개인과제: 크래커 실험 F-test

201623290 김범조

**1.**

1. Factor A (Weight) 의 변화 (Normal, Obese)와 number of crackers eaten 의 관계

2. Factor B (Fullness)의 변화 (Empty, Full)와 number of crackers eaten의 관계

3. 두가지 독립변인의 동시존재와 number of crackers eaten의 관계

H0: µ1=µ2= µ3

H1: 적어도 한 평균값이 다른 평균값과 다를 것이다.

**Total variability**

***SS total***: 31836-(1440)^2/80

=31836-25920

=5916

***df total***: N-1

=79

**Between variability**

***SS between***: 440^2/20+300^3/20+340^2/20+360^2/20-1440^2/80

=9680+4500+5780+6480-25920

=26440-25920

=520

***df between***=K-1

=3

**Within variability**

***SS within***= 1540+1270+1320+1266

=5396

***df within***= 19+19+19+19

=76

**SS total= SS between + SS within**

5916=520+5396

**df total= df between + df within**

79=3+76

1. *For factor A*

**SS A**= 740^2/40+700^2/40+1440^2/80

=13690+12250-25920

=20

**df A**=2-1=1

1. *For factor B*

**SS B**= 780^2/40+660^2/40-1440^2/80

=15210+10890-25920

=180

**dfB**=2

1. For interaction (A X B)

**SS (A X B)**= SS between-SSA-SSB

=520-20-180

=320

**df (A X B)**= 3-1-1=1

**MS within**= SS within/ df within

=5396/76

=71

**MS A**= SS A/df A=20/1=20

**MS B**= SS B/df B=180/1=180

**MS (A X B)**= SS (A X B)/df (A X B)= 320/1=320

**F A**= 20/71=0.2816

**F B**= 180/71=2.5352

**F (A X B)** = 320/71= 4.507

**2.**

|  |  |  |  |
| --- | --- | --- | --- |
| Table1. Mean number of crackers eaten in each treatment condition | | | |
|  |  | **Fullness** | |
|  |  | Empty  stomach | Full  stomach |
| weight | Normal | M=22  SD=9 | M=15  SD=8.18 |
|  | Obese | M=17  SD=8.34 | M=18  SD=8.16 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Result | | | | |
| Source | SS | df | MS | F |
| Between treatment | 520 | 3 |  |  |
| Factor A  (Weight) | 20 | 1 | 20 | 0.28 |
| Factor B  (Fullness) | 180 | 1 | 180 | 2.53 |
| A X B interaction | 320 | 1 | 320 | 4.5 |
| Within treatment | 5396 | 76 | 71 |  |
| Total | 5916 | 79 |  |  |
| Weight x Fullness factorial design | | | | |

**3.**

F A (1,71)=0.28

F B (1,71)=2.53

F (A X B) (1,71)= 4.5

F distribution Table 를통해서, F A (1,71)와F B (1,71)은 영가설을 부정하지 못하는 반면,

F (A X B) (1,71)는 영가설을 부정한다.

이것이 의미하는 것은 Factor A (weight), Factor B (Fullness) 는 영가설은 부정하는데 실패했으므로 ‘**Number of crackers eaten in each treatment condition’**  과는 상관관계가 없다고 말할수 있겠다. 반면 두 팩터가 동시에 작용할 경우 영가설을 부정했으므로’**Number of crackers eaten in each treatment condition’ Number of crackers eaten in each treatment condition’**  과 상관관계가 있다고 말할 수 있다.