ANCOVA Patterns

ANCOVA results are different from ANOVA results in 2 ways:

1. Including the covariate decreases the error variance -- so tests of the IV effect is more powerful
2. takes into account any initial non-equivalences between the groups on the covariate -- so "apparent" group differences on the DV might be changed between ANOVA and ANCOVA

When the results of ANCOVA differ from those of the corresponding ANOVA, remember …
More complex analyses are more accurate "on average" -- because they involve more variables, and so are more likely to represent a complex reality!

The 15 have combinations of DV pattern and covariate pattern have 3 basic results, resulting from..

- no cov mean dif (middle column)
- cov mean dir same direction as "IV effect" -- so, IV effect smaller in ANCOVA than ANOVA (upper 2 of left- and lower 2 of right-hand column)
- cov mean dir opposite direction as "IV effect" -- so, IV effect larger in ANCOVA than ANOVA (lower 2 of left- and upper 2 of right-hand column)

Pattern of Mean IV Differences Between IV Conditions	**Pattern of Mean Covariate Differences Between IV Conditions**		
	C < T	C = T (error goes down, F of DV goes up)	C > T
C <<< T (sig ANOVA)	Part of IV effect is really an initial noneq on the cov Now C << T, may still be sig	Still C <<< T, still sig	IV effect underestimated by ANOVA, had to overcome initial cov noneq Now C <<<< T, will be sig
C << T (nonsig ANOVA)	Part of IV effect is really an initial noneq on the cov Now C < T or C = T, may become sig	Still C << T, more likely to be sig	IV effect underestimated by ANOVA, had to overcome initial cov noneq Now C <<< T, will be sig
C = T nonsig ANOVA)	Now C > T, may become sig	Still C = T, still nonsig	Now C< T, may become sig
C >> T nonsig ANOVA)	IV effect underestimated by ANOVA, had to overcome initial cov noneq Now C >>> T, will be sig	Still C >> T, more likely to be sig	Part of IV effect is really an initial noneq on the cov Now C > T or C = T, may become sig
C >>> T (sig ANOVA)	IV effect underestimated by ANOVA, had to overcome initial cov noneq Now C >>>> T, will be sig	Still C >>> T, still sig	Part of IV effect is really an initial noneq on the cov Now C >> T, may still be sig