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Promotions in Minor League Baseball - An Analysis Across Leagues

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Promotions in Baseball



- Long-standing tradition in baseball
- Aim to attract fans to stadiums, boost attendance, and enhance the overall fan experience
- Originated in the early 20th century.
- Occur at both the Major and Minor League levels
- Minor League promotions often more innovative and interesting





- Bobbleheads (1960s): First bobblehead giveaway by San Francisco Giants
 - Often feature star players, memorable moments, or pop culture references
- Bat Days (1970s): First miniature bat giveaways
 - Often include the logo of the team or a sponsor
- Helmet Ice Cream Sundaes (1980s): Concession stands began to offer miniature team helmets filled with ice cream





Promotions - Timeline



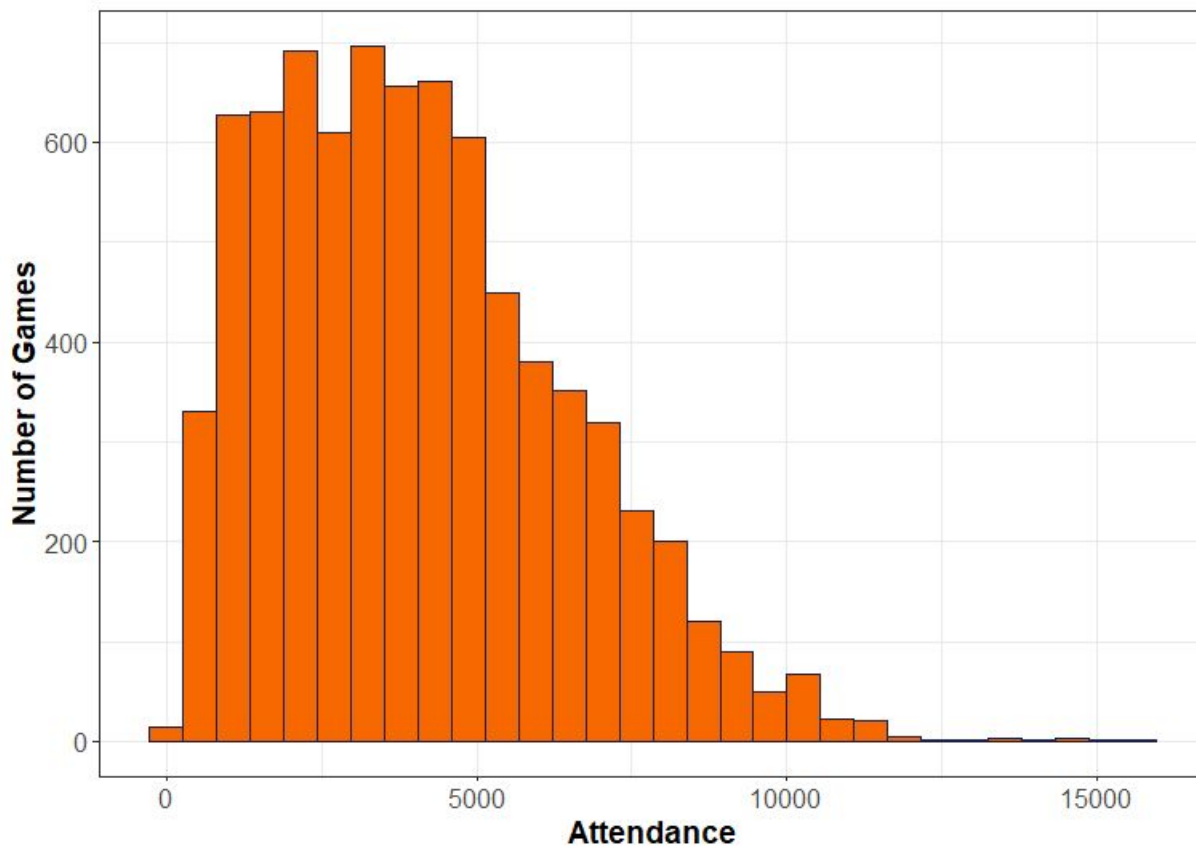
- T-shirt Nights (1990s): Teams began to give away promotional T-shirts
 - Often feature team logos, slogans, or specific designs related to the team or game
- Mascot Giveaways (2000s): Teams started giving away miniature mascot figurines, plush toys, and other mascot-themed merchandise
- Themed Nights (Modern Era): Items or activities related to a specific theme, designed to attract fans with a passion for both the theme and baseball
 - Example: Star Wars Nights, Superhero Nights, etc.
- Replica Jerseys, Hats, and Other Giveaways (Modern Era): Team-branded merchandise to attract fans and create a sense of unity among attendees



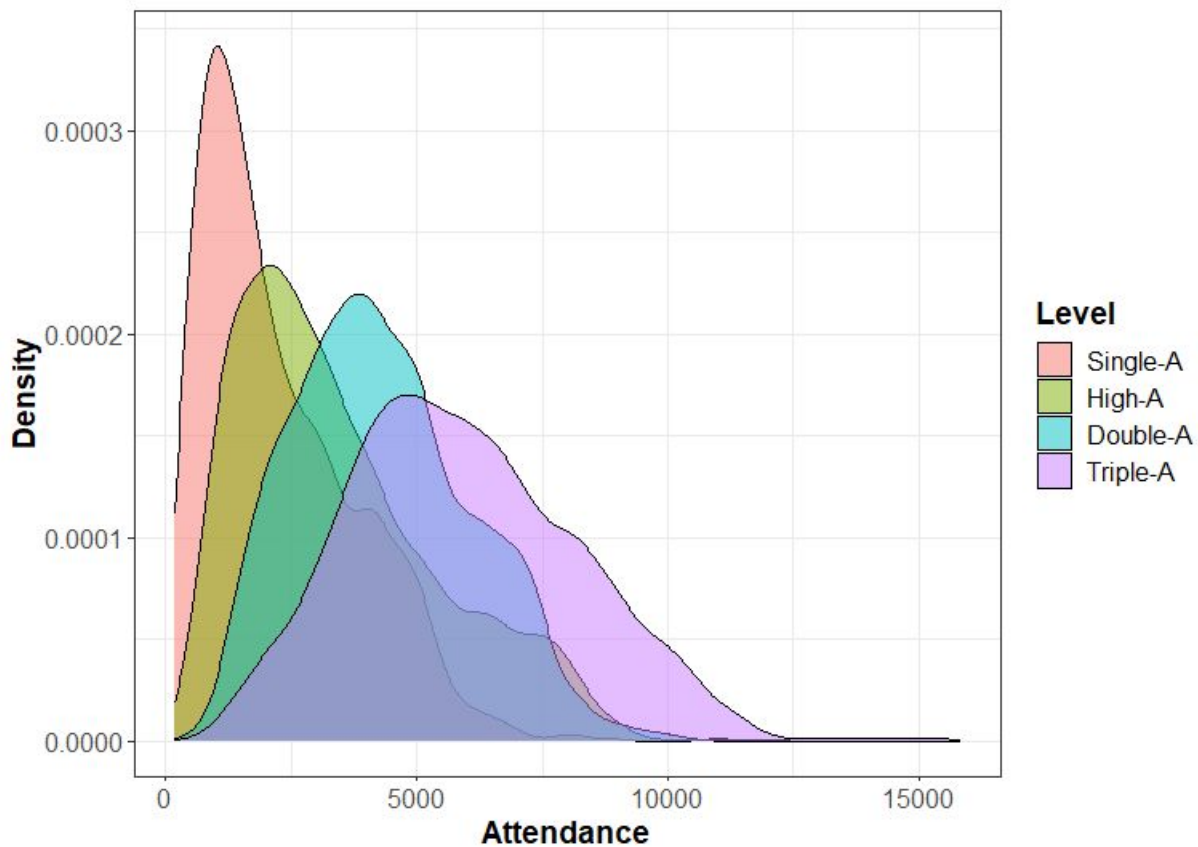
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2023 MiLB Attendance



Attendance by Level



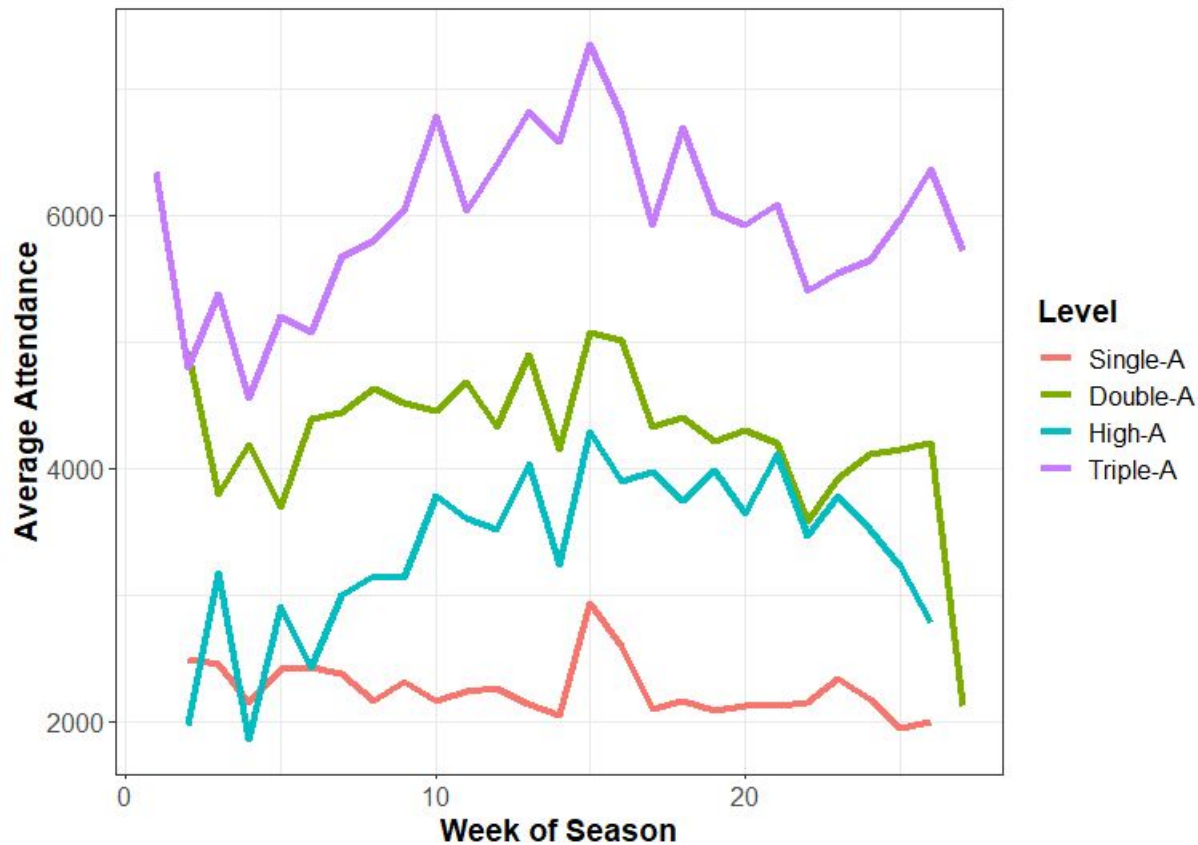
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Factors Impacting Attendance

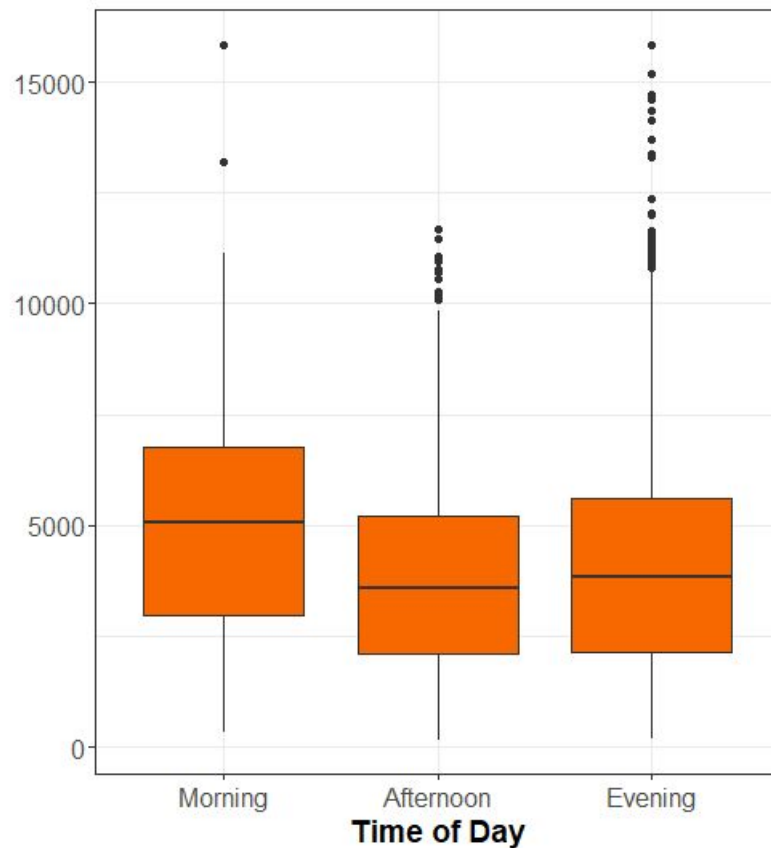
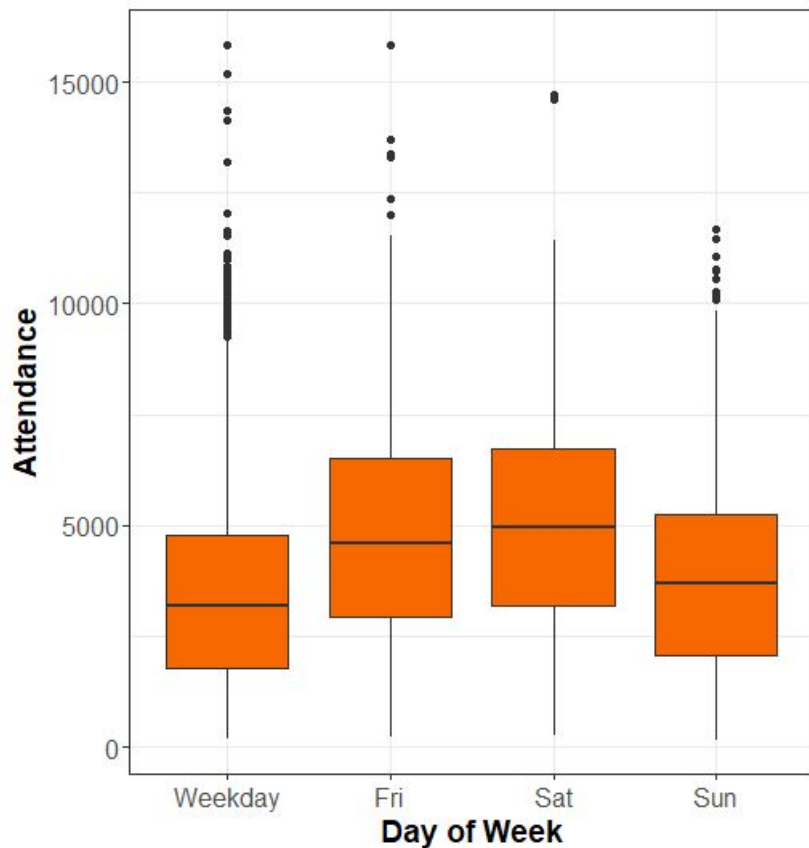


Point in Season



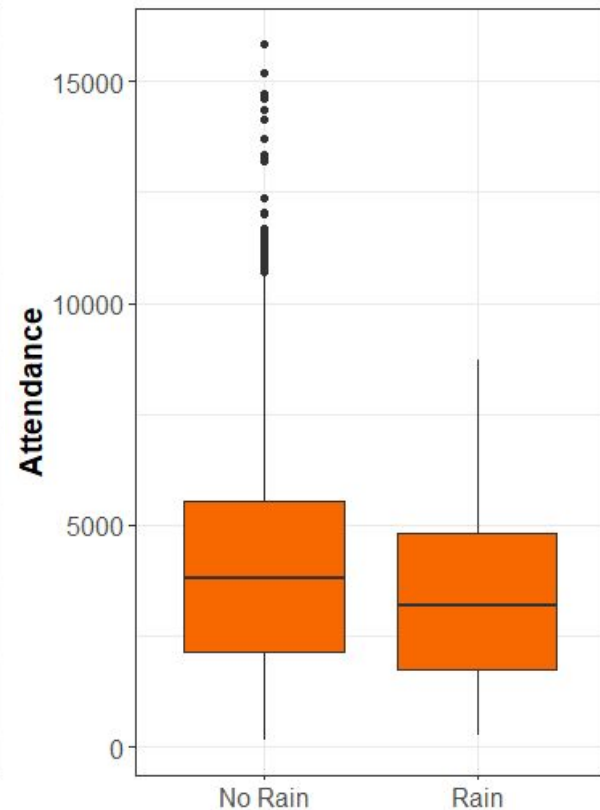
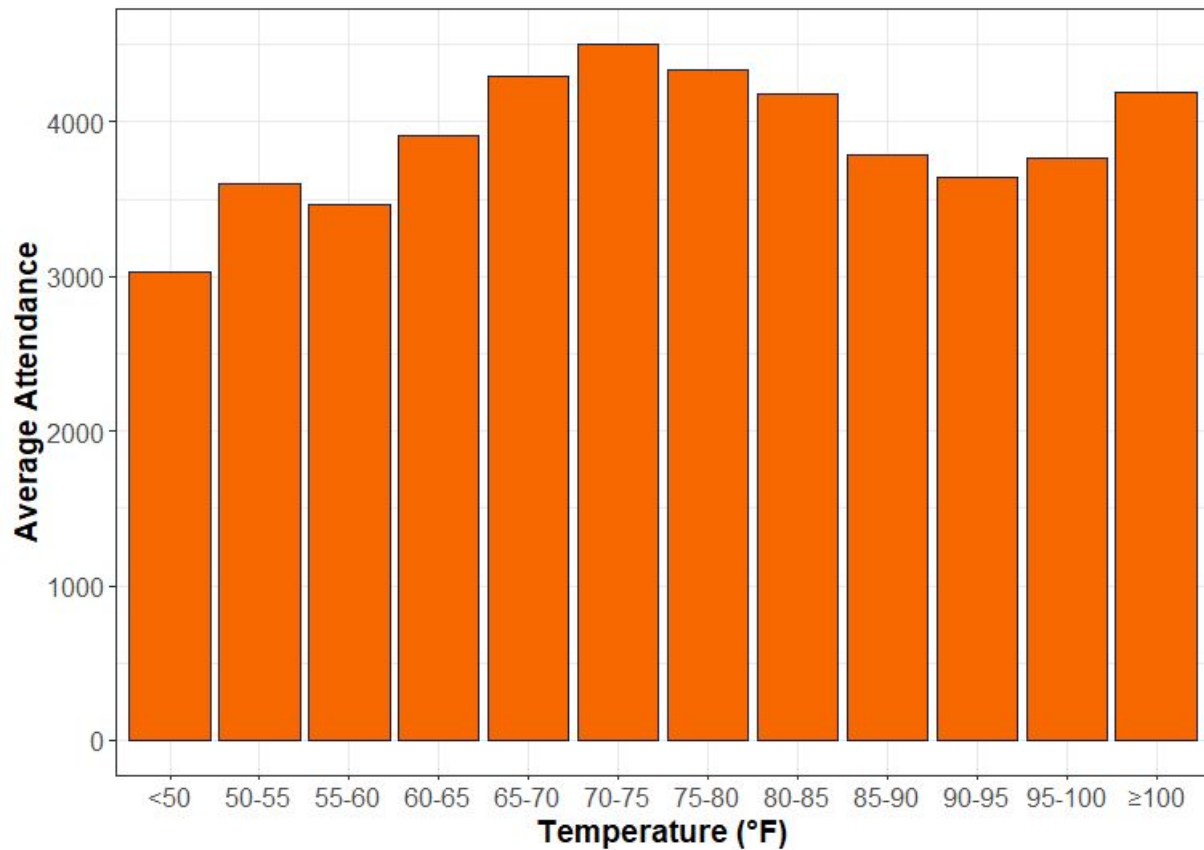


Game Day and Time



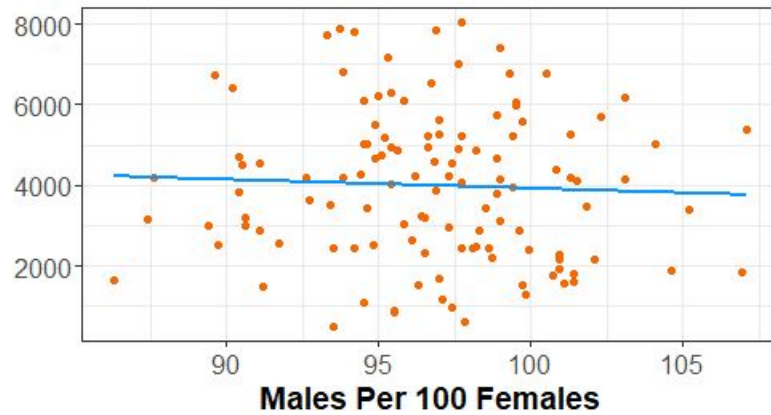
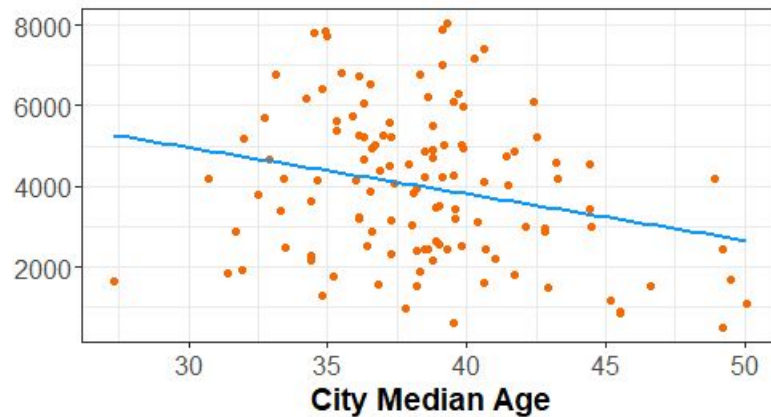
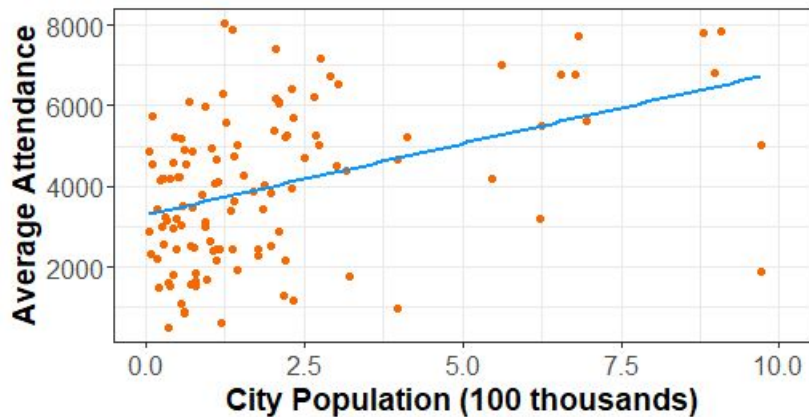


Weather





City Demographics



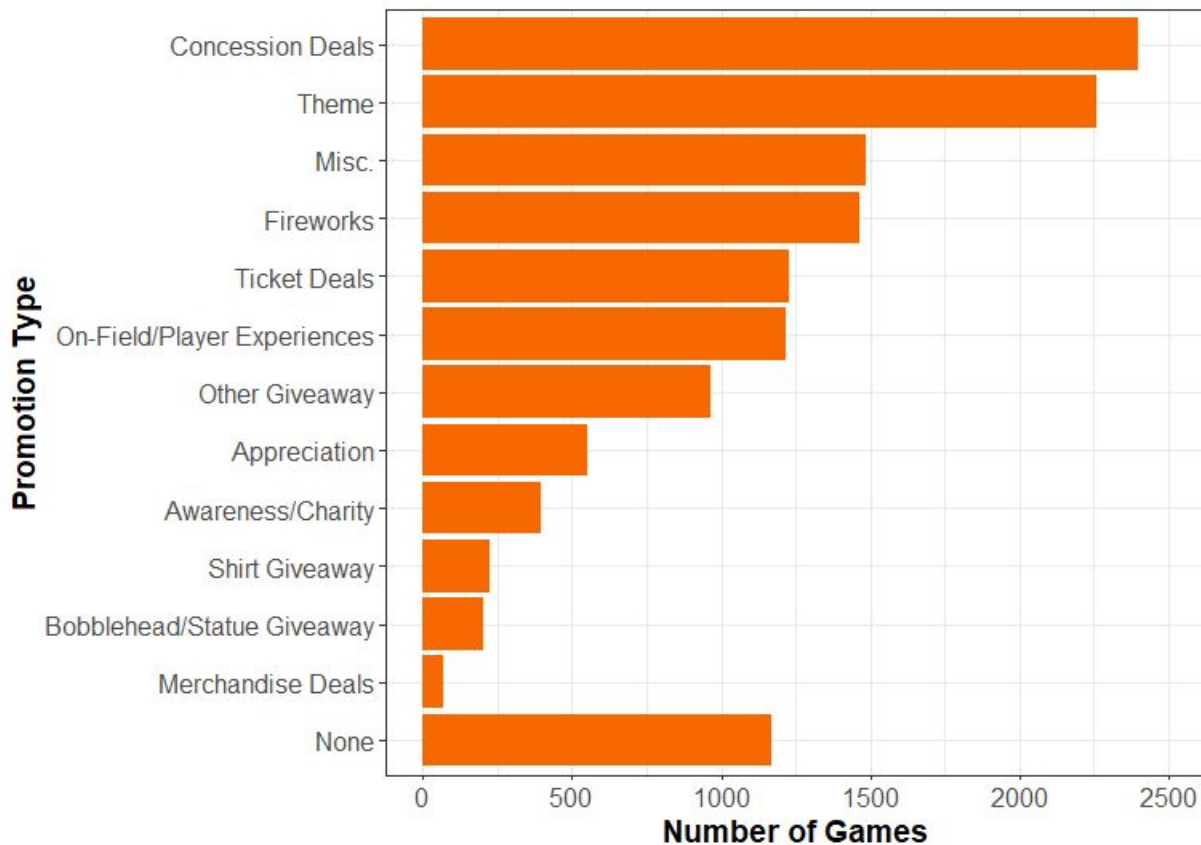


- Awareness/Charity
- Appreciation
- Bobblehead/Statue Giveaway
- Shirt Giveaway
- Other Giveaway
- On-Field/Player Experience
- Concession Deal
- Ticket Deal
- Merchandise Deal
- Theme
- Fireworks
- Misc





Frequency of Promotion Types



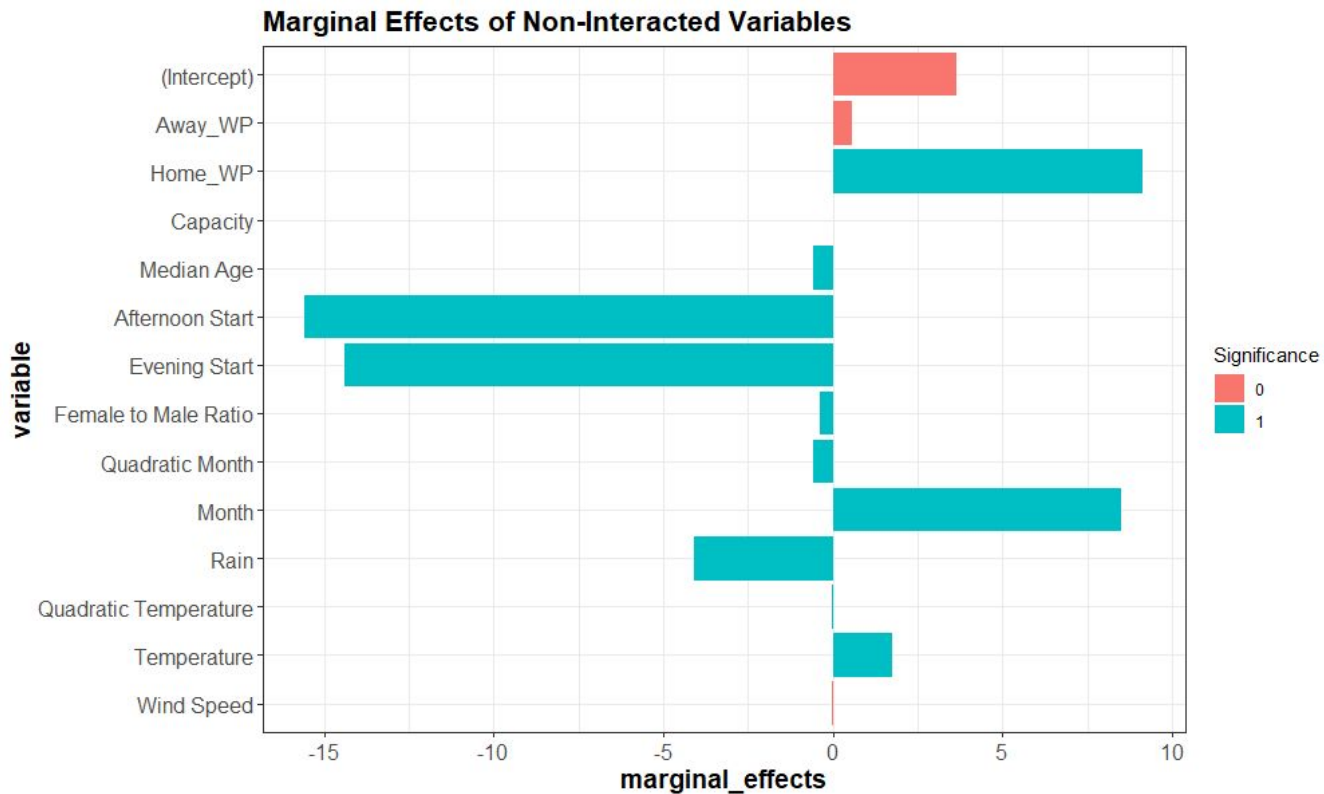


- Used a OLS linear regression model to make statistical inference
- Square Root Transformation of Attendance to account for heteroskedasticity
- Used 2 and 3 Dimensional Interactions to measure specific marginal effects

Model	Description	Coefficients	R Squared	ADJ R Squared	AIC	BIC
Model 1	Base Model	32	0.496	0.494	138808.2	139038.1
Model 2	SQRT transformation of Attendance, income & city size categorical transformation	36	0.526	0.523	62797.1	63054.8
Model 3	Added quadratic terms to month and weather	38	0.545	0.543	62479.7	62751.4
Model 4	Added 2D Interaction terms between Level and Promotion Group	74	0.566	0.562	62176.3	62698.8
Model 5	Added 3D Interaction terms between Level, Day of Week, and Promotion Group	220	0.598	0.587	61857.2	63397.0
Model 6	Added 4D Interaction terms between Level, Day of Week, Month, and Promotion Group. Reverted to 3D	385	0.608	0.588	62003.3	64692.6
Model 7	Interaction, added 2D interaction between Income Bracket and Promotional Group	255	0.609	0.595	61728.0	63511.5
Model 8	Added Final 2D Interaction between City Size and Promotional Group	291	0.617	0.603	61619.5	63653.9



- Noon starts draw most fans
- Home team has an impact, not away
- Diminishing Month and Temperature Effects
- Older-male predominant counties bring slight boost.





Unique Scenario: Interactions between categorical variables

- Add each layer of effects together to get a cumulative effect
- Makes Interpreting Interactions much more simple

Example: Interacting Day of Week, Level, and Fireworks

$$M_E(\text{Fireworks}) = \begin{matrix} \text{B}_1(\text{Fireworks}) \\ + \\ \text{B}_2(\text{Fireworks} * \text{High-A}) \\ + \\ \text{B}_3(\text{Fireworks} * \text{High-A} * \text{Saturday}) \end{matrix}$$

Both Variables = 1



Median Income Marginal Effects



Marginal Effects of Promotions on City Mean Income Brackets

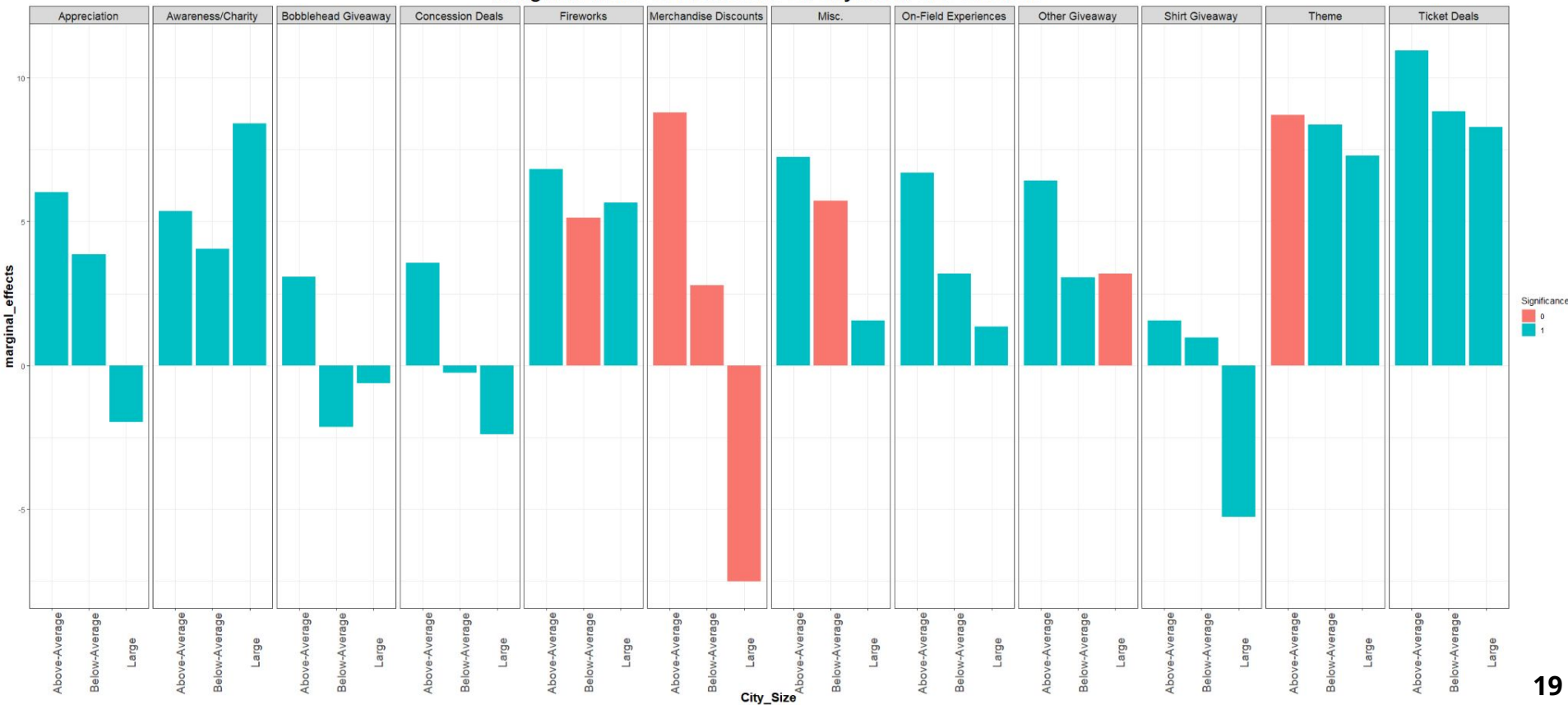




Median City Size Marginal Effects



Marginal Effects of Promotions on City Mean Size Brackets

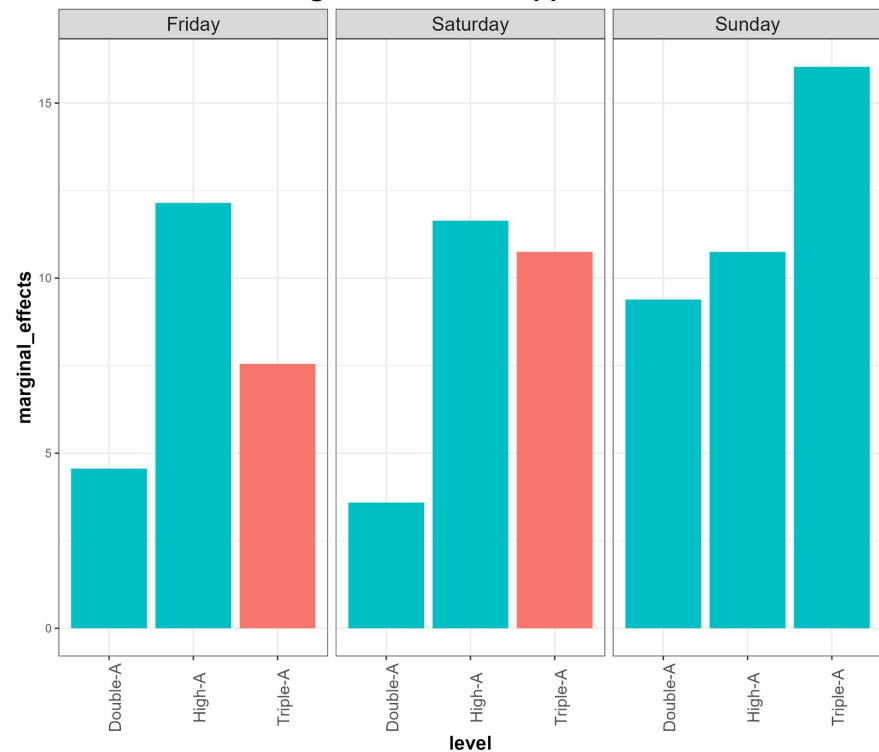




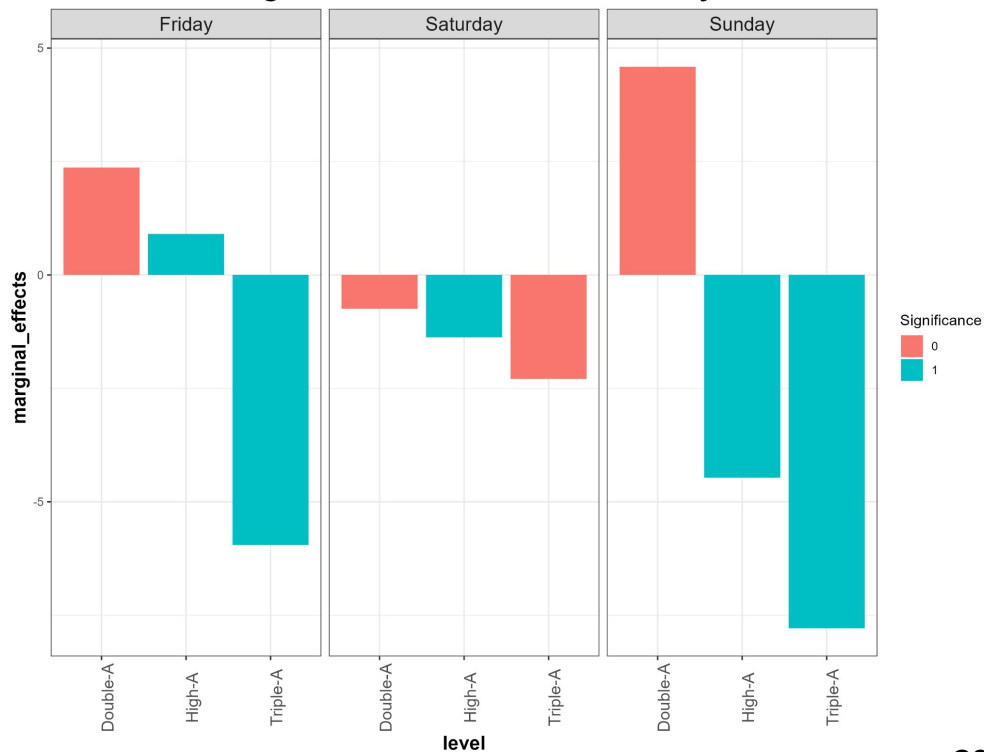
Marginal Effects of Promotions



Marginal Effects of Appreciation



Marginal Effects of Awareness/Charity

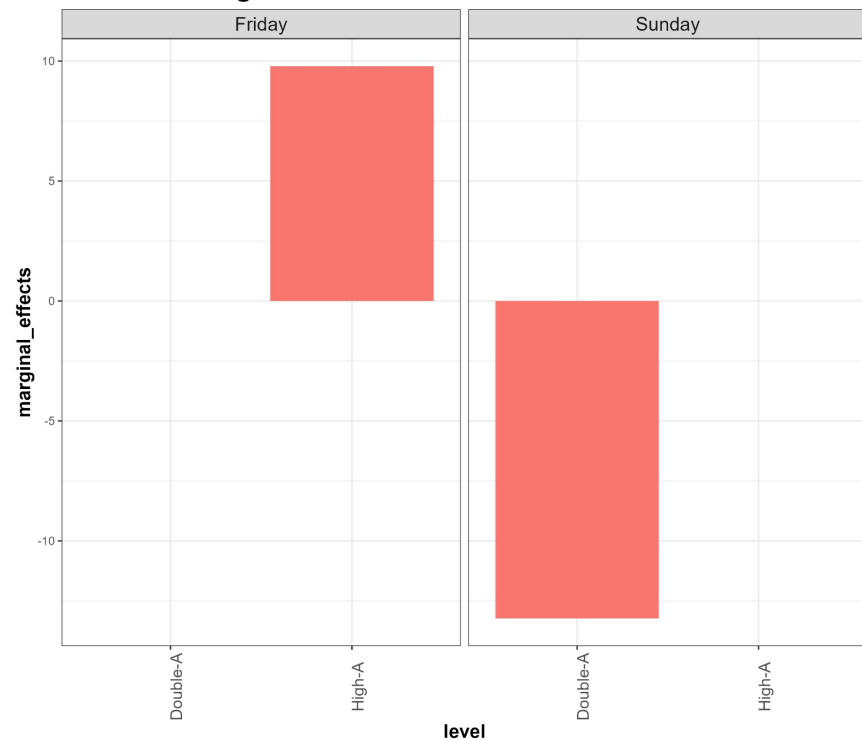




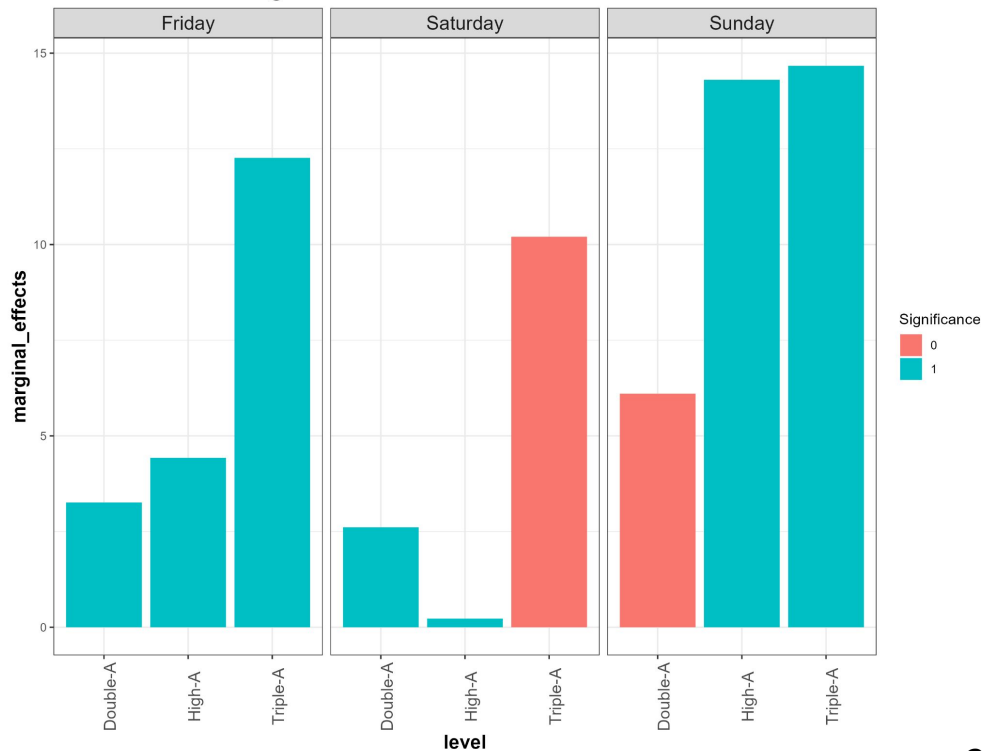
Marginal Effects of Promotions



Marginal Effects of Merchandise Discounts



Marginal Effects of Concession Deals

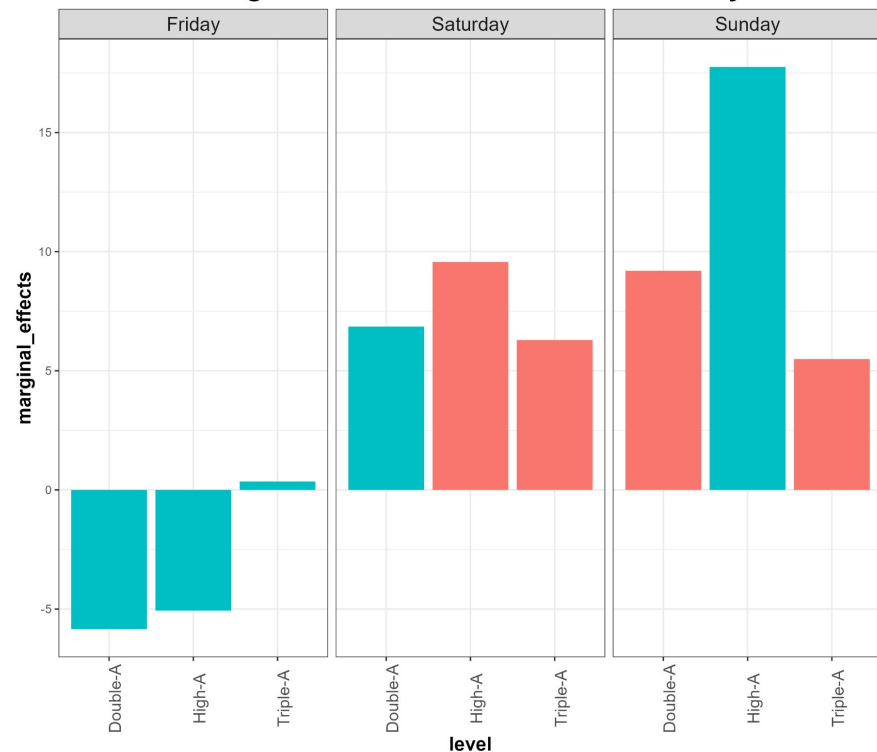




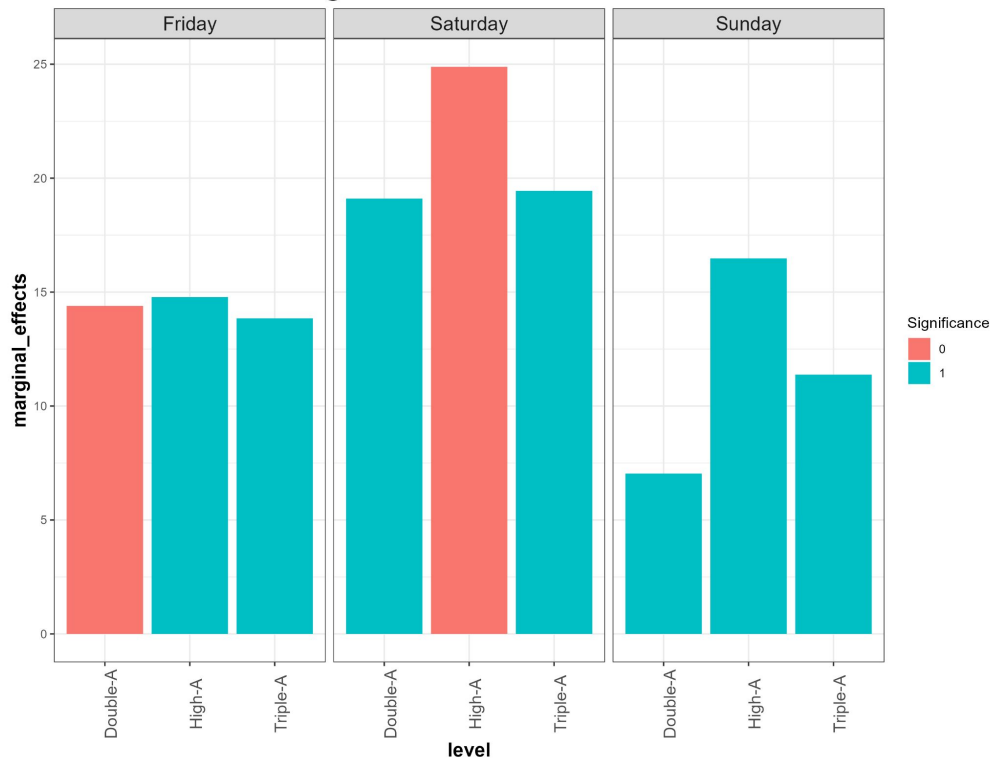
Marginal Effects of Promotions



Marginal Effects of Bobblehead Giveaway



Marginal Effects of Fireworks

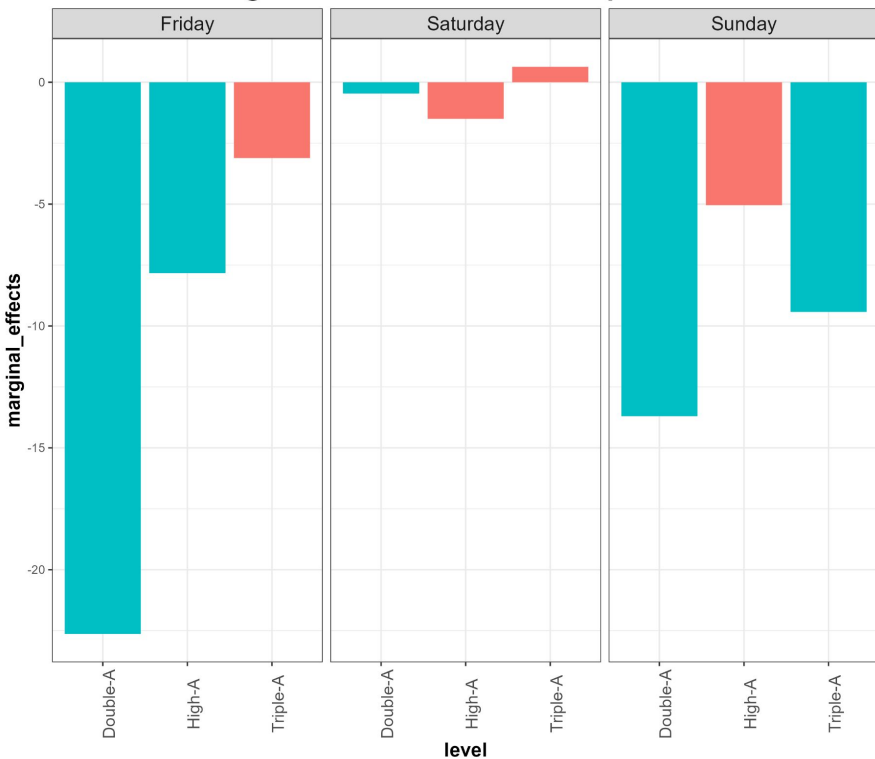




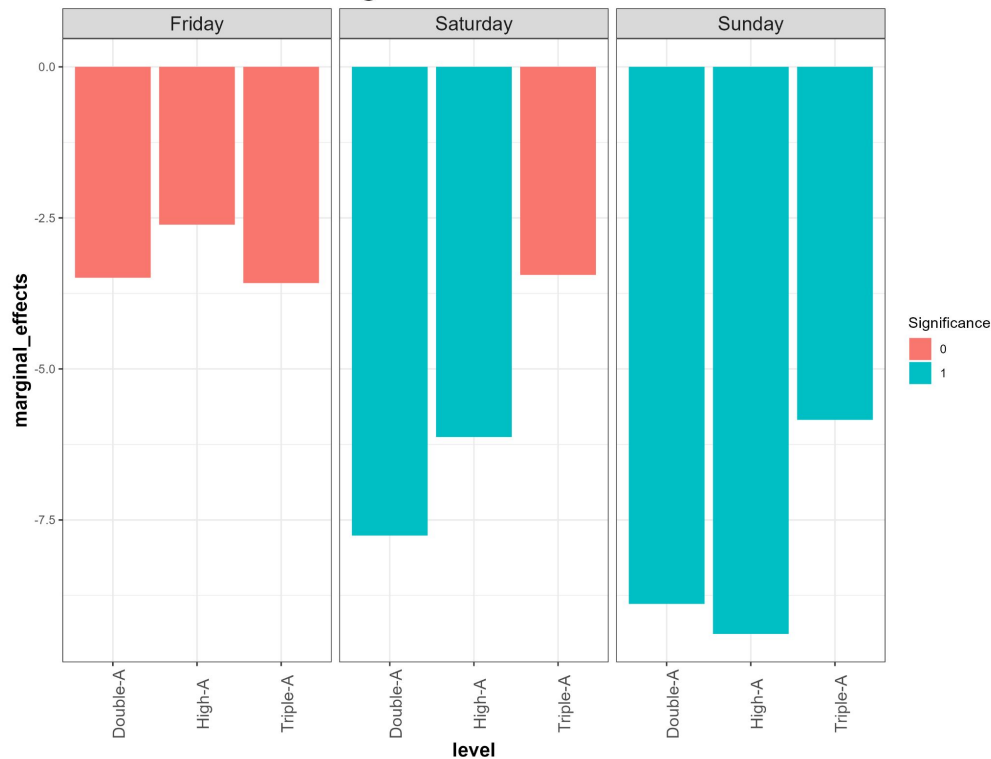
Marginal Effects of Promotions



Marginal Effects of On-Field Experiences



Marginal Effects of Misc.

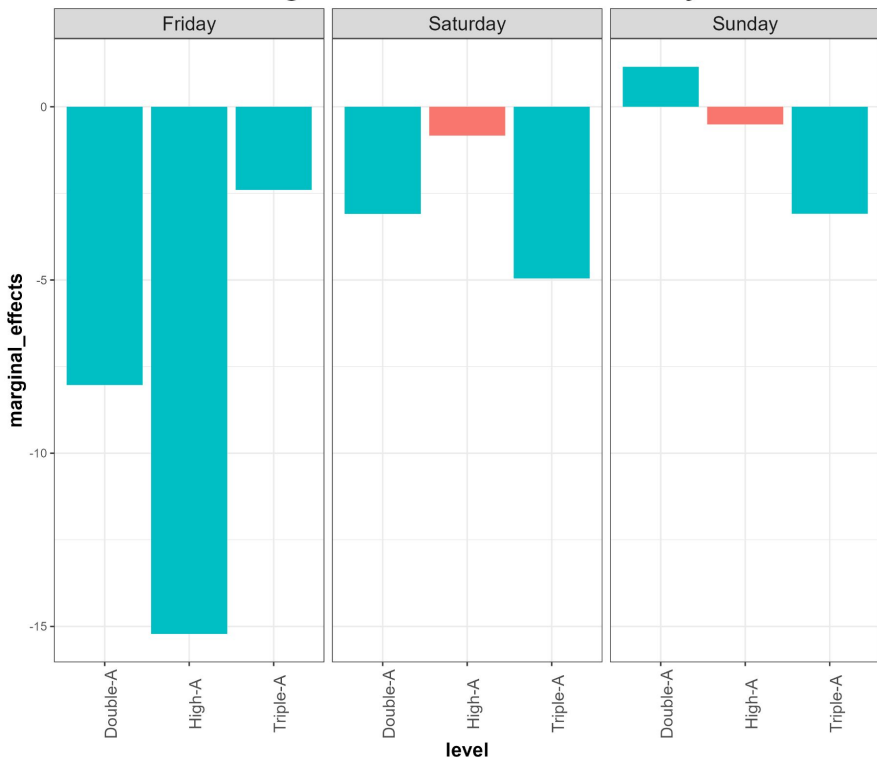




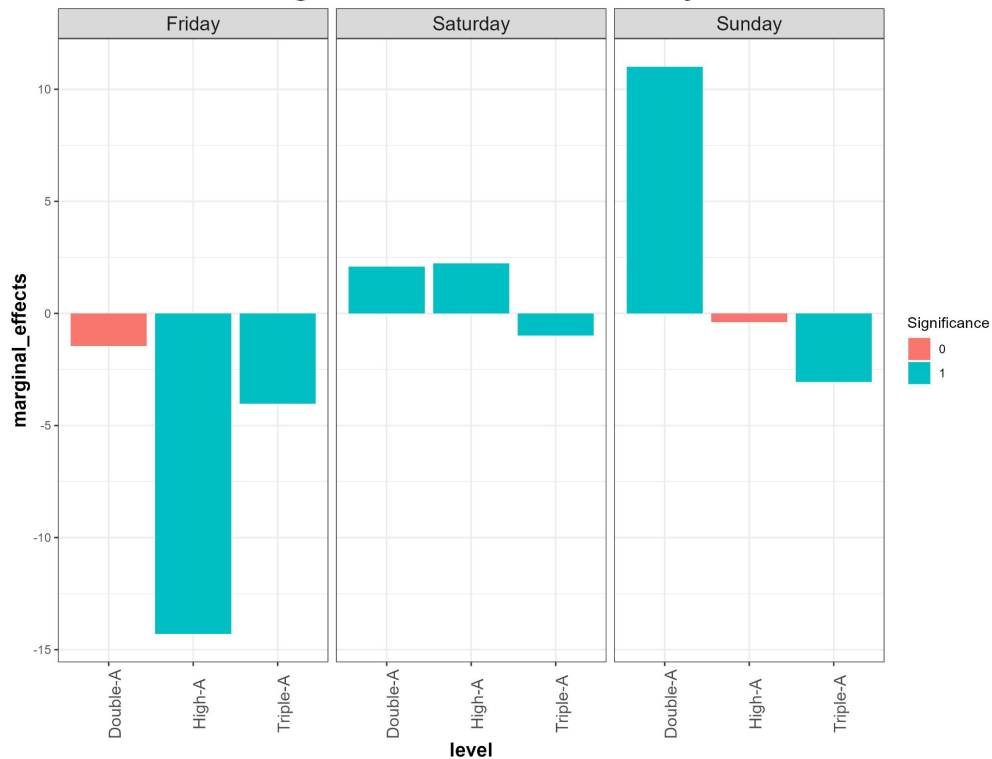
Marginal Effects of Promotions



Marginal Effects of Other Giveaway



Marginal Effects of Shirt Giveaway

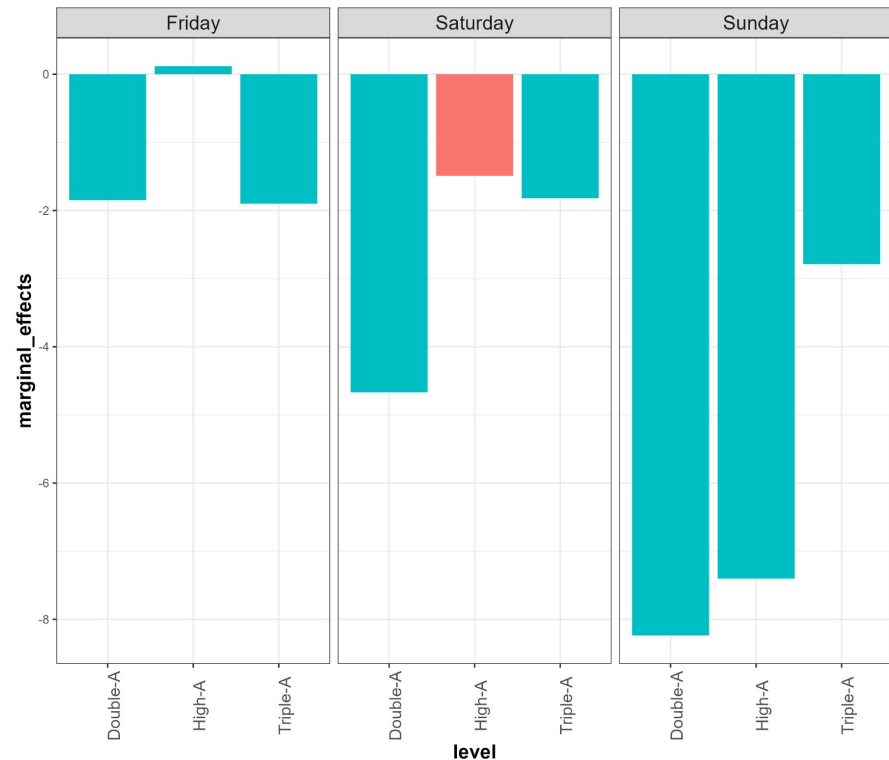




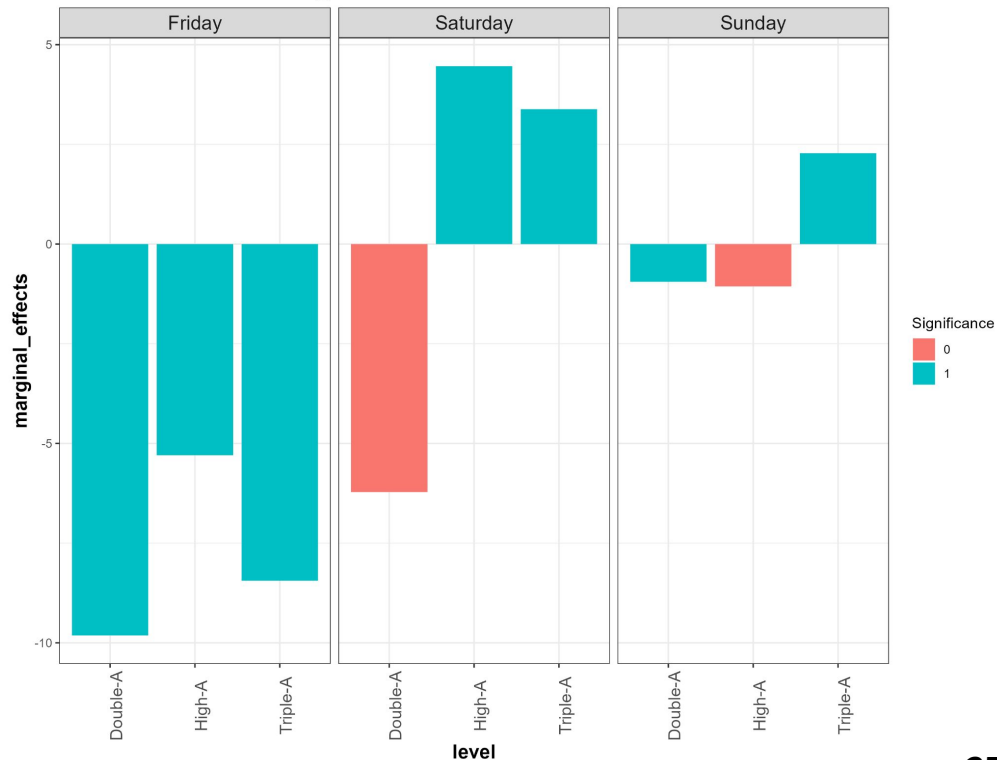
Marginal Effects of Promotions



Marginal Effects of Theme



Marginal Effects of Ticket Deals





Promotion Takeaways



Top Gains from Weekday Single-A

Rank	Promotion	Level	Day Of Week	Marginal Effects
1	Fireworks	Triple-A	Saturday	19.441
2	Fireworks	Double-A	Saturday	19.105
3	Bobblehead Giveaway	High-A	Sunday	17.751
4	Fireworks	High-A	Sunday	16.480
5	Appreciation	Triple-A	Sunday	16.034
6	Fireworks	High-A	Friday	14.779
7	Concession Deals	Triple-A	Sunday	14.668
8	Concession Deals	High-A	Sunday	14.306
9	Fireworks	Triple-A	Friday	13.848
10	Concession Deals	Triple-A	Friday	12.265
11	Appreciation	High-A	Friday	12.147
12	Appreciation	High-A	Saturday	11.640
13	Fireworks	Triple-A	Sunday	11.378
14	Shirt Giveaway	Double-A	Sunday	10.999
15	Appreciation	High-A	Sunday	10.748
16	Appreciation	Double-A	Sunday	9.390
17	Fireworks	Double-A	Sunday	7.037
18	Bobblehead Giveaway	Double-A	Saturday	6.855
19	Appreciation	Double-A	Friday	4.558
20	Ticket Deals	High-A	Saturday	4.459

Biggest Drops from Weekday Single-A

Rank	Promotion	Level	Day Of Week	Marginal Effects
1	On-Field Experiences	Double-A	Friday	-22.634
2	Other Giveaway	High-A	Friday	-15.216
3	Shirt Giveaway	High-A	Friday	-14.297
4	On-Field Experiences	Double-A	Sunday	-13.701
5	Ticket Deals	Double-A	Friday	-9.814
6	On-Field Experiences	Triple-A	Sunday	-9.424
7	Misc.	High-A	Sunday	-9.386
8	Misc.	Double-A	Sunday	-8.889
9	Ticket Deals	Triple-A	Friday	-8.442
10	Theme	Double-A	Sunday	-8.236
11	Other Giveaway	Double-A	Friday	-8.031
12	On-Field Experiences	High-A	Friday	-7.831
13	Awareness/Charity	Triple-A	Sunday	-7.787
14	Misc.	Double-A	Saturday	-7.758
15	Theme	High-A	Sunday	-7.402
16	Misc.	High-A	Saturday	-6.128
17	Awareness/Charity	Triple-A	Friday	-5.951
18	Misc.	Triple-A	Sunday	-5.843
19	Bobblehead Giveaway	Double-A	Friday	-5.842
20	Ticket Deals	High-A	Friday	-5.295



- Home Team WP, Noon Start Time, and Month significant predictors
- Higher Income: Merch Discounts and Shirt Giveaways
- Lower Income: Concessions and Ticket Deals
- Lower Levels: Theme Nights, Misc (team specific), & Giveaways bring fans in weekday & weekend
- Higher Levels: Fireworks, Concessions Discounts, & Appreciation Nights draw big weekend crowds
- Bobbleheads: Hit with anyone at any time



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Thank You!
Any Questions?