**Research Questions**

1. Are there any benefits of gameplay + supports vs. gameplay without supports?
   1. ECT: Compare (AC Day 3 + BD Day 5) and (F Day 3 + E Day 5) posttest controlling for pretest and including order as a cov.
   2. POT: Compare (BD Day 3 + AC Day 5) and (E Day 3 + F Day 5) posttest controlling for pretest and including order as a cov.
2. Is there any value-added of affective support beyond cognitive support?
   1. Compare ECT-Cog (A and C) POT (B and D) on Day 3
   2. Compare ECT-Cog (B and D) POT (A and C) on Day 5

|  | Days 1-3 | |  | Test UID | Days 4-5 | |  | Test UID |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Intervention | Concept | Posttest |  | Intervention | Concept | Posttest |  | *N = 244* |
| A | Cognitive Only | ECT | ECT + (N POT) | 999ad1\* | Cognitive + Affective | POT | POT (N&F) | 999ad2 | 44 |
| B | Cognitive Only | POT | POT (N&F) | 999bd1 | Cognitive + Affective | ECT | ECT + (N POT) | 999bd2 | 41 |
| C | Cognitive + Affective | ECT | ECT+ (N POT) | 999cd1 | Cognitive Only | POT | POT (N&F) | 999cd2 | 42 |
| D | Cognitive + Affective | POT | POT (N&F) | 999dd1 | Cognitive Only | ECT | ECT + (N POT) | 999dd2 | 46 |
| E & F (c) | None | POT | POT (N&F) | 999ed1 | None | ECT | ECT + (N POT) | 999ed2 | 36 / 35 |
| None | ECT | ECT+ (N POT) | 999fd1 | None | POT | POT (N&F) | 999fd2 |

A vs F Day 3; Day 5

ACF

BDE

A,B – cog supports part 1

C,D – cog supports part 2

E,F – control

A, C, F – ECT first

B, D, E – POT first

Day 1: All groups Near ECT(A-NQ1–7), Near POT(A-NQ8–14), Far ECT (A-FQ1–7), Far POT (A-FQ8–14)

Day 3: Groups A, C & F got ECT, Groups B, D & E got POT

Day 5: Groups B,D & E got ECT, Groups A, C & F got POT

Oops: for ECT and POT everybody got A questions again rather than B questions.

ECT: Near ECT (A-NQ1-7), Far ECT (A-FQ1-7), also *Near POT (A-NQ8–14)*

POT: Near POT (A-NQ8-14), Far ECT (A-FQ7–14)

So groups A,C and F see POT items 3 times.

Covariates:

Age ! (12, 13, 14+)

Gender

Physics

Gaming (1:2 vs 3:5)

Ethnicity (White vs non-white)

Physics !

Class (random effect)

RQ1: Gameplay + supports versus

contrast (E:F vs A:D)

POT.pot ~ Group + POT.pre + ?(Group\*POT.pre) +Age + Physics

[ANCOVA]

RQ2: cog supports vs cog + affect (A:B vs C:D)

A vs C – ECT

B vs D – POT

C vs A – POT

D vs B – ECT

ECT contrast (A+D vs B+C)

POT contrast (B+C vs A+D)

|  | Cog | Cog+Aff |
| --- | --- | --- |
| ECT | A,D | B, C |
| POT | B,C | A, D |
|  |  |  |

Outcome variables:

ECT, POT, ECT+POT,

Near. Far. Near+Far

Covaraiates:

– Grade/age

– Class (random effect)

–

## Learning Support Analyses

Average (N, mean, sd, kurtosis) durations per support per level.

– Filter on conditions?

– Breakdown by trophy

– Look at trivial vs substantial time (watch vs skip)

Correlation of learning support with duration.

Need list of which conditions video was mandatory versus optional.

PRE vs POSt

number of wrong->right, right->wrong transitions.

wrong -> wrongdiff transition