

Profile Analysis and Doubly Manova

Comps in PA
and Doubly Manova
Psy 524
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Comparisons on mains effects

- If the equal levels or flatness hypotheses are rejected and there are more than levels you need to break down the effect to see where the differences lie.

Equal levels

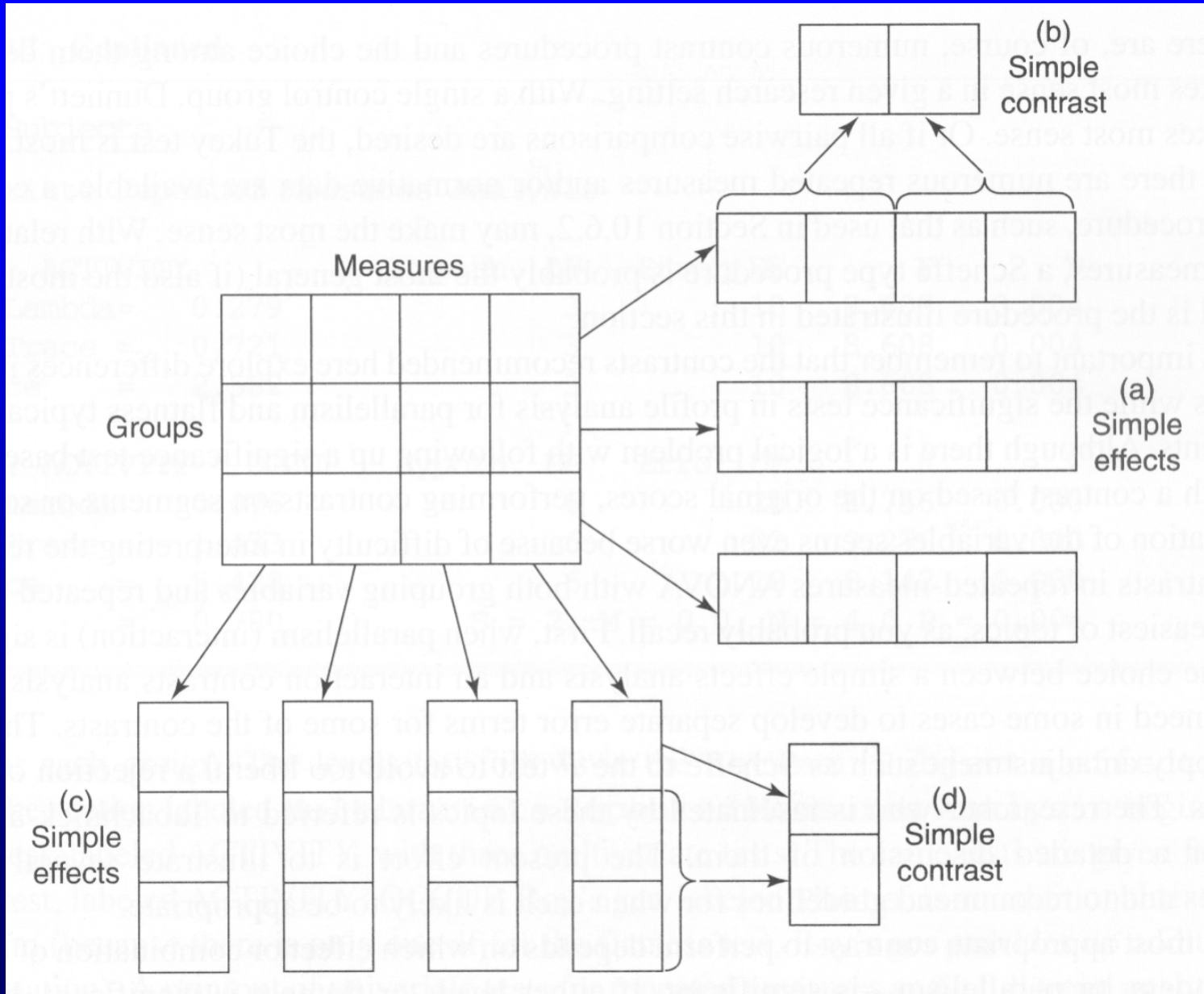
- For a significant equal levels test simply use the compute function in SPSS to create averages over all of the DVs.
- Use this new variable as a DV in a univariate ANOVA where you can use post hoc tests or implement planned comparisons using syntax.

Flatness

- If the multivariate test for flatness is rejected than you turn to interpreting comparisons in a univariate within subjects ANOVA.
- You can rerun the analysis removing the between subjects variables and implement post hoc tests on the within subjects variable or use syntax to use planned comparisons.

Testing interactions - Simple Effects, Simple Comparisons and Interaction Contrasts

Simple effect and Simple Comparisons



Interactions

- Whenever the parallelism hypothesis is rejected you need to pull apart the data to try and pinpoint what parts of the profile are causing the interaction

Interactions

- Parallelism and Flatness significant, equal levels not significant
 - Simple effects would be used to compare the groups while holding each of the DVs constant

Interactions

- Parallelism and Flatness significant, equal levels not significant
 - This is the same as doing a separate ANOVA between groups for each DV
 - A Scheffe adjustment is recommended if doing this post hoc
 - $F_s = (k - 1)F(k - 1, k(n - 1))$
 - K is number of groups and n is number of subjects

Interactions

- Parallelism and Flatness
significant, equal levels not significant
 - If any simple effect is significant than it should be followed by simple contrasts that can be implemented through syntax if planned or by post hoc adjustment.

Interactions

- Parallelism and Equal levels significant, flatness not significant
 - This happens “rarely because if parallelism and levels are significant, flatness is nonsignificant only if profiles for different groups are mirror images that cancel each other out”.

Interactions

- Parallelism and Equal levels significant, flatness not significant
 - This is done by doing a series of one-way within subjects ANOVAs for each group separately.

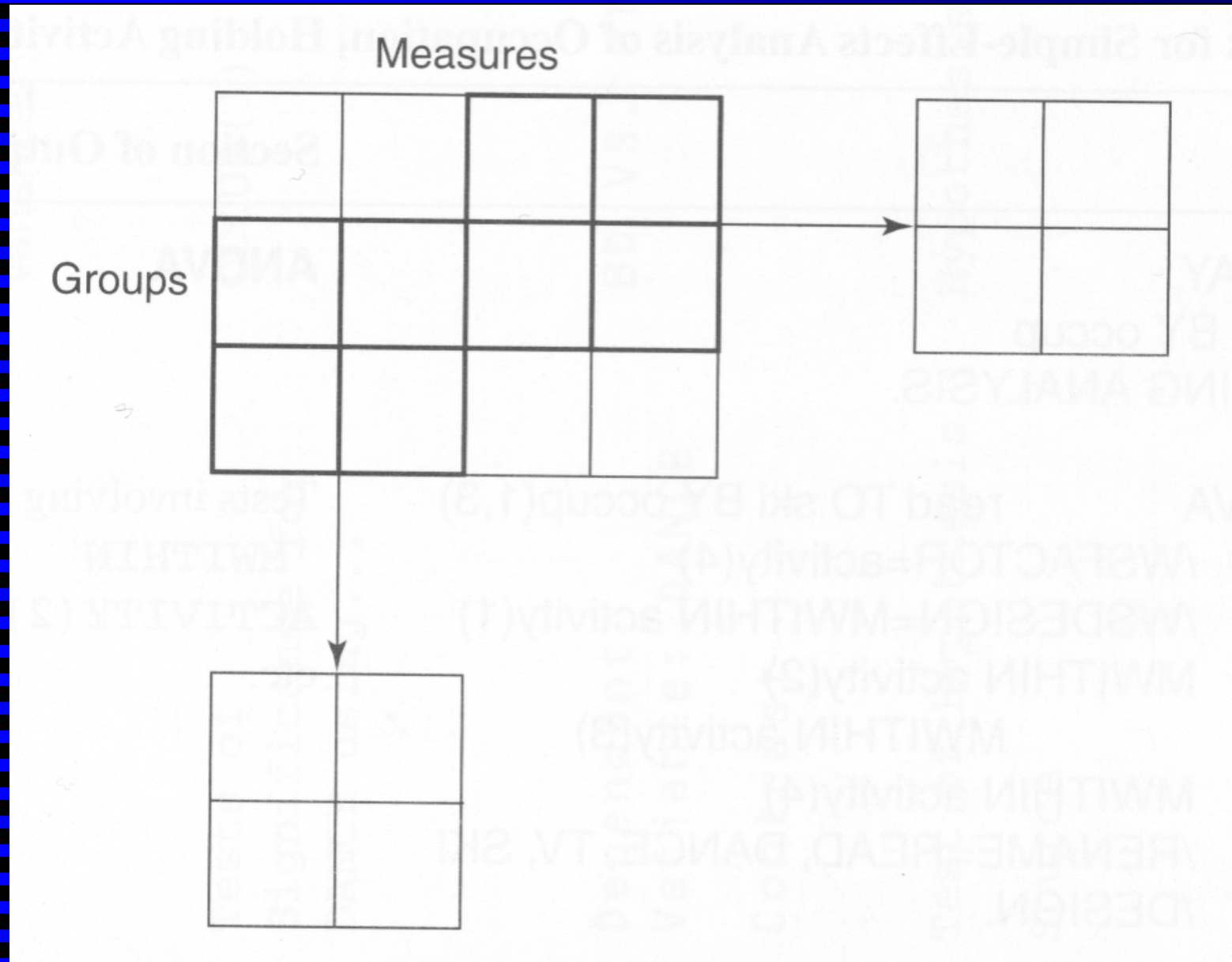
Interactions

- Parallelism and Equal levels significant, flatness not significant
 - A Scheffe adjustment is recommended if doing this post hoc
 - $F_s = (p - 1)F(p - 1), k(p - 1)(n - 1)$
 - P is number of repeated measures, n is number of subjects
 - If any are significant, follow up with simple contrasts on the within subjects variable.

Interactions

- If all effects are significant
 - Perform interaction contrasts by separating the data into smaller two by two interactions

Interaction Contrasts



Interactions

- If all effects are significant
 - This can be done by using the select cases function in SPSS, selecting two groups and doing a mixed ANOVA with just two of the DVs; this will break down the interaction into smaller interactions that are easier to interpret.

Interactions

- If all effects are significant
 - It can also be done by averaging over groups (form comparisons on the BG variable) and averaging over DVs (form comparisons on the WG variable) and taking the interaction between them.

Doubly MANOVA

- Doubly manova is a generalization of MANOVA and Profile analysis taken together in one set of data

Doubly MANOVA

- The basic design is multiple DVs taken at multiple time points, but the multiple DVs do not have to be commensurate.
- For example, students at different schools (private vs. public) are measured on basic math, reading, athleticism and IQ in grades 7 through 12.

Doubly MANOVA

D V Month	W e i g h t L o s s			S e l f - E s t e e m		
	1	2	3	1	2	3
Group Control	4	3	3	14	13	15
	4	4	3	13	14	17
	4	3	1	17	12	16
	3	2	1	11	11	12
	5	3	2	16	15	14
	6	5	4	17	18	18
	6	5	4	17	16	19
	5	4	1	13	15	15
	5	4	1	14	14	15
	3	3	2	14	15	13
Diet	4	2	2	16	16	11
	5	2	1	15	13	16
	6	3	2	12	11	14
	5	4	1	13	14	15
	7	6	3	17	11	18
	6	4	2	16	15	18
	3	2	1	16	17	15
	5	5	4	13	11	1
	4	3	1	12	11	14
	4	2	1	12	11	11
Diet + exercise	6	5	3	17	16	19
	7	6	4	19	19	19
	4	3	2	15	15	15
	7	4	3	16	14	18
	8	4	2	16	12	16
	3	6	3	19	19	16
	7	7	4	15	11	19
	4	7	1	16	12	18
	9	7	3	13	12	17
	3	4	1	16	13	17
	3	5	1	13	13	16
	6	5	2	15	12	18
	6	6	3	15	13	18
	9	5	2	16	14	17
	7	9	4	16	16	19
	8	6	1	17	17	17

Doubly MANOVA

- This can be treated as a between-within (groups by time) singly multivariate design but the time effect has to meet the sphericity assumption
- Sphericity can be circumvented by using both the DVs and Time in a multivariate design.

Doubly MANOVA

- Called Doubly MANOVA because linear combinations of DVs (at each time) are linearly combined across time.
- Within subjects and interaction effects are doubly multivariate while the between groups effects is singly multivariate.

Doubly MANOVA

- This can be performed using the repeated measures ANOVA function in SPSS (now with two within subjects IVs) and just interpreting the multivariate tests.