| **Factor B: Fullness** | | | | | |
| --- | --- | --- | --- | --- | --- |
| Factor A:  Weight |  | Empty | Full |  |  |
| Normal | n=20  $\overline{X}=22$ T=440  SS=1540 | n=20  $\overline{X}$=15  T=300  SS=1270 | $T_\text{Normal}=740$ |  |
| Obese | n=20  $\overline{X}$= 17  T=340  SS=1320 | n=20  $\overline{X}$= 18  T=360  SS=1266 | $T_\text{obese} = 700$ |  |
|  | $T_\text{empty} =780$ | $T_\text{full} = 660$ |  | G=1440  N=80  $\Sigma{X^2}=31836$ |

양식의 맨 위

양식의 맨 아래

1. weight의 변화(2가지,normal,obese)에 따른 number of crackers eaten의 차이

H1: weight의 변화에 따른 number of crackers eaten의 차이가 있을 것이다.

H0: weight의 변화에 따른 number of crackers eaten의 차이가 없을 것이다.

1. fullness의 변화(2가지,empty,full)에 따른 number of crackers eaten의 차이

H1: fullness의 변화에 따른 number of crackers eaten의 차이가 있을 것이다.

H0: fullness의 변화에 따른 number of crackers eaten의 차이가 없을 것이다.

1. H1: weight와 fullness의 상호작용에 따른 number of crackers eaten의 차이가 있을 것이다.

H0: weight와 fullness의 상호작용에 따른 number of crackers eaten의 차이가 없을 것이다.

$\overline{X_{t}}= 18 $  
$\overline{X_{t}}^2= 324 $  
$N = 80 $  
$N*(\overline{X_t}^2) = 25920 $  
$\sum{X^2} - N*(\overline{X_t}^2) = 31836 - 25920 = 5916$

1.$df_{total}$= N-1= 80-1=79

2.$df_{within}$= N-k=80-4=76

3.$df_{between}$= k-1=4-1=3

4.$df_A$= number of levels of a – 1=2-1=1

5.$df_B$= number of levels of b -1 =2-1=1

6.=dfbetween-dfa-dfb=3-1-1=1



SS

1. $SS_{total}$=31836-(80\*324)=5916

$\overline{X_{t}}= 18 $  
$\overline{X_{t}}^2= 324 $  
$N = 80 $  
$N*(\overline{X_t}^2) = 25920 $  
$\Sigma{X^2} - N*(\overline{X_t}^2) = 31836 - 25920 = 5916$

2.$SS_{within}$=∑SS each group=1540+1270+1320+1266=5396

$SS_{within} = \Sum{SS_{within}} = 1540 + 1270 + 1320 + 1266 = 5396$

1.$SS_{between}$=SS total-SS within=5916-5396=520

1.$SS_A$=∑(TA^2/ nA )– G^2/N = (740^2)/40 + (700^2)/40 -(1440^2)/80=13690+12250-25920=20

2.$SS_B$=∑(TB^2/ nB )– G^2/N=(780^2)/40 + (660^2)/40 – (1440^2)/80 = 15210+10890-25920=180

3.$SS_{AxB}$=SSbetween-SSA-SSB=520-20-180=320

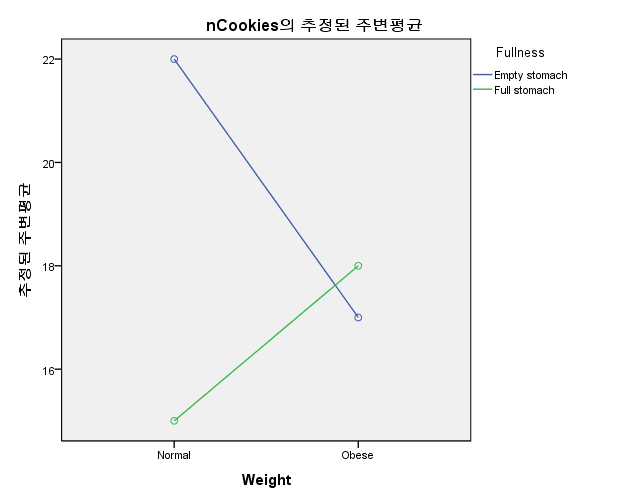
MS

1. $MS_{A}$=SSA/dfA=20/1=20
2. $MS_{B}$=SSB/dfB=180/1=180
3. $MS_{AxB}$=SSAXB/dfAXB=320/1=320
4. $MS_{Within}$=SSwithin/dfwithin=5396/76=71

F-ratio

1. $F_{A}$=MSA/MSwithin = 20/71=0.2817
2. $F_{B}$=MSB/ MSwithin = 180/71=2.5352
3. $F_{AxB}$=MSAXB/ MSwithin = 320/71=4.5070

| **Table 1. Mean number of crackers eaten in each treatment condition** | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | | | Fullness | | | |
|  |  | | | | Empty  stomach | | | Full  stomach |
| Weight | Normal | | | | M= 22 SD= 9.00 | | | 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 | | 4.50 |
| Within treatment | | | 5396 | 76 | 71 | |  |
| Total | | | 5916 | 79 |  | |  |
| weigth x fullness factorial | | | | | | | |



Weight와 numbers of cracker eaten는 상관관계가 없다. (F(1,71)=0.2817, p>.05) Fullness와 numbers of cracker eaten는 상관관계가 없다. (F(1,71)=2.5352, p>.05) 그리고 Weight와 fullness의 상호작용에 따른 number of crackers eaten는 상관관계가 있을 것이다. (F(1,71)=4.5070, p<.05)

따라서, weight와 fullness의 상호작용에 따른 number of crackers eaten라는 가설은 통계적으로 유의미하다.