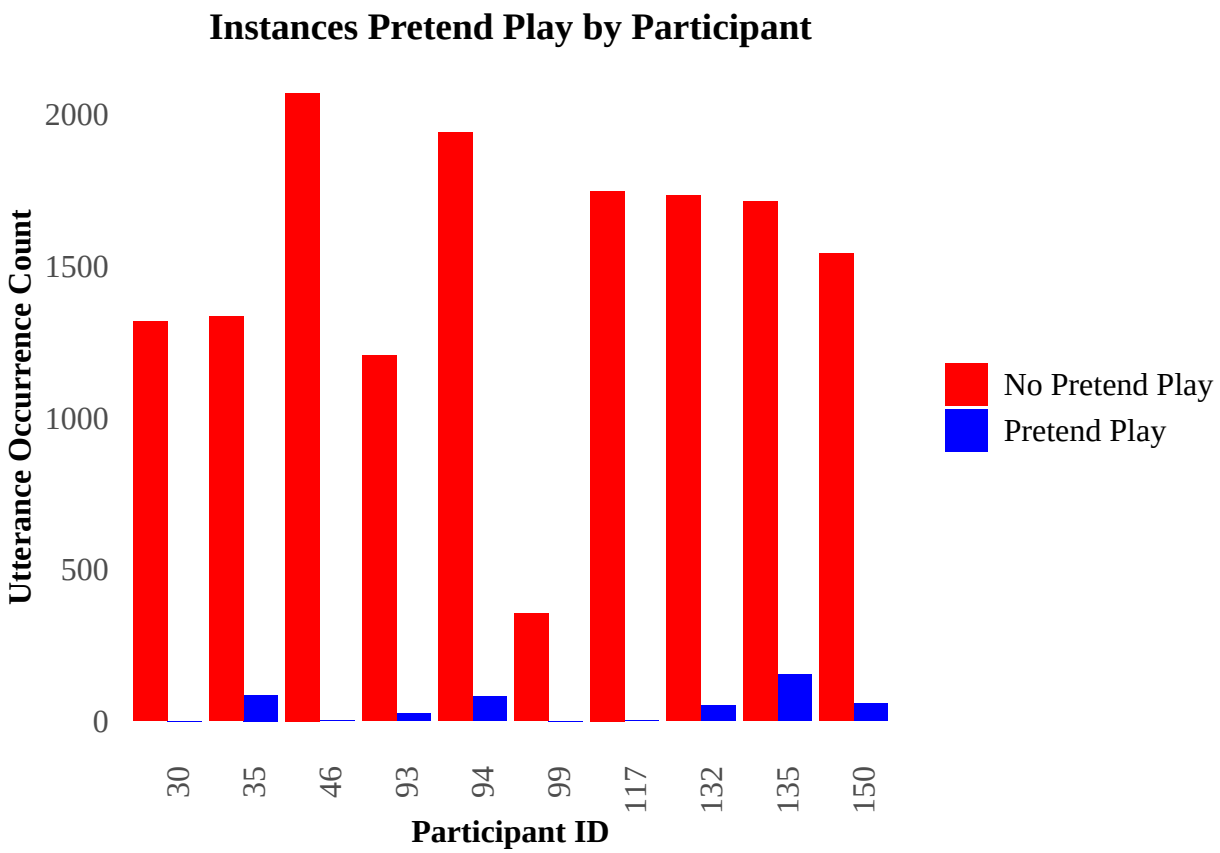
Pretend Play Instances per Individual

```
# Import and clean dataset
P3_H8_ALL <- read.csv("/Users/kristenjohnson/KristenWorkingDirectory/Play_Narrative/PN_Datasets/Pretend_

# Summarize pretend play counts per participant
PP_Individual <- P3_H8_ALL %>%
  group_by(participant_id) %>%
  summarise(
    `Pretend Play` = sum(c_pret, na.rm = TRUE),  # Count of 1s (Pretend Play)
    `No Pretend Play` = sum(c_pret == 0, na.rm = TRUE)  # Count of 0s
  ) %>%
  pivot_longer(cols = c(`Pretend Play`, `No Pretend Play`),
               names_to = "Category", values_to = "Count")

# Create paired bar graph with APA formatting
ggplot(PP_Individual, aes(x = factor(participant_id), y = Count, fill = Category)) +
  geom_bar(stat = "identity", position = "dodge") +  # Side-by-side bars
  labs(title = "Instances Pretend Play by Participant",
       x = "Participant ID",
       y = "Utterance Occurrence Count") +
  scale_fill_manual(values = c("Pretend Play" = "blue", "No Pretend Play" = "red")) +

  # APA Style Formatting
  theme_minimal() +
  theme(
    text = element_text(family = "Times New Roman", size = 12),  # Set Times New Roman
    plot.title = element_text(hjust = 0.5, face = "bold"),  # Center title, bold
    axis.title = element_text(face = "bold"),  # Bold axis titles
    axis.text = element_text(size = 12),  # Ensure axis labels are size 12
    legend.title = element_blank(),  # Remove the legend title
    legend.text = element_text(size = 12),  # Legend text size
    panel.grid.major = element_blank(),  # Remove major gridlines (APA style)
    panel.grid.minor = element_blank(),  # Remove minor gridlines
    axis.text.x = element_text(angle = 90, hjust = 1)  # Rotate x-axis labels
  )
```



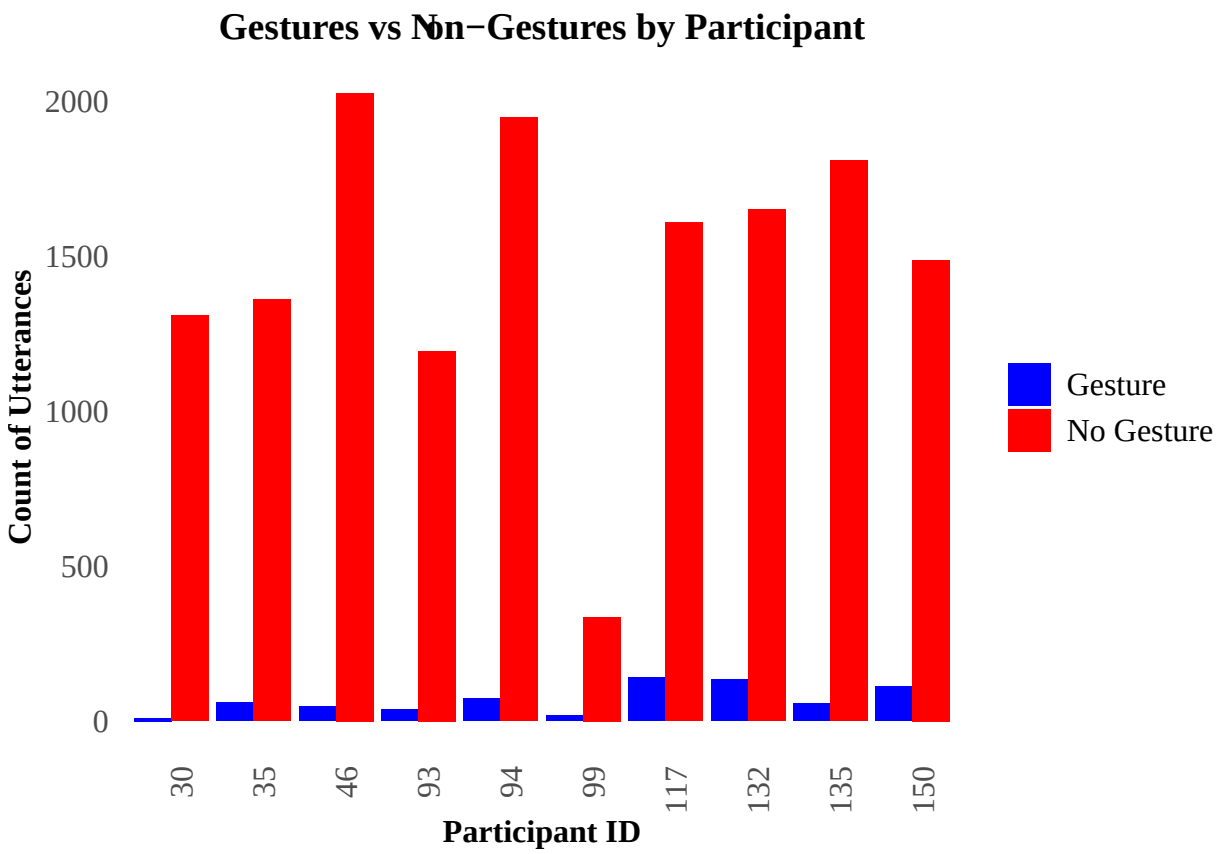
ALL Gestures per Indiviudal

```
# Count gestures (non-NA) and non-gestures (NA) for each participant
gesture_count <- P3_H8_ALL %>%
  group_by(participant_id) %>%  # Group data by participant ID
  summarise(
    `Gesture` = sum(!is.na(c_form), na.rm = TRUE),  # Counts non-NA values for gestures
    `No Gesture` = sum(is.na(c_form), na.rm = TRUE)  # Counts NA values (no gesture)
  ) %>%
  pivot_longer(cols = c(`Gesture`, `No Gesture`),
               names_to = "Gesture Status", values_to = "Count")

# Create a bar graph comparing gestures and non-gestures for each participant
ggplot(gesture_count, aes(x = factor(participant_id), y = Count, fill = `Gesture Status`)) +
  geom_bar(stat = "identity", position = "dodge") +  # Side-by-side bars for gestures vs non-gestures
  labs(title = "Gestures vs Non-Gestures by Participant",
       x = "Participant ID",
       y = "Count of Utterances") +

  # APA Style Formatting
  theme_minimal() +
  theme(
    text = element_text(family = "Times New Roman", size = 12),  # Set Times New Roman
    plot.title = element_text(hjust = 0.5, face = "bold"),  # Center title, bold
    axis.title = element_text(face = "bold"),  # Bold axis titles
```

```
    axis.text = element_text(size = 12),  # Ensure axis labels are size 12
    legend.title = element_blank(),  # Remove the legend title
    legend.text = element_text(size = 12),  # Legend text size
    panel.grid.major = element_blank(),  # Remove major gridlines (APA style)
    panel.grid.minor = element_blank(),  # Remove minor gridlines
    axis.text.x = element_text(angle = 90, hjust = 1)  # Rotate x-axis labels
  ) +
  scale_fill_manual(values = c("Gesture" = "blue", "No Gesture" = "red"))
```



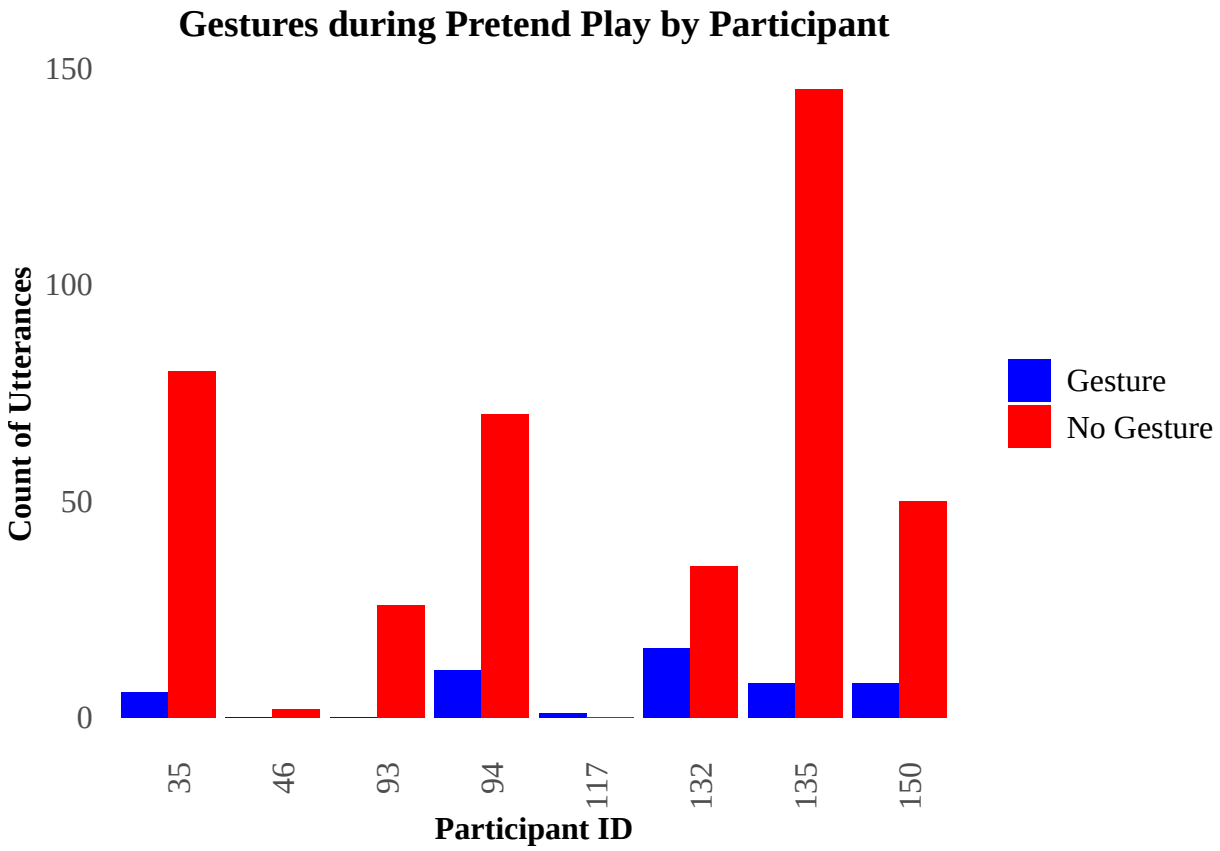
ALL Gesture during Pretend Play per individual

```
# Count utterances with and without gestures during pretend play for each participant
gesture_vs_no_gesture_pp <- P3_H8_ALL %>%
  filter(c_pret == 1) %>%  # Filter for pretend play instances (c_pret == 1)
  group_by(participant_id) %>%  # Group by participant ID
  summarise(
    `Gesture` = sum(!is.na(c_form), na.rm = TRUE),  # Count gestures (non-NA c_form)
    `No Gesture` = sum(is.na(c_form), na.rm = TRUE)  # Count non-gestures (NA c_form)
  ) %>%
  pivot_longer(cols = c(`Gesture`, `No Gesture`),
               names_to = "Gesture Status", values_to = "Count")

# Create the paired bar graph comparing gestures vs. non-gestures during pretend play
ggplot(gesture_vs_no_gesture_pp, aes(x = factor(participant_id), y = Count, fill = `Gesture Status`)) +
  geom_bar(stat = "identity", position = "dodge") +  # Side-by-side bars
```

```r
  labs(title = "Gestures during Pretend Play by Participant",
       x = "Participant ID",
       y = "Count of Utterances") +

  # APA Style Formatting
  theme_minimal() +
  theme(
    text = element_text(family = "Times New Roman", size = 12),  # Set Times New Roman
    plot.title = element_text(hjust = 0.5, face = "bold"),  # Center title, bold
    axis.title = element_text(face = "bold"),  # Bold axis titles
    axis.text = element_text(size = 12),  # Ensure axis labels are size 12
    legend.title = element_blank(),  # Remove the legend title
    legend.text = element_text(size = 12),  # Legend text size
    panel.grid.major = element_blank(),  # Remove major gridlines (APA style)
    panel.grid.minor = element_blank(),  # Remove minor gridlines
    axis.text.x = element_text(angle = 90, hjust = 1)  # Rotate x-axis labels
  ) +
  scale_fill_manual(values = c("Gesture" = "blue", "No Gesture" = "red"))
```



Representational Gestures per Individual

```r
# convert every entry in the column to lowercase
P3_H8_ALL$c_form <- tolower(P3_H8_ALL$c_form)

# list of unique values in the c_form column:
```

```r
unique(P3_H8_ALL$c_form)
```

```
##  [1] NA
##  [2] "hold"
##  [3] "nod"
##  [4] "palm"
##  [5] "point"
##  [6] "shake"
##  [7] "point~"
##  [8] "iconic"
##  [9] "nod~"
## [10] "shake~"
## [11] "flip"
## [12] "point - nod"
## [13] "beat - beat - shake"
## [14] "hold~"
## [15] "shake - nod"
## [16] "point - point"
## [17] "<back off> - point"
## [18] "point  + nod"
## [19] "<whisper>"
## [20] "<whisper> - beat"
## [21] "shh"
## [22] "point - iconic"
## [23] "palm + palm"
## [24] "beat*3"
## [25] "beat"
## [26] "shake - palm"
## [27] "nod -palm"
## [28] "tada"
## [29] "palm - hold"
## [30] "wave"
## [31] "wave~"
## [32] "palm - point"
## [33] "hold - point"
## [34] "<darn it >"
## [35] "beat x 2"
## [36] "number"
## [37] "naughties"
## [38] "cont point"
## [39] "$"
## [40] "shrug with flip"
## [41] "point - point - point - point - point - point"
## [42] "hold + point"
## [43] "demo"
## [44] "flip - point"
## [45] "iconic - flip"
## [46] "come"
## [47] "point - point - point"
## [48] "pick up"
## [49] "point - point x 4"
## [50] "point + hold"
## [51] "point + hold~"
## [52] "point - hold~"
```

```
## [53] "point -point"
## [54] "point  - point x 4"
## [55] "point - point x  8"
## [56] "number+ number"
```

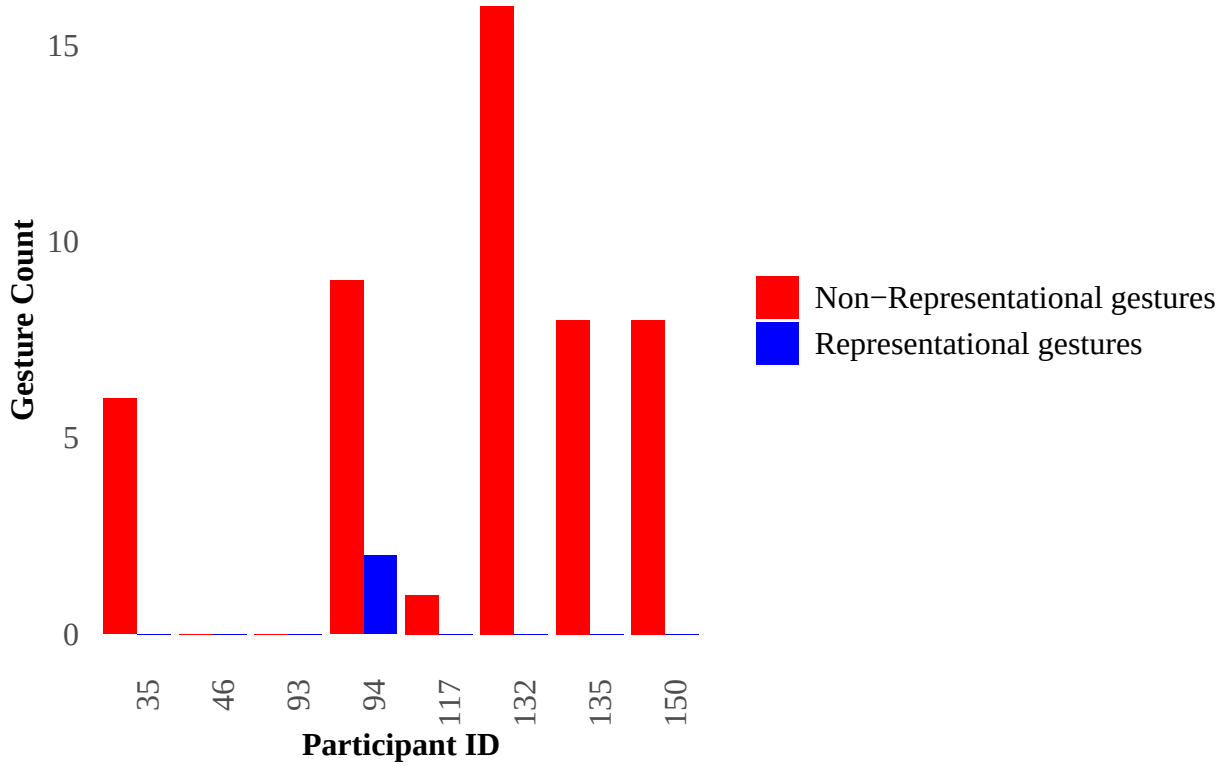
```r
# Categorize gestures into 'representational' and 'non-representational'
P3_H8_ALL <- P3_H8_ALL %>%
  mutate(
    gesture_category = case_when(
      !is.na(c_form) &c_form %in% c("iconic", "iconic - flip", "point - iconic", "metaphoric", "demo") ~
      !is.na(c_form) ~ "Non-Representational",  # All non-NA gestures are non-representational
      TRUE ~ NA_character_  # Set NA for missing gestures
    )
  )

# Count Representational and Non-Representational gestures during pretend play for each participant
gesture_comparison <- P3_H8_ALL %>%
  filter(c_pret == 1) %>%  # Filter for pretend play instances
  group_by(participant_id) %>%  # Group by participant ID
  summarise(
    `Representational gestures` = sum(gesture_category == "Representational", na.rm = TRUE),  # Count R
    `Non-Representational gestures` = sum(gesture_category == "Non-Representational", na.rm = TRUE)  # 
  ) %>%
  pivot_longer(cols = c(`Representational gestures`, `Non-Representational gestures`),
               names_to = "Gesture_Type", values_to = "Count")

# Create the paired bar graph comparing Representational vs. Non-Representational gestures during prete
ggplot(gesture_comparison, aes(x = factor(participant_id), y = Count, fill = Gesture_Type)) +
  geom_bar(stat = "identity", position = "dodge") +  # Side-by-side bars
  labs(title = "Participants' Representational vs. Non-Representational Gestures during Pretend Play",
       x = "Participant ID",
       y = "Gesture Count") +

  # APA Style Formatting
  theme_minimal() +
  theme(
    text = element_text(family = "Times New Roman", size = 12),  # Set Times New Roman
    plot.title = element_text(hjust = 0.5, face = "bold"),  # Center title, bold
    axis.title = element_text(face = "bold"),  # Bold axis titles
    axis.text = element_text(size = 12),  # Ensure axis labels are size 12
    legend.title = element_blank(),  # Remove the legend title
    legend.text = element_text(size = 12),  # Legend text size
    panel.grid.major = element_blank(),  # Remove major gridlines (APA style)
    panel.grid.minor = element_blank(),  # Remove minor gridlines
    axis.text.x = element_text(angle = 90, hjust = 1)  # Rotate x-axis labels
  ) +
  scale_fill_manual(values = c("Representational gestures" = "blue", "Non-Representational gestures" = 
```

resentational vs. Non−Representational Gestures during Pretend Play



Scatterplot of gesture and utterance

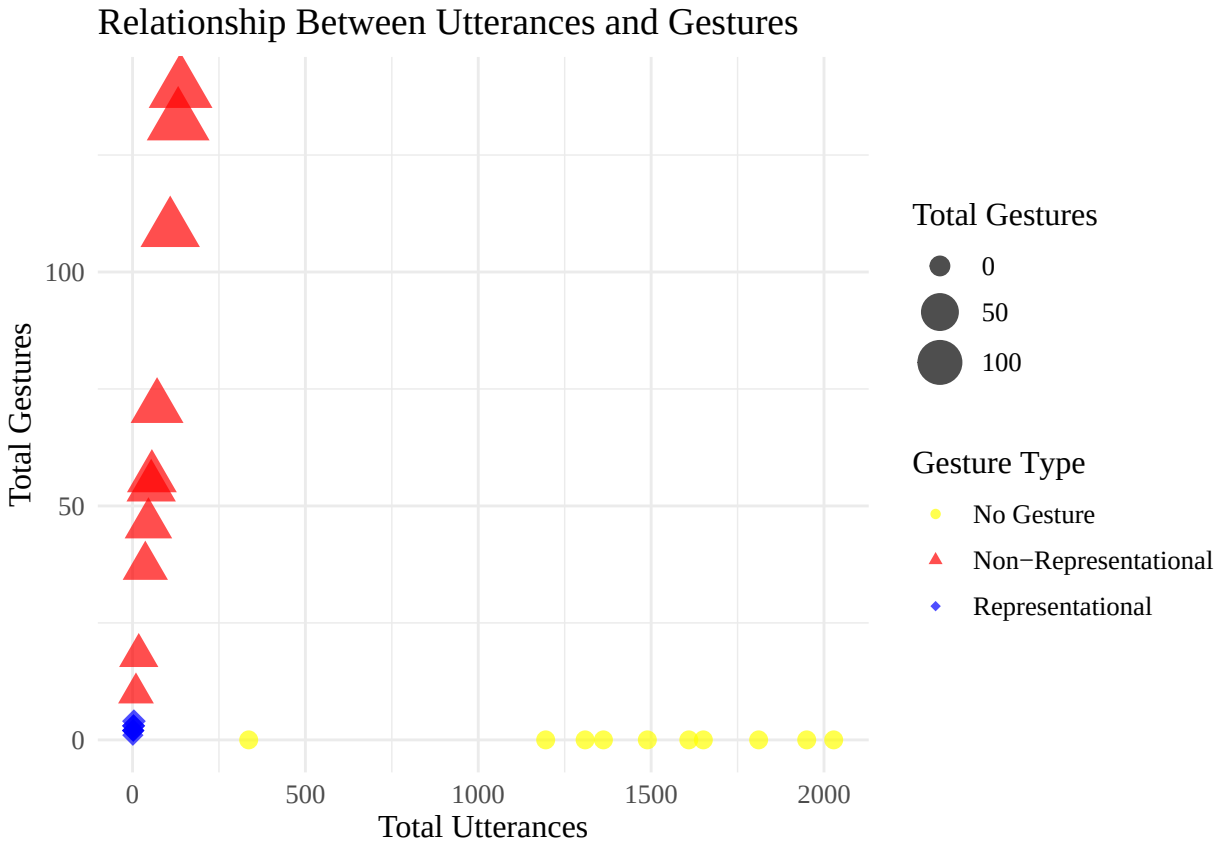
```
# Add a new column classifying gestures as Representational or Non-Representational
P3_H8_ALL <- P3_H8_ALL %>%
  mutate(
    `Gesture Type` = case_when(
      tolower(c_form) %in% c("iconic", "iconic - flip", "point - iconic", "metaphoric", "demo") ~ "Repr
      !is.na(c_form) ~ "Non-Representational",# Non-representational for all other non-NA gestures
      TRUE ~ "No Gesture" # Replace NA with "No Gesture" for missing gesture data
    )
  )

# Summarize data: Count utterances and gestures per participant
gesture_summary <- P3_H8_ALL %>%
  group_by(participant_id, `Gesture Type`) %>%  # Categorized by gesture type
  summarise(
    `Total Utterances` = n(),                # Total utterances per participant
    `Total Gestures` = sum(!is.na(c_form))  # Count non-NA gestures
  ) %>%
  ungroup()
```

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

```
# Scatter plot: Utterances vs Gestures per Participant
ggplot(gesture_summary, aes(x = `Total Utterances`, y = `Total Gestures`,
```

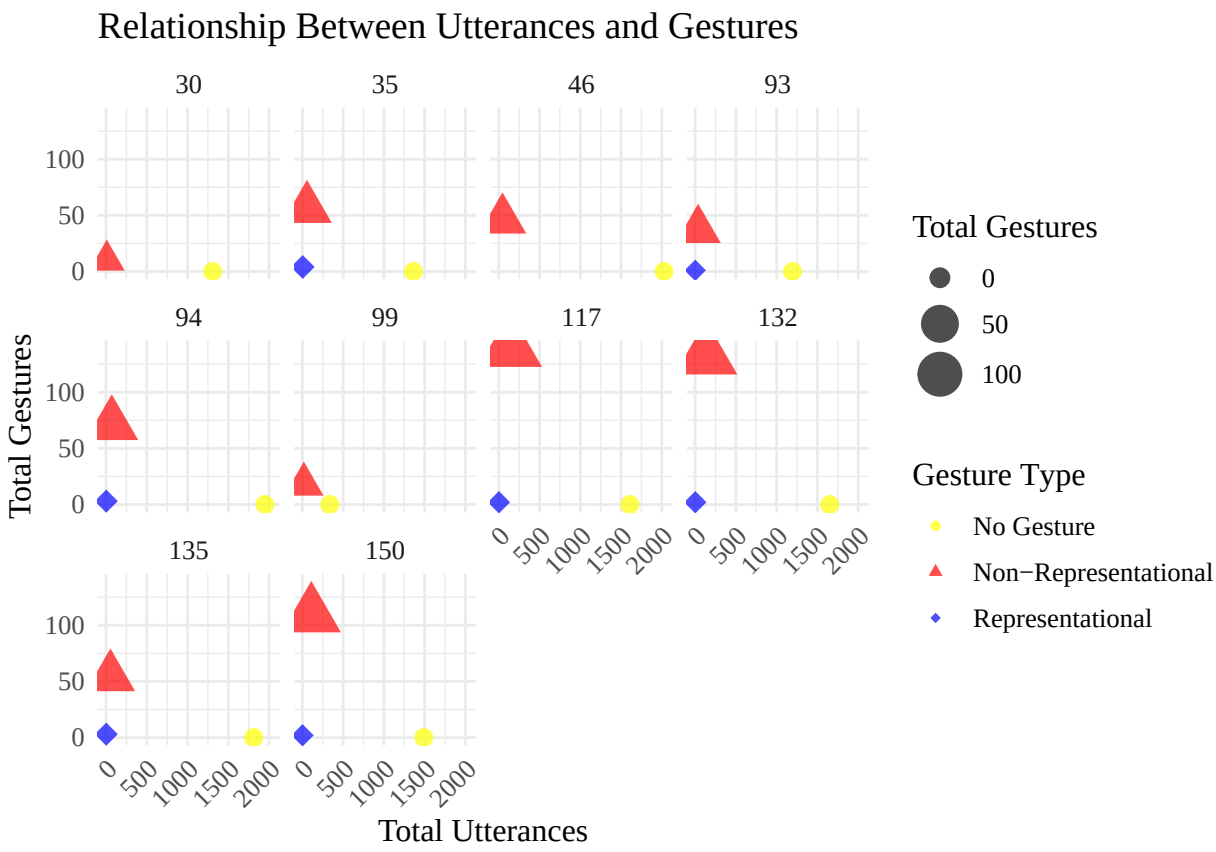
```
                          shape = `Gesture Type`, size = `Total Gestures`, color = `Gesture Type`)) +
  geom_point(alpha = 0.7) +  # Semi-transparent points
  scale_shape_manual(values = c(16, 17, 18)) +  # Different shapes for gesture categories
  scale_size_continuous(range = c(3, 8)) +  # Adjust point sizes
  scale_color_manual(values = c("Representational" = "blue", "Non-Representational" = "red", "No Gestur
  labs(title = "Relationship Between Utterances and Gestures",
       x = "Total Utterances",
       y = "Total Gestures",
       shape = "Gesture Type") +  # Legend for gesture type
  theme_minimal() +
  theme(text = element_text(family = "Times New Roman", size = 12))
```



Looking at individual participants

```
# Scatter plot: Utterances vs Gestures per Participant with Facets
ggplot(gesture_summary, aes(x = `Total Utterances`, y = `Total Gestures`,
                          shape = `Gesture Type`, size = `Total Gestures`, color = `Gesture Type`)) +
  geom_point(alpha = 0.7) +  # Semi-transparent points
  scale_shape_manual(values = c(16, 17, 18)) +  # Different shapes for gesture categories
  scale_size_continuous(range = c(3, 8)) +  # Adjust point sizes
  scale_color_manual(values = c("Representational" = "blue",
                                "Non-Representational" = "red",
                                "No Gesture" = "yellow")) +  # Custom color for gesture categories
  labs(title = "Relationship Between Utterances and Gestures",
       x = "Total Utterances",
```

```
      y = "Total Gestures",
      shape = "Gesture Type") +  # Legend for gesture type
  theme_minimal() +
  theme(
    text = element_text(family = "Times New Roman", size = 12),
    axis.text.x = element_text(angle = 45, hjust = 1)  # Rotate x-axis labels
  ) +
  facet_wrap(~participant_id)  # Facet by participant_id
```




```
# Scatter plot: Utterances vs Gestures per Participant with facet_grid
ggplot(gesture_summary, aes(x = `Total Utterances`, y = `Total Gestures`,
                            shape = `Gesture Type`, size = `Total Gestures`, color = `Gesture Type`)) +
  geom_point(alpha = 0.7) +  # Semi-transparent points
  scale_shape_manual(values = c(16, 17, 18)) +  # Different shapes for gesture categories
  scale_size_continuous(range = c(3, 8)) +  # Adjust point sizes
  scale_color_manual(values = c("Representational" = "blue",
                                "Non-Representational" = "red",
                                "No Gesture" = "yellow")) +  # Custom color for gesture categories
  scale_x_continuous(breaks = seq(0, max(gesture_summary$`Total Utterances`), by = 1000)) +  # Custom b
  labs(title = "Relationship Between Utterances and Gestures",
       x = "Total Utterances",
       y = "Total Gestures",
       shape = "Gesture Type") +  # Legend for gesture type
  theme_minimal() +
  theme(
    text = element_text(family = "Times New Roman", size = 12),
    axis.text.x = element_text(angle = 45, hjust = 1)  # Rotate x-axis labels
```

```
  ) +
  facet_grid(`Gesture Type` ~ participant_id)  # Facet by gesture type (rows) and participant_id (colum
```