Note: Here

	DOSE 0	DOSE 1	DOSE 2	DOSE 3
s_i^2	8.018	5.873	11.315	3.875

so we might suspect that the treatment variances $\sigma_1^2, \sigma_2^2, \sigma_3^2, \sigma_4^2$ are not equal. We may test this formally using

LEVENE'S TEST

- SPSS can report this test result.

Note: Visual inspection can give an idea of whether the equal variance assumption is valid, or whether the populations are normal. **But the sample sizes may be small, so that visual inspection or testing may not detect deviations from these assumptions**.

Ideally we would like to be able to relax these assumptions.

The ANOVA Table

For a completely randomized design, we may report the results of the ANOVA F-test in a stylized form, the **ANOVA Table**

SOURCE	DF	SS	MS	F
TREATMENTS	$k-1$	SST	$MST = \dfrac{SST}{(k-1)}$	$F = \dfrac{MST}{MSE}$
ERROR	$n-k$	SSE	$MSE = \dfrac{SSE}{(n-k)}$	
TOTAL	$n-1$	SS		

Note

(i) $(k-1) + (n-k) = (n-1)$

(ii) $SST + SSE = SS$

i.e. we can fill in missing values if they are not given.

Sometimes an extra column is added at the right of the table to give the *p*-value of the ANOVA F-test.

SOURCE	DF	SS	MS	F	p
TMT	$k-1$	SST	MST	$F = \dfrac{MST}{MSE}$	*p*-val
ERROR	$n-k$	SSE	MSE		
TOTAL	$n-1$	SS			

where *p*-val solves

$$\frac{MST}{MSE} = F_{p\text{-val}}(k-1, n-k)$$

and $F_\alpha(\nu_1, \nu_2)$ is the $(1-\alpha)$ probability point of the Fisher-F distribution.

SPSS Handout: Examples

- **DIET**: milk-protein level example (p. 1)
- **DOSE-LEVEL**: pull-strength in Alzheimer's example (p. 3)
- **DIAGNOSIS**: (p. 5)
    - RESPONSE: gut permeability of drug mannitol in AIDS/HIV patients
    - FACTOR: AIDS/HIV Status
    - FACTOR LEVELS: $k = 4$
        - AIDS - Full AIDS
        - ARC - AIDS-related conditions
        - HIV+ - HIV positive
        - HIV- - HIV negative

SPSS Handout: Examples

- **BATCH NUMBER**: bacteria level (per mill.) in different batches of milk (p. 7)
  - RESPONSE: Bacteria level count per million
  - FACTOR: Batch number
  - FACTOR LEVELS: 1,2,3,4,5 ($k = 5$)

- **TREATMENT GROUP**: Post-traumatic stress disorder (PTSD) score in different treatment groups(p. 9)
  - RESPONSE: PTSD score
  - FACTOR: Therapeutic treatment method
  - FACTOR LEVELS: $k = 4$
    - SIT - "Stress Innoculation Therapy"
    - RE - "Relive Experience"
    - SC - "Standard Counselling"
    - WL - "Waiting List" (Control)