Velocity Breakdown by Pitch Type

Data available for home games only

Analysis Variable : velocity					
pitchType	N Obs	N	Minimum	Mean	Maximum
CB	16	16	72.0	77.0	81.0
CH	27	27	78.0	82.4	86.0
FB	42	42	84.0	87.5	92.0
SL	15	15	73.0	78.2	82.0

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

Average Velocity (y-axis), Game Date (x-axis)

pitchType		CB	CH	FB	SL

Data labels:
- 88.522 (FB, 03Jul) → 86.158 (FB, 10Jul)
- 84.528 (dashed, 03Jul) → 81.362 (dashed, 10Jul)
- 84.357 (CH, 03Jul) → 80.385 (CH, 10Jul)
- 79.857 (SL, 03Jul) → 76.75 (SL, 10Jul)
- 78.222 (CB, 03Jul) → 75.429 (CB, 10Jul)

Dependent Variable: swingingStrRate

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	4.51580842	0.30105389	1.75	0.1126
Error	22	3.77734948	0.17169770		
Corrected Total	37	8.29315789			

R-Square	Coeff Var	Root MSE	swingingStrRate Mean
0.544522	125.9667	0.414364	0.328947

Source	DF	Type III SS	Mean Square	F Value	Pr > F
location	12	4.37855306	0.36487942	2.13	0.0604
pitchType	3	0.21471071	0.07157024	0.42	0.7426

Dependent Variable: swingingStrRate

Fit Diagnostics for swingingStrRate

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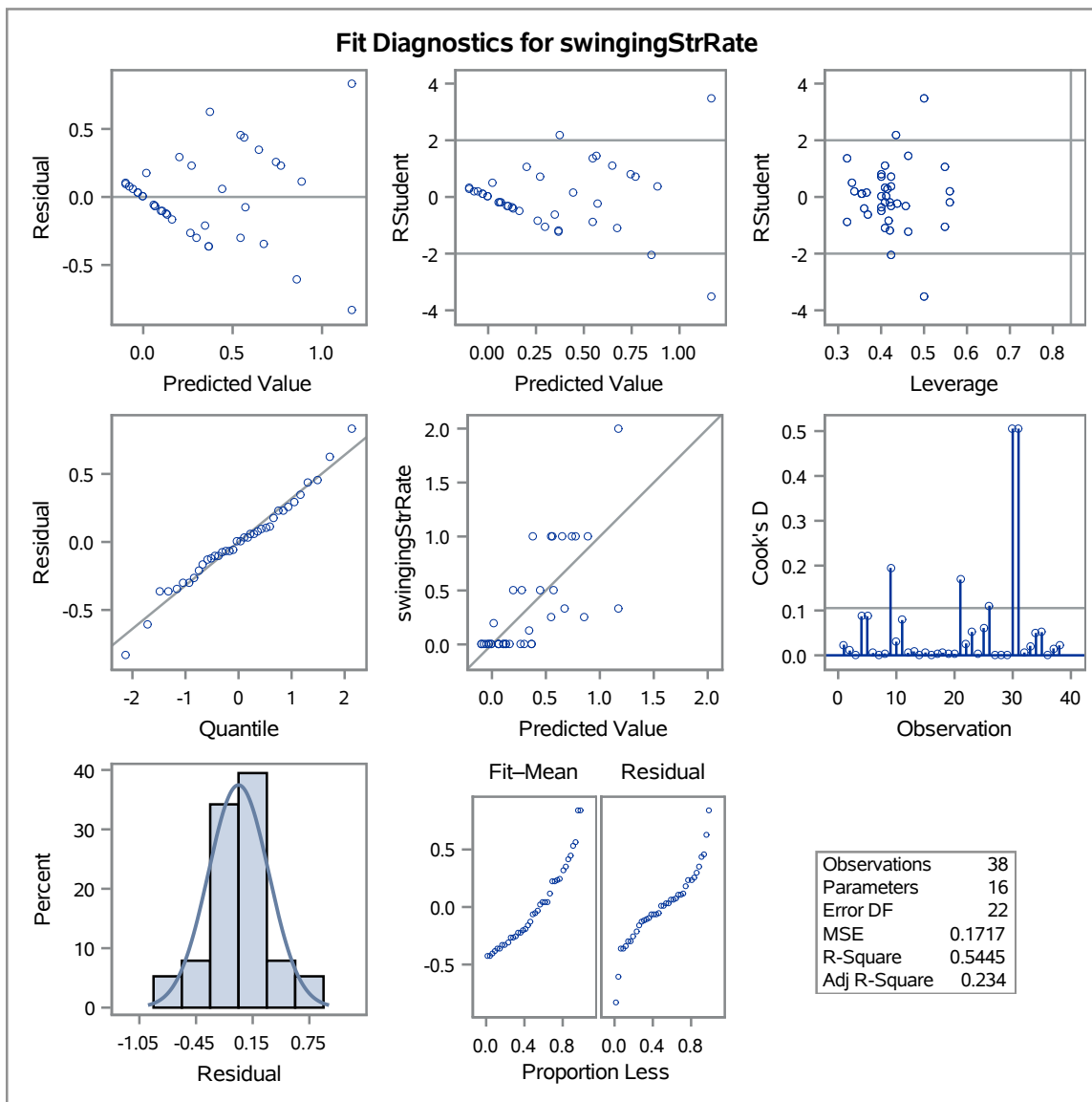
Interaction Plot for swingingStrRate
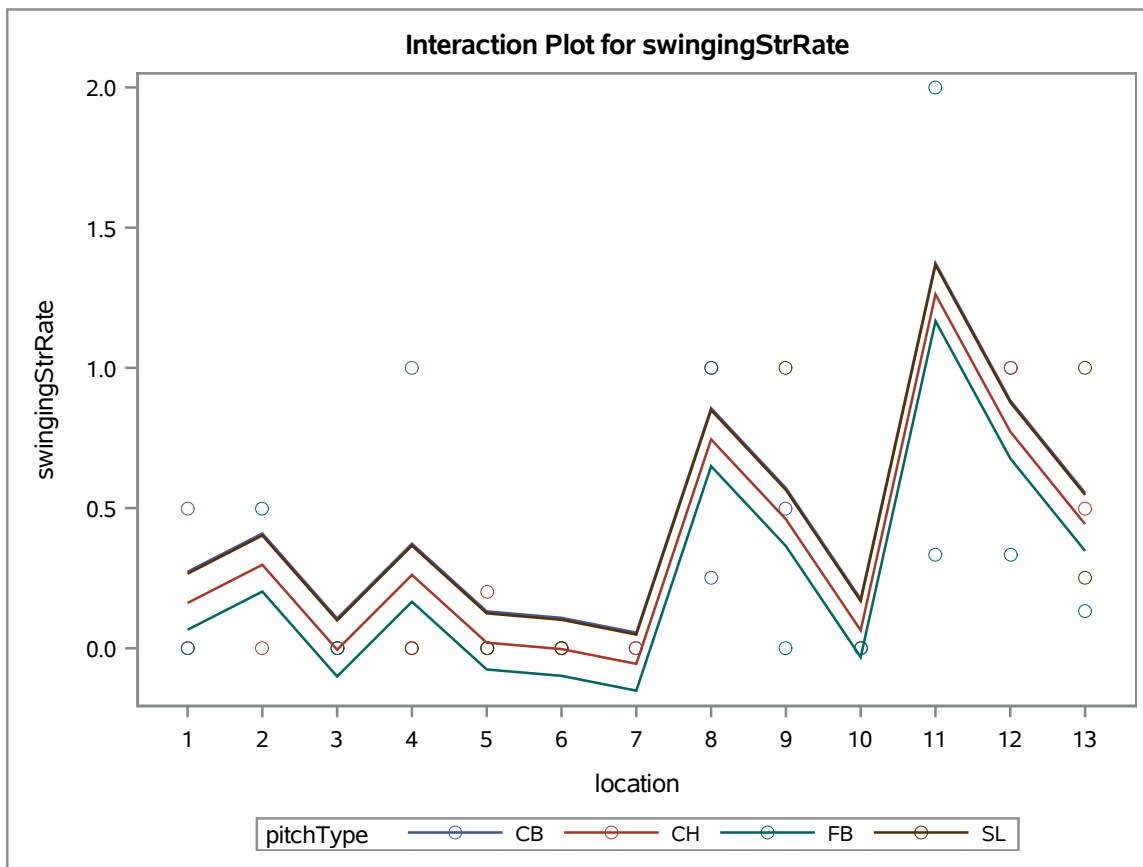
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

pitchType	swingingStrRate LSMEAN	LSMEAN Number
CB	0.45155544	1
CH	0.34016486	2
FB	0.24459533	3
SL	0.44462295	4

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

Dependent Variable: swingingStrRate

i/j	1	2	3	4
1		0.9455	0.7604	1.0000
2	0.9455		0.9530	0.9704
3	0.7604	0.9530		0.8346
4	1.0000	0.9704	0.8346	

pitchType	swingingStrRate LSMEAN	95% Confidence Limits	
CB	0.451555	0.122105	0.781006
CH	0.340165	0.072247	0.608083
FB	0.244595	-0.012375	0.501566
SL	0.444623	0.034728	0.854518

		Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
i	**j**			
1	2	0.111391	-0.450664	0.673445
1	3	0.206960	-0.377562	0.791482
1	4	0.006932	-0.702834	0.716699
2	3	0.095570	-0.413297	0.604436

Least Squares Means for Effect pitchType

Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

		Least Squares Means for Effect pitchType		
i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
2	4	-0.104458	-0.760505	0.551589
3	4	-0.200028	-0.860857	0.460801

LS-Means for pitchType
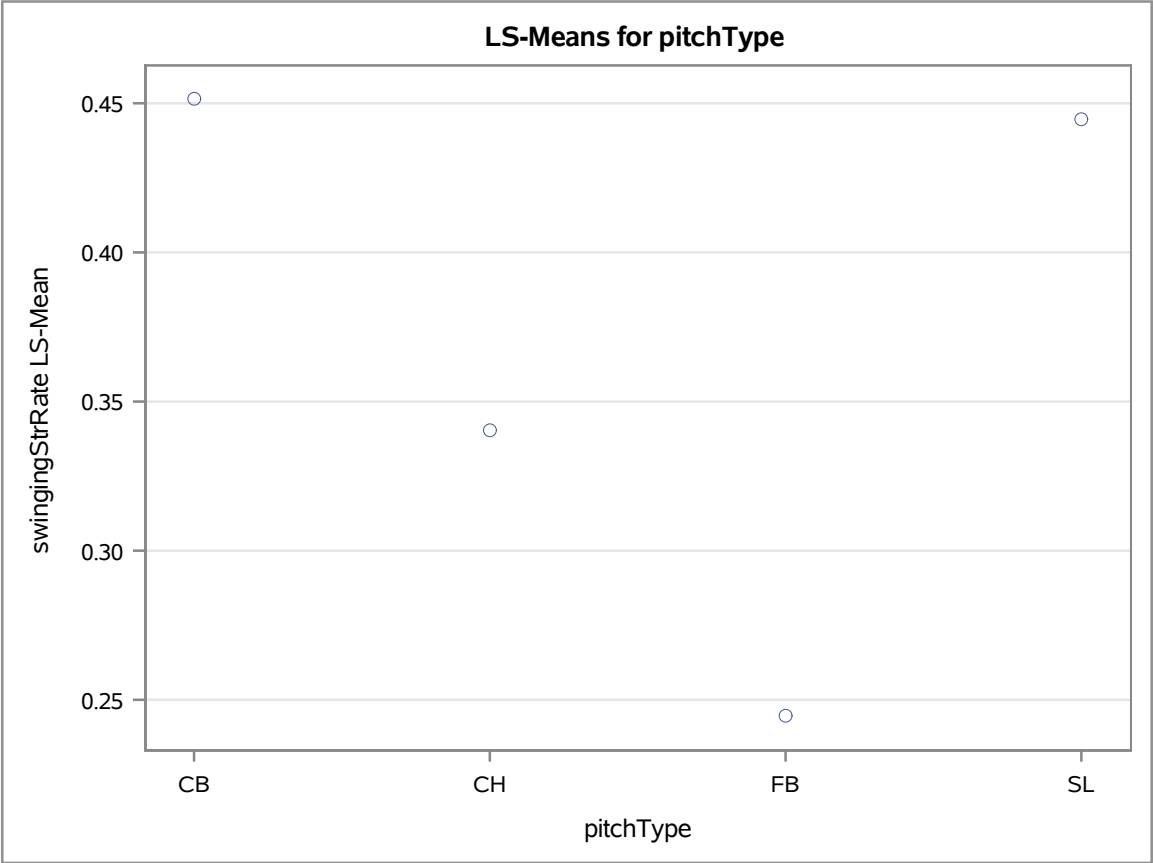
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

swingingStrRate Comparisons for pitchType

Differences for alpha=0.05 (Tukey-Kramer Adjustment)
— Not significant   — Significant
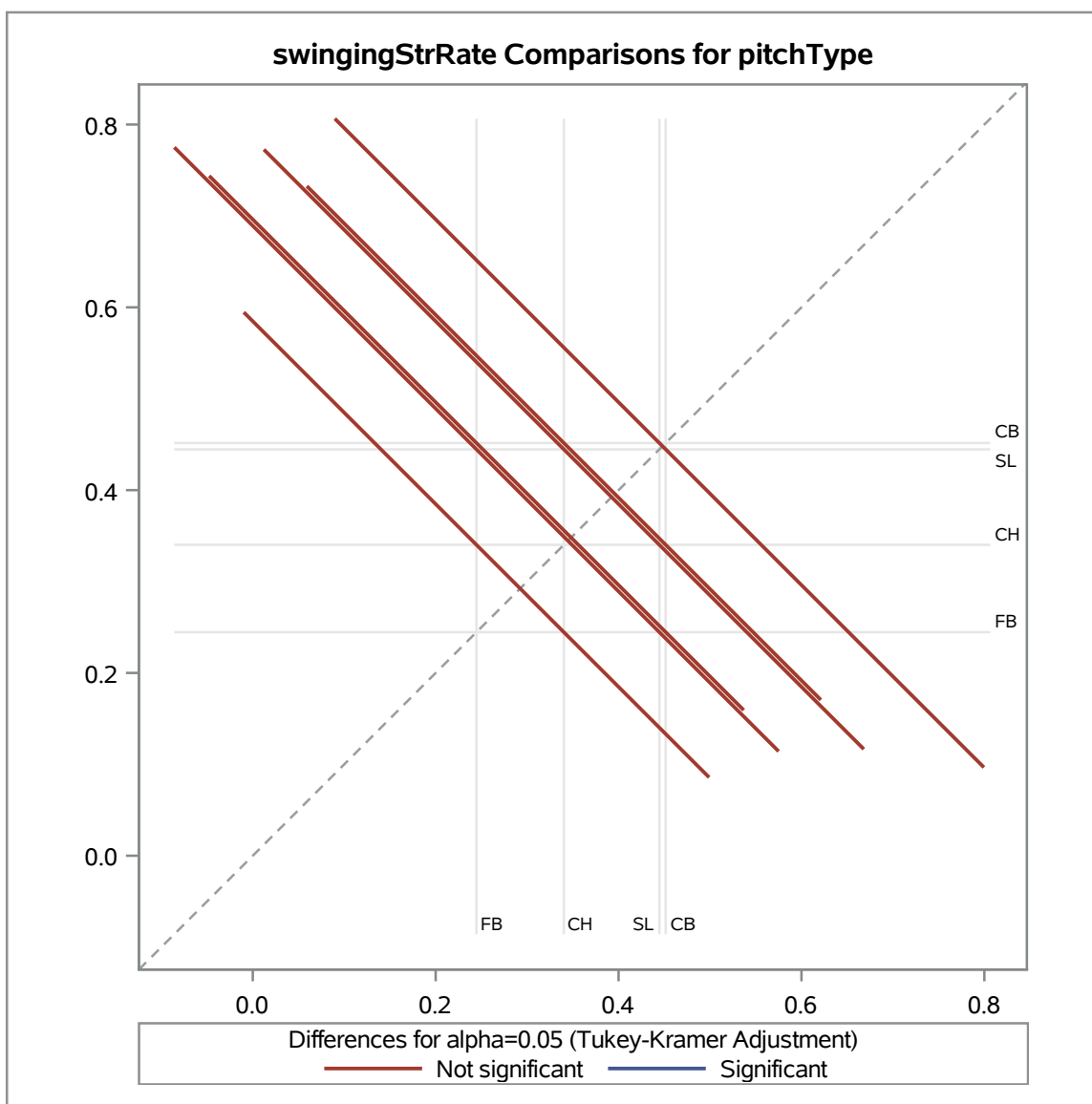
Swinging Strike Rate by Zone
Zones 1-9 are inside strikezone, 10-13 are outside of zone

Pitch Location	Total Pitches	Total Swings	Total Misses	Swinging Strike Rate
1	7	7	1	14.29%
2	5	5	2	40.00%
3	7	4	0	0.00%
4	6	4	1	16.67%
5	10	7	1	10.00%
6	10	6	0	0.00%
7	3	0	0	0.00%
8	6	5	3	50.00%
9	7	5	3	42.86%
10	7	1	0	0.00%
11	7	3	2	28.57%
12	5	1	1	20.00%
13	29	2	2	6.90%

Pitch Type	Total Pitches	Total Swings	Total Misses	Swinging Strike Rate
CB	17	11	5	29.41%
CH	29	12	2	6.90%
FB	48	18	5	10.42%
SL	15	9	4	26.67%

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	1	30.73015873	30.73015873	7.78	0.0145
Error	14	55.26984127	3.94784580		
Corrected Total	15	86.00000000			

R-Square	Coeff Var	Root MSE	velocity Mean
0.357327	2.580414	1.986919	77.00000

Source	DF	Type I SS	Mean Square	F Value	Pr > F
date	1	30.73015873	30.73015873	7.78	0.0145

Source	DF	Type III SS	Mean Square	F Value	Pr > F
date	1	30.73015873	30.73015873	7.78	0.0145
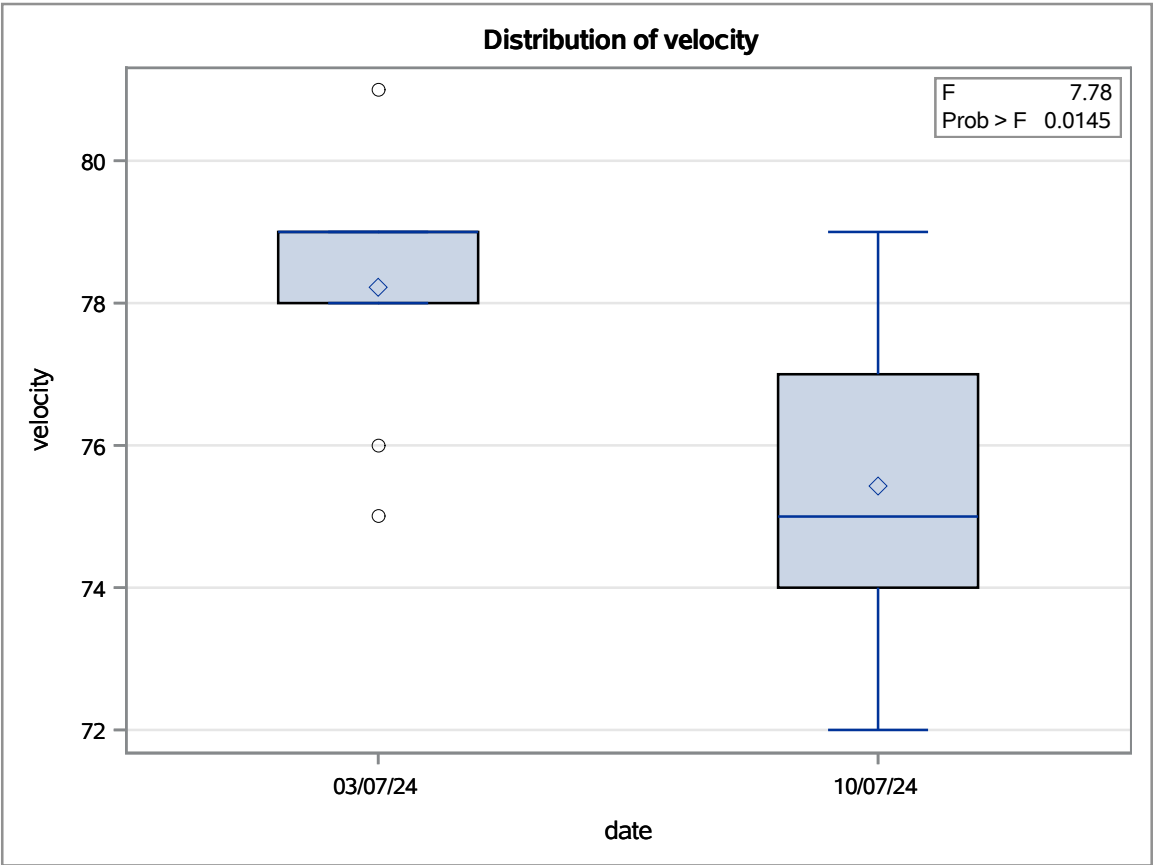
Distribution of velocity

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	1	106.3754579	106.3754579	40.12	<.0001
Error	25	66.2912088	2.6516484		
Corrected Total	26	172.6666667			

R-Square	Coeff Var	Root MSE	velocity Mean
0.616074	1.975134	1.628388	82.44444

Source	DF	Type I SS	Mean Square	F Value	Pr > F
date	1	106.3754579	106.3754579	40.12	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
date	1	106.3754579	106.3754579	40.12	<.0001
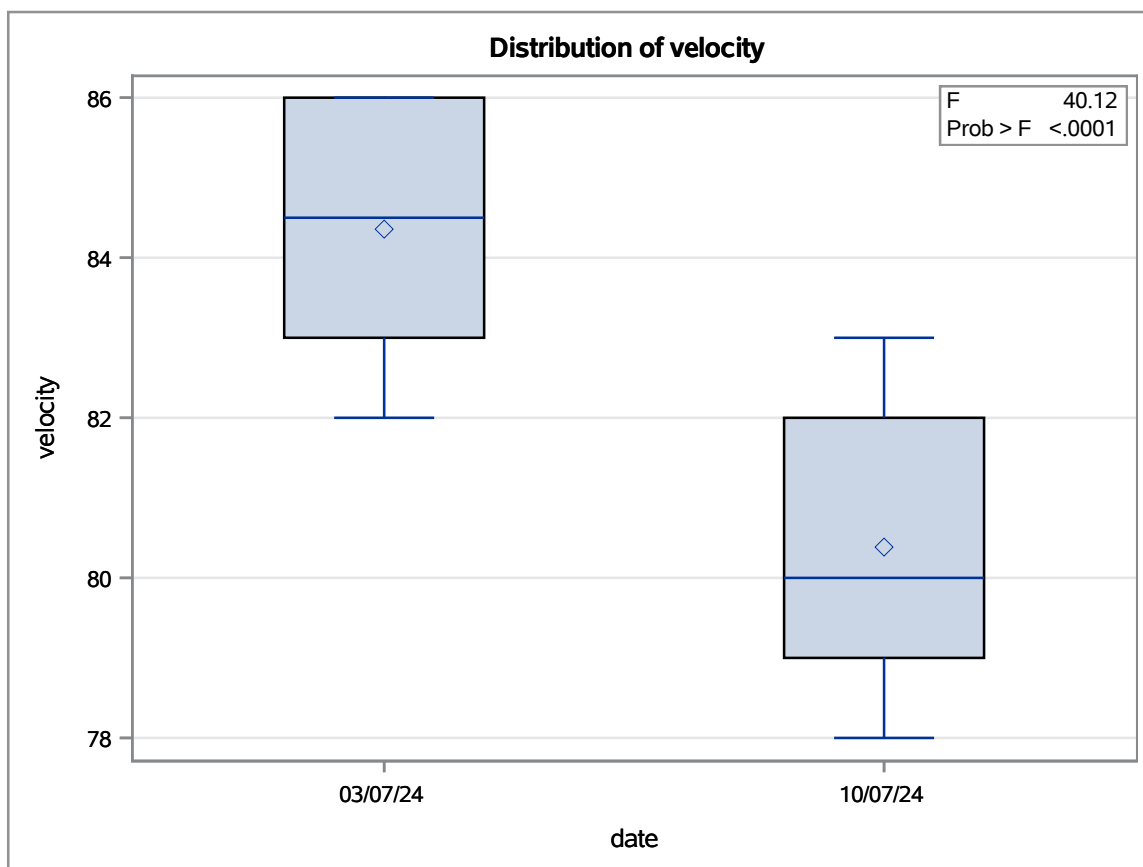
Distribution of velocity

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	1	58.1393157	58.1393157	18.13	0.0001
Error	40	128.2654462	3.2066362		
Corrected Total	41	186.4047619			

R-Square	Coeff Var	Root MSE	velocity Mean
0.311898	2.047638	1.790708	87.45238

Source	DF	Type I SS	Mean Square	F Value	Pr > F
date	1	58.13931568	58.13931568	18.13	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
date	1	58.13931568	58.13931568	18.13	0.0001

Distribution of velocity

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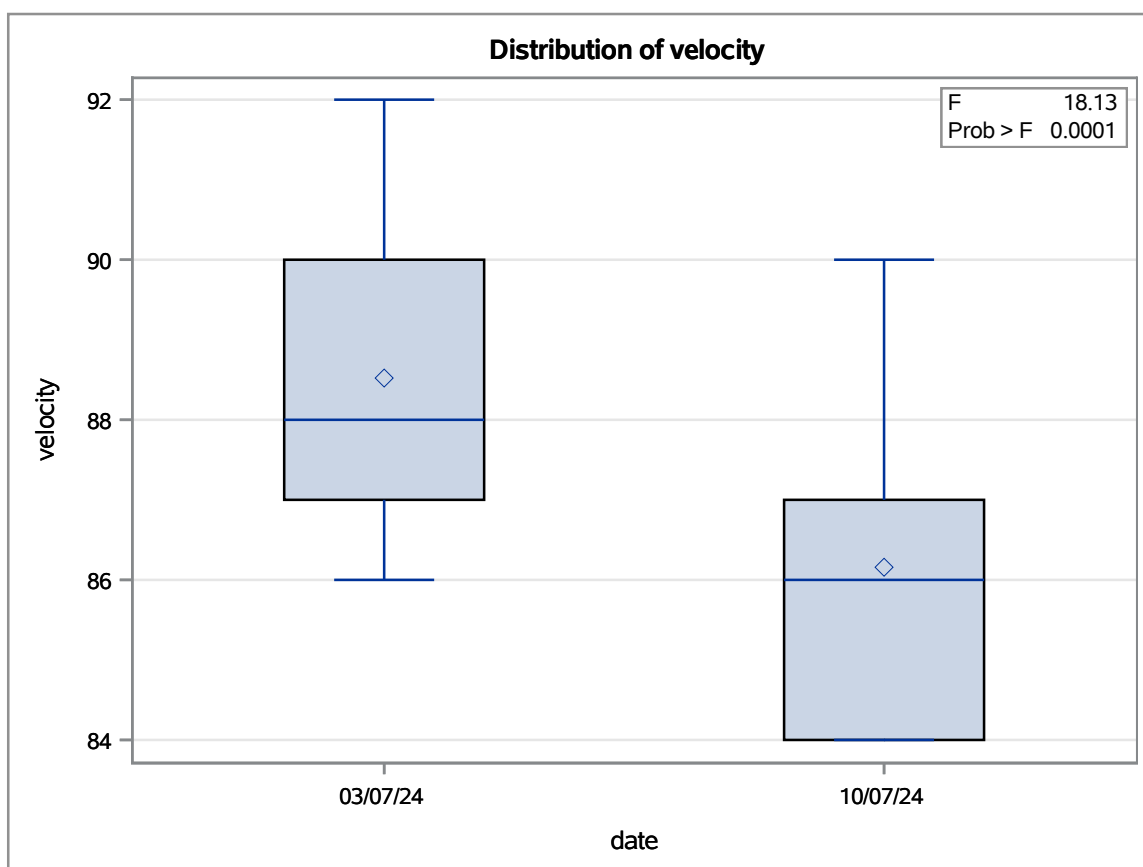
Dependent Variable: velocity

pitchType=SL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	36.0428571	36.0428571	5.55	0.0348
Error	13	84.3571429	6.4890110		
Corrected Total	14	120.4000000			

R-Square	Coeff Var	Root MSE	velocity Mean
0.299359	3.257486	2.547354	78.20000

Source	DF	Type I SS	Mean Square	F Value	Pr > F
date	1	36.04285714	36.04285714	5.55	0.0348

Source	DF	Type III SS	Mean Square	F Value	Pr > F
date	1	36.04285714	36.04285714	5.55	0.0348

Distribution of velocity