1. Suppose in a study of a training program, children living with single fathers and children living with single mothers were randomly assigned to control and treatment groups. The dependent variable was performance on some task, with higher scores indicating greater performance. Data are presented in the following tables. In each of the four cells there are 43 children.

Condition	Treatment		Control	
Raised by	Mom	Dad	Mom	Dad
Mean	25.8	26.3	23.0	20.3
S.D.	3.6	5.0	4.0	4.5

	Treatment	Control	means
Mom	25.8	23.0	24.4
Dad	26.3	20.3	23.3
means	26.05	21.65	23.85

1.1 Test the two main effects and the interaction effect. Draw conclusions in terms of the problem. For the interaction effect, calculate SS by subtracting from SS_{cells}. Show your work.You don't need to present an ANOVA table or state the hypotheses.

1.2. Calculate the complete $\hat{\omega}^2$ for the treatment factor and the partial $\hat{\omega}^2$ for the interaction.

1.3 Use WebPower, find the power of this design (2×2 with per cell sample size $n = 43$) to detect an interaction effect of partial $\omega^2 = 0.1$. Show a screen shot.

1.4 Suppose by literature review you found that the main effect of Parental situation has partial $\omega^2 = 0.05$ and the interaction has partial $\omega^2 = 0.03$. What is the partial ω^2 of the main effect of Condition corresponding to a complete ω^2 of 0.06?

2. Before working on the following set of problems, review what happens in the population if there is no main effect of a factor, or if there is no simple effect of a factor at an level of another factor, or if there is no interaction. Briefly show your reasoning.

2.1. Below is a table of population cell means. Neither B nor A has a main effect. Find the missing entries. (Hint: calculate the values in the order of their labels.)

	B1	B2	B3	Mean
A1	32	(7)	(9)	(6)
A2	56	61	(8)	(5)
Mean	(1)	(2)	(3)	(4)

2.2. In the following table of population cell means, the two factors have no interaction effect. Find the missing entries.

	B1	B2	B3
A1	32	27	
A2	56		15

2.3. In the following table of population cell means, factor A has no simple effect at level B1, factor B has no simple effect at level A2, and factor A has no main effect. Find the missing entries.

	B1	B2	B3	mean
A1			37	
A2	32			