**PSY 653 Module 4: Inferences regarding fixed and random effects**

**Feb 19, 2020**

The following results are reported

**Source df SS MS**

A 2 200 100

B 3 160 53.33

C 2 400 200

AB 6 60 10

AC 4 80 20

BC 6 70 15

ABC 12 30 2.5

Error 685 420 2

1. Determine 𝜂2 values for each effect (Hint 𝜂2 = SSeffect/SSTotal)
2. How many total cells are there? (Hint: Identify how many levels in each variable)
3. Subjects were divided evenly. How many subjects per cell? (Hint: Calculate the DFtotal)
4. **Assuming all factors are fixed**
   1. Create EMS table and EMS Equations

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 𝜎2A | 𝜎2B | 𝜎2C | 𝜎2AB | 𝜎2AC | 𝜎2BC | 𝜎2ABC | 𝜎2Error |
| EMSA |  |  |  |  |  |  |  |  |
| EMSB |  |  |  |  |  |  |  |  |
| EMSC |  |  |  |  |  |  |  |  |
| EMSAB |  |  |  |  |  |  |  |  |
| EMSAC |  |  |  |  |  |  |  |  |
| EMSBC |  |  |  |  |  |  |  |  |
| EMSABC |  |  |  |  |  |  |  |  |
| EMSError |  |  |  |  |  |  |  |  |

* 1. Identify variance components for all factors (i.e., write out the equations for each effect)

|  |  |
| --- | --- |
| EMSA |  |
| EMSB |  |
| EMSC |  |
| EMSAB |  |
| EMSAC |  |
| EMSBC |  |
| EMSABC |  |
| EMSError |  |

* 1. Plug in the weights for each effect and solve for the s2 effect (hint: this can be tedious, so using excel to calculate values could speed up the process)

|  |  |
| --- | --- |
| EMSA |  |
| EMSB |  |
| EMSC |  |
| EMSAB |  |
| EMSAC |  |
| EMSBC |  |
| EMSABC |  |
| EMSError |  |

1. **Assuming A is fixed and B and C are random**
   1. Create EMS table and EMS Equations

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 𝜎2A | 𝜎2B | 𝜎2C | 𝜎2AB | 𝜎2AC | 𝜎2BC | 𝜎2ABC | 𝜎2Error |
| EMSA |  |  |  |  |  |  |  |  |
| EMSB |  |  |  |  |  |  |  |  |
| EMSC |  |  |  |  |  |  |  |  |
| EMSAB |  |  |  |  |  |  |  |  |
| EMSAC |  |  |  |  |  |  |  |  |
| EMSBC |  |  |  |  |  |  |  |  |
| EMSABC |  |  |  |  |  |  |  |  |
| EMSError |  |  |  |  |  |  |  |  |

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| EMSError |  |

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| --- | --- |
| EMSA |  |
| EMSB |  |
| EMSC |  |
| EMSAB |  |
| EMSAC |  |
| EMSBC |  |
| EMSABC |  |
| EMSError |  |

1. **Assuming A, B, and C are random**
   1. Create EMS table and EMS Equations

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 𝜎2A | 𝜎2B | 𝜎2C | 𝜎2AB | 𝜎2AC | 𝜎2BC | 𝜎2ABC | 𝜎2Error |
| EMSA |  |  |  |  |  |  |  |  |
| EMSB |  |  |  |  |  |  |  |  |
| EMSC |  |  |  |  |  |  |  |  |
| EMSAB |  |  |  |  |  |  |  |  |
| EMSAC |  |  |  |  |  |  |  |  |
| EMSBC |  |  |  |  |  |  |  |  |
| EMSABC |  |  |  |  |  |  |  |  |
| EMSError |  |  |  |  |  |  |  |  |

* 1. Identify variance components for all factors (i.e., write out the equations for each effect)

|  |  |
| --- | --- |
| EMSA |  |
| EMSB |  |
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| EMSAB |  |
| EMSAC |  |
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* 1. Plug in the weights for each effect and solve for the s2 effect (hint: this can be tedious, so using excel to calculate values could speed up the process)

|  |  |
| --- | --- |
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| EMSC |  |
| EMSAB |  |
| EMSAC |  |
| EMSBC |  |
| EMSABC |  |
| EMSError |  |

1. How would you use these values to solve for F or Quasi F ratios? (You don’t need to actually solve these equations, unless you would like the algebra practice!)