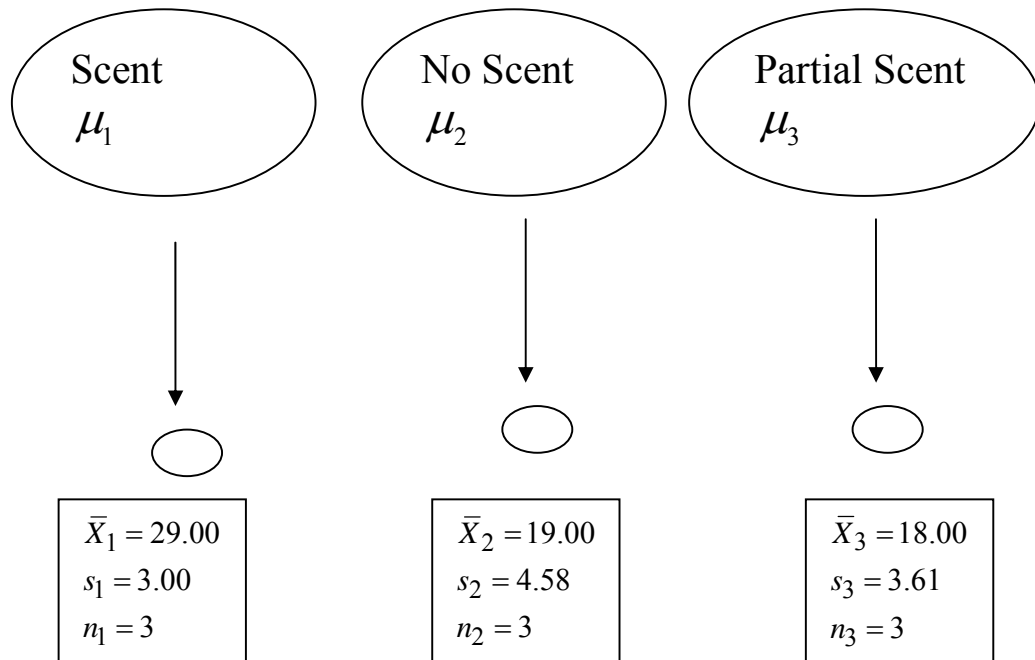


ANOVA  
Alison's Problem



**Step 1**

$$H_0 : \mu_1 = \mu_2 = \mu_3$$

$H_1$  : At least one pair is different

$$\alpha = .05$$

**Step 2**

Source	SS	df	MS	F	p
Between	222	2	111.00	7.74	.022
Within	86	6	14.33		
Total	308	8			

### Step 3

#### 1. Critical Value (CV) Approach

$$F_{crit} = F_{\alpha, df 1, df 2} = F_{\alpha, k-1, n-k} = F_{.05, 2, 6} = 5.14$$

$$F_{calc} \geq F_{crit}$$

Reject  $H_0$

#### 2. The p value Approach

$$p = .022$$

$$p \leq \alpha$$

Reject  $H_0$

### Step 4

Reject  $H_0$

There is a significant difference between at least one pair of the means of the three groups ( $F_{2,6} = 7.75, p = .022$ ).

#### Step 5: Post Hoc Procedure

Tukey's Test

Group 1 vs. Group 2

$$29 - 19 = 10^*$$

Group 2 vs. Group 3

$$19 - 18 = 1$$

Group 1 vs. Group 3

$$29 - 18 = 11^*$$

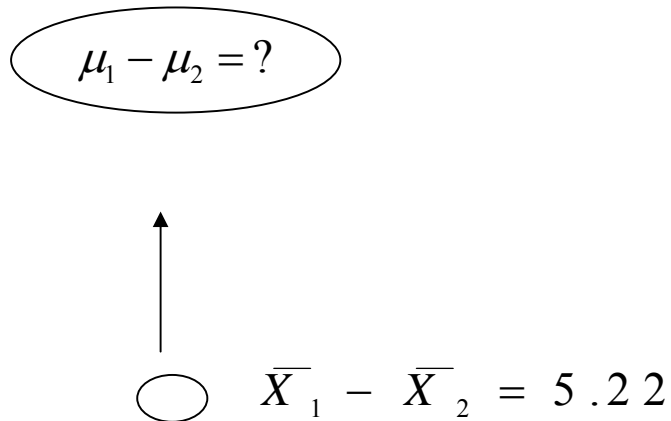
## Conclusions:

Group 1 is significantly different from Groups 2 and 3; the difference between groups 2 and 3 is not significant. Alison concludes that the presence of scent during passage reading and passage recall leads to recall greater than that recorded when no scent is present on either occasion or when scent is present only during passage reading.

## **Assumptions**

1. Independence
2. Normality
3. Homoscedasticity

## Interval Estimation



Point Estimate  $\pm$  (Critical Value at  $\alpha$ )(SE)

$$(\bar{X}_1 - \bar{X}_2) \pm t_{\alpha, df} \cdot s_{\bar{X}_1 - \bar{X}_2}$$

**A 95% ( $\alpha = .05$ ) Confidence Interval**

$$5.22 \pm (2.12) \cdot (2.18) = 5.22 \pm 4.62$$

$$.60 < \mu_1 - \mu_2 < 9.84$$

**A 99% ( $\alpha = .01$ ) Confidence Interval**

$$5.22 \pm (2.921) \cdot (2.18) = 5.22 \pm 6.37$$

$$-1.15 < \mu_1 - \mu_2 < 11.59$$