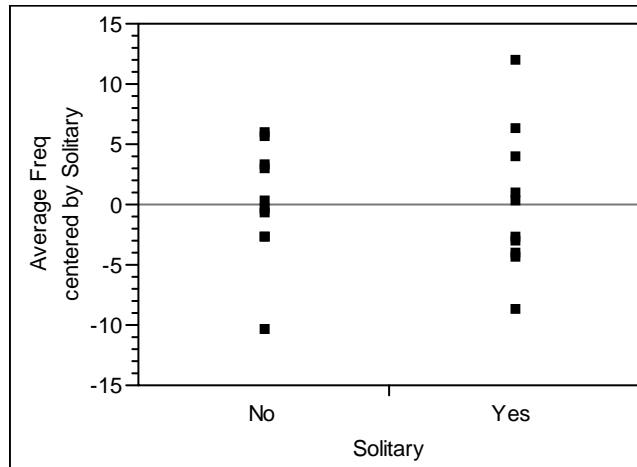


Residuals for the Split Plot/Repeated Measures Design

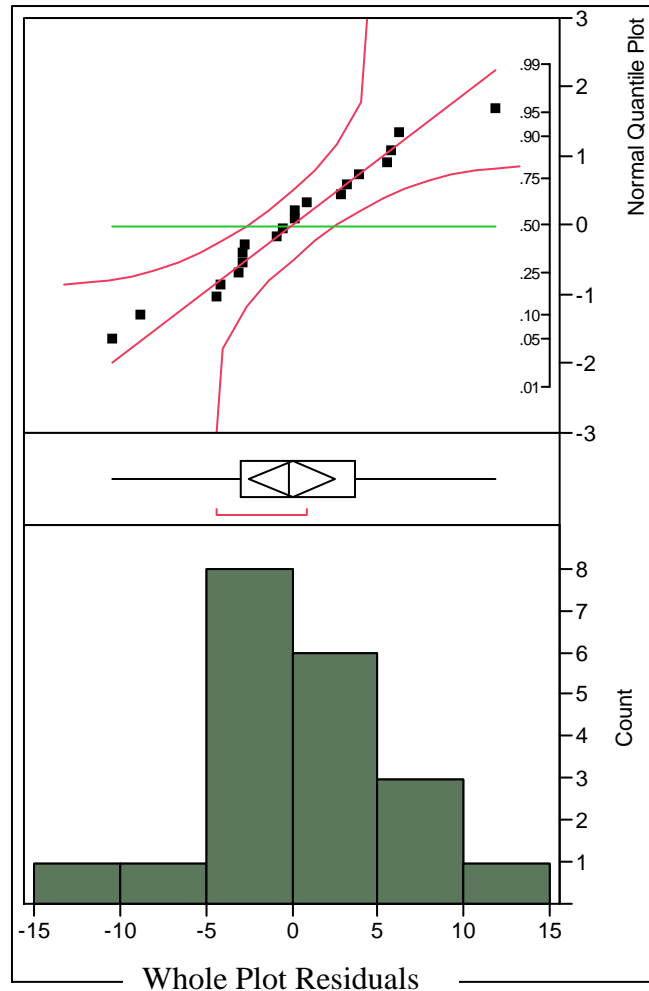
Because there are two different error terms (one for the whole plot factor and another for the subplot/repeated measures factor) there are two sets of residuals.

In our example the whole plot factor is Solitary (Yes or No). Consider the brain wave frequencies for each prisoner averaged over the three days. These average frequencies form the basis for sums of squares for Solitary and for Prisoner[Solitary]. Residuals for the whole plot would be the prisoner average frequency minus the average frequency for the solitary confinement condition (15.8333 for Solitary=No and 11.7667 for Solitary=Yes).

Solitary	Prisoner	Average Frequency	Whole Plot "Residual"
Yes	1	9.0000	-2.7667
Yes	2	18.0000	6.2333
Yes	3	12.6667	0.9000
Yes	4	15.6667	3.9000
Yes	5	7.3333	-4.4333
Yes	6	8.6667	-3.0999
Yes	7	12.0000	0.2333
Yes	8	7.6667	-4.0999
Yes	9	3.0000	-8.7667
Yes	10	23.6667	11.9000
No	11	19.0000	3.1667
No	12	16.0000	0.1667
No	13	15.3333	-0.5000
No	14	18.6667	2.8333
No	15	15.0000	-0.8333
No	16	13.0000	-2.8333
No	17	5.3333	-10.5000
No	18	21.6667	5.8333
No	19	21.3333	5.4999
No	20	13.0000	-2.8333

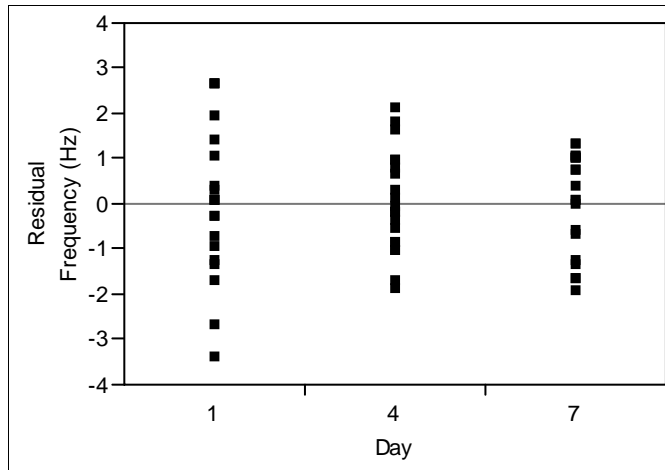


There is slightly more variation in the brain waves of prisoners put in solitary confinement compared to those who are not in solitary confinement. The Fisher condition of equal standard deviations is most likely satisfied.

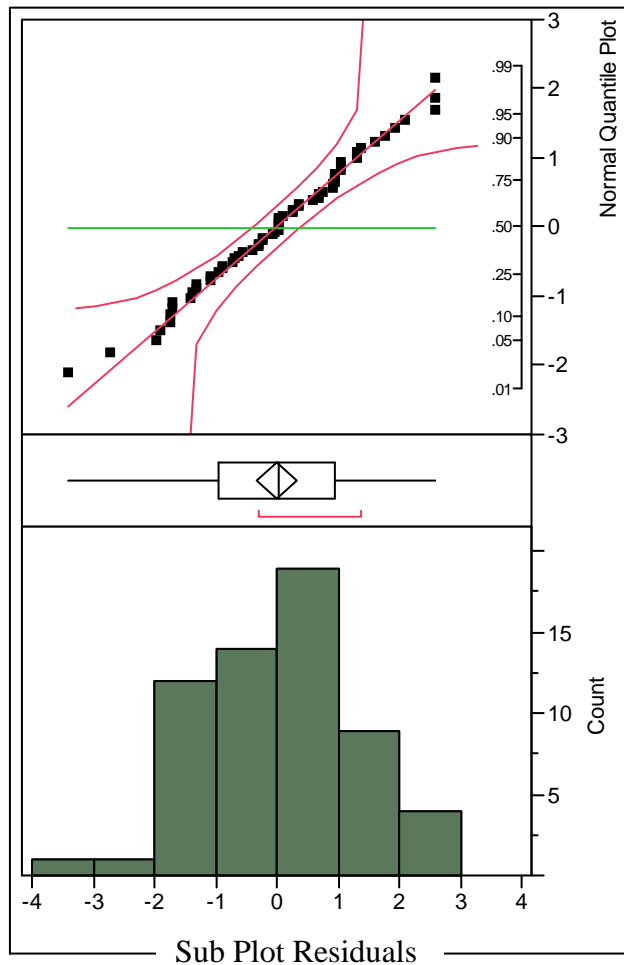


The histogram shows a skew to the right. The box plot is fairly symmetric. The points on the normal quantile plot follow the normal model (diagonal) line fairly well. The Fisher condition of normally distributed errors is most likely satisfied.

For the subplot/repeated measures factor (and the interaction) the residuals constitute what remains after accounting for the overall mean, the effect of solitary, the block effect due to prisoners, the effect of day and the solitary*day interaction term. These are calculated by JMP by Save Columns – Residuals.



There appears to be a decrease in variation as day increases. However, this decrease is not large so that the Fisher condition of equal standard deviations is most likely satisfied.



The histogram is fairly symmetric as is the box plot. The normal quantile plot has all points following the diagonal (Normal model) line fairly well. The Fisher condition of normally distributed errors is most likely met.