Randomization for BANNER

# Selection of the Final Sample

Our final sample comprises a total of 299 participants.

Initially we had 334 registered participants, but we had to exclude some of them because of various eligibility issues:

* 2 red coders were excluded because already engaged in the private MM
* other 28 were excluded because found without any prior registration to MM or ALGO
* we excluded other 5 who have not completed the registration survey (and were unrated, although they registered once to either MM or ALGO).

# Rooms & Treatments

We split 299 coders into 24 rooms in the following way:

* 12 rooms of 15 coders for a total of 180 coders
* 12 rooms of 10 coders for a total of 120 coders

Each room was then randomly assigned to one of three treatments.

We consider three alternative ways to proceed:

* Complete Randomization
* Randomization tries to minimize the index of dispersion of MM ratings *across* rooms (to better allocate red coders across rooms).
* Triplets. Rank order coders by MM rating (randomly sort ties). Then assign coders sequentially to each treatment, and sequentially to each room type (i.e., large & small). Then randomly assign them to rooms within each assigned treatment and room type.

# Outcomes of Triplets Randomization

Chisq. Test on Age, Country and Gender show no differences across treatmetns.

Mean differences are not statistically significant for Algo (rating, events and registrations) and MM (rating, events and registrations) and total payments. Lowest p-value well above significance levels (p-value min = 0.3.).

OLS regressions with room types (large or small) and treatments are also non-significant.

Distribution of mm rating is balanced across treatments and also across rooms of different sizes and treatments. See Boxplots.

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# Outcomes of Complete Randomization

There are many advantages from complete randomization. The main problems occur when distributions very skewed (e.g., we may not want to have 2 red coders in the same room). In our case, the ratings are skewed, but not terribly so (except totalpayments).

See figures.

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Overall the complete randomization is mostly successful on average across treatments. See the Table. The shape of the distributions are also quite similar. See Boxplots

Nevertheless, the treatment Tournament has significantly less **algoevents** & **algoreg**, the race & reserve have slightly higher mm ratings compared to tournament.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **race** | **tournament** | **reserve** |
| **1** | algorating | 1138.73 (78) | 995.42 (67) | 1017.68 (72) |
| **2** | algoevents | 45.47 (5.86) | 29.56 (4.32) | 46.71 (6.78) |
| **3** | algoreg | 51.15 (6.57) | 32.62 (4.74) | 53.34 (7.54) |
| **4** | mmrating | 1361.54 (47.24) | 1290.69 (46.44) | 1311.82 (58) |
| **5** | mmevents | 9.03 (1.29) | 9.50 (1.41) | 12.60 (1.88) |
| **6** | mmreg | 15.74 (2.1) | 15.20 (1.79) | 21.93 (2.83) |
| **7** | totalpayments | 31922.12 (10667.14) | 33935.96 (15924.85) | 93380.51 (32161.23) |

Sample means. Standard Errors in Parenthesis.

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# Outcomes of Randomization Minimizing Index of Dispersion Across Rooms

Here I randomly generate 1,000 room configurations and I select the one that minimizes the index of dispersion of MM rating across rooms (i.e., var(x)/mean(x) across rooms).

See the code here:

N <- 1e3 ## number of iterations

stat <- rep(NA,N) ## initialize

oldStat <- 1e6 ## initialize

for (i in 1:N){

z <- randomize(low=10,high=15,pool) ## assign coders to rooms

mm <- aggregate(mmrating~room\_id,data=z,FUN=mean)[,2] ## stats of rooms

stat[i] <- var(mm) / mean(mm) ## compute index across rooms

if (stat[i] < min(oldStat,na.rm=T)) { ## if index is lower then current minimum

out <- z; ## update the outcome

}

oldStat <- stat

}

By comparing the following Table with the previous Table, results look better (e.g., **algoevents, algoreg** are more balanced).

See Table and Boxplots.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **race** | **tournament** | **reserve** |
| **1** | algorating | 1074.80 (71) | 1034.86 (77) | 1042.97 (71) |
| **2** | algoevents | 40.40 (6.11) | 42.25 (5.43) | 39.19 (5.85) |
| **3** | algoreg | 45.18 (6.68) | 47.10 (6.05) | 44.95 (6.65) |
| **4** | mmrating | 1296.44 (54.58) | 1374.46 (53) | 1300.04 (46.5) |
| **5** | mmevents | 10.11 (1.81) | 9.72 (1.37) | 11.44 (1.5) |
| **6** | mmreg | 17.30 (2.57) | 16.86 (2.22) | 18.73 (2.1) |
| **7** | totalpayments | 96781.28 (38024.7) | 35967.46 (9585.65) | 31826.34 (9188.12) |

Sample means. Standard Errors in parenthesis

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