Velocity Breakdown by Pitch Type
Data available for home games only

	Analysis Variable : velocity				
pitchType	N Obs	N	Minimum	Mean	Maximum
CB	36	36	63.0	72.8	78.0
CH	65	65	71.0	78.1	83.0
FB	91	91	81.0	85.2	89.0
SL	73	73	71.0	74.9	80.0

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
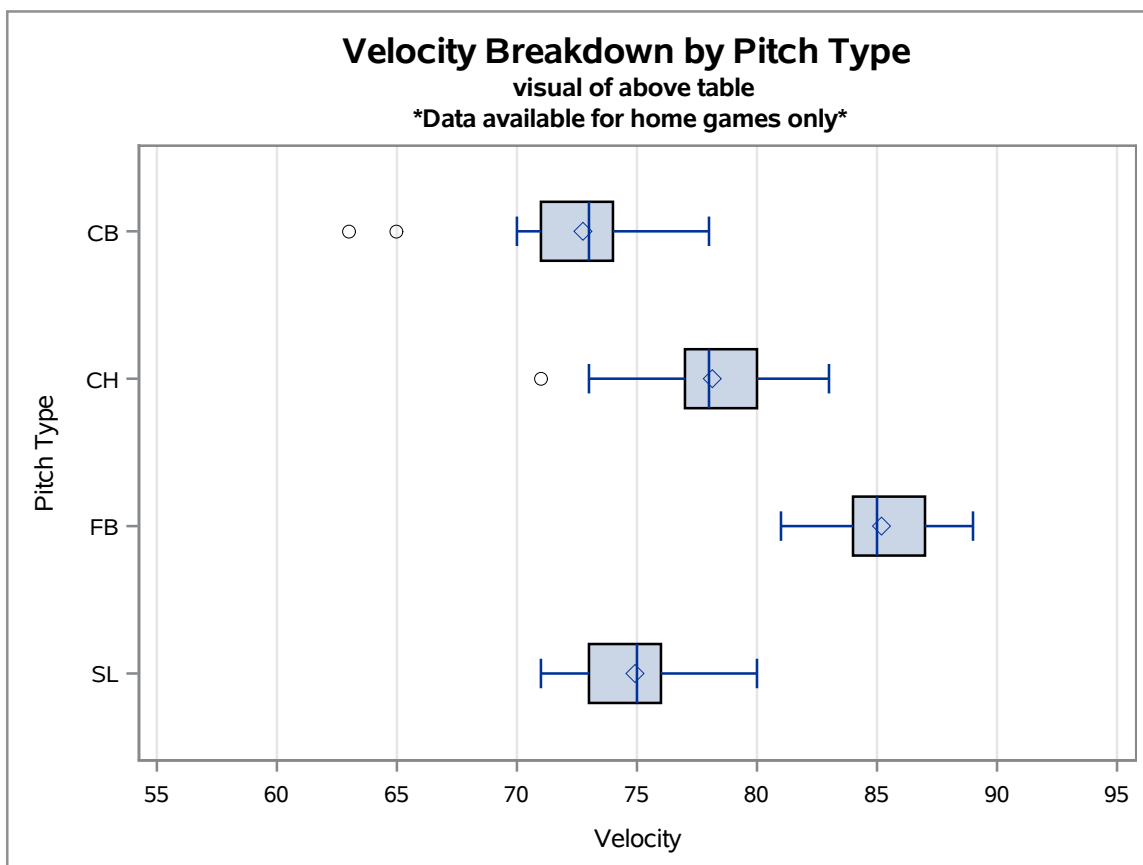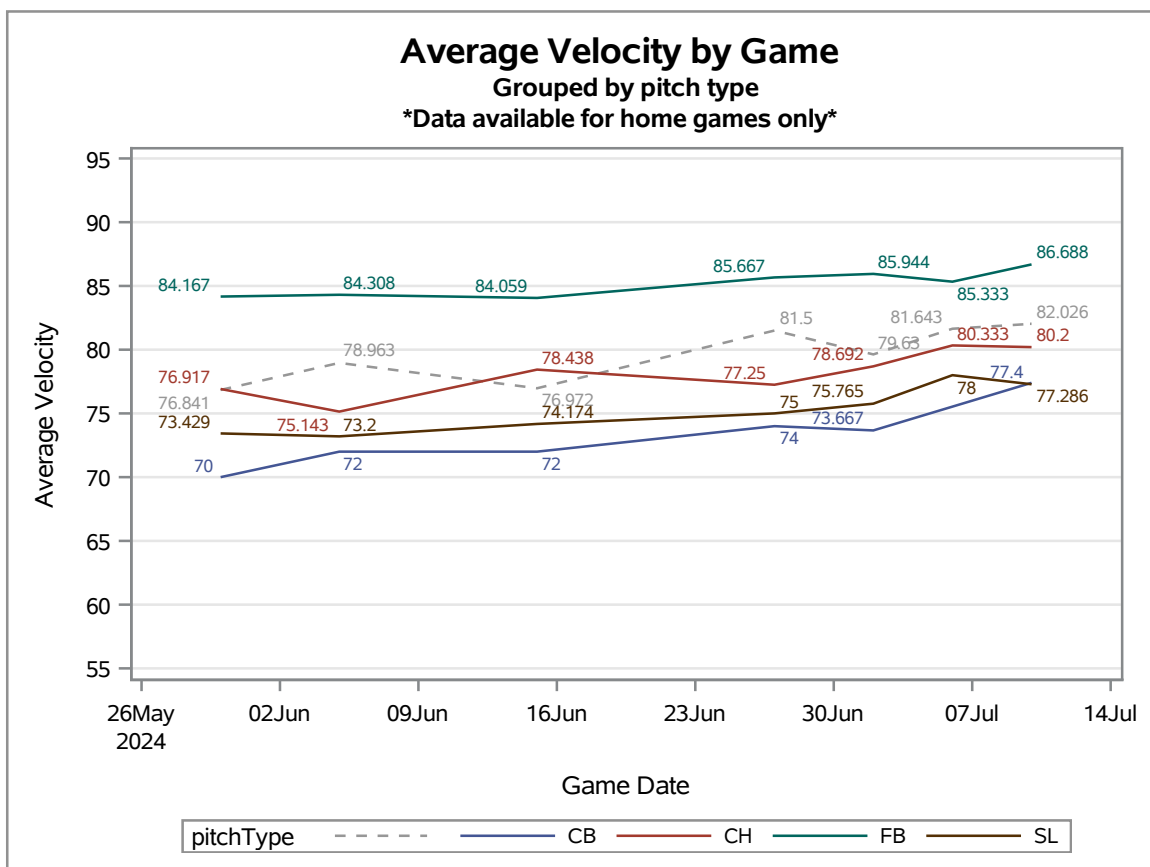
Dependent Variable: swingingStrRate

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	1.72194724	0.11479648	0.85	0.6217
Error	34	4.60078142	0.13531710		
Corrected Total	49	6.32272866			

R-Square	Coeff Var	Root MSE	swingingStrRate Mean
0.272342	147.5657	0.367855	0.249282

Source	DF	Type III SS	Mean Square	F Value	Pr > F
location	12	1.57302458	0.13108538	0.97	0.4959
pitchType	3	0.08051929	0.02683976	0.20	0.8968

Analysis of Swinging Strike Rate by Pitch Type and Location

Dependent Variable: swingingStrRate

Fit Diagnostics for swingingStrRate

Observations	50
Parameters	16
Error DF	34
MSE	0.1353
R-Square	0.2723
Adj R-Square	-0.049

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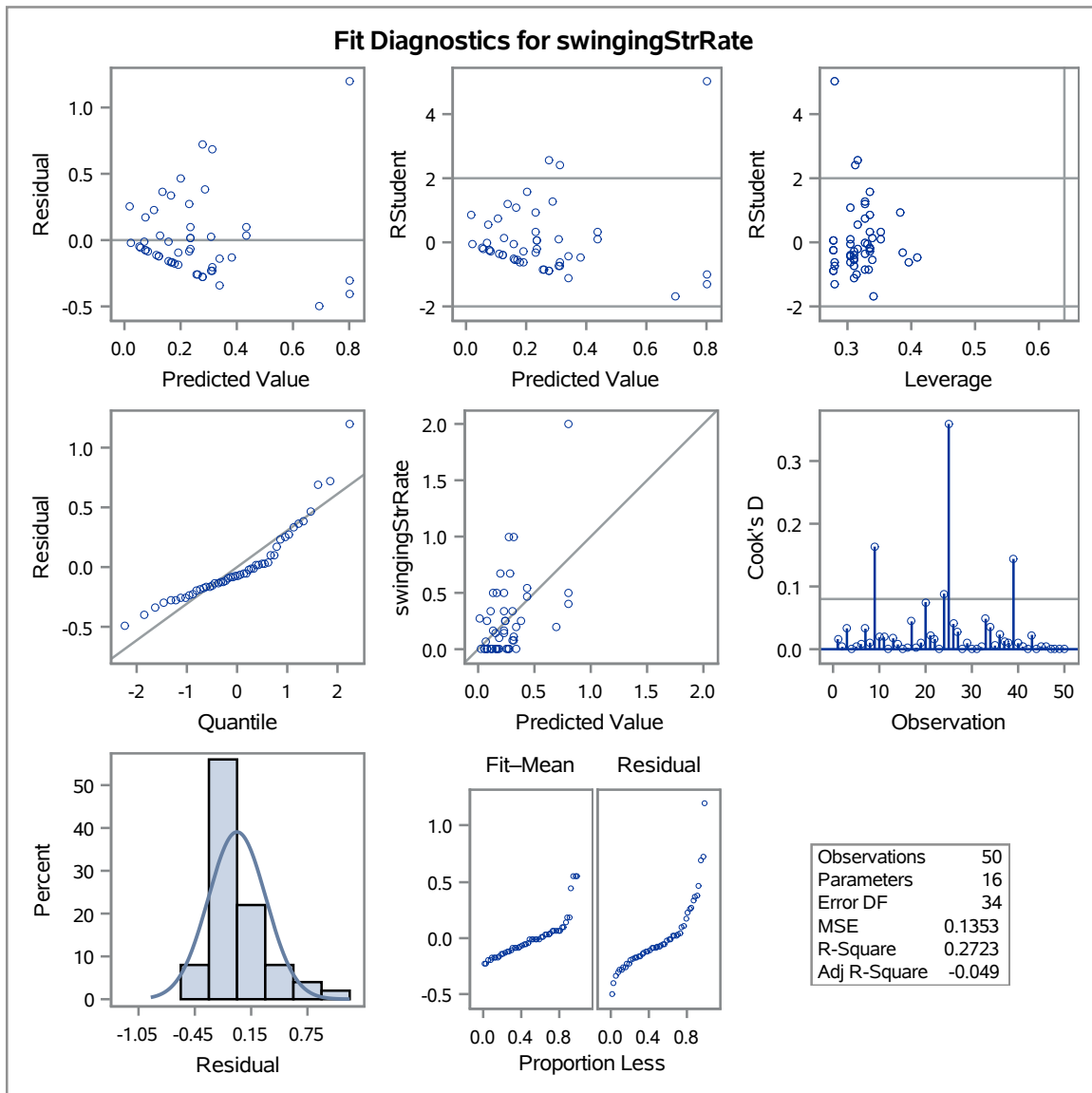
Interaction Plot for swingingStrRate
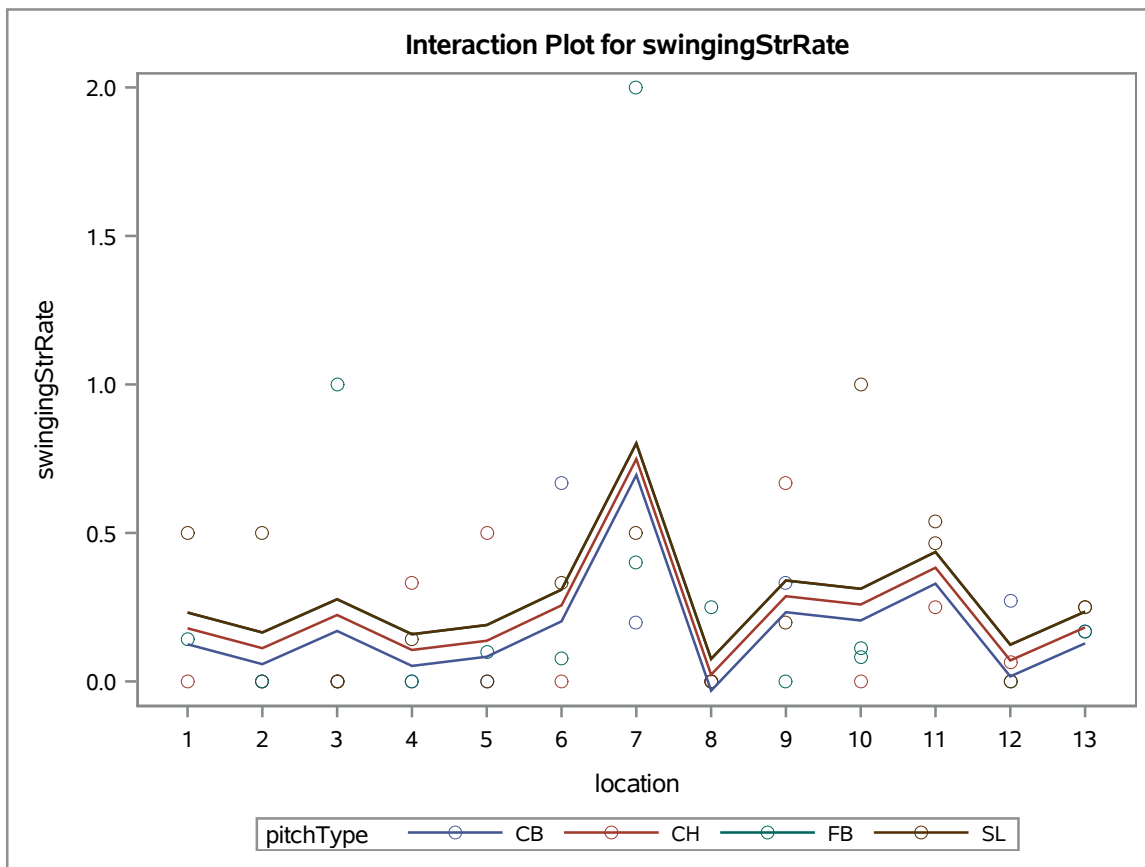
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

pitchType	swingingStrRate LSMEAN	LSMEAN Number
CB	0.17445608	1
CH	0.22822859	2
FB	0.28102776	3
SL	0.28134212	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		0.9903	0.9126	0.9066
2	0.9903		0.9870	0.9852
3	0.9126	0.9870		1.0000
4	0.9066	0.9852	1.0000	

| pitchType	swingingStrRate LSMEAN	95% Confidence Limits	
CB	0.174456	-0.086283	0.435195
CH	0.228229	-0.015612	0.472069
FB	0.281028	0.074940	0.487116
SL	0.281342	0.095816	0.466869

Least Squares Means for Effect pitchType				
i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
1	2	-0.053773	-0.535016	0.427471
1	3	-0.106572	-0.545130	0.331987
1	4	-0.106886	-0.535812	0.322040
2	3	-0.052799	-0.481056	0.375458

Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

		Least Squares Means for Effect pitchType		
		Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
i	j			
2	4	-0.053114	-0.464242	0.358015
3	4	-0.000314	-0.373611	0.372982

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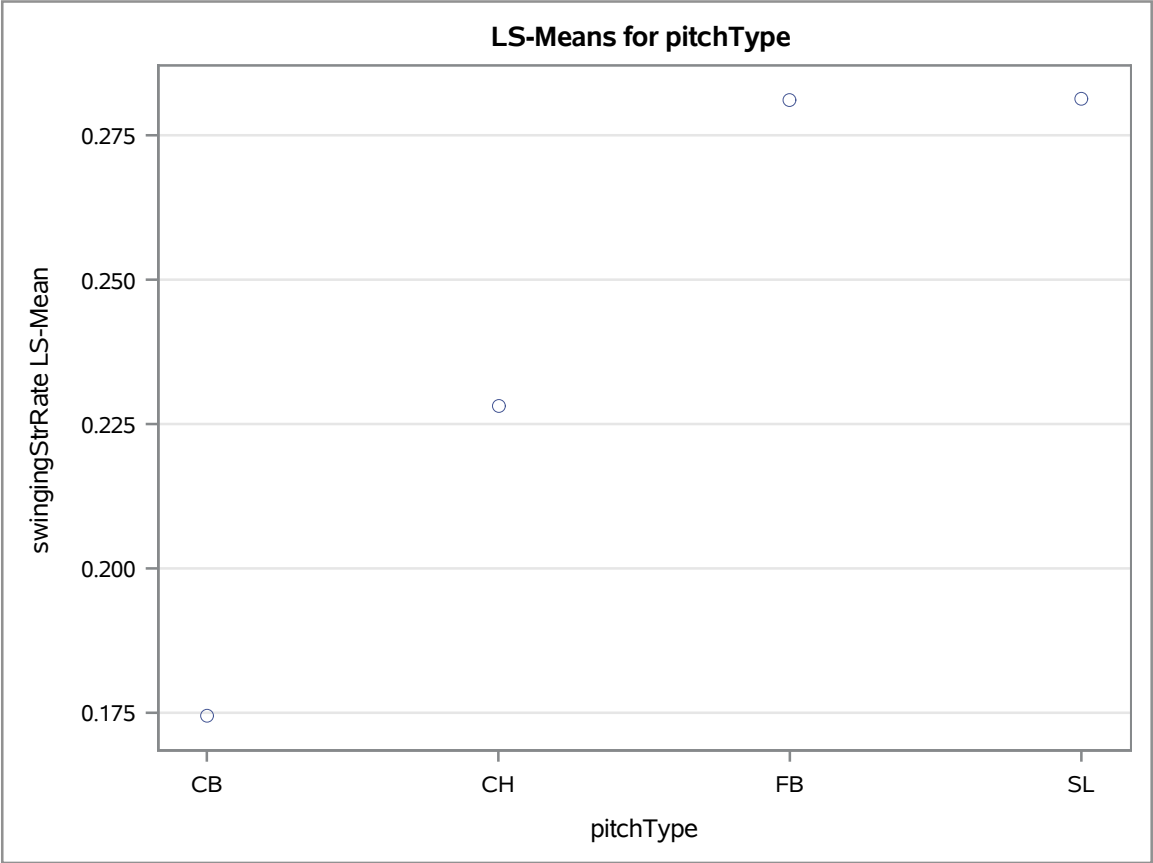
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

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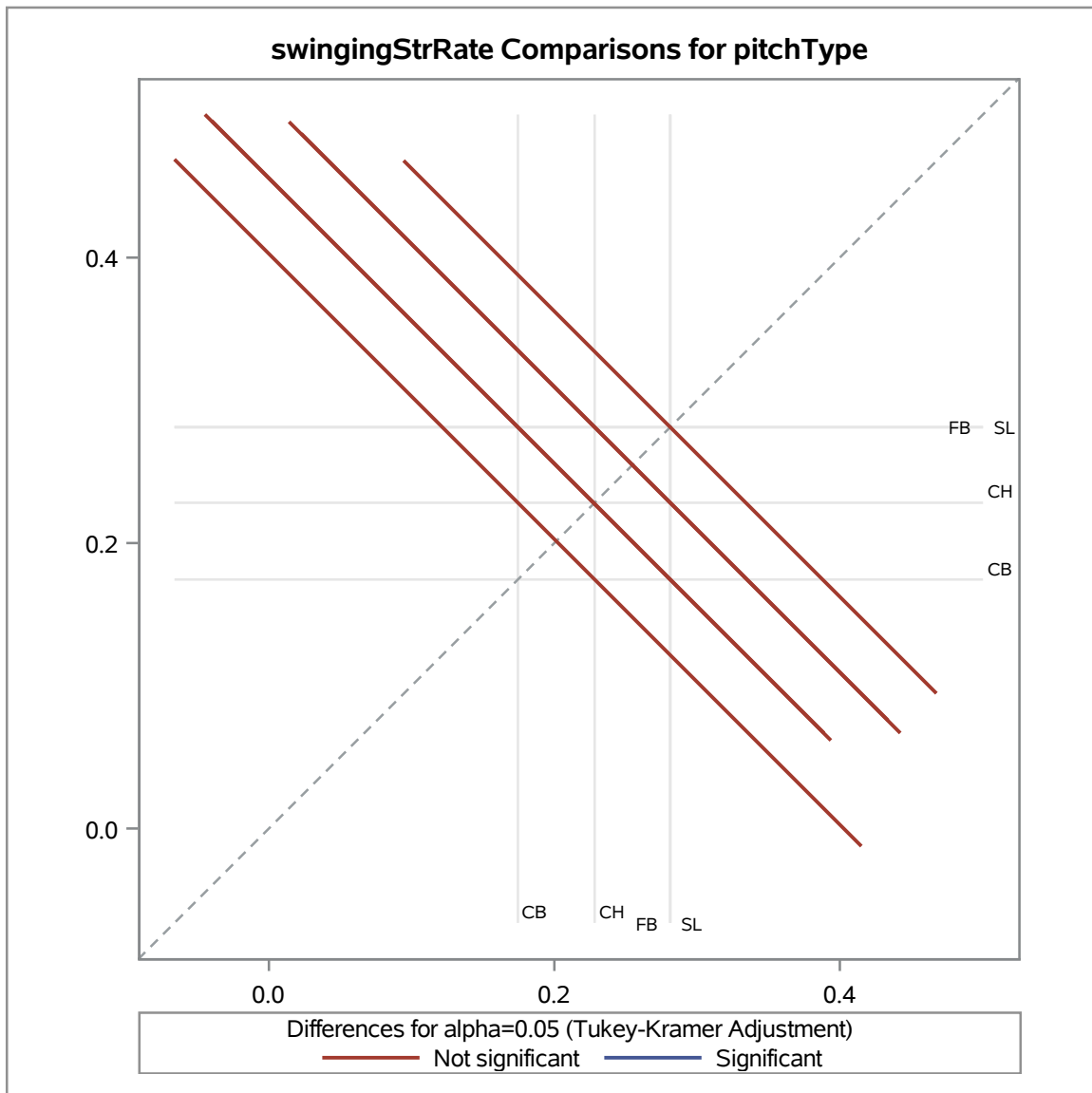
Swinging Strike Rate by Zone
Zones 1-9 are inside strikezone, 10-13 are outside of zone

Pitch Location	Total Pitches	Total Swings	Total Misses	Swinging Strike Rate
1	13	7	1	7.69%
2	14	13	1	7.14%
3	12	5	1	8.33%
4	20	12	2	10.00%
5	27	19	3	11.11%
6	27	16	6	22.22%
7	15	4	3	20.00%
8	20	11	1	5.00%
9	18	13	4	22.22%
10	25	4	1	4.00%
11	32	8	8	25.00%
12	36	5	4	11.11%
13	50	10	7	14.00%

Pitch Type	Total Pitches	Total Swings	Total Misses	Swinging Strike Rate
CB	43	17	8	18.60%
CH	69	20	7	10.14%
FB	115	50	10	8.70%
SL	82	40	17	20.73%

Pitch Type	Total Pitches	Total Swings	Total Misses	Swinging Strike Rate

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	5	170.2166667	34.0433333	5.99	0.0006
Error	30	170.5333333	5.6844444		
Corrected Total	35	340.7500000			

R-Square	Coeff Var	Root MSE	velocity Mean
0.499535	3.277261	2.384207	72.75000

Source	DF	Type I SS	Mean Square	F Value	Pr > F
date	5	170.2166667	34.0433333	5.99	0.0006

Source	DF	Type III SS	Mean Square	F Value	Pr > F
date	5	170.2166667	34.0433333	5.99	0.0006

Distribution of velocity

F 5.99
Prob > F 0.0006

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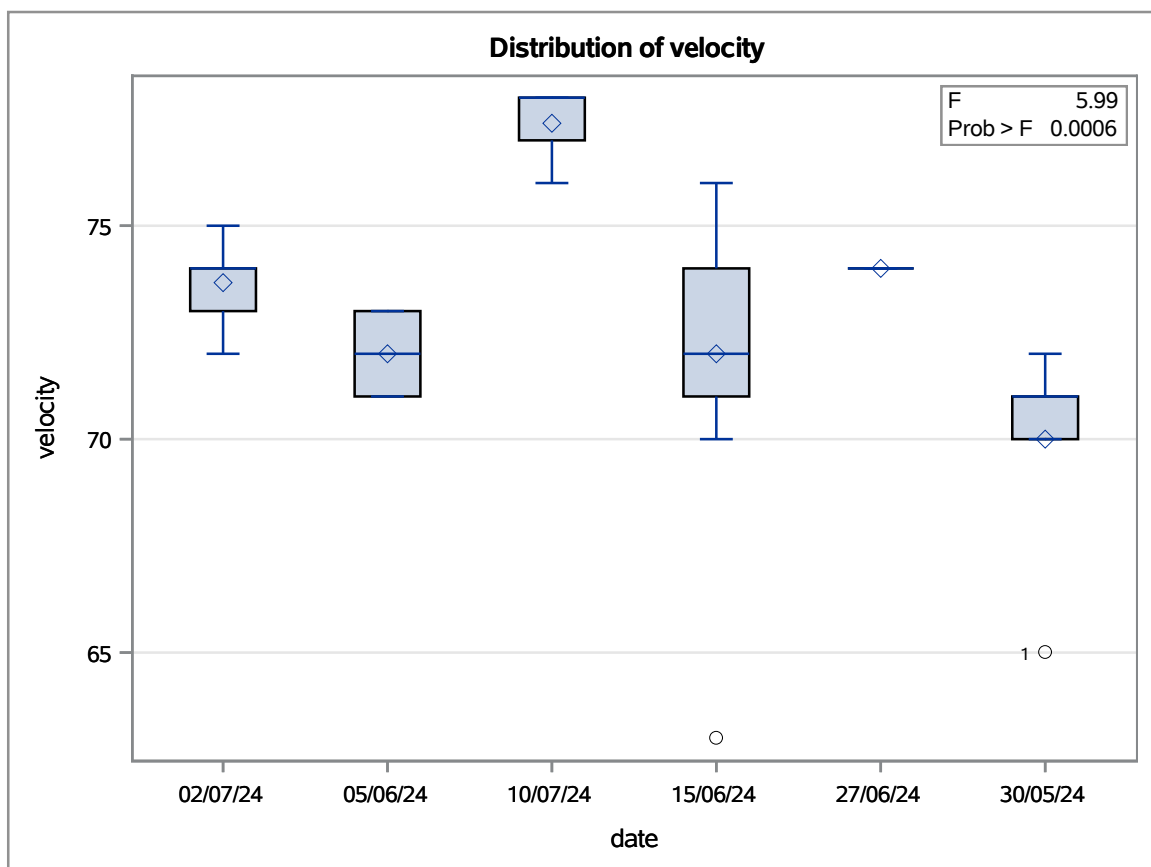
Dependent Variable: velocity

pitchType=CH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	146.2566392	24.3761065	4.99	0.0004
Error	58	283.4972070	4.8878829		
Corrected Total	64	429.7538462			

R-Square	Coeff Var	Root MSE	velocity Mean
0.340327	2.829408	2.210856	78.13846

Source	DF	Type I SS	Mean Square	F Value	Pr > F
date	6	146.2566392	24.3761065	4.99	0.0004

Source	DF	Type III SS	Mean Square	F Value	Pr > F
date	6	146.2566392	24.3761065	4.99	0.0004
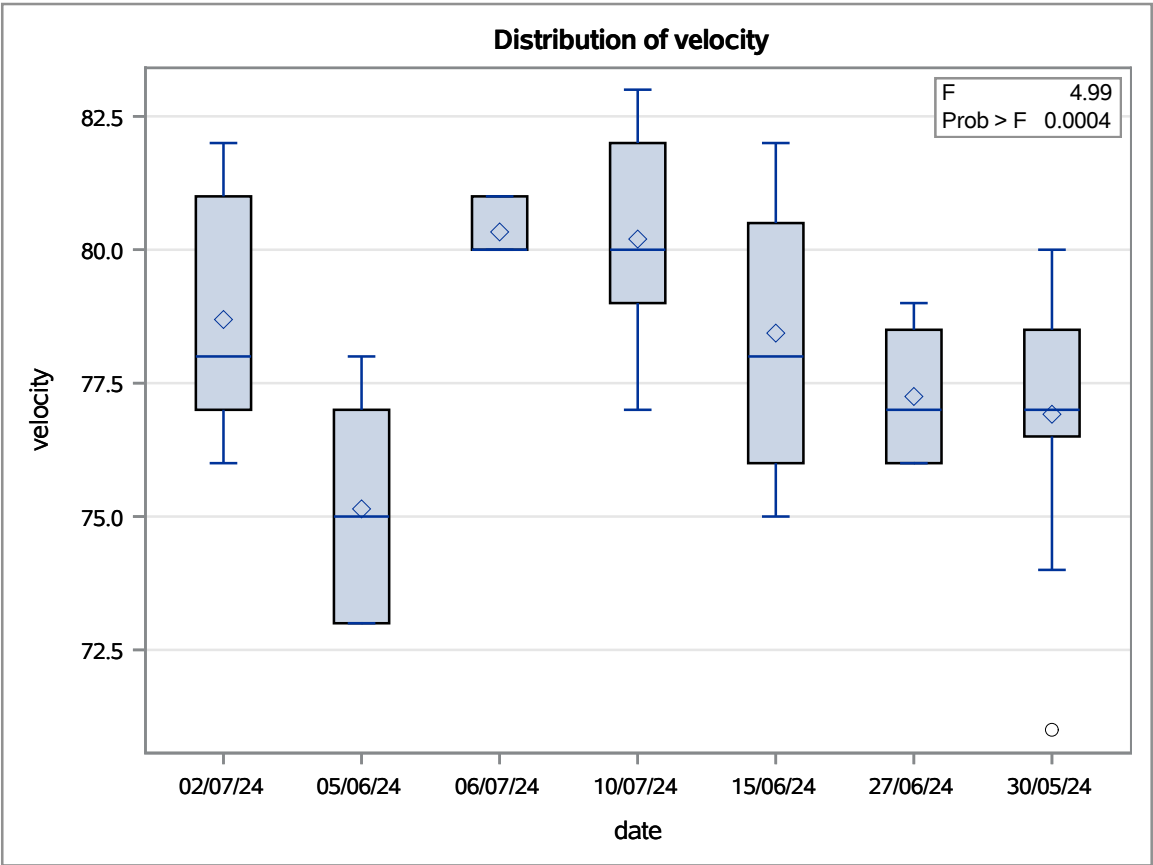
Distribution of velocity

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	6	92.7318241	15.4553040	6.15	<.0001
Error	84	211.0923517	2.5130042		
Corrected Total	90	303.8241758			

R-Square	Coeff Var	Root MSE	velocity Mean
0.305215	1.860905	1.585246	85.18681

Source	DF	Type I SS	Mean Square	F Value	Pr > F
date	6	92.73182414	15.45530402	6.15	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
date	6	92.73182414	15.45530402	6.15	<.0001
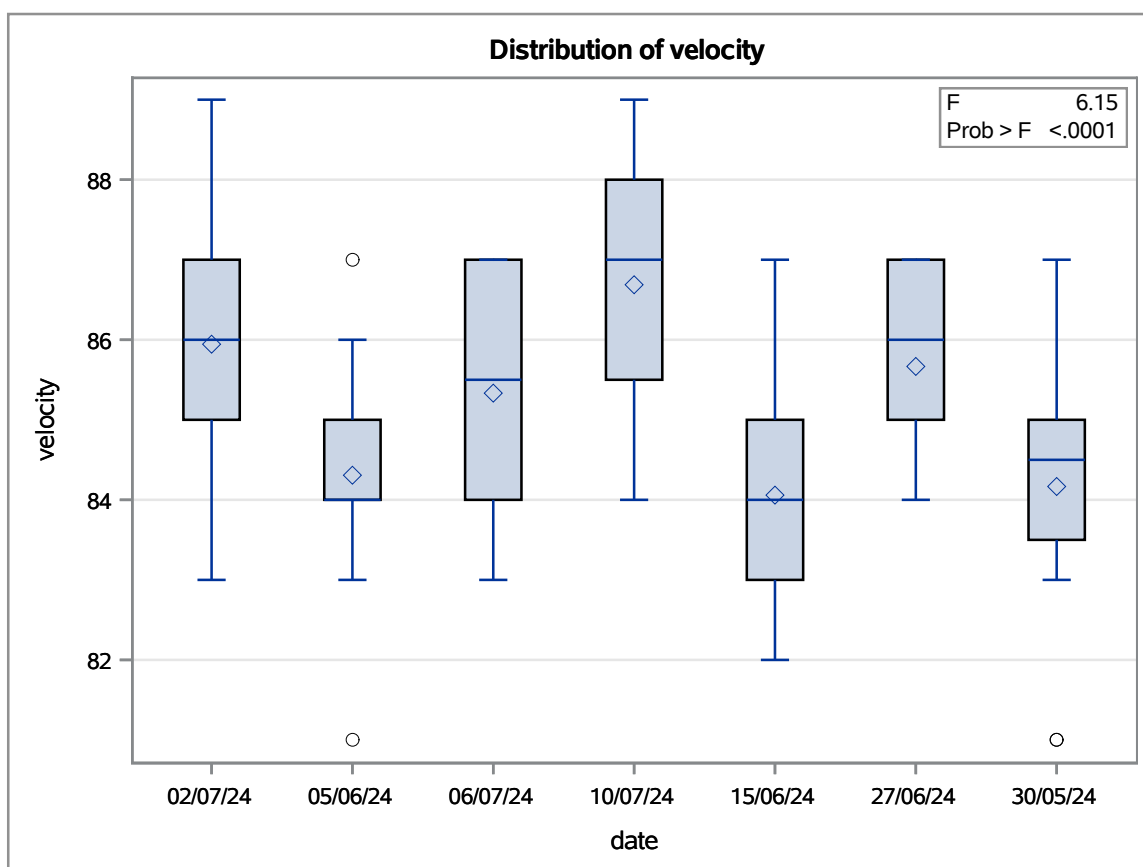
Distribution of velocity

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	6	157.4865351	26.2477559	11.40	<.0001
Error	66	152.0203142	2.3033381		
Corrected Total	72	309.5068493			

R-Square	Coeff Var	Root MSE	velocity Mean
0.508831	2.025787	1.517675	74.91781

Source	DF	Type I SS	Mean Square	F Value	Pr > F
date	6	157.4865351	26.2477559	11.40	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
date	6	157.4865351	26.2477559	11.40	<.0001

Distribution of velocity