# Velocity Breakdown by Pitch Type
## *Data available for home games only*

| pitchType | N Obs | N | Minimum | Mean | Maximum |
|---|---|---|---|---|---|
| CB | 2 | 2 | 63.0 | 63.5 | 64.0 |
| CH | 13 | 13 | 74.0 | 76.8 | 78.0 |
| FB | 44 | 44 | 79.0 | 80.8 | 83.0 |
| SL | 1 | 1 | 66.0 | 66.0 | 66.0 |

**Analysis Variable : velocity**

**Velocity Breakdown by Pitch Type**
visual of above table
*Data available for home games only*

**Average Velocity by Game**
**Grouped by pitch type**
**\*Data available for home games only\***
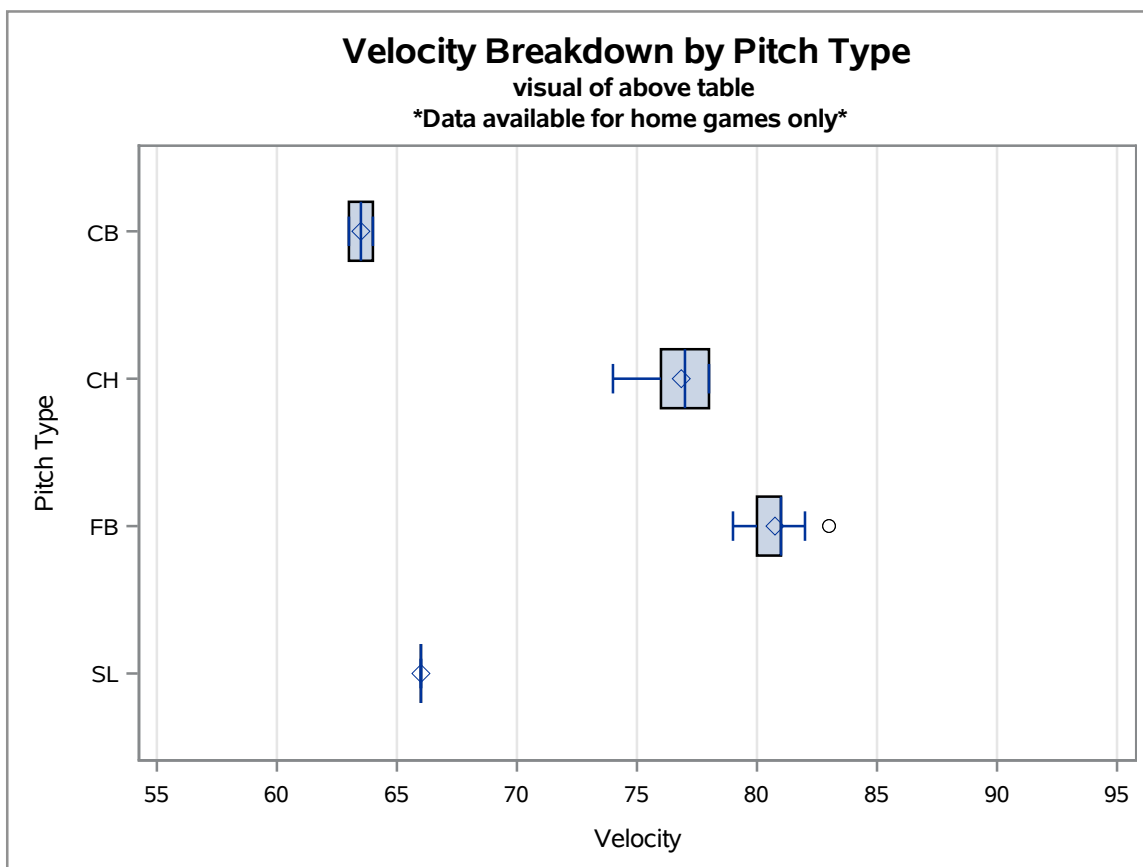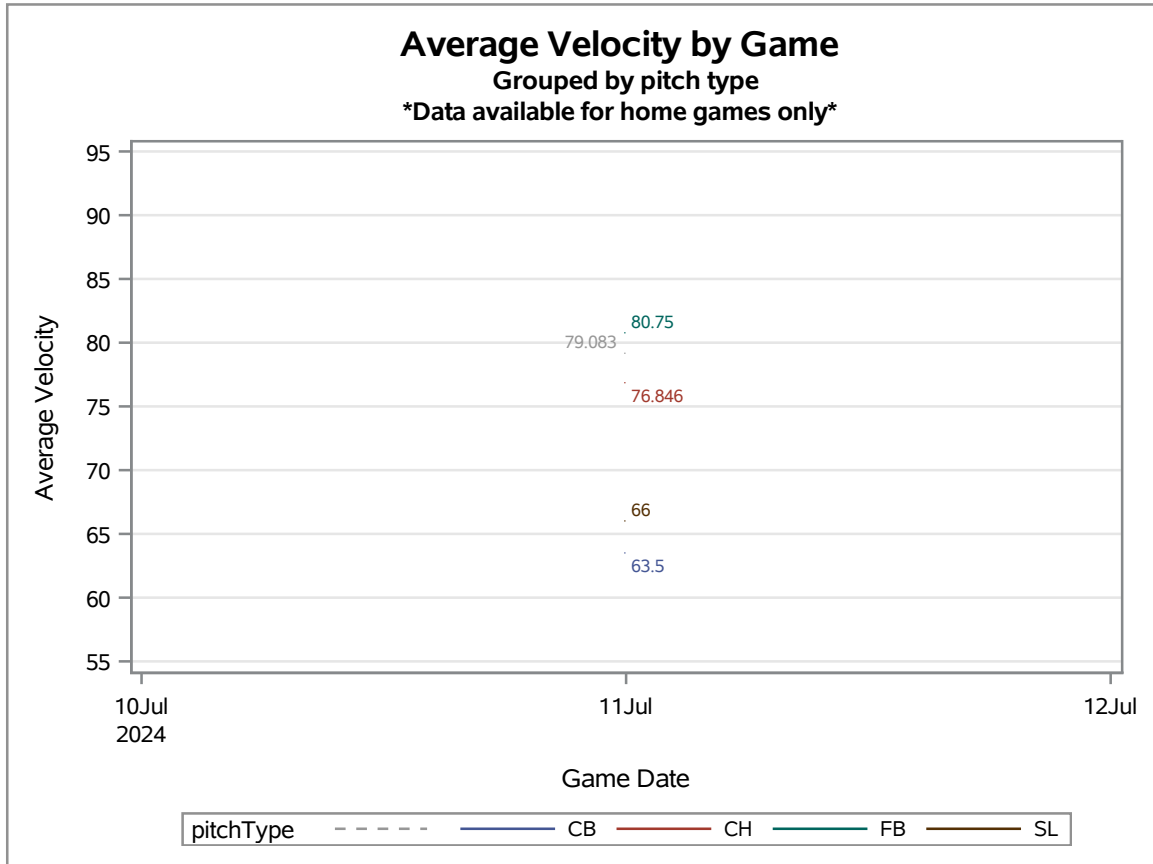
## Dependent Variable: swingingStrRate

| Source | DF | Sum of Squares | Mean Square | F Value | Pr > F |
|---|---|---|---|---|---|
| Model | 14 | 2.16166667 | 0.15440476 | 2.22 | 0.1152 |
| Error | 9 | 0.62500000 | 0.06944444 | | |
| Corrected Total | 23 | 2.78666667 | | | |

| R-Square | Coeff Var | Root MSE | swingingStrRate Mean |
|---|---|---|---|
| 0.775718 | 112.9385 | 0.263523 | 0.233333 |

| Source | DF | Type III SS | Mean Square | F Value | Pr > F |
|---|---|---|---|---|---|
| location | 12 | 1.67918301 | 0.13993192 | 2.02 | 0.1494 |
| pitchType | 2 | 0.06018519 | 0.03009259 | 0.43 | 0.6612 |

## Dependent Variable: swingingStrRate



Fit Diagnostics for swingingStrRate

# Analysis of Swinging Strike Rate by Pitch Type and Location

## Dependent Variable: swingingStrRate
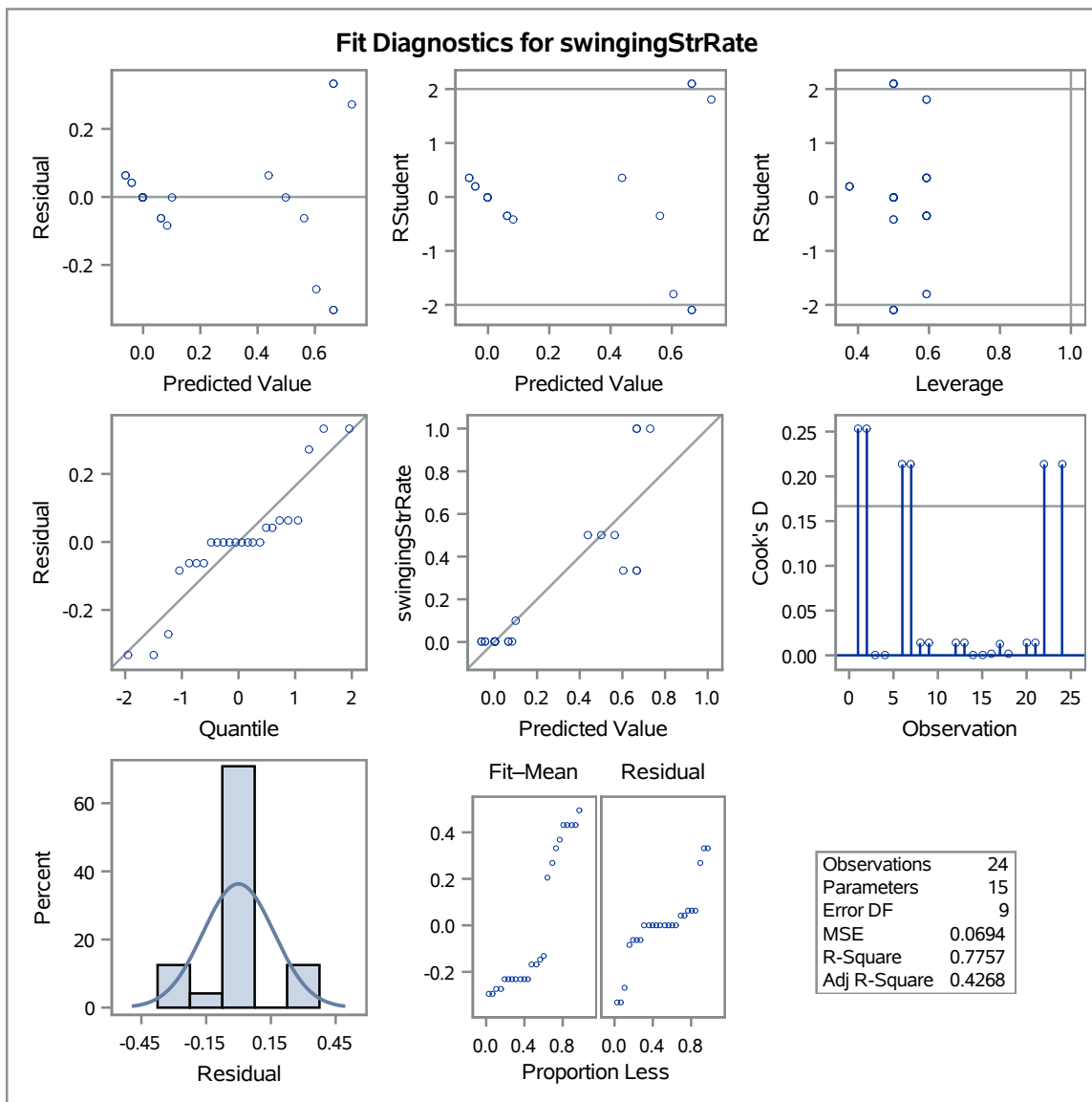


Interaction Plot for swingingStrRate
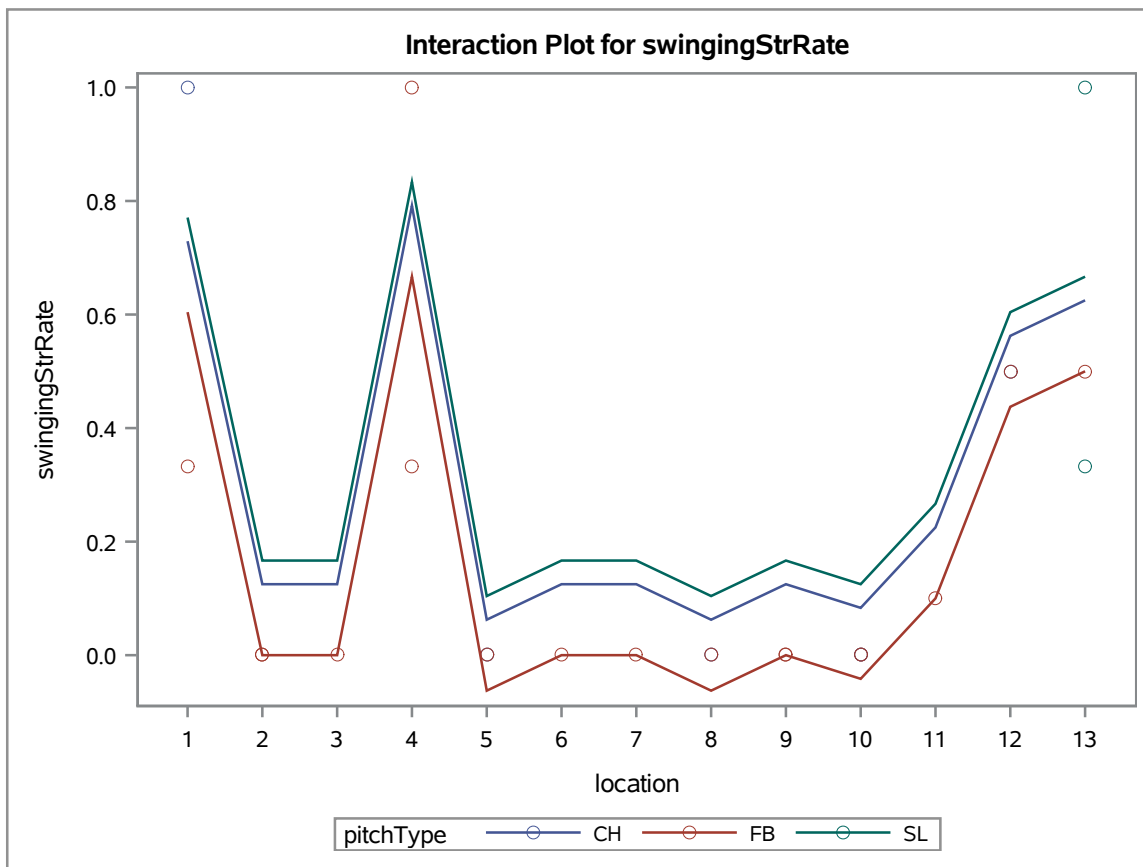
## Least Squares Means
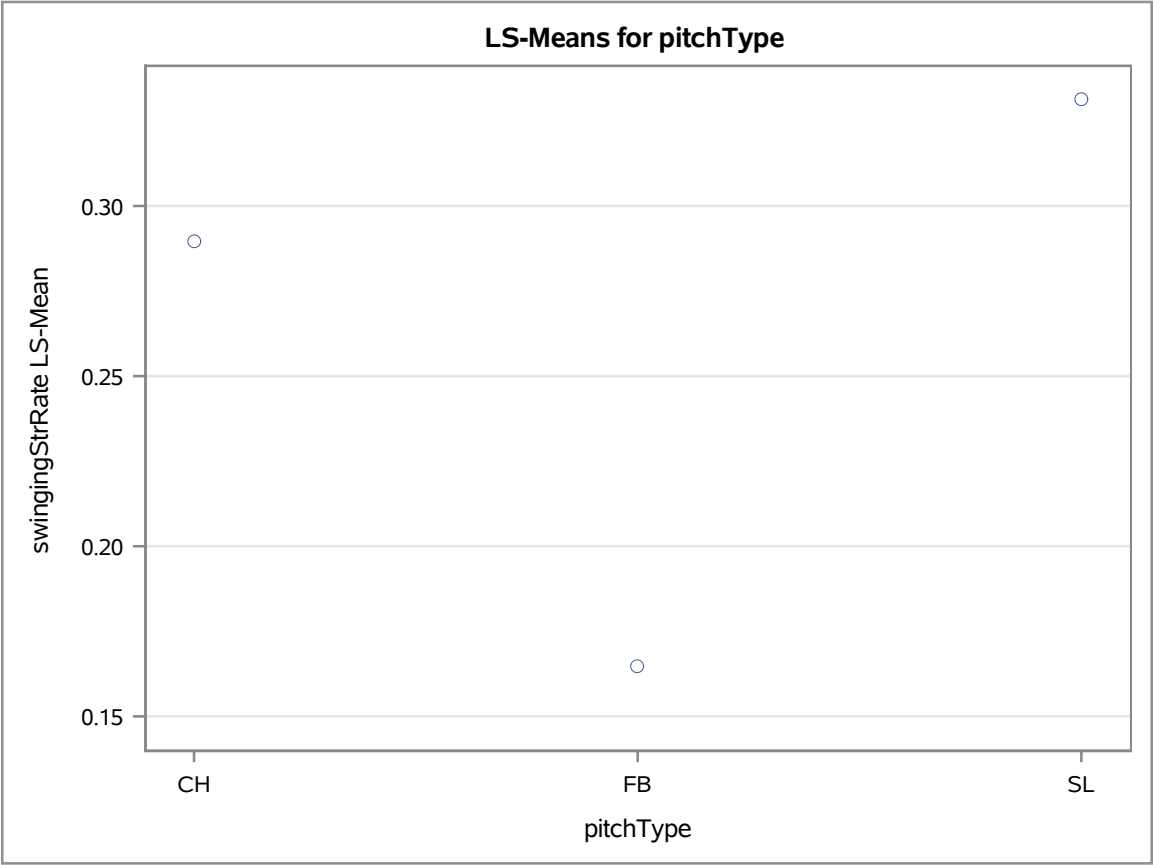## Adjustment for Multiple Comparisons: Tukey-Kramer

| pitchType | swingingStrRate LSMEAN | LSMEAN Number |
|---|---|---|
| CH | 0.28974359 | 1 |
| FB | 0.16474359 | 2 |
| SL | 0.33141026 | 3 |

**Least Squares Means for effect pitchType**
**Pr > |t| for H0: LSMean(i)=LSMean(j)**

**Dependent Variable: swingingStrRate**

| i/j | 1 | 2 | 3 |
|---|---|---|---|
| 1 | | 0.7270 | 0.9927 |
| 2 | 0.7270 | | 0.8654 |
| 3 | 0.9927 | 0.8654 | |

| pitchType | swingingStrRate LSMEAN | 95% Confidence Limits | |
|---|---|---|---|
| CH | 0.289744 | -0.039337 | 0.618824 |
| FB | 0.164744 | 0.013522 | 0.315965 |
| SL | 0.331410 | -0.376582 | 1.039403 |

| **Least Squares Means for Effect pitchType** | | | | |
|---|---|---|---|---|
| i | j | Difference Between Means | Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j) | |
| 1 | 2 | 0.125000 | -0.325548 | 0.575548 |
| 1 | 3 | -0.041667 | -1.049122 | 0.965789 |
| 2 | 3 | -0.166667 | -1.067762 | 0.734429 |

**Least Squares Means**
**Adjustment for Multiple Comparisons: Tukey-Kramer**

## Least Squares Means
## Adjustment for Multiple Comparisons: Tukey-Kramer



swingingStrRate Comparisons for pitchType
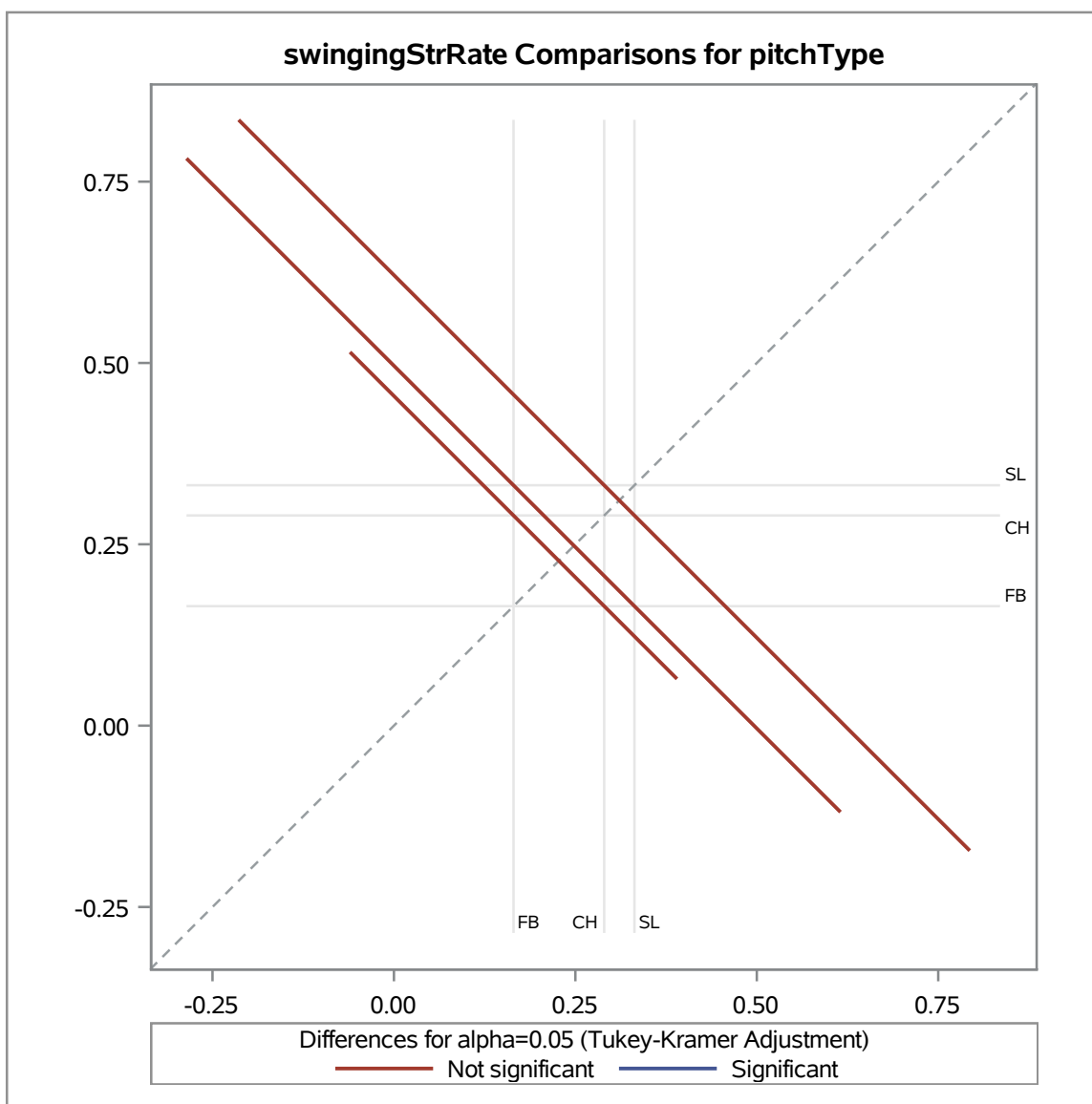
# Swinging Strike Rate by Zone
### Zones 1-9 are inside strikezone, 10-13 are outside of zone

| Pitch Location | Total Pitches | Total Swings | Total Misses | Swinging Strike Rate |
|---|---|---|---|---|
| 1 | 4 | 3 | 2 | 50.00% |
| 2 | 3 | 1 | 0 | 0.00% |
| 3 | 3 | 2 | 0 | 0.00% |
| 4 | 4 | 2 | 1 | 25.00% |
| 5 | 3 | 3 | 0 | 0.00% |
| 6 | 5 | 4 | 0 | 0.00% |
| 7 | 1 | 1 | 0 | 0.00% |
| 8 | 3 | 2 | 0 | 0.00% |
| 9 | 4 | 2 | 0 | 0.00% |
| 10 | 13 | 1 | 0 | 0.00% |
| 11 | 10 | 1 | 1 | 10.00% |
| 12 | 4 | 2 | 2 | 50.00% |
| 13 | 6 | 1 | 1 | 16.67% |

| Pitch Type | Total Pitches | Total Swings | Total Misses | Swinging Strike Rate |
|---|---|---|---|---|
| CB | 2 | 0 | 0 | 0.00% |
| CH | 14 | 4 | 2 | 14.29% |
| FB | 46 | 20 | 4 | 8.70% |
| SL | 1 | 1 | 1 | 100.0% |

# Regression Analysis of Velocity by Pitch Type
## *Data available for home games only*

## Dependent Variable: velocity

### pitchType=CB

| Source | DF | Sum of Squares | Mean Square | F Value | Pr > F |
|---|---|---|---|---|---|
| Model | 0 | 0.00000000 | . | . | . |
| Error | 1 | 0.50000000 | 0.50000000 | | |
| Corrected Total | 1 | 0.50000000 | | | |

| R-Square | Coeff Var | Root MSE | velocity Mean |
|---|---|---|---|
| 0.000000 | 1.113554 | 0.707107 | 63.50000 |

| Source | DF | Type I SS | Mean Square | F Value | Pr > F |
|---|---|---|---|---|---|
| date | 0 | 0 | . | . | . |

| Source | DF | Type III SS | Mean Square | F Value | Pr > F |
|---|---|---|---|---|---|
| date | 0 | 0 | . | . | . |



Distribution of velocity

# Regression Analysis of Velocity by Pitch Type
## *Data available for home games only*
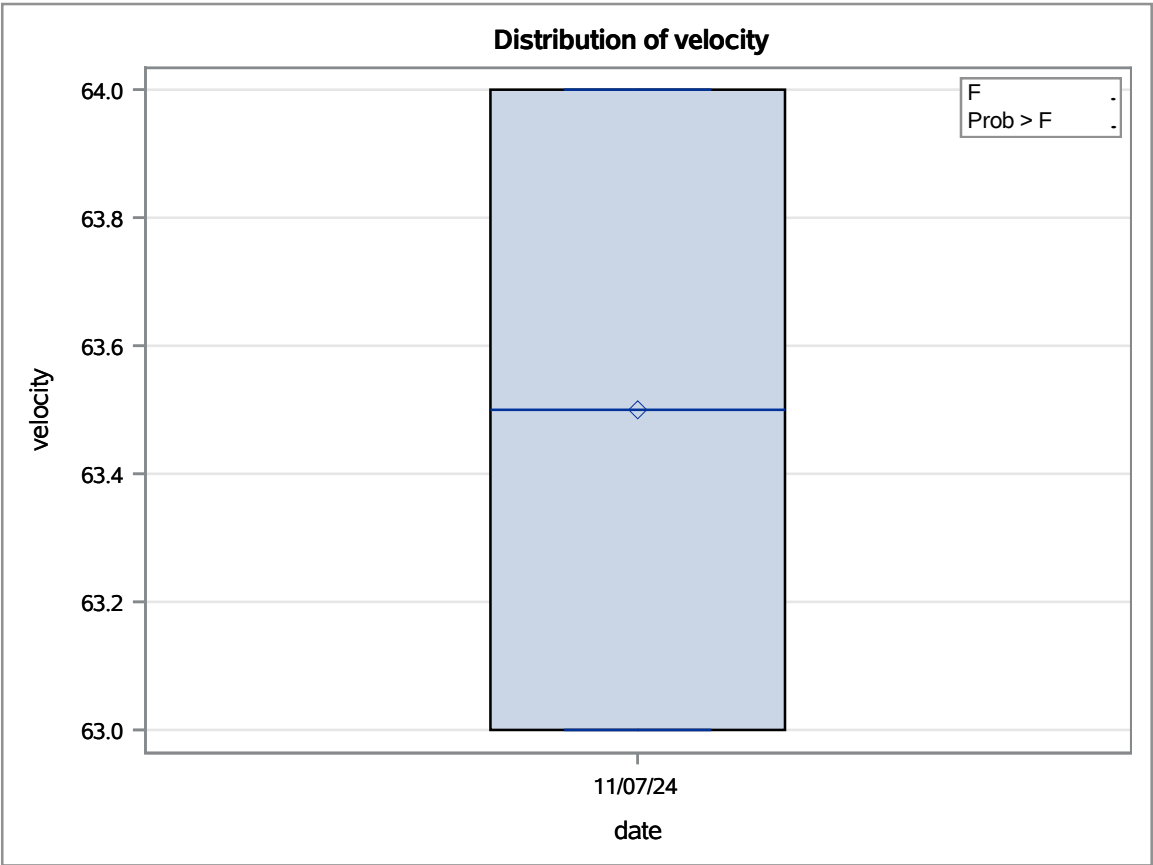
### Dependent Variable: velocity

### pitchType=CH

| Source | DF | Sum of Squares | Mean Square | F Value | Pr > F |
|--------|-----|----------------|-------------|---------|--------|
| Model | 0 | 0.00000000 | . | . | . |
| Error | 12 | 19.69230769 | 1.64102564 | | |
| Corrected Total | 12 | 19.69230769 | | | |

| R-Square | Coeff Var | Root MSE | velocity Mean |
|----------|-----------|----------|---------------|
| 0.000000 | 1.667000 | 1.281025 | 76.84615 |

| Source | DF | Type I SS | Mean Square | F Value | Pr > F |
|--------|-----|-----------|-------------|---------|--------|
| date | 0 | 0 | . | . | . |

| Source | DF | Type III SS | Mean Square | F Value | Pr > F |
|--------|-----|-------------|-------------|---------|--------|
| date | 0 | 0 | . | . | . |



Distribution of velocity

| F | . |
| Prob > F | . |

# Regression Analysis of Velocity by Pitch Type
***Data available for home games only***
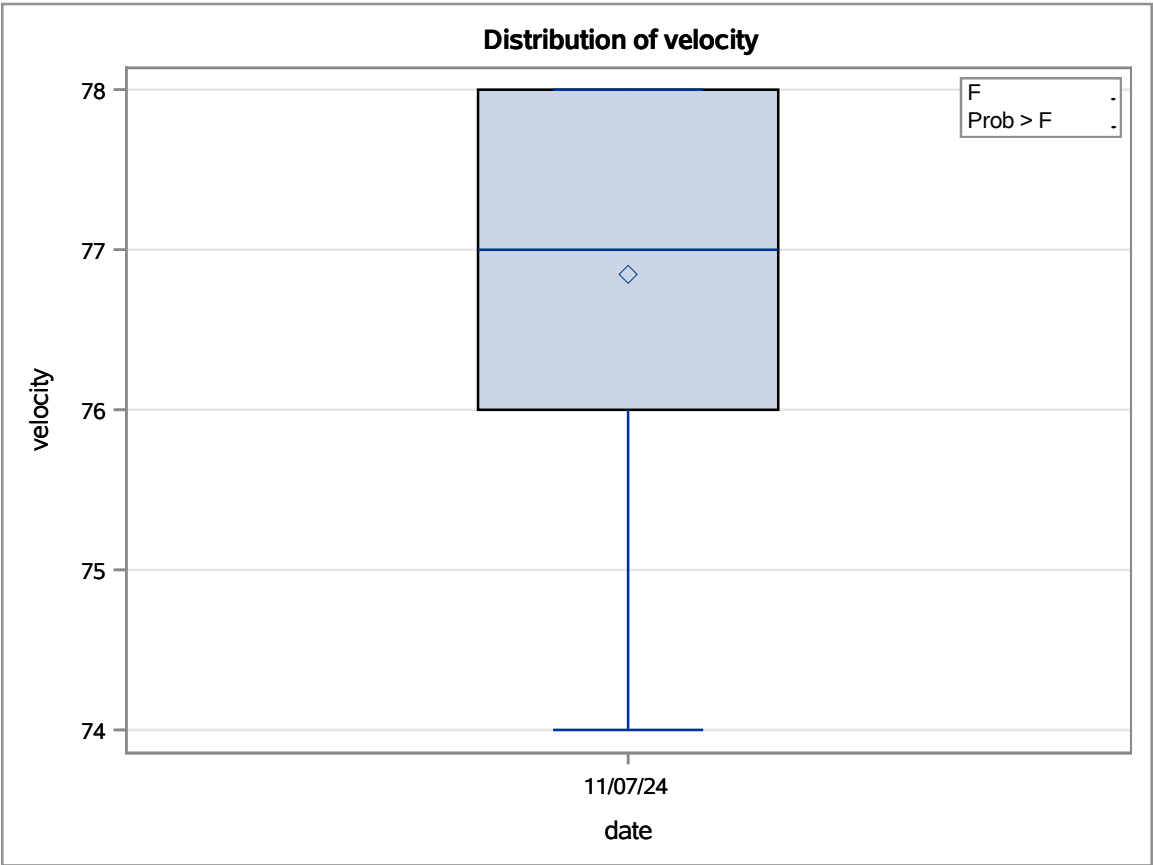
## Dependent Variable: velocity

### pitchType=FB

| Source | DF | Sum of Squares | Mean Square | F Value | Pr > F |
|---|---|---|---|---|---|
| Model | 0 | 0.00000000 | . | . | . |
| Error | 43 | 42.25000000 | 0.98255814 | | |
| Corrected Total | 43 | 42.25000000 | | | |

| R-Square | Coeff Var | Root MSE | velocity Mean |
|---|---|---|---|
| 0.000000 | 1.227543 | 0.991241 | 80.75000 |

| Source | DF | Type I SS | Mean Square | F Value | Pr > F |
|---|---|---|---|---|---|
| date | 0 | 0 | . | . | . |

| Source | DF | Type III SS | Mean Square | F Value | Pr > F |
|---|---|---|---|---|---|
| date | 0 | 0 | . | . | . |



Distribution of velocity

# Regression Analysis of Velocity by Pitch Type
## *Data available for home games only*
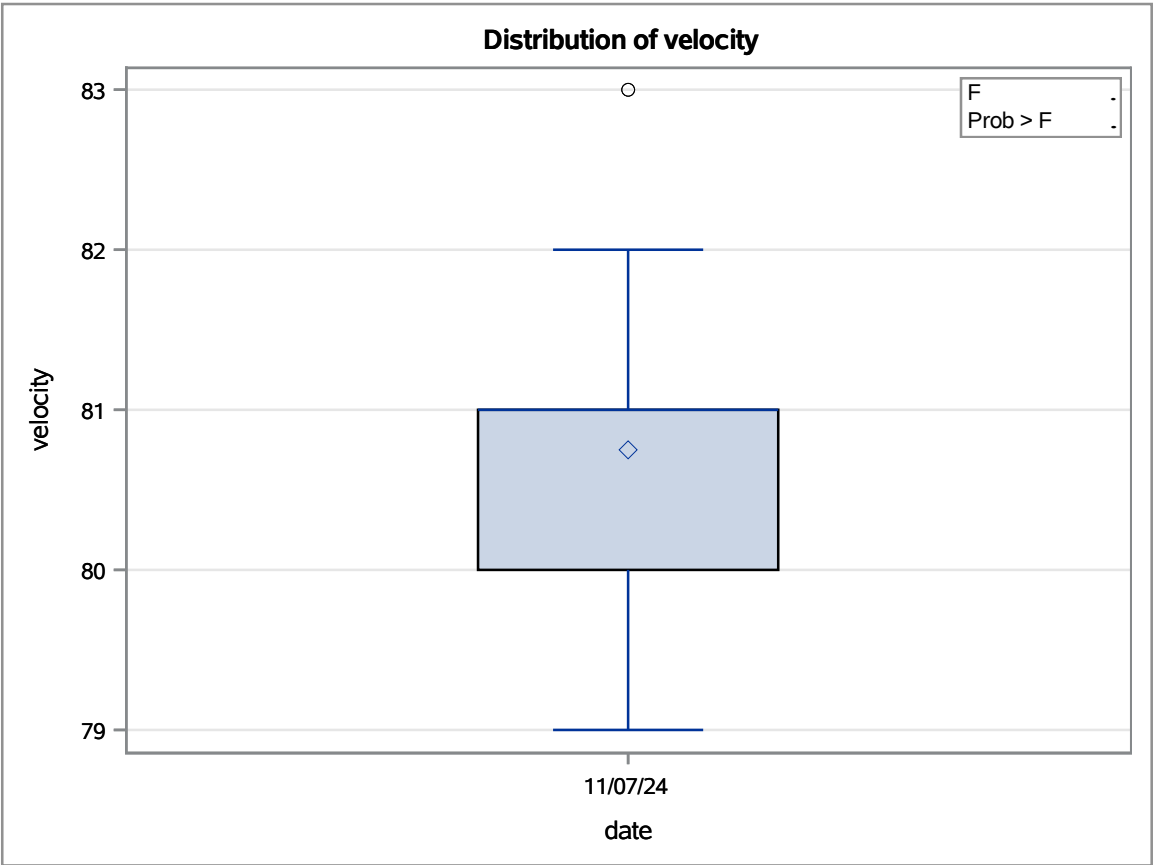
## Dependent Variable: velocity

### pitchType=SL

| Source | DF | Sum of Squares | Mean Square | F Value | Pr > F |
|---|---|---|---|---|---|
| Model | 0 | 0 | . | . | . |
| Error | 0 | 0 | . | | |
| Corrected Total | 0 | 0 | | | |

| R-Square | Coeff Var | Root MSE | velocity Mean |
|---|---|---|---|
| 0.000000 | . | . | 66.00000 |

| Source | DF | Type I SS | Mean Square | F Value | Pr > F |
|---|---|---|---|---|---|
| date | 0 | 0 | . | . | . |

| Source | DF | Type III SS | Mean Square | F Value | Pr > F |
|---|---|---|---|---|---|
| date | 0 | 0 | . | . | . |



Distribution of velocity