Applying the Generalized t-Test: In-Class Exercise

Psychology 311
Spring, 2013

1. The following data are from a reaction time experiment in which subjects were randomly assigned to one of two strategies. Participants all attempted to hit a target on an iPhone screen as quickly as possible during a Control session, using a standard strategy of hitting the target on the screen with their thumb when starting from a resting position. Depending on which group they were in, the participants attempted to hit the target using the "cross-hair" (CH) method or the "roll" (R) method. The "cross-hair" method cause a moving cross-hair to sweep across the screen based on thumb movements until it contacts a target, while the "roll" method causes the screen background to roll, allowing the participant to move the target toward a fixed cross-hair. The score for each subject is their average reaction time in milliseconds.

   Data are in the file *GT2.p1.csv*. The data are shown in tabular form in Table 1 on a following page. Note that the format of the data is such that each subject has one and only one line in the data file.

   (a) Is this a between-subjects, within-subjects, or between-within design?

   Test the following hypotheses:

   (b) For the CH condition, the experimental and control methods have the same mean.

   (c) For the R condition, the experimental and control methods have the same mean.

   (d) The change in reaction time (relative to the control method) for the CH group is the same as the corresponding change for the R group.

Table 1: Data for Problem 1

	Experimental	Control	condition
1	2200	2430	CH
2	2474	2278	CH
3	2314	2228	CH
4	2329	2426	CH
5	2279	2470	CH
6	2112	2587	CH
7	2283	2508	CH
8	2272	2562	CH
9	2361	2462	CH
10	2325	2493	CH
11	2323	2309	CH
12	2334	2488	CH
13	2246	2482	CH
14	2320	2423	CH
15	2373	2297	CH
16	2125	2448	CH
17	2446	2376	CH
18	2379	2330	CH
19	2294	2533	CH
20	2432	2257	CH
21	2461	2290	R
22	2303	2300	R
23	2371	2349	R
24	2510	2205	R
25	2466	2268	R
26	2484	2382	R
27	2433	2567	R
28	2341	2327	R
29	2531	2523	R
30	2298	2335	R
31	2458	2220	R
32	2240	2394	R
33	2369	2417	R
34	2418	2361	R
35	2523	2419	R
36	2447	2485	R
37	2351	2238	R
38	2229	2245	R
39	2388	2226	R
40	2497	2531	R