Ezra M. Wingard[1], Cailee M. Nelson[1], Mengya Xia[2], & Caitlin M. Hudac[1]

University of South Carolina, Department of Psychology & Carolina Autism and Neurodevelopment (CAN) Research Center[1], Arizona State University[2]

Is Friendship In The Cards? How Adolescent Brains Make Decisions About Friendship Quantity

Background

Social Connectedness Impacts Wellbeing

Lacking social connectedness can lead to loneliness and impact well-being, especially during shifting dynamics in adolescence[1-2].

Limited Understanding of Quantity in the Brain

Despite knowledge of an approximate number system implicated in processing of quantity[3], there is limited research on how the brain considers quantity.

No Clear Model of Social Quantity Decisions

Decisions are often made in social contexts (e.g., time spent with others, number of friends) and may impact feelings social connectedness and well-being.

Objective

This study aimed to explore how decisions made within social contexts vary based upon quantity (i.e., number of friends, duration of social experiences) using frontal alpha asymmetry (FAA) as an electrophysiological correlate.

Method

FortuneTeller Task: Participants (Table 1) were presented with a social activity and a constraint that varied on group size or duration, then asked to choose between a small and large option.

- **Group Size**
  - Small: 2, 3, or 4 Friend
  - Large: 10, 11, or 12 Friends
- **Duration**
  - Small: 10, 20, or 30 minutes
  - Large: 7, 8, or 9 hours

Fortunes: After completing 80 decisions in the FortuneTeller task, we calculated the proportion of participant choices that were aligned with the following decision categories:

1. High Social Preference (**"Butterfly"**)
2. Large Group Preference (**"Rabbit"**)
3. Low Social Preference(**"Sloth"**)
4. Long Duration Preference (**"Swan"**)

Demographics	**Adolescent** (*N* = 28)	**Adult** (*N* = 36)
Age M (SD); Range	14.4 (1.6); 12-17 years	19.9 (1.1); 18 - 22 years
Sex	F: 14, M: 14	F: 32, M: 3, N: 1
Race	White: 82%, Black: 14%, Asian: 0%, Multi-racial: 4%	White: 81%, Black: 6%, Asian: 6%, Multi-racial: 3%
Latine/Hispanic	Yes: 14%, No: 86%	Yes: 17%, No: 83%

Table 1., Demographics per group.

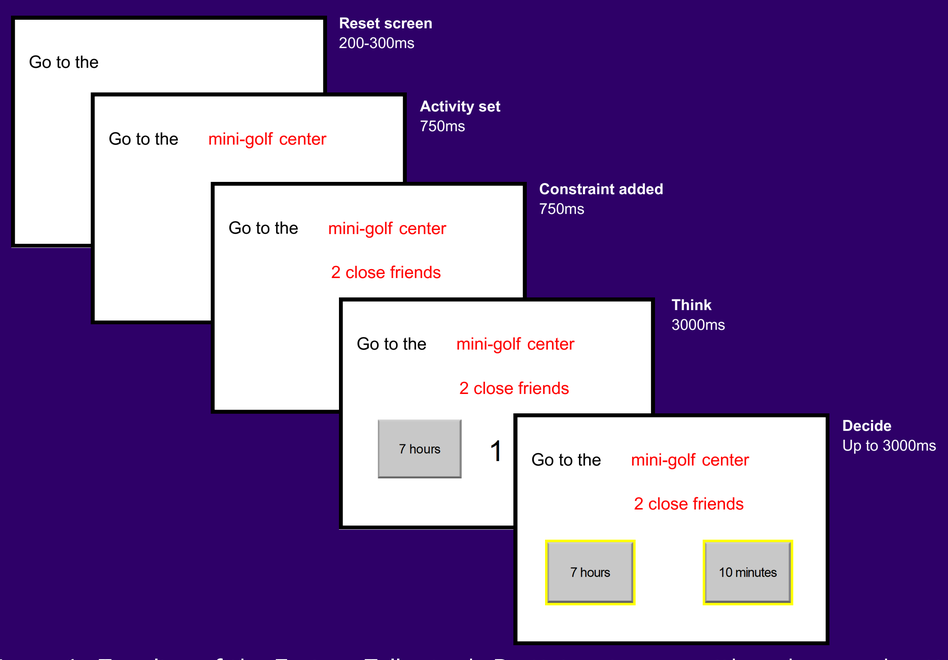


Figure 1., Timeline of the FortuneTeller task. Participants were either shown a duration or group size constraint and made decisions based on the inverse type. Example: with a group size constraint, participants made decisions on duration.

Results

In adolescents, there was a **main effect of low social quantity preference over high group preference**, (Sloth > Rabbit), p = .016, FDR corrected.

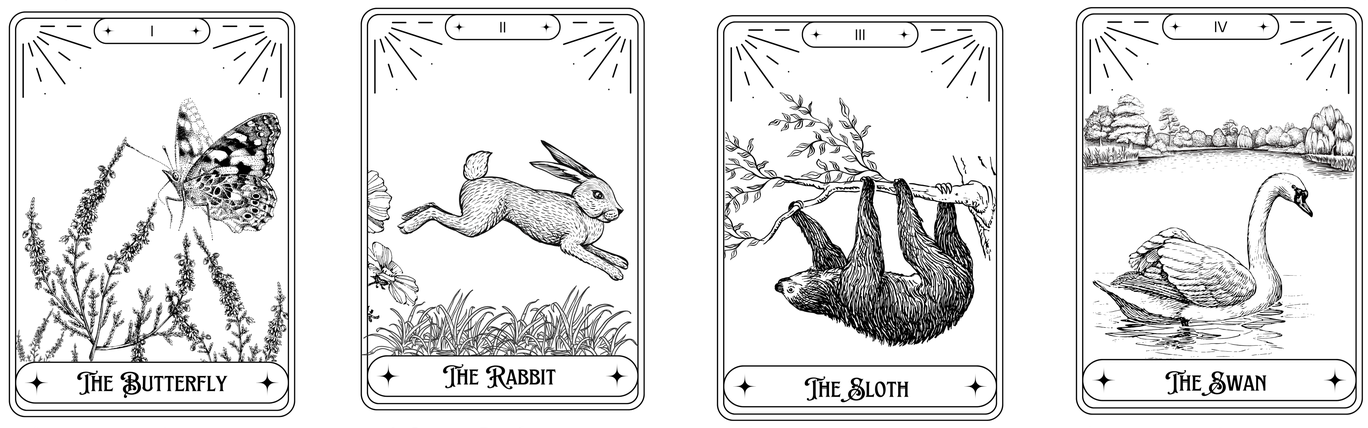
In adults, there were **main effects in low social quantity and high duration preference over large group preference and high social quantity**, (Sloth > Rabbit, p = .006 ; Sloth > Butterfly, p = .016 ; Swan > Rabbit, p = .006 ; Swan > Butterfly, p = .016), FDR corrected.

References: 1. Caputi M, Pantaleo G, Scaini S. Do Feelings of Loneliness Mediate the Relationship between Sociocognitive Understanding and Depressive Symptoms During Late Childhoodand Early Adolescence? J Genet Psychol. 2017;178(4):207-216.doi:10.1080/00221325.2017.1317629 **2.** Chen W-C. Adolescent interpersonal relationship quantity and quality, belongingness, and loneliness. Arch Guid Couns. 2009;31(1):17-37. **3.** Cantlon, J. F., Platt, M. L., & Brannon, E. M. (2009). Beyond the number domain. Trends in cognitive sciences, 13(2), 83–91. https://doi.org/10.1016/j.tics.2008.11.007

Acknowledgements: **This study is funded by the NIH** (R01HD107593, MPIs: Xia, Hudac).

Scan me to check out this poster and others by the B-RAD Lab!

Both adults and adolescents were more likely to prefer lower social quantity over high group sizes.



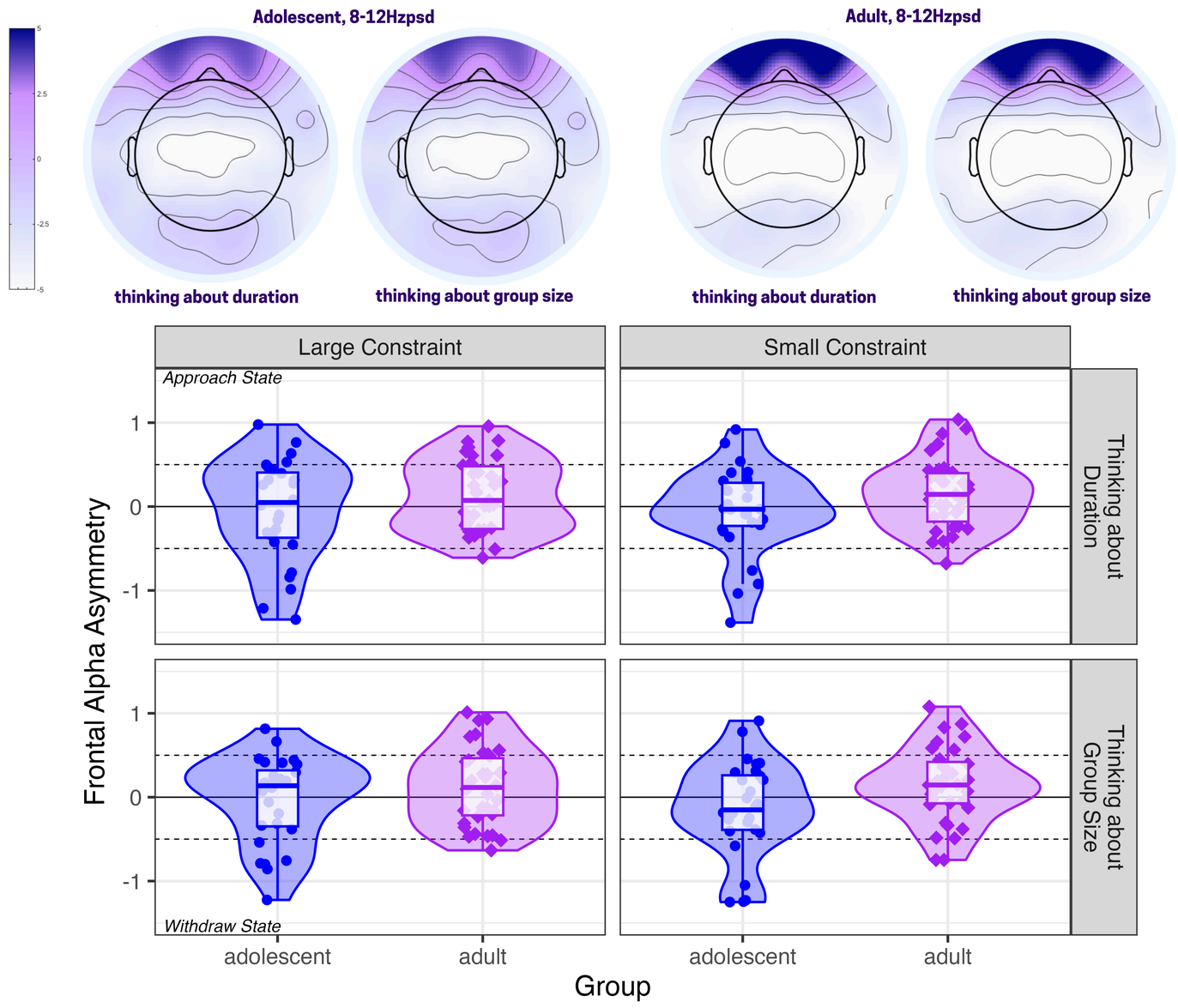
The Butterfly	The Rabbit	The Sloth	The Swan
↑ *Group Preference*	↑ *Group Preference*	↓ *Group Preference*	↓ *Group Preference*
↑ *Duration Preference*	↓ *Duration Preference*	↓ *Duration Preference*	↑ *Duration Preference*

Collapsed across group, people were more likely to make decisions aligned with:

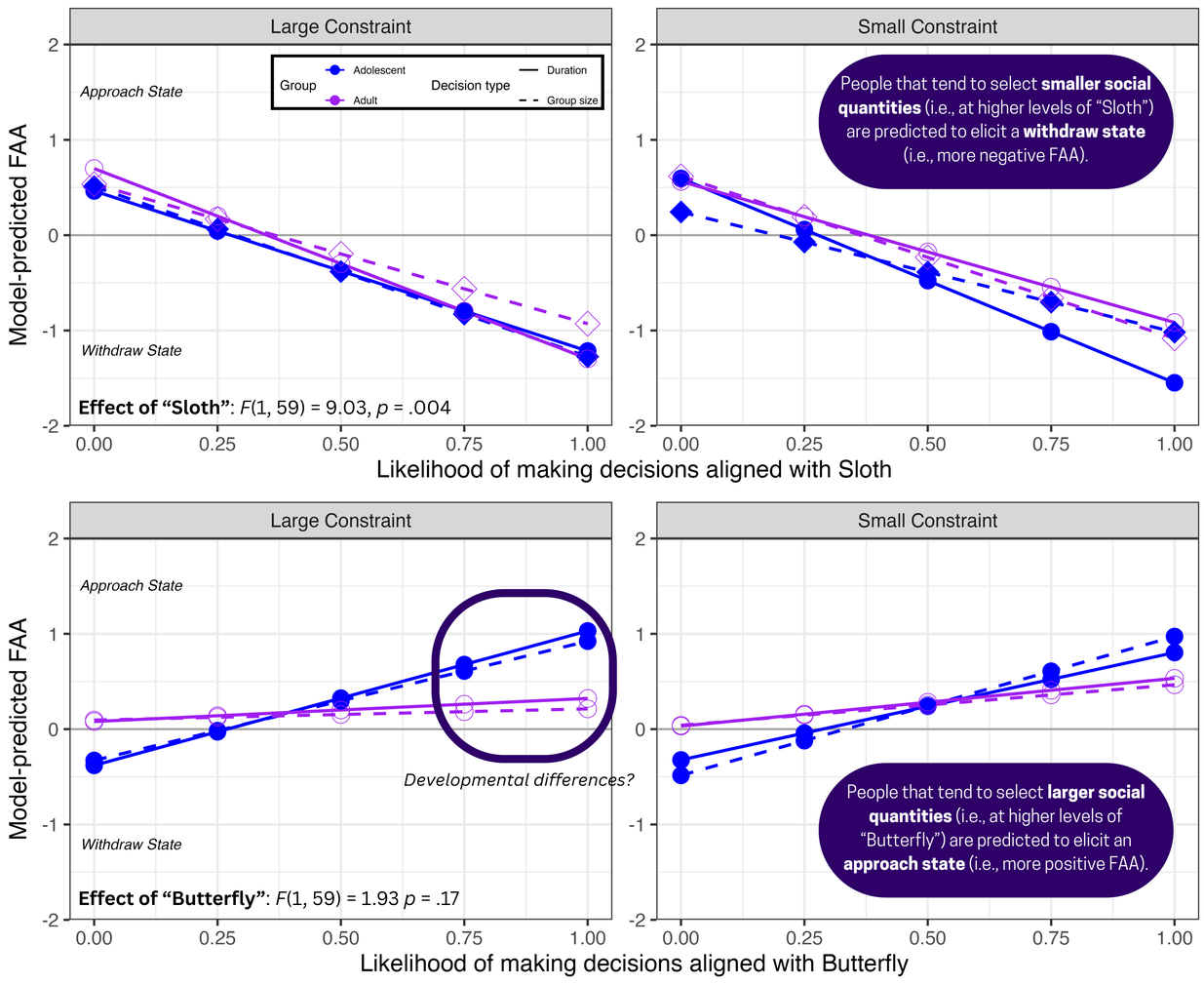
Sloth > Butterfly & Rabbit $p < 0.003$

Swan > Rabbit $p < 0.001$

Adolescents had increased variability compared to adults across constraint with FAA when thinking about duration and group size.



In both adolescents and adults, proportion of choices aligned with low social quantity predicted more negative FAA.



CAROLINA AUTISM & NEURODEVELOPMENT CENTER
@ University of South Carolina
https://go.sc.edu/can

Brain Research Across Development (B-RAD) Laboratory
PI: Dr. Caitlin Hudac

Curious about what your future may hold? Get your fortune by scanning this QR code and taking a brief quiz!