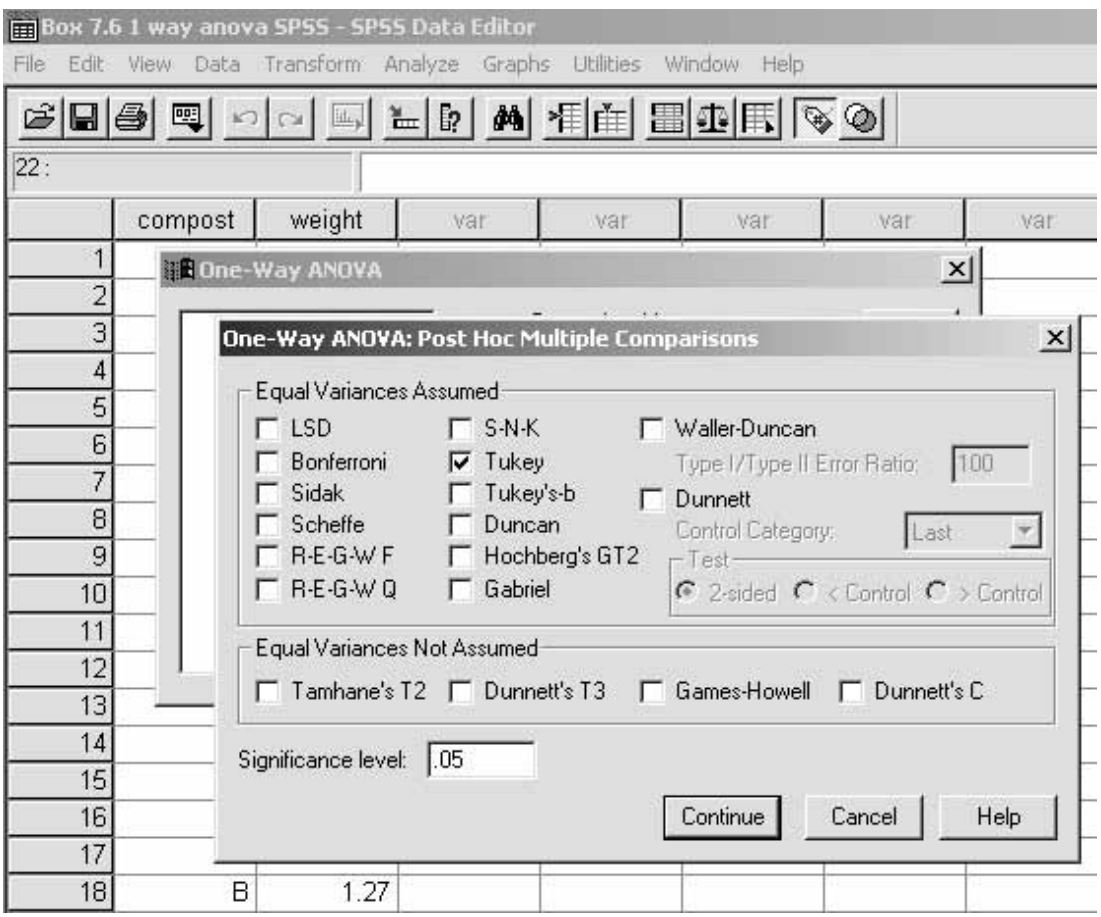
7.6. Tukey's test following a parametric one-way ANOVA

This calculation follows on from those outlined in BOXES 7.5. and 7.6. and is illustrated from Example 7.4.

BOX 7.7. How to carry out a Tukey's test after a significant one-way parametric anova with equal replicates

Step 1. Proceed with the analysis as in Box 7.6., but after transferring the variables to the 'Dependent List' and 'Factor' windows (but before clicking on 'OK'), click on 'Post Hoc' and make sure that 'Tukey' is selected. (There is also an option for Tukey's-b, but this is a different test.)



Click on 'Continue'. Click on 'OK'.

Step 2. The results will appear in a separate window.

Oneway

ANOVA

WEIGHT

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	26.876	3	8.959	5.755	.003
Within Groups	56.039	36	1.557		
Total	82.914	39			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: WEIGHT
Tukey HSD

(I) COMPOST	(J) COMPOST	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
A	B	2.1050(*)	.55797	.003	.6023	3.6077
	C	1.0950	.55797	.221	–.4077	2.5977
	D	1.8590(*)	.55797	.010	.3563	3.3617
B	A	–2.1050(*)	.55797	.003	–3.6077	–.6023
	C	–1.0100	.55797	.285	–2.5127	.4927
	D	–.2460	.55797	.971	–1.7487	1.2567
C	A	–1.0950	.55797	.221	–2.5977	.4077
	B	1.0100	.55797	.285	–.4927	2.5127
	D	.7640	.55797	.526	–.7387	2.2667
D	A	–1.8590(*)	.55797	.010	–3.3617	–.3563
	B	.2460	.55797	.971	–1.2567	1.7487
	C	–.7640	.55797	.526	–2.2667	.7387

* The mean difference is significant at the .05 level.

Homogeneous Subsets

WEIGHT

Tukey HSD

COMPOST	N	Subset for alpha = .05	
		1	2
B	10	2.6390	
D	10	2.8850	
C	10	3.6490	3.6490
A	10		4.7440
Sig.		.285	.221

Means for groups in homogeneous subsets are displayed.
a Uses Harmonic Mean Sample Size = 10.000.

Step 3. Decide what the results mean.

In the 'Post Hoc Tests' table, the column headed 'Sig.' gives the *p* value of the difference between the pairs of samples. Since all the sample pairs are computed in both directions (A and B, as well as B and A), everything is duplicated. However, there are two pairs where the *p* value is less than 0.05: A and B, and A and D. Thus we conclude that the significant difference detected by the ANOVA process is explained by significant differences between the pairs AB and AD.

The final table ('Homogeneous Subsets') puts the composts into groups that can be separated by the ANOVA process. B and D clearly fall into one group, and A into the other. The group into which C should be placed is unconfirmed by the tests: it could belong to either.