

# IDS 702: An Analysis of the Sneaker Resale Market

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## Summary

After analyzing and fitting data scraped from Kicks on Fire and StockX to a multi-linear regression model, this analysis answered the following inferential questions: -Which of the variables appears to be the best covariate for explaining sneaker resale values? -What is the likely range for the difference in resale values for collaborated and non-collaborated sneakers? -Is there any evidence that the association between sentiment and resale values differ by collaborations? -Are there other interesting associations with resale values that are worth mentioning and modeling? Ultimately, it was determined that the log of the resale price of a sneaker was the most important factor in determining the resale value of a sneaker. Additionally,

## Introduction

Using data scraped from a sneaker news website, Kicks on Fire, and StockX, a resale marketplace for Sneakers, the aim of this analysis is to understand what factors effect a sneaker's resale value. The dataset contains over 6000 sneakers released over the past decade with their average resale value after two plus months of initial release. Additional features such as is a sneaker a collaboration, the intended sex for the sneaker release, if a sneaker was retro, or if it is a kids shoe were engineered using regular expressions. The color of a sneaker was also assigned using a vector representation of the colorway string and getting the max cosine similarity of that vector with common colors to determine the “main color” of a sneaker.

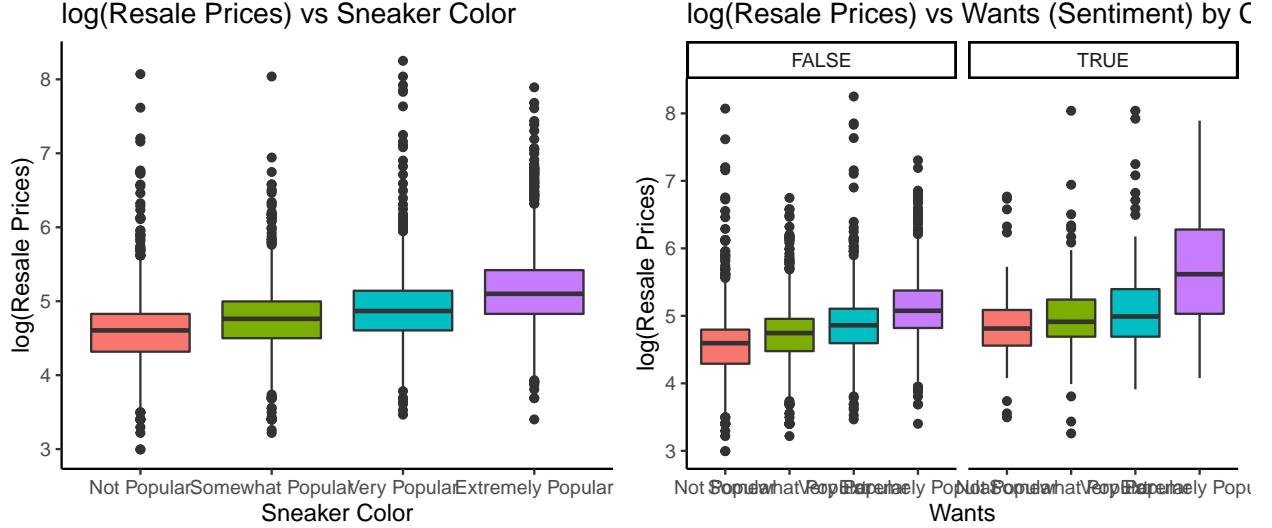
Ultimately, this analysis will answer inferential questions such as which variable is the biggest contributor to a sneaker's resale values, a likely range for differences in resale values for collab and non-collab sneakers, and potential evidence of associations, in particular, between sentiment and resale values differing by collaborations. To answer these questions posed, this analysis will explore and transform the data, fit multi-linear regression models with appropriate features, and interpret the results.

## Exploratory Data Analysis (EDA)

**Data Transformation** Before beginning the analysis, the number of null values in the dataset were counted. Although there were no null values found in the predictors, there were 181 rows in the response variable missing values. This was likely due to the scraper unable to find those sneakers on StockX. Ultimately, these rows were removed instead of imputed since they accounted for less than 3% of the entire dataset and it wasn't apparent if they weren't on StockX or they were difficult to find in the scraping process. After removing those rows, the final dataset contained 6,164 unique observations and 12 model interpretable columns.

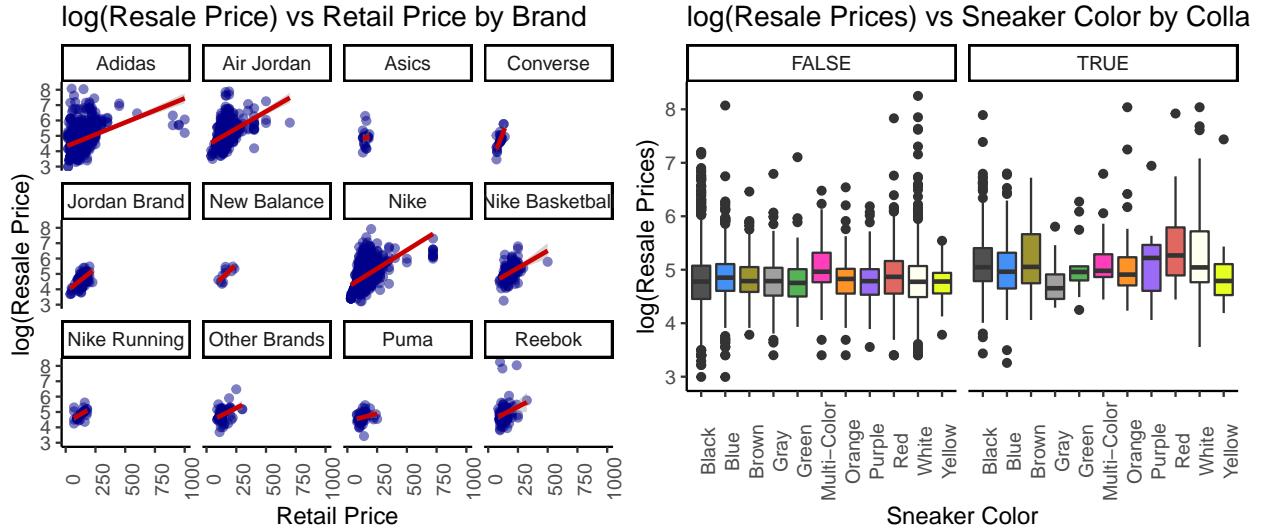
Since one of the assumptions of a linear model is normality, the distribution of the response variable was plotted in a histogram. The distribution of Resale prices were heavily skewed left, and therefore multiple transformation were performed. Ultimately, the log transformation was deemed to have the best resemblance to a normal distribution. This transformation was used for the rest of the analysis.

The “wants” column scraped from Kicks on Fire is akin to a like button, and therefore a proxy for public sentiment for each sneaker. The distribution of “wants” was heavily skewed left with a wide range of values. Due to this, and since many sneakers had zero “want”, the column was binned into four groups roughly representing the quartiles of values in the column. A sneaker with less than 50 “wants” was considered “Not Popular”, greater than equal to 50 and less than 250 was “Somewhat Popular”, greater than or equal to 250 and less than 1000 was “Very Popular”, and greater than or equal to “1000” was “Extremely Popular”. The figure on the left below visualizes the distribution of each category.



**Data Visualization** Due to our interest in a possible association between sentiment and resale values by whether or not a sneaker was collaborated on, the plot on the right (above) visualizes that relationship. This revealed that there does appear to be a difference in resale values among each popularity group when collaborated on versus not. Although the resale distributions for non-collaborated sneakers look similar to the overall distribution of the data set (above, left), the distributions for sneakers that were collaborated do not. The median resale values for “Somewhat Popular” and “Very Popular” collaborated sneakers appear to be roughly the same, as compared to before. The median value and distribution of extremely popular, collab sneakers, seem to be higher than before as well.

Two additional potential associations found while performing EDA can be seen in the plots below. The graph on the left shows the log of resale prices versus retail prices split by brand. From this chart, we can make out that some brands, such as Converse, Nike, Air Jordan, and Adidas, all appear to have strong positive correlations between the two variables. Meanwhile, some brands such as Puma and Asics, have relatively flat slopes with no correlation between the two variables. The second graph on the right depicts the log of resale prices versus sneaker color split by collaboration. The resale value medians and distributions for each colors vary a lot more sneakers for sneakers that are collaborated on versus not. In particular, the resale value distributions for brown, purple, red, and white sneakers seem to be a lot higher when collaborated on, while the distribution of resale values for gray sneakers seems to decrease. All of these potential associations will be tested for statistical significance when modeling.



## Model

**Model Selection** The final model was selecting based on our findings from the EDA, AIC and BIC step-wise model selection, and ANOVA f-tests. When checking model diagnostic plots, it was determined that the log transformation of the retail value for each sneaker would create more randomness among the residuals in the residuals vs fitted plots and was necessary to satisfy the linearity assumption. The rest of the variables were all categorical, and therefore no other transformations to predictors were made. The final model took the form:  $y_i = \beta_0 + \beta_1 Brand + \beta_2 ReleaseMonth + \beta_3 ReleaseDay + \beta_4 Sex + \beta_5 Collab + \beta_6 Retro + \beta_7 Kids + \beta_8 Color + \beta_9 BinWants + \beta_{10} \log(RetailPrice) + \beta_{11}(BinWants : Collab) + \beta_{12}(\log(RetailPrice) : Brand) + \beta_{13}(Collab : Color)$ . The model summary can be seen below. Since the response variable is the log of resale values, it is important to exponentiate the coefficients before interpreting the model.

The model's intercept is 15.21, which means that, if all variables are set to 0 or their respective baseline, the average resale price of a sneaker would be \$15.21. The intercept is also statistically significant as its' p-value is smaller than 0.05. The adjusted r-squared value for the model is ~0.38, which means about 38% of variability in the dataset can be explained by the variables in our model.

We can also determine that the log of the sneaker's retail price is the best covariate for explaining sneaker resale values. This is because predictors with higher absolute t-values indicate greater evidence against the null hypothesis and importance in predicting the response variable. The coefficient of this covariate indicates that for every additional increase in the log of the retail price, the resale value, on average, for a sneaker increases by \$1.48, holding all other variables constant.

For this analysis, only variables that had p-values lower than the 0.05 level were deemed to be statistically significant. Therefore, brand, release month, release day, retro, "wants" binned, log of retail price, the interaction between brand and the log of retail price, the interaction between collab and "wants" binned, and the interaction between collab and main color were all statistically significant variables.

Additionally, since the interaction between collaborations and "wants" binned was statistically significant, we know that there is evidence of an association between sentiment and resale values different. For the interaction, non-collaborated sneakers and "Not Popular" were the model's baseline. The statistically significant effects of this interaction can be interpreted as, if all other variables are held constant, on average, for sneakers that were collaborated on and were "Somewhat Popular", the average resale price of a sneaker increased by \$1.13 compared to the model baseline. For the same conditions, on average, sneakers that were collaborated on and were "Extremely Popular", the average resale price of a sneaker increased by \$1.69 compared to the model baseline. Although not statistically significant on the 0.05 level, holding all variables constant, sneakers that were collaborated on and were "Very Popular", the average resale price of a sneaker increased by \$1.12 compared to the model baseline.

	2.5 %	97.5 %
<b>collabTRUE</b>	0.9619	1.2

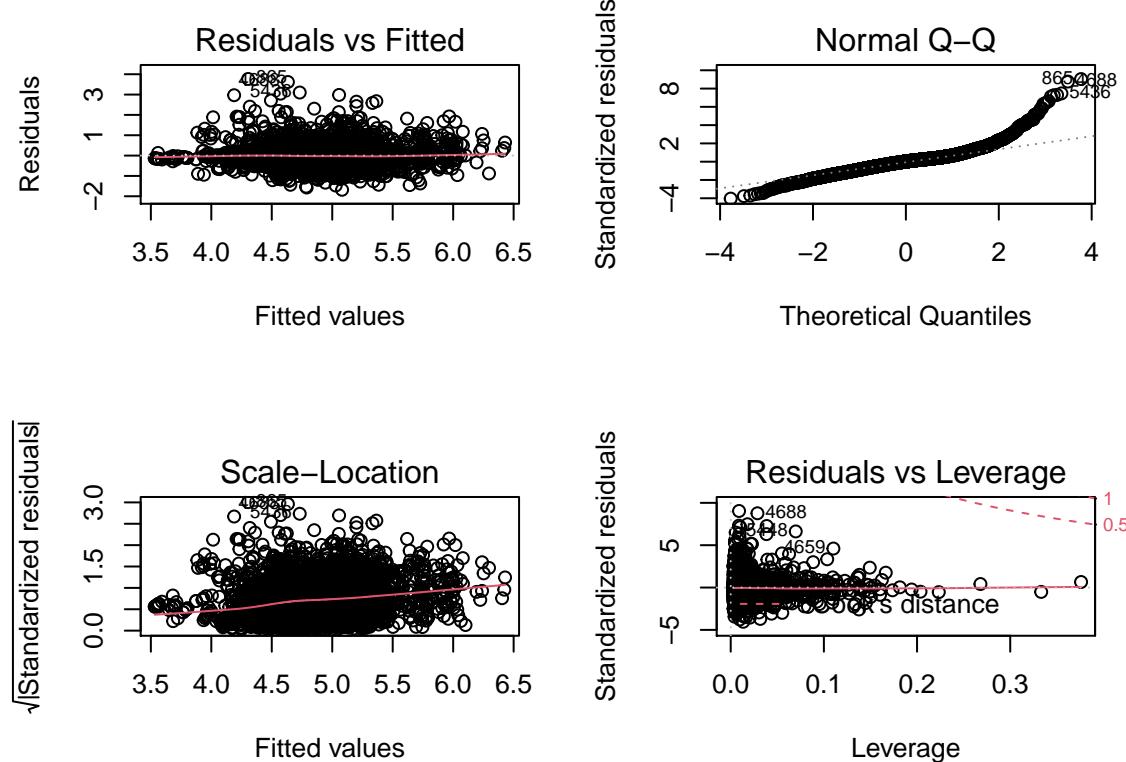
Next, a likely range for the difference in sneaker resale values for collab and non-collab sneakers can be found by getting the 95% confidence interval of the collab variable for the final model, which can be seen above. Based on the 95% confidence interval for the variable collab, if all other variables are held constant, the average resale price of a collab sneaker increases by \$0.96 to \$1.20 compared non-collab sneakers. It is worth noting that collab was not found to be significant on its own, but was significant in its interaction between sneaker sentiment and color.

term	estimate	std.error	statistic	p.value
(Intercept)	2.7220249	0.1309938	20.7797938	0.0000000
brandAir Jordan	-1.4736253	0.2795425	-5.2715610	0.0000001
brandAsics	5.8292930	3.9994977	1.4575063	0.1450282
brandConverse	-3.8826690	1.9132581	-2.0293493	0.0424661
brandJordan:Brand	-1.0193292	0.6562504	-1.5532626	0.1204123
brandNew Balance	-3.7749322	2.5269023	-1.4938972	0.1352543
brandNike	-1.7853927	0.1626169	-10.9791346	0.0000000
brandNike Basketball	-2.1295007	0.7247864	-2.9381078	0.0033146
brandNike Running	-0.9793677	1.2241818	-0.8000182	0.4237314
brandOther Brands	0.0420777	0.9012705	0.0466871	0.9627641
brandPuma	0.0597020	1.0646902	0.0560746	0.9552843
brandReebok	-0.2161552	0.8269331	-0.2613938	0.7937977
release_monthFeb	0.0263528	0.0289974	0.9087966	0.3634935
release_monthMar	0.0787506	0.0289739	2.7179847	0.0065867
release_monthApr	0.0246435	0.0294154	0.8377768	0.4021889
release_monthMay	-0.0198294	0.0307540	-0.6447755	0.5190969
release_monthJun	0.0413382	0.0297805	1.3880963	0.1651585
release_monthJul	0.0167872	0.0303453	0.5532063	0.5801424
release_monthAug	0.0262351	0.0299913	0.8747593	0.3817394
release_monthSep	0.0685826	0.0309396	2.2166588	0.0266832
release_monthOct	0.0401937	0.0316186	1.2712069	0.2037036
release_monthNov	0.0872633	0.0299581	2.9128457	0.0035945
release_monthDec	0.0826664	0.0303689	2.7220703	0.0065059
release_dowMonday	0.1008594	0.0351539	2.8690810	0.0041308
release_dowTuesday	0.0225498	0.0327940	0.6876176	0.4917198
release_dowWednesday	0.0251268	0.0300584	0.8359345	0.4032245
release_dowThursday	-0.0109732	0.0266154	-0.4122877	0.6801431
release_dowFriday	0.0091321	0.0278366	0.3280599	0.7428777
release_dowSaturday	0.0359227	0.0270957	1.3257686	0.1849660
wmns:TRUE	0.0262820	0.0160629	1.6361880	0.1018519
collab:TRUE	0.0716579	0.0563916	1.2707185	0.2038773
retro:TRUE	0.1620268	0.0323543	5.0078971	0.0000006
kids:TRUE	-0.0153924	0.0228705	-0.6730217	0.5009590
main_colorBlue	0.0062015	0.0170300	0.3641490	0.7157594
main_colorBrown	-0.0273718	0.0381856	-0.7168096	0.4735190
main_colorGray	-0.0098409	0.0280986	-0.3502283	0.7261795
main_colorGreen	-0.0021702	0.0386206	-0.0561918	0.9551909
main_colorMulti-Color	0.0833139	0.0425781	1.9567304	0.0504248
main_colorOrange	-0.0628058	0.0384314	-1.6342321	0.1022618
main_colorPurple	-0.0292959	0.0369776	-0.7922620	0.4282388
main_colorRed	0.0083963	0.0238334	0.3522905	0.7246326
main_colorWhite	0.0147409	0.0150038	0.9824734	0.3259057
main_colorYellow	-0.0972134	0.0730376	-1.3310053	0.1832371
bin_wantsSomewhat Popular	-0.0248405	0.0176301	-1.4089882	0.1588897
bin_wantsVery Popular	0.0494566	0.0183010	2.7023988	0.0069032
bin_wantsExtremely Popular	0.1771991	0.0199648	8.8755807	0.0000000
log_retail_price	0.3921911	0.0263512	14.8832570	0.0000000
collab:TRUE:bin_wantsSomewhat Popular	0.1199308	0.0592720	2.0233968	0.0430758
collab:TRUE:bin_wantsVery Popular	0.1120288	0.0585095	1.9147114	0.0555761
collab:TRUE:bin_wantsExtremely Popular	0.5248961	0.0615767	8.5242597	0.0000000
brandAir Jordan:log_retail_price	0.3238057	0.0553798	5.8470028	0.0000000
brandAsics:log_retail_price	-1.1940970	0.7962466	-1.4996572	0.1337550
brandConverse:log_retail_price	0.8384674	0.4181146	2.0053531	0.0449695
brandJordan:Brand:log_retail_price	0.1898603	0.1341948	1.4148115	0.1571749
brandNew Balance:log_retail_price	0.7353419	0.4998966	1.4709880	0.1413460
brandNike:log_retail_price	0.3736445	0.0333368	11.2081817	0.0000000
brandNike Basketball:log_retail_price	0.4352096	0.1406644	3.0939576	0.0019840
brandNike Running:log_retail_price	0.2321527	0.2520508	0.9210552	0.3570581
brandOther Brands:log_retail_price	-0.0127406	0.1849630	-0.0688816	0.9450861
brandReebok:log_retail_price	-0.0637214	0.2202884	-0.2892636	0.7723895
brandPuma:log_retail_price	0.0502490	0.1679321	0.2992225	0.7647805
collab:TRUE:main_colorBlue	-0.0863874	0.0534528	-1.6161427	0.1061152
collab:TRUE:main_colorBrown	-0.0258520	0.0913443	-0.2830168	0.7771736
collab:TRUE:main_colorGray	-0.3347995	0.1242360	-2.6948667	0.0070610
collab:TRUE:main_colorGreen	0.1345769	0.1236725	1.0881715	0.2765624
collab:TRUE:main_colorMulti-Color	-0.0872436	0.1087129	-0.8025135	0.4222873
collab:TRUE:main_colorOrange	0.1608573	0.0918387	1.7515207	0.0799066
collab:TRUE:main_colorPurple	0.0550746	0.1054543	0.5222600	0.6015083
collab:TRUE:main_colorRed	0.0709415	0.0834196	0.8504179	0.3951262
collab:TRUE:main_colorWhite	0.1100795	0.0470256	2.3408402	0.0192725
collab:TRUE:main_colorYellow	0.0453065	0.1552968	0.2917414	0.7704943

**Model Assesment** The model diagnostics are shown in the graph below. Looking at the residuals vs. fitted plot, the model does seem to satisfy the independence and equal variance assumptions as the data points are randomly scattered throughout the plot and the red line indicating trends is straight. When looking at the Residual vs. Log(Retail), the linearity assumption doesn't appear to be violated as the as the plot shows the data points appear to be randomly distributed across the plot as well. Additionally, the Normal Q-Q plot indicates whether or not the assumption of Normality is violated by the model. Looking at the plot, the points roughly lie on the dashed line drawn, until the right most extremity. This is likely due to the long right tail of the response variable distribution. Therefore, the normality assumption does appear to be

satisfied as well.

Potential outliers, leverage points, or highly influential points can all be identified using the Residuals vs. Leverage plot below. From the Cook's distance lines, there are no highly influential data points as there are not values with a Cook's distance value greater than 0.5 or 1. This meant no data points were highly influential and did not need to be removed from our analysis. High leverage points were calculated using the formula  $2 * (p + 1)/n$ . Using this threshold, quite a few high leverage points were found. Outliers could also be identified from the Residuals vs. Leverage plot below by looking at the y-values of the data points in the graph. The distribution of data points appear to follow a normal distribution and can be found between 3 and -3 standard deviations. However, there are quite a few data points that are outside those metrics.



Finally, the Variance Inflation Factor (VIF) score for each variable in the model was calculated to determine how much multicollinearity between the variables in the model was inflating the variance of the regression coefficient for each variable. However, since the only continuous variable was the log of the retail price, that was the only VIF score worth noting. The log of the retail price had a VIF score of 3.31, and therefore we can safely say it's not correlated with other variables because it's lower than the high correlation threshold of 10.

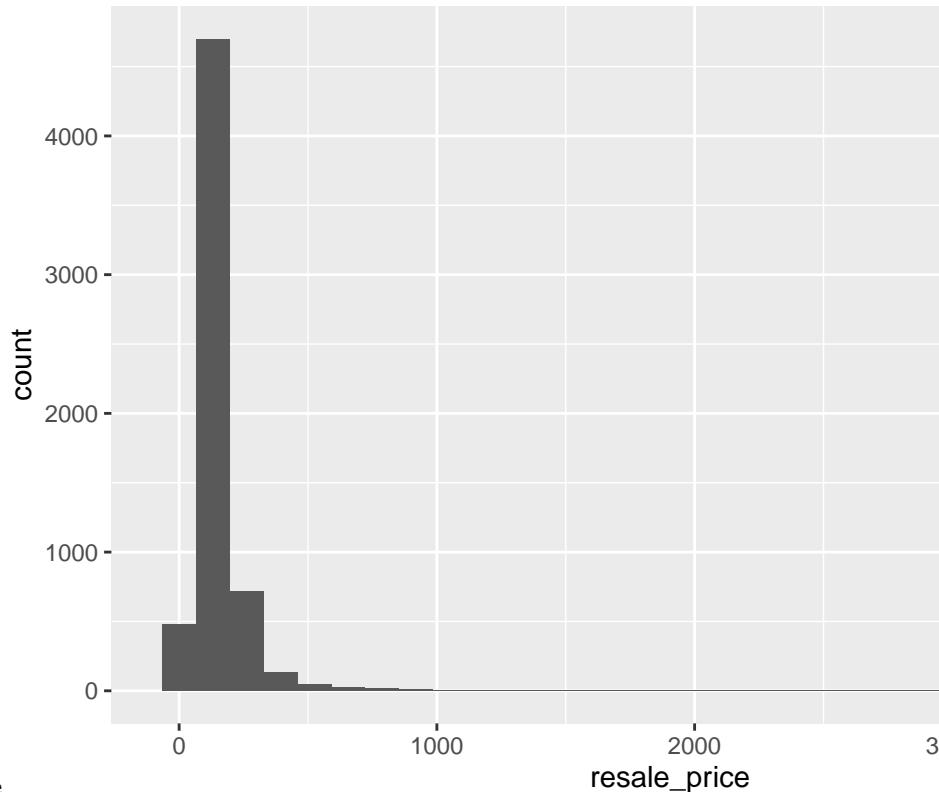
## Conclusion

In conclusion, our analysis determined that the best covariate for explaining sneaker resale values was the log of the resale price. In general, the log of the resale price was positively correlated with resale values. Additionally, there was an association found between sentiment and resale values differing by collaborations. As discussed earlier, sneakers that were collaborated on and were “Somewhat Popular” or “Extremely Popular” usually had higher resale values than “Not Popular” and non-collab sneakers. There were also associations found between the log of the resale price and resale values differing by Brand, as well as the main color and resale values of sneakers differing by collaborations. Although collaborations were not found to be statistically significant, the likely difference in resale values for collab and non-collab sneakers was found to be between an increase in \$0.96 to \$1.20 for collab sneakers versus not.

Overall, there were a few limitations of this analysis. First, the dataset built from Kicks on Fire is not an exhaustive list of every sneaker ever released and is general biased towards talking about more “trendy” sneakers. Therefore, some brands may appear to only have sneakers with high resale values, such as Converse. Second, determining the main color for a sneaker is tough job for a human to label, let alone a computer. Although the labels seemed generally accurate, the main color of a sneaker is hard to quantify and up for debate. Third, although the response variable is an average resale price of sneakers, According to StockX there has been found to be a range of average prices between different shoe sizes of the same sneaker, which is something the model doesn’t take into account.

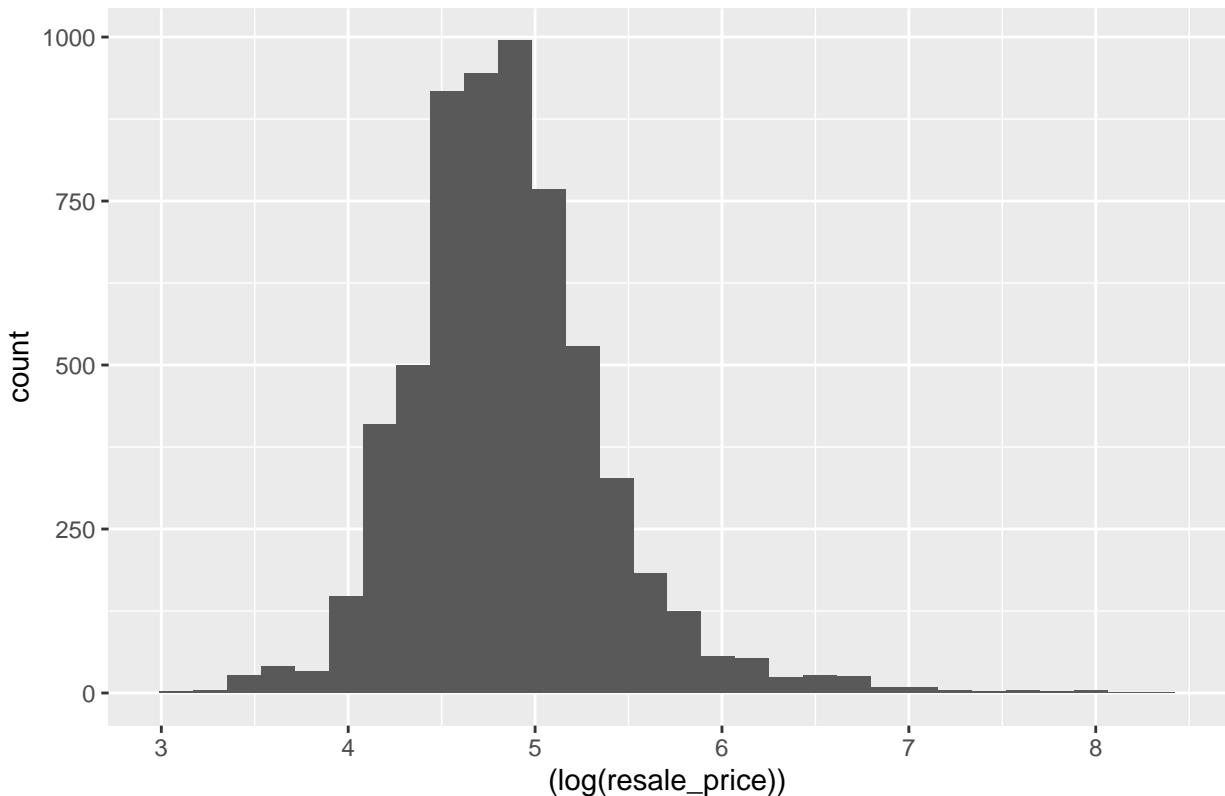
## Appendix

Distribution of sneaker resale values

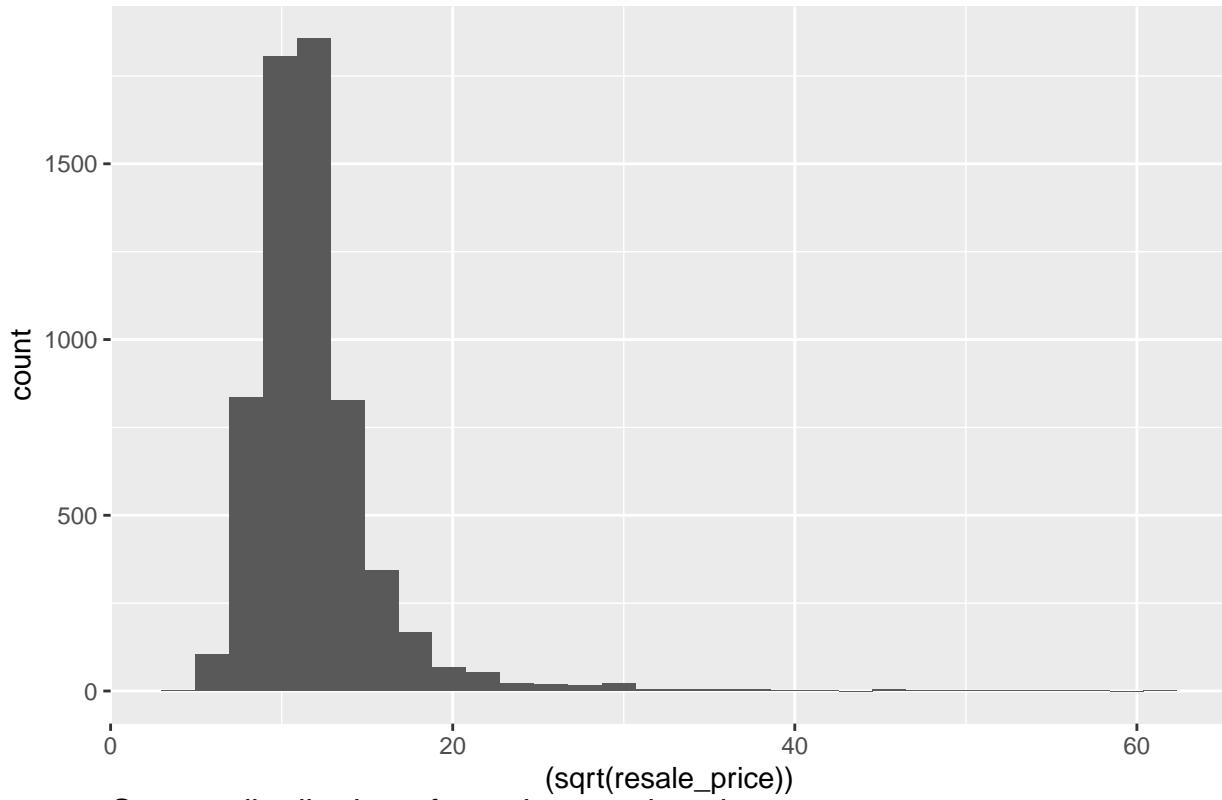


### III. EDA Distributions of response variable

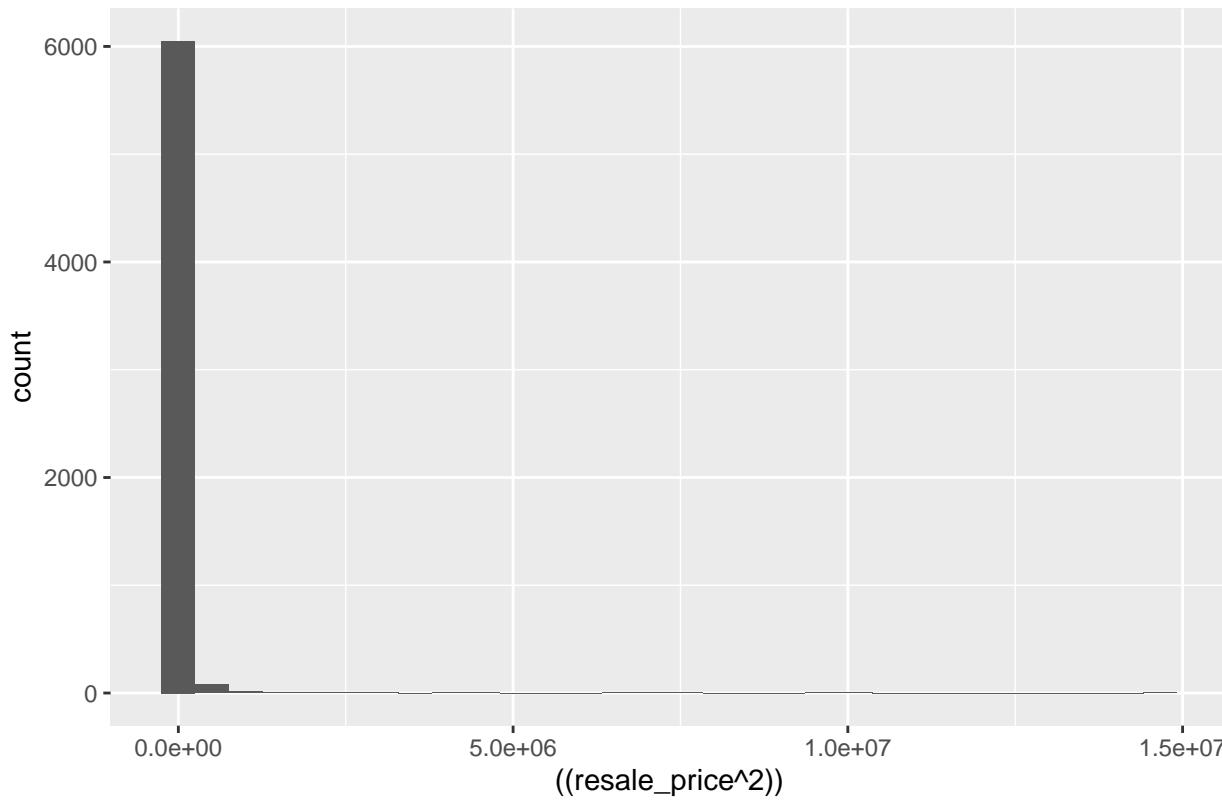
Log distribution of sneaker resale values



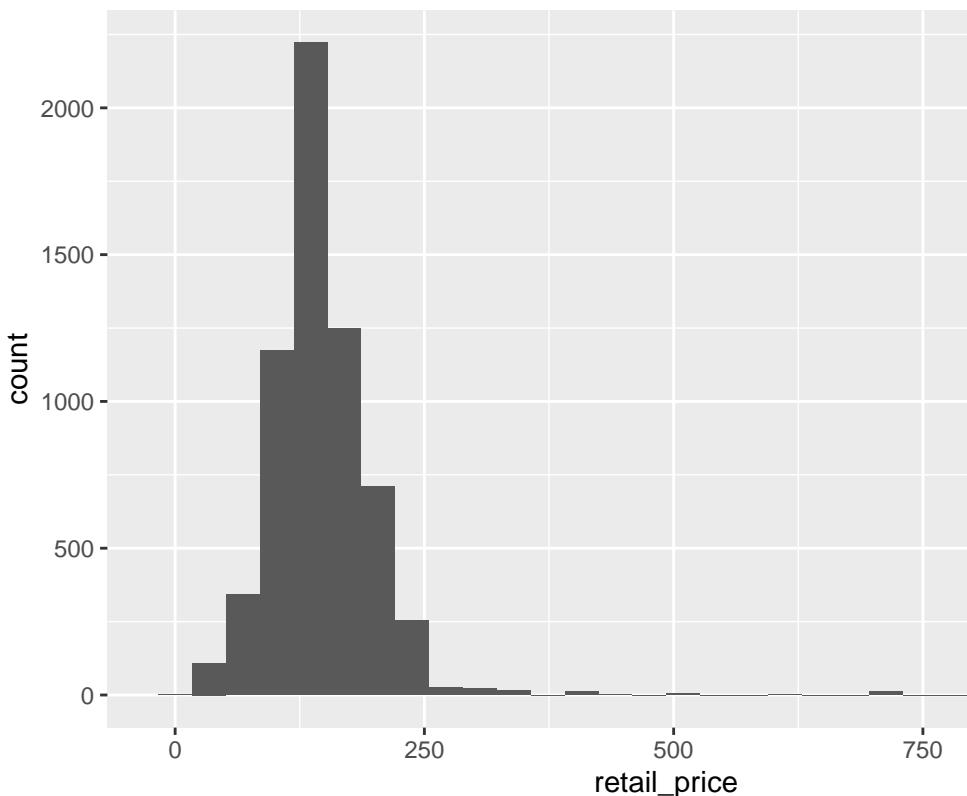
Square root distribution of sneaker resale values



Square distribution of sneaker resale values

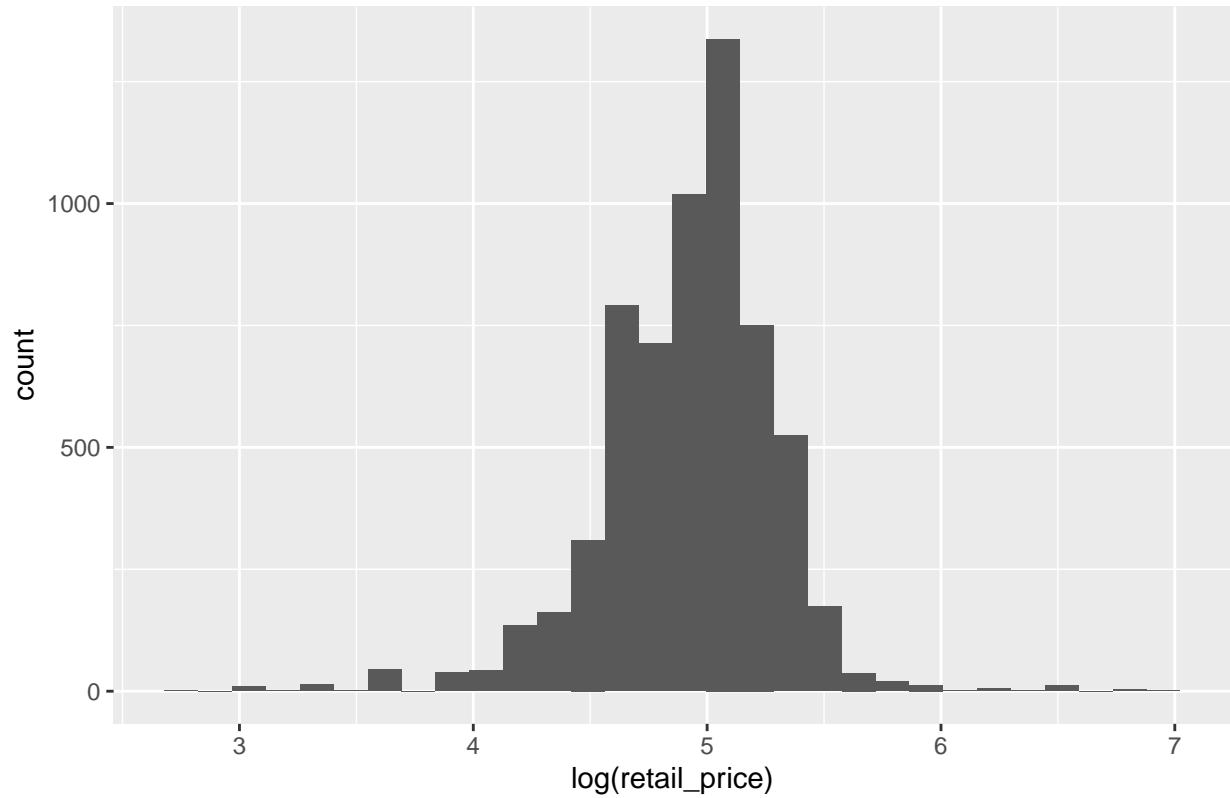


Distribution of retail price

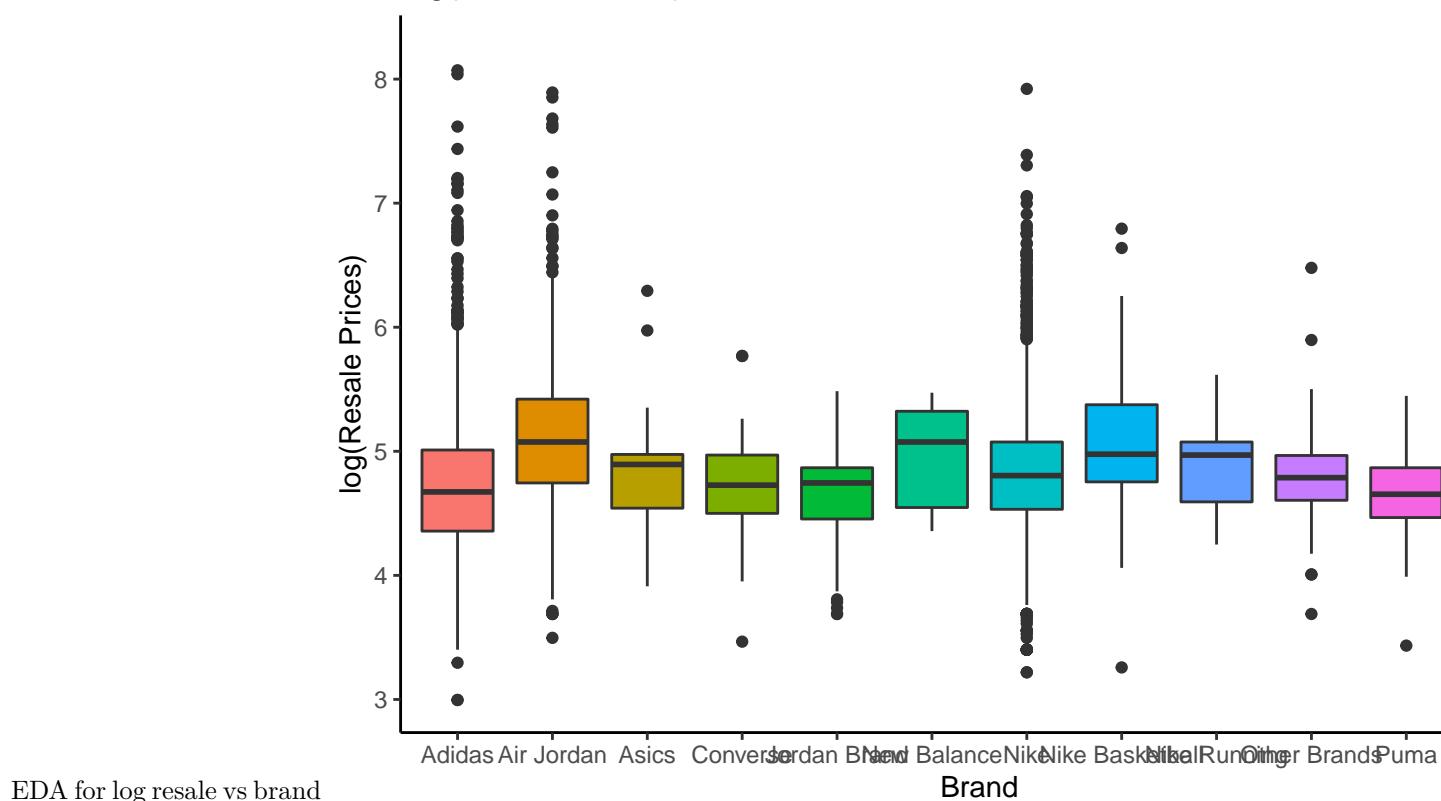


Distributions of retail price

Distribution of retail price

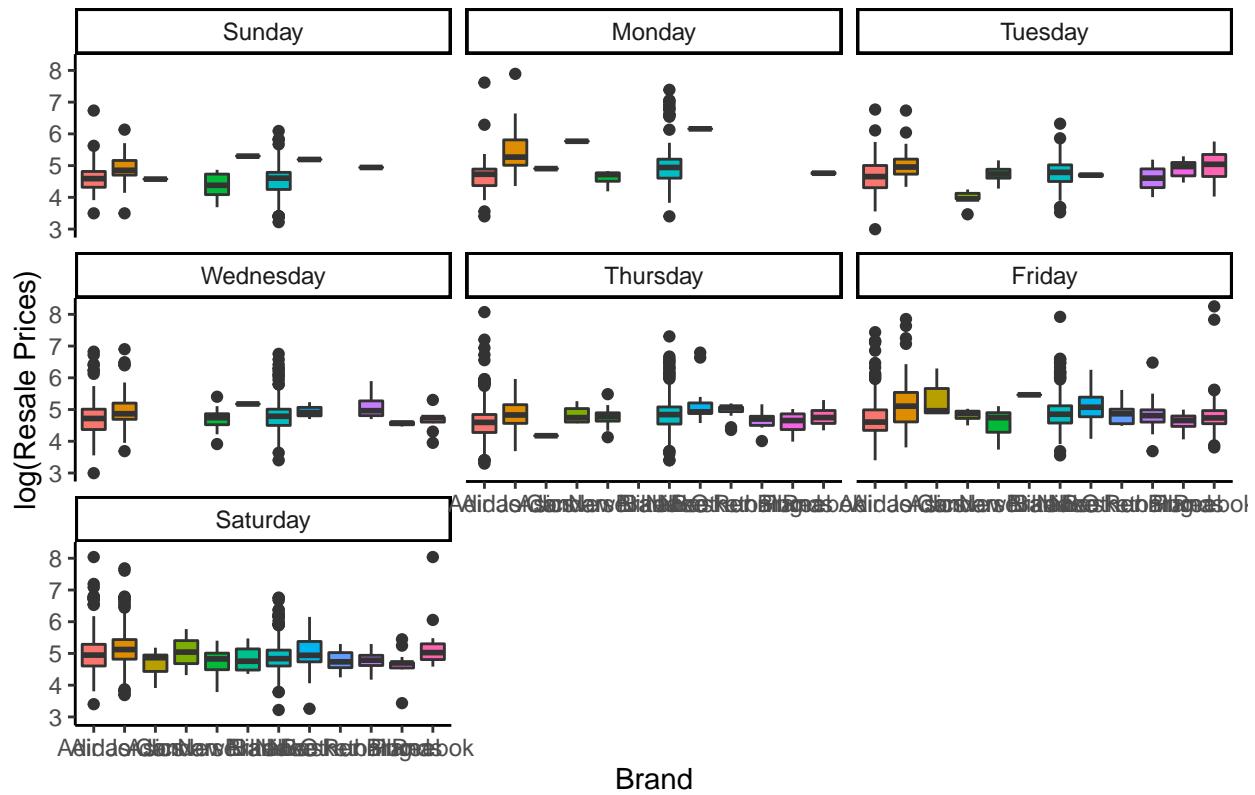


### log(Resale Prices) vs Brand

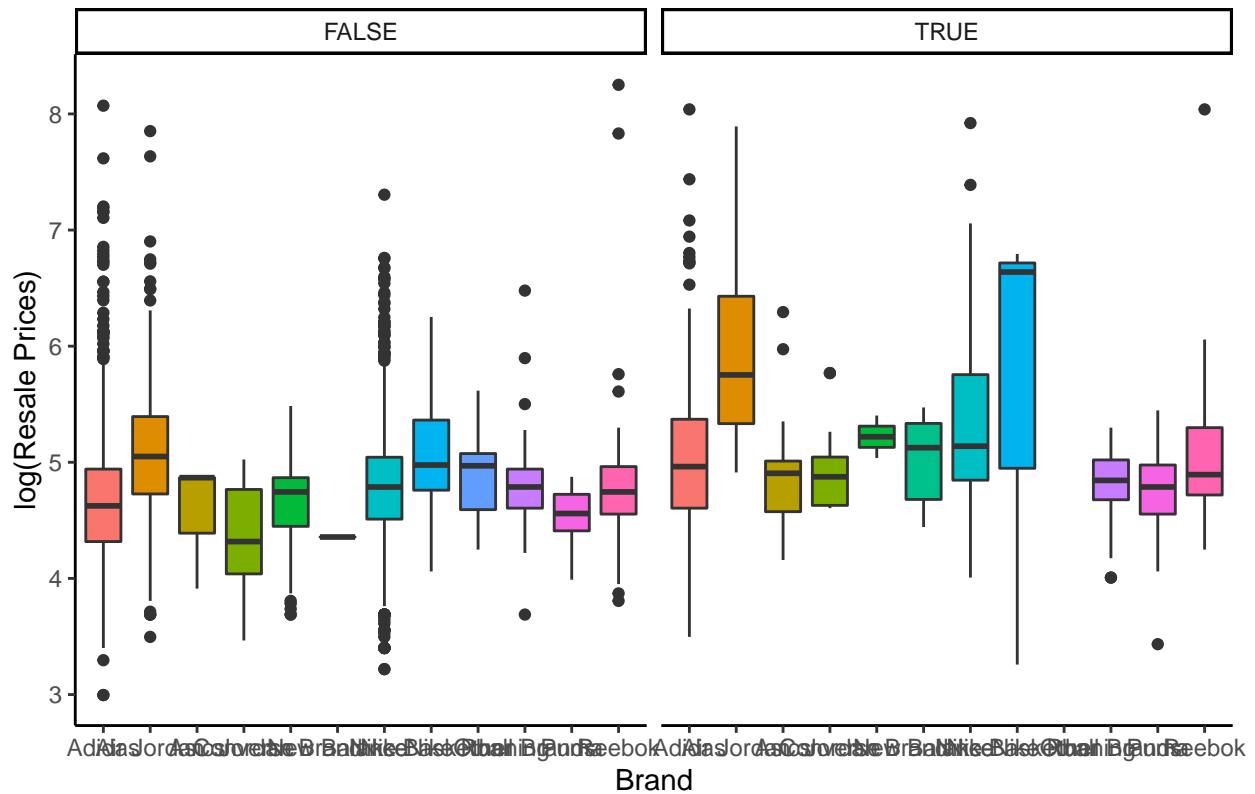


EDA for log resale vs brand

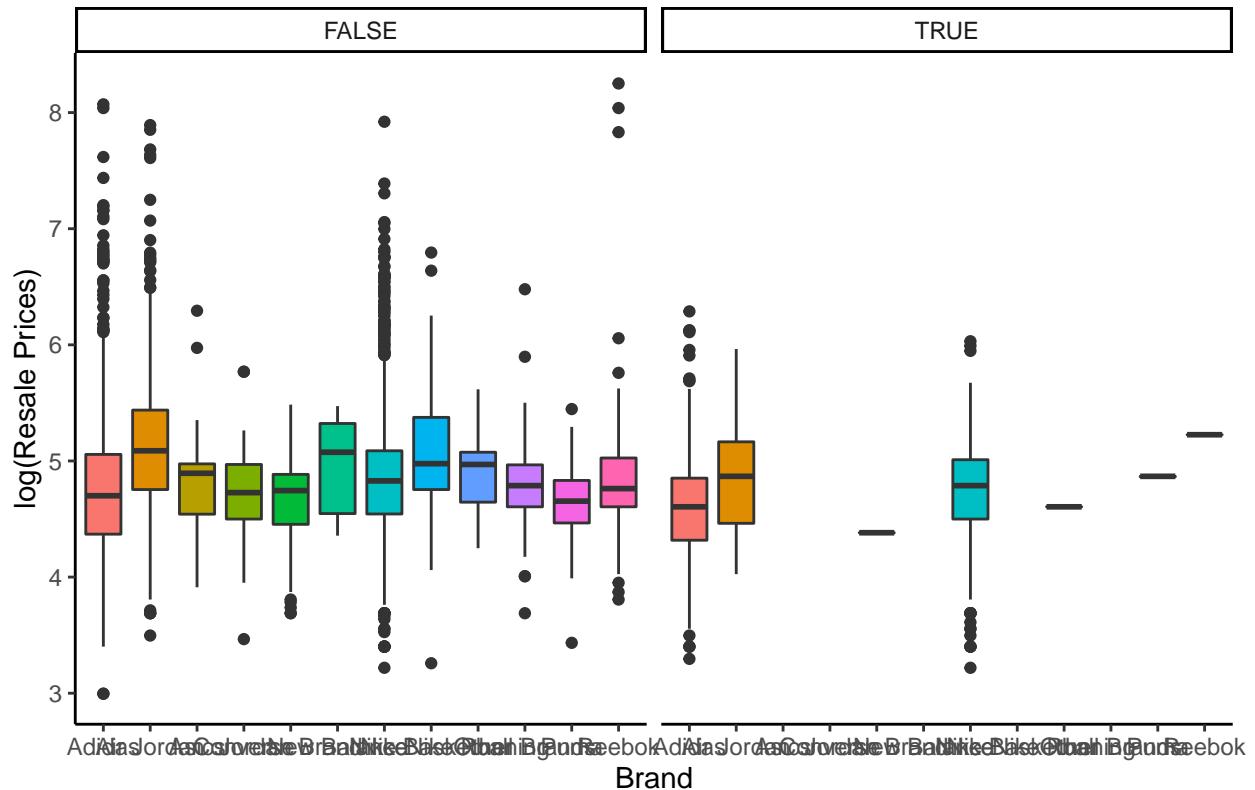
### log(Resale Prices) vs Brand by Release Day of Week



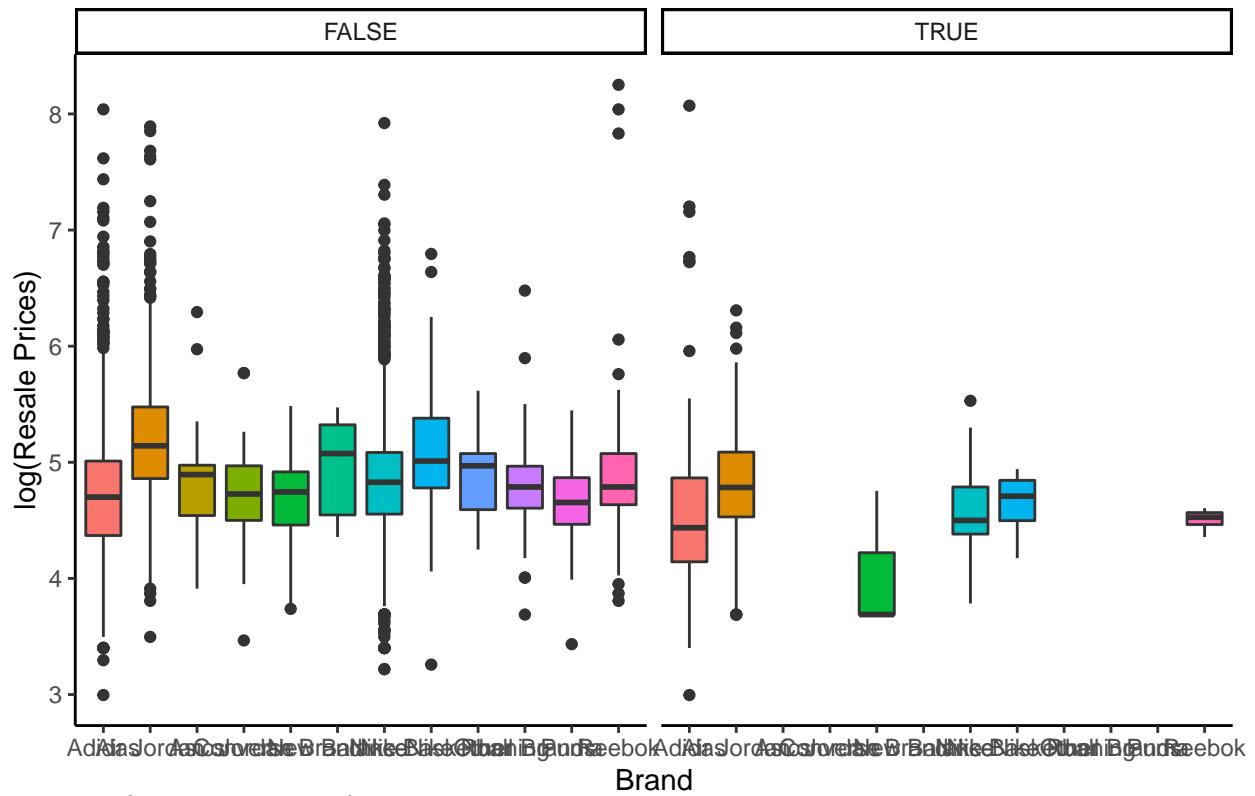
log(Resale Prices) vs Brand by Collab



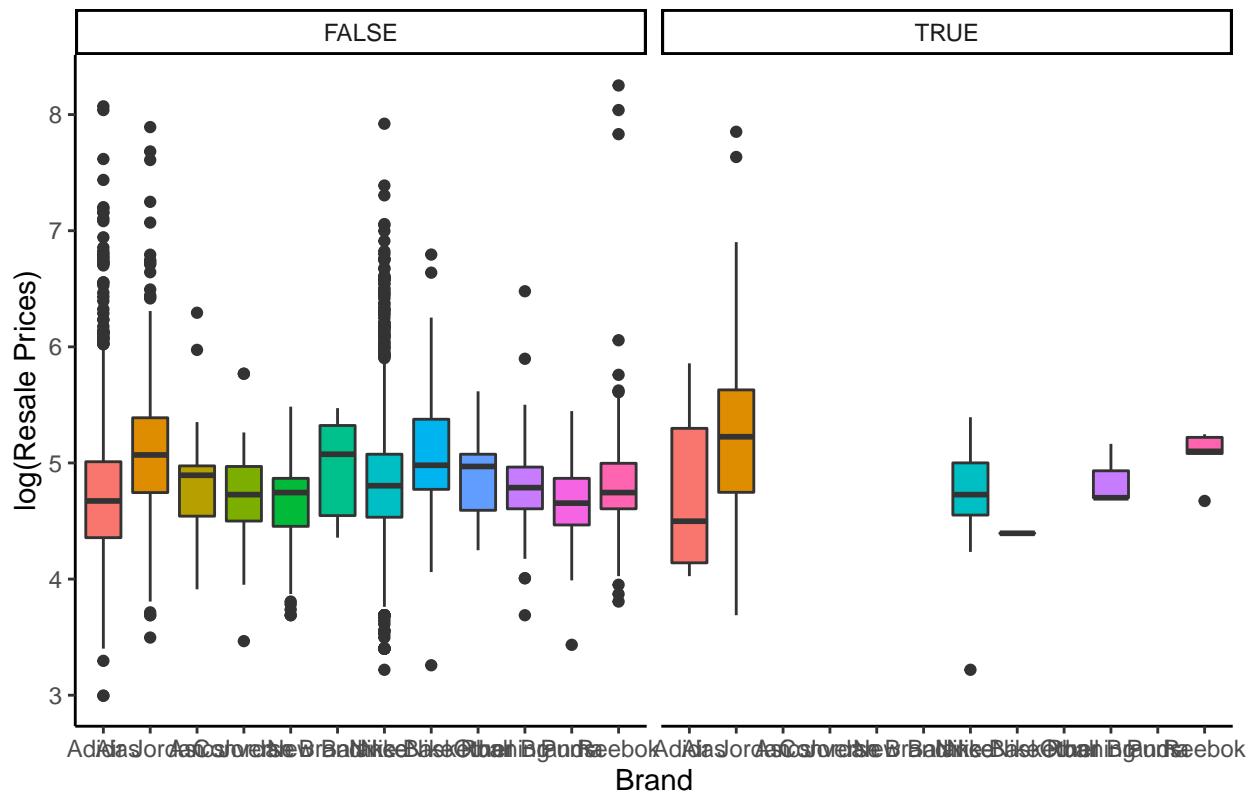
log(Resale Prices) vs Brand by Sex



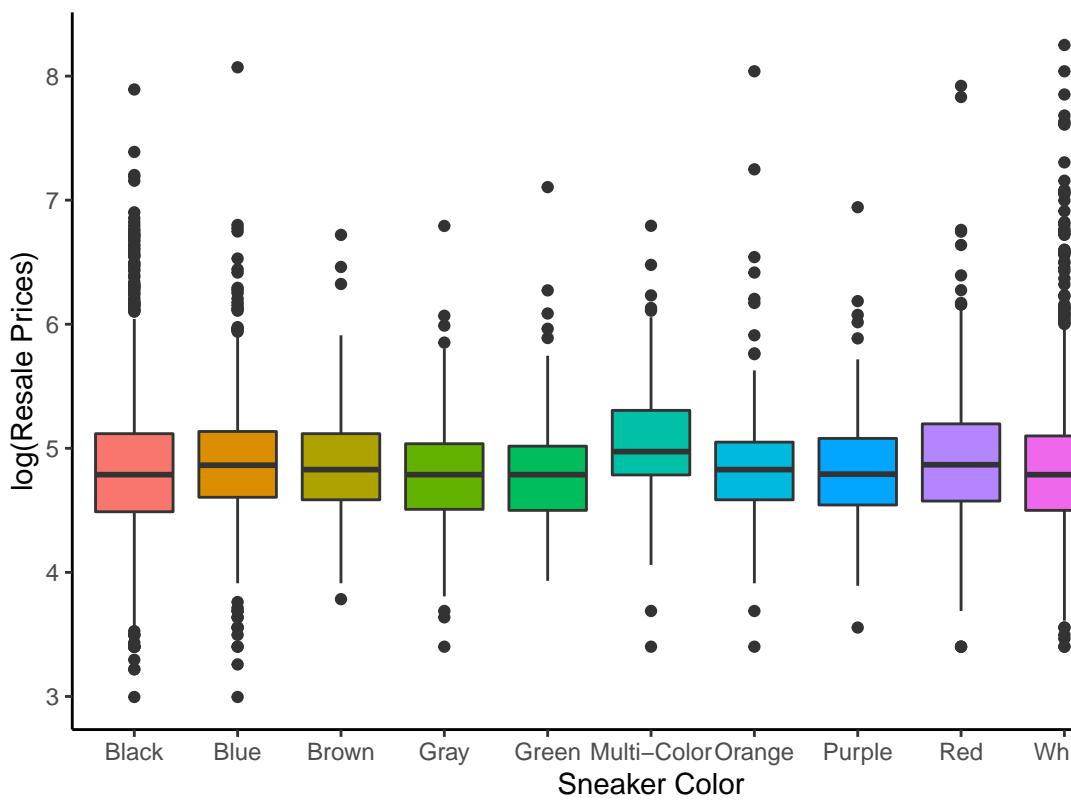
log(Resale Prices) vs Brand by Kid's Shoe



log(Resale Prices) vs Brand by Retro

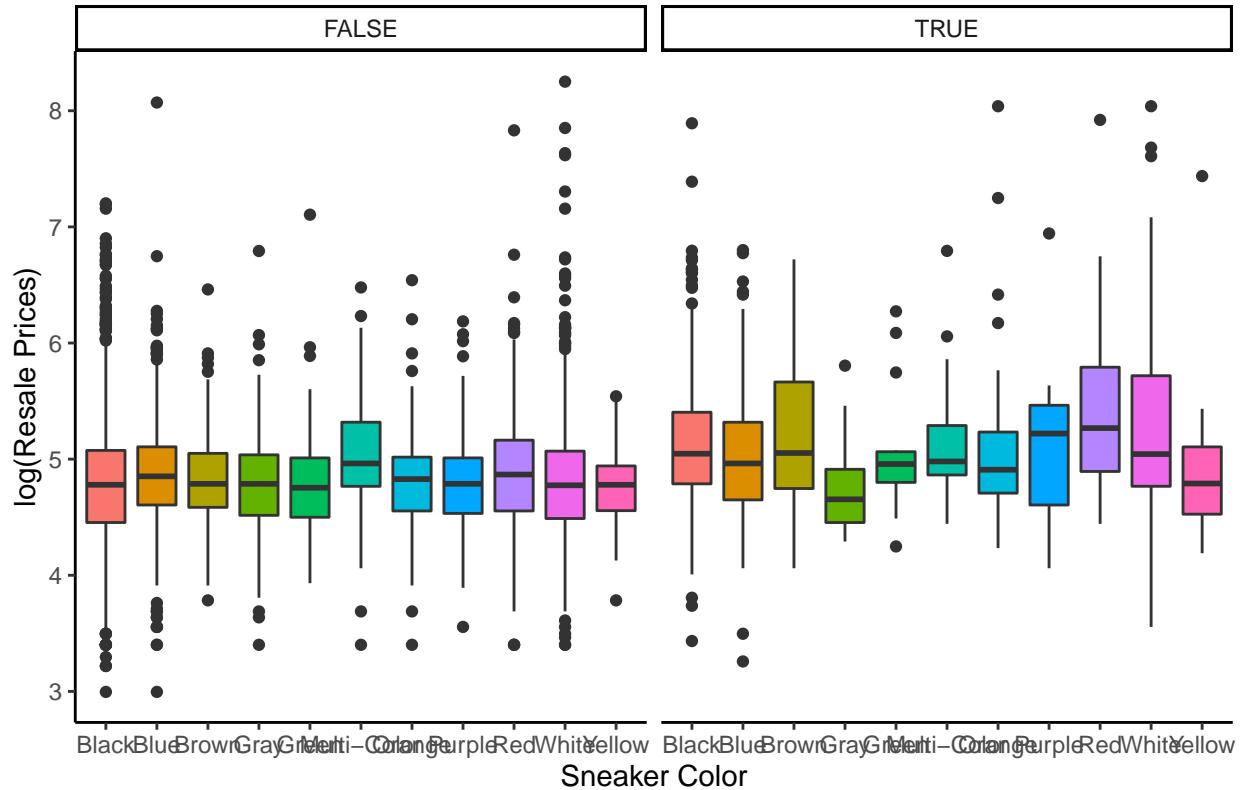


log(Resale Prices) vs Sneaker Color

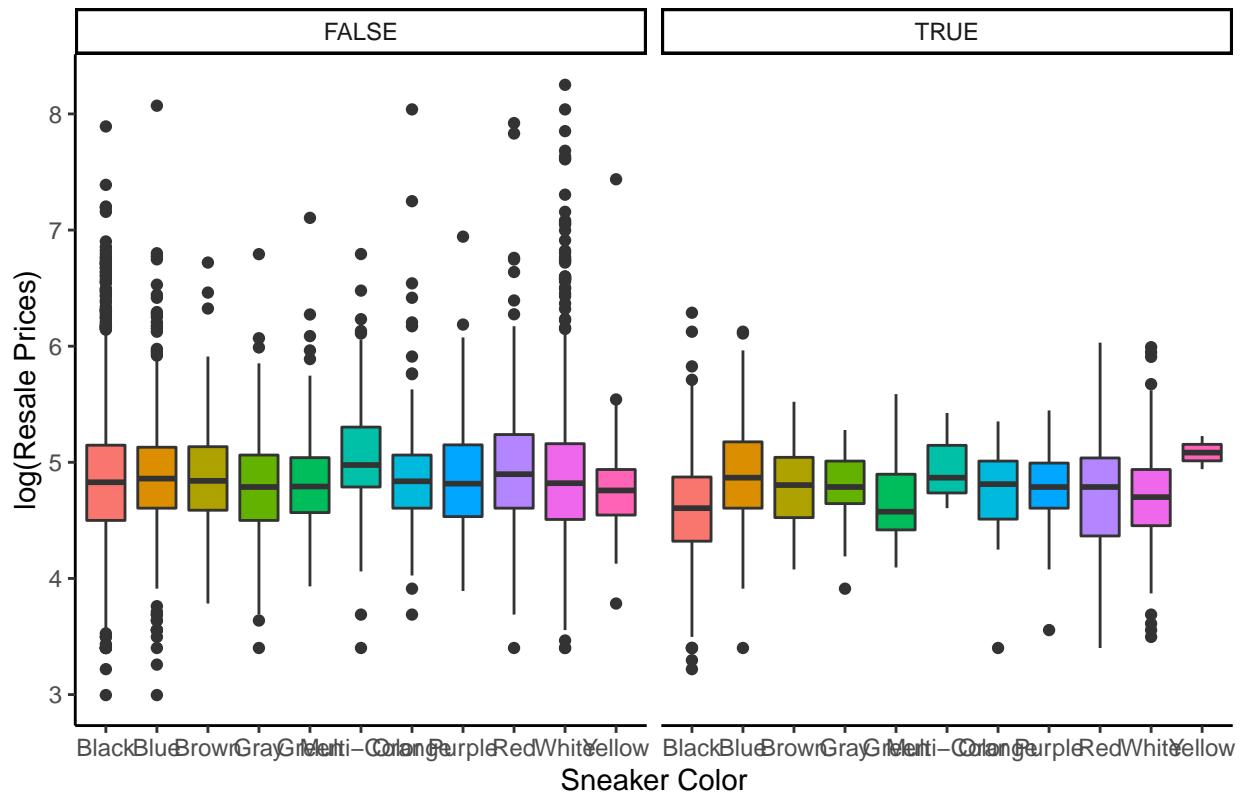


EDA for log resale vs main color

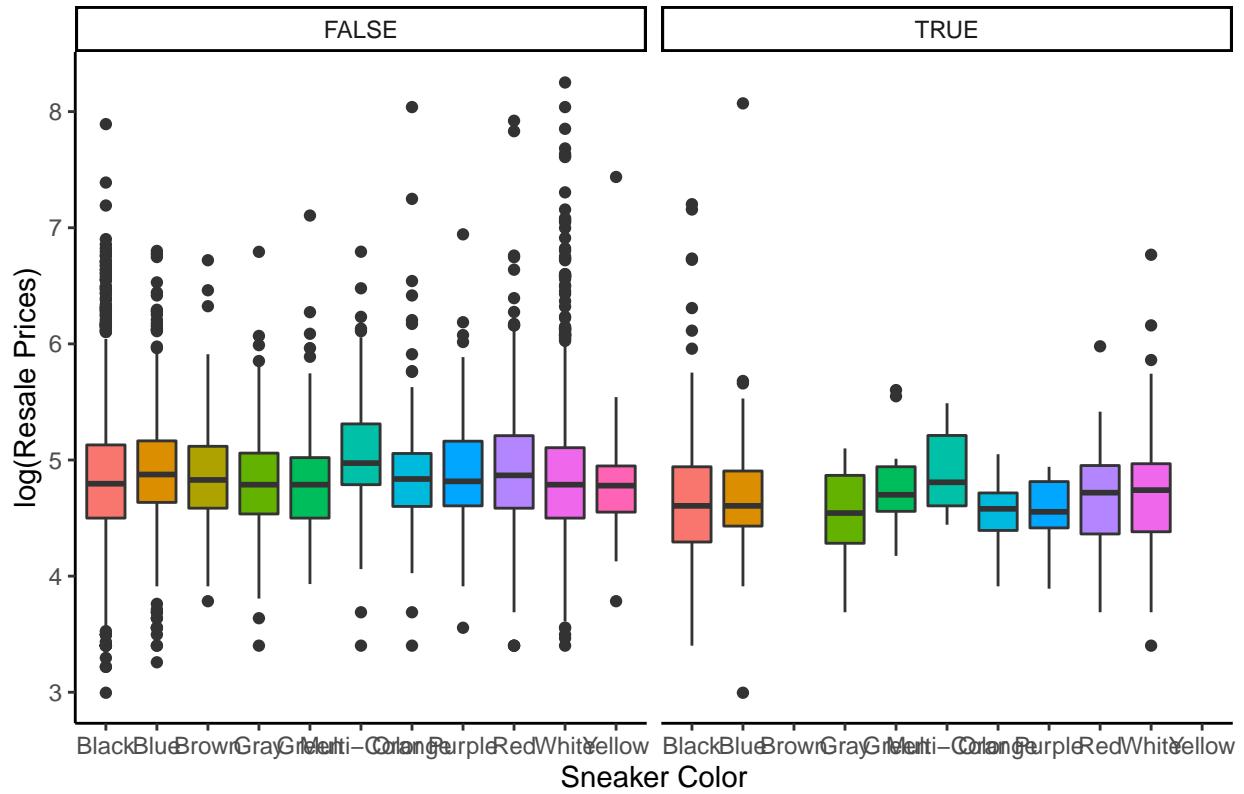
log(Resale Prices) vs Sneaker Color by Collaboration



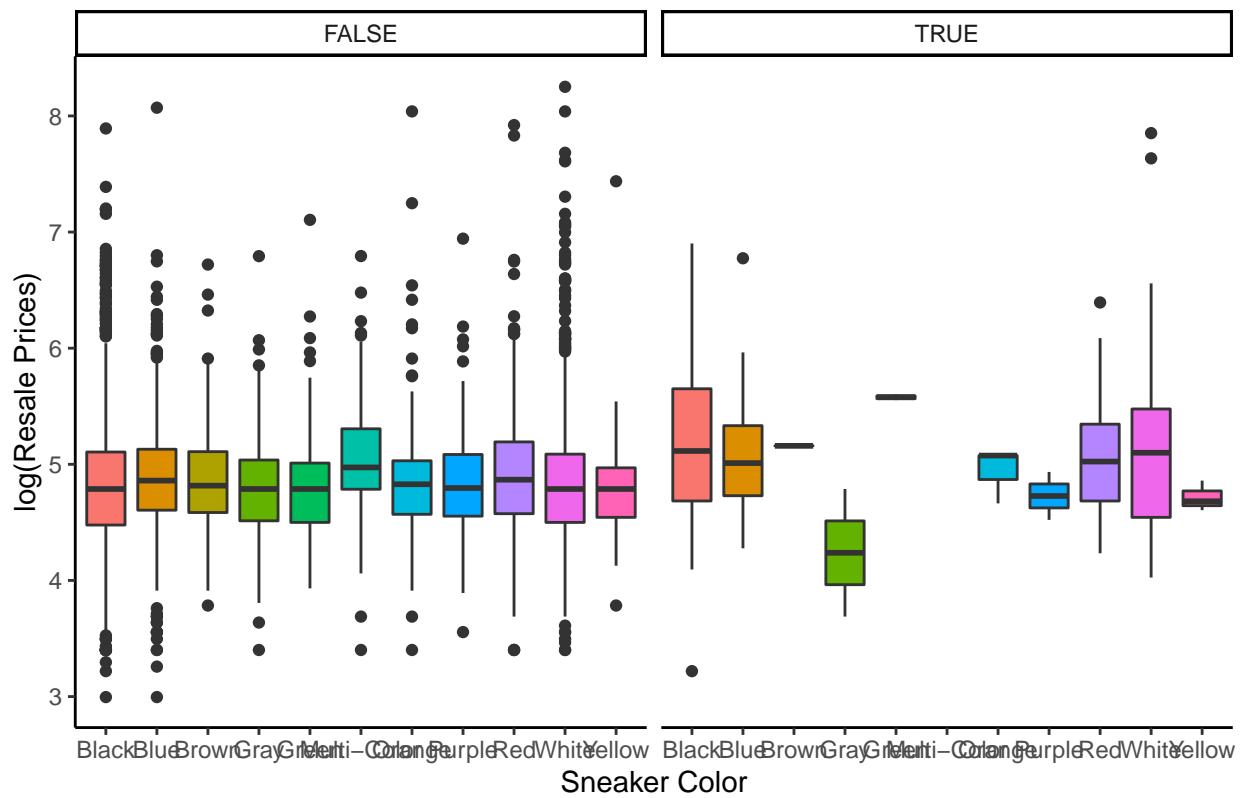
log(Resale Prices) vs Sneaker Color by Sex



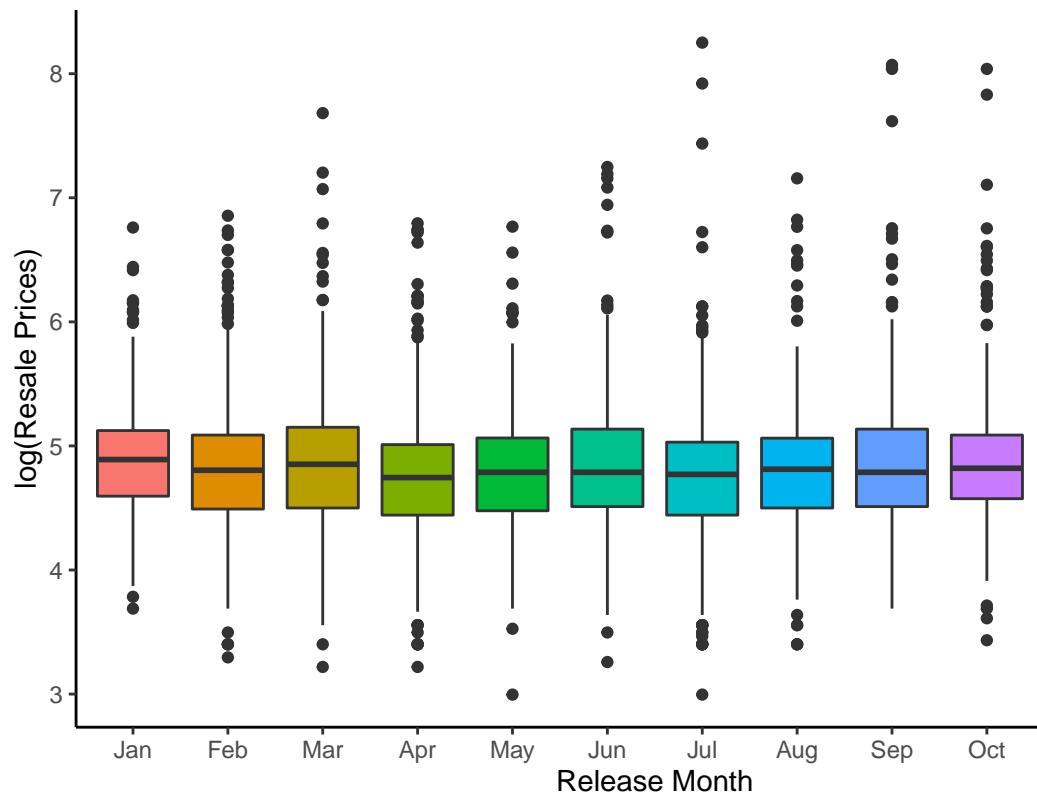
log(Resale Prices) vs Sneaker Color by Kid's Shoe



### log(Resale Prices) vs Sneaker Color by Retro

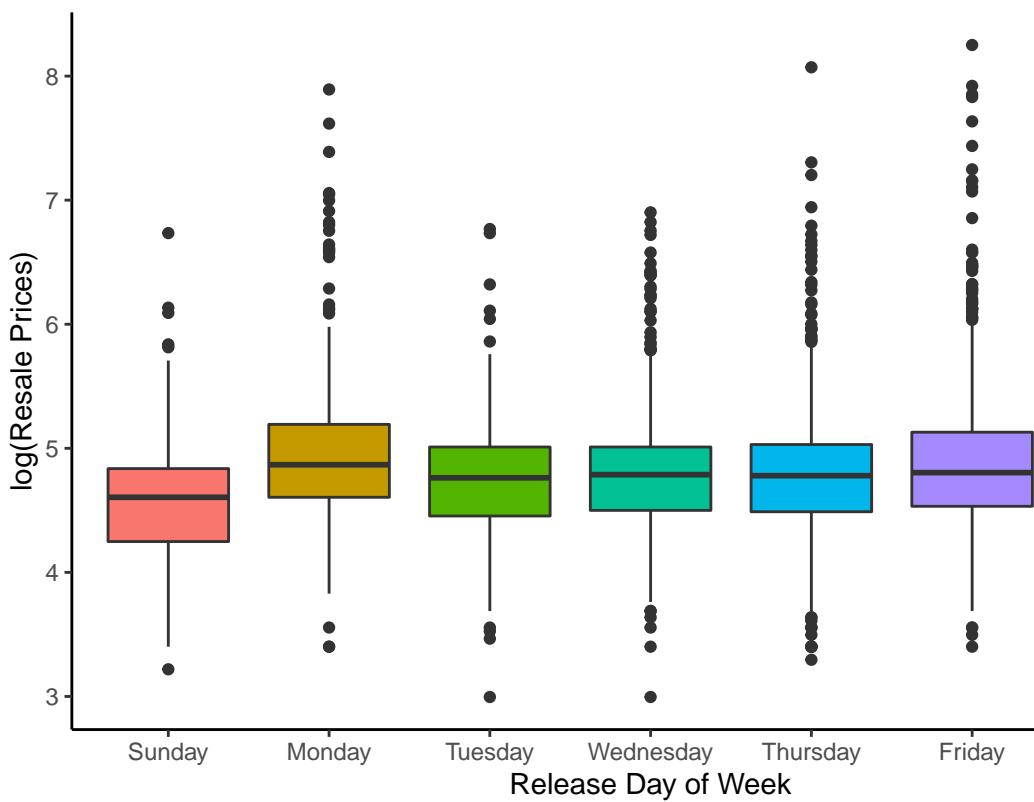


### log(Resale Prices) vs Release Month



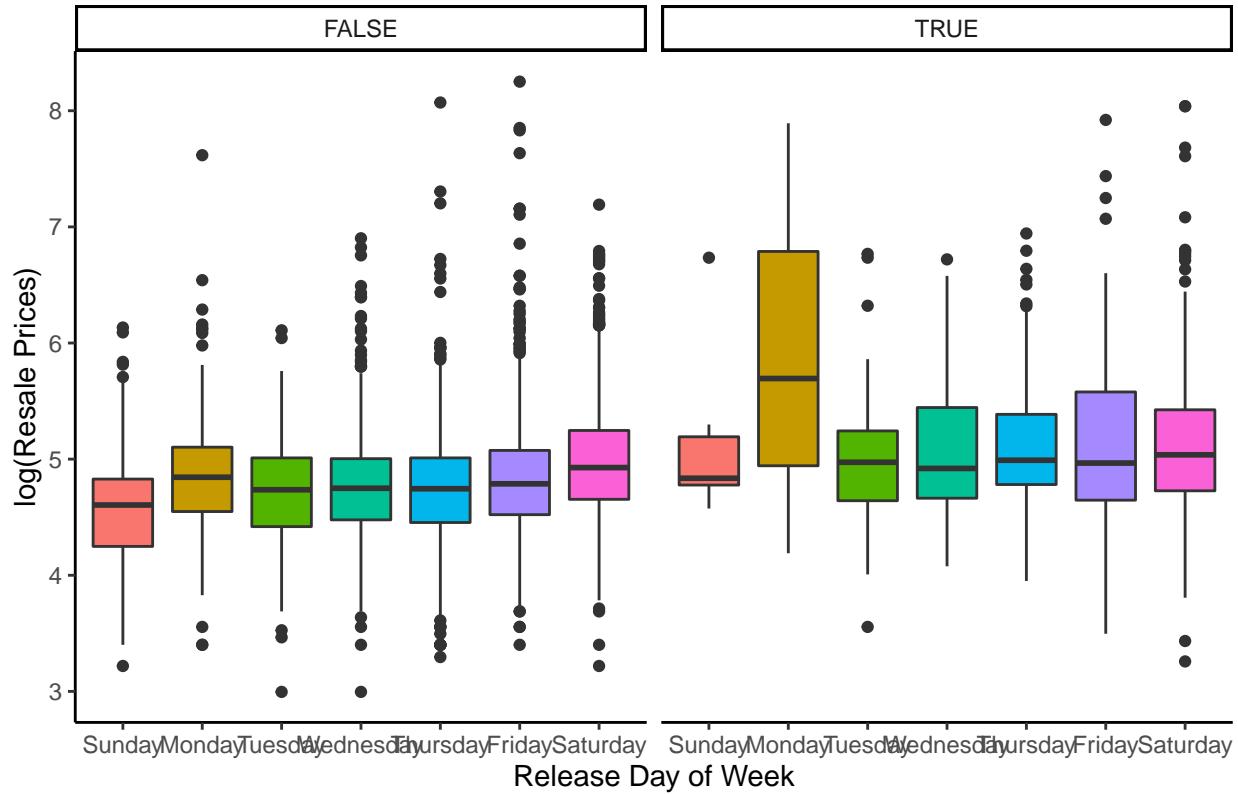
EDA for log resale vs release month

log(Resale Prices) vs Release Day of Week

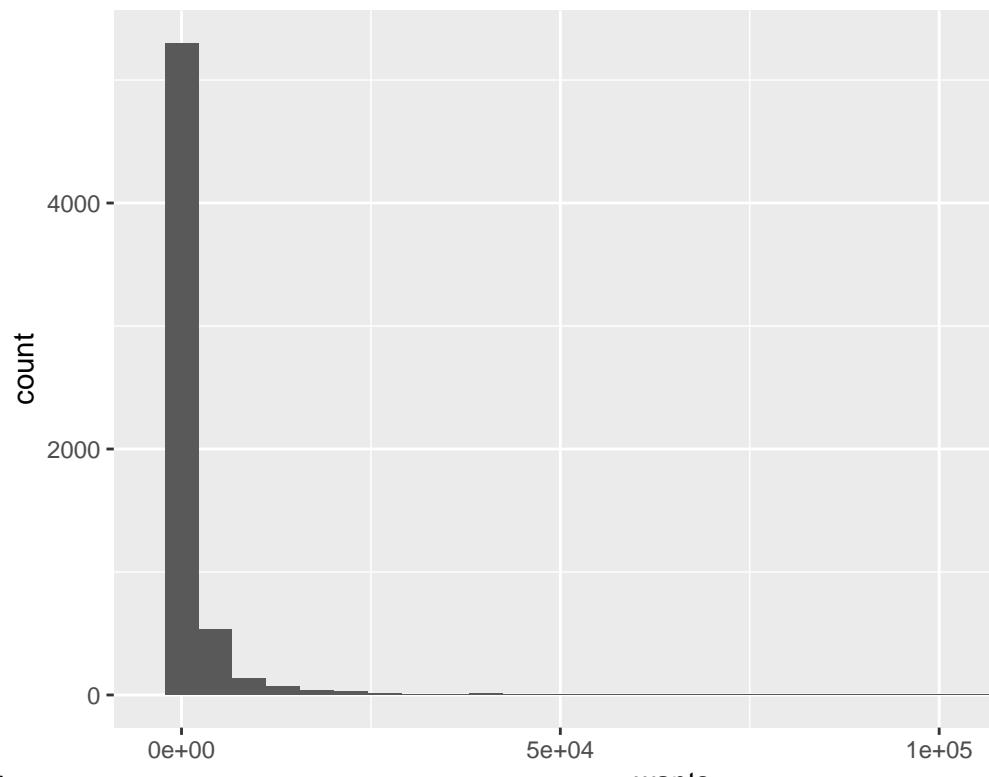


EDA for log resale vs release day

log(Resale Prices) vs Release Day of Week by Collaboration

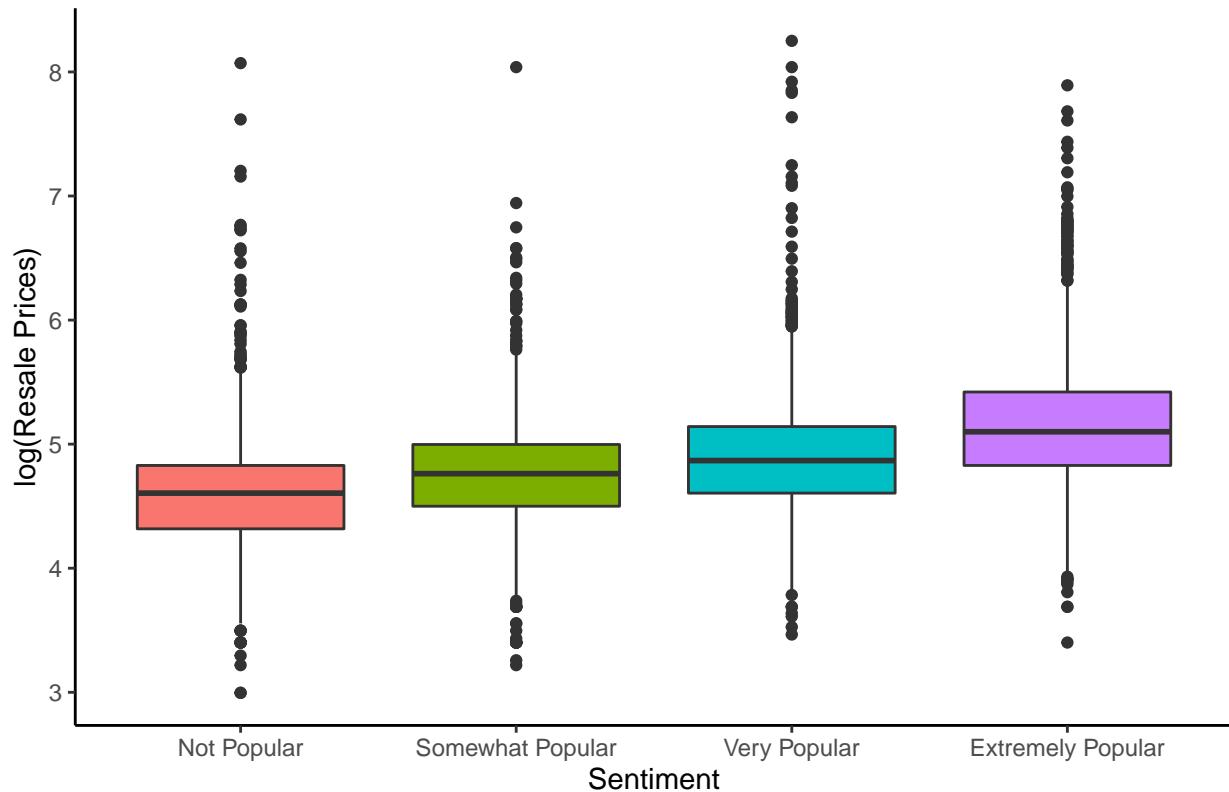


### Distribution of Kicks on Fire wants

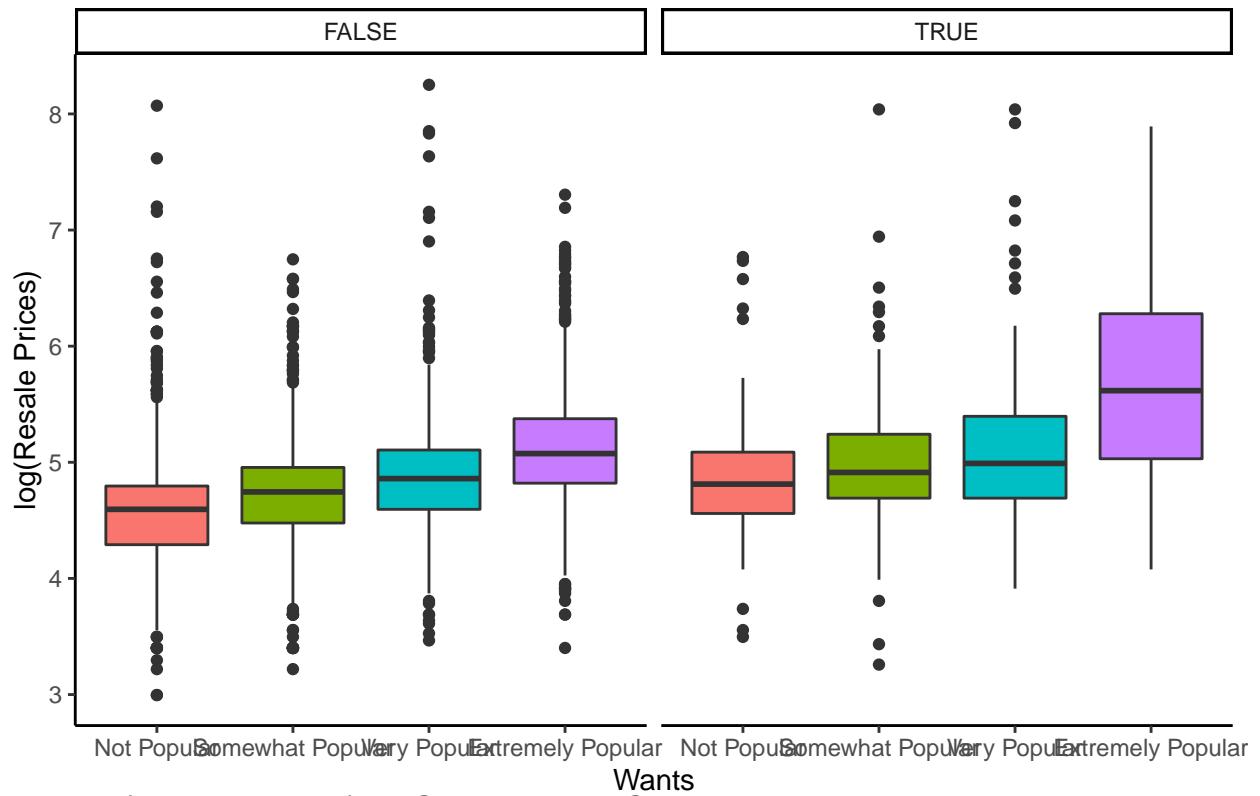


EDA for log resale vs binned “wants”

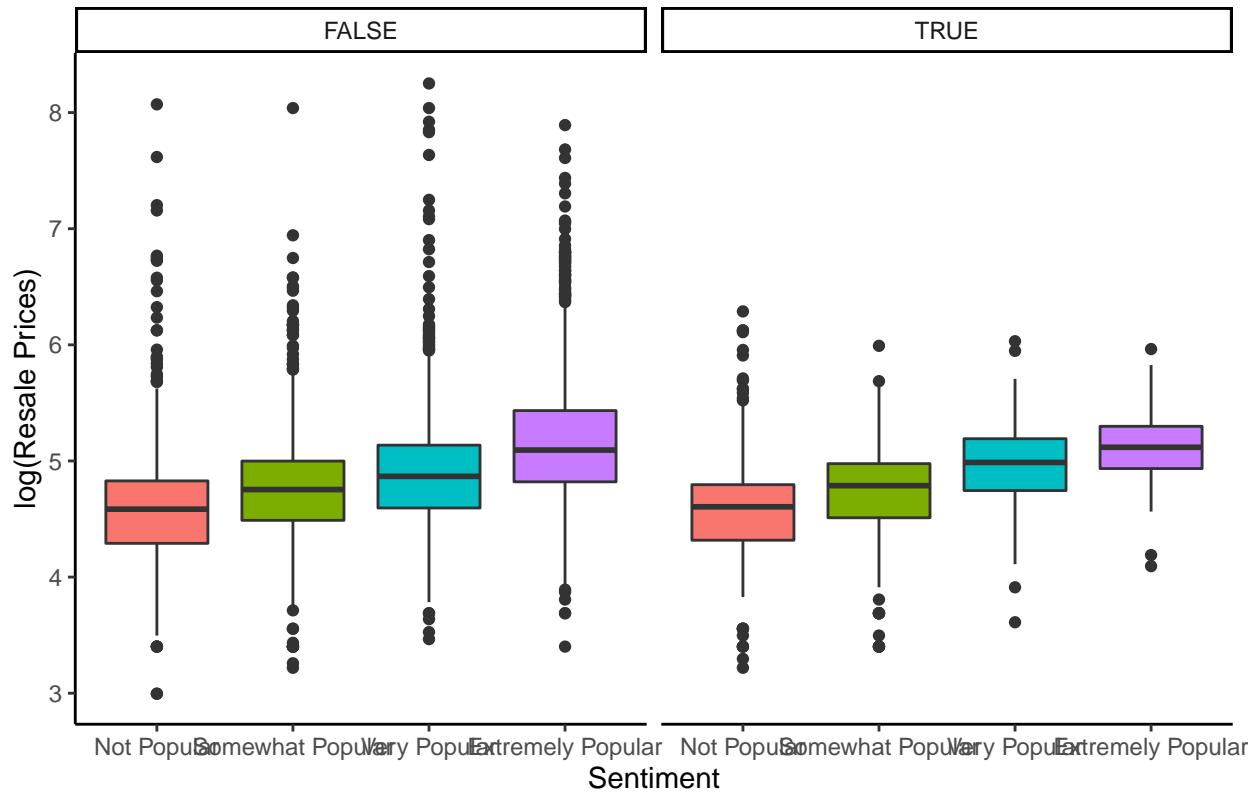
### log(Resale Prices) vs Sentiment



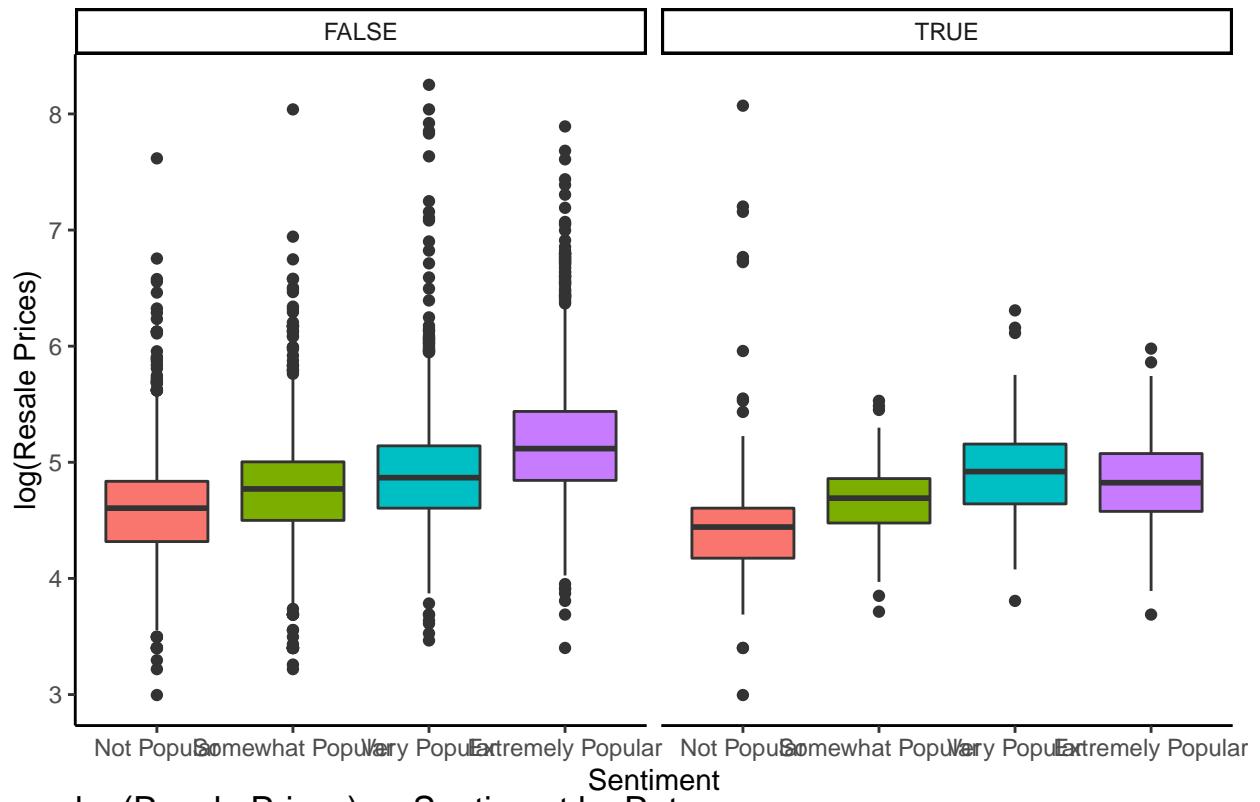
log(Resale Prices) vs Wants (Sentiment) by Collaboration



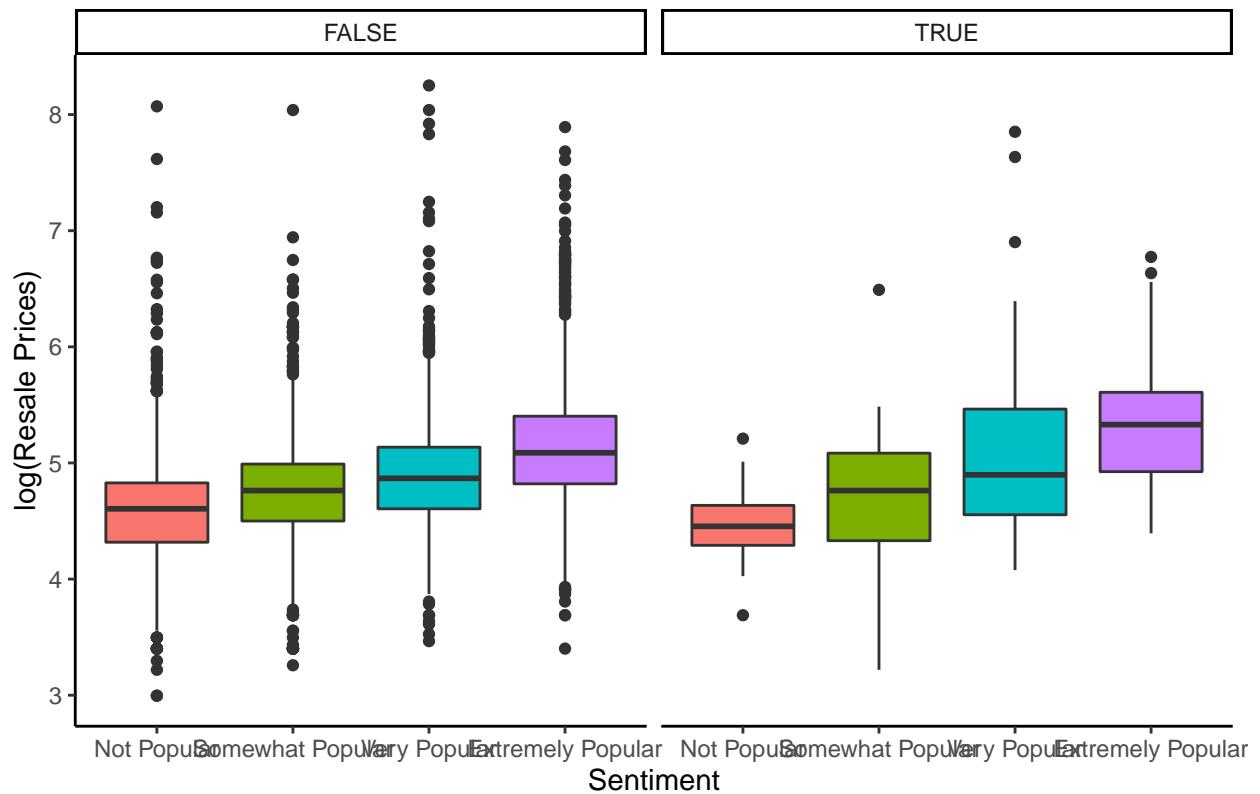
log(Resale Prices) vs Sentiment by Sex



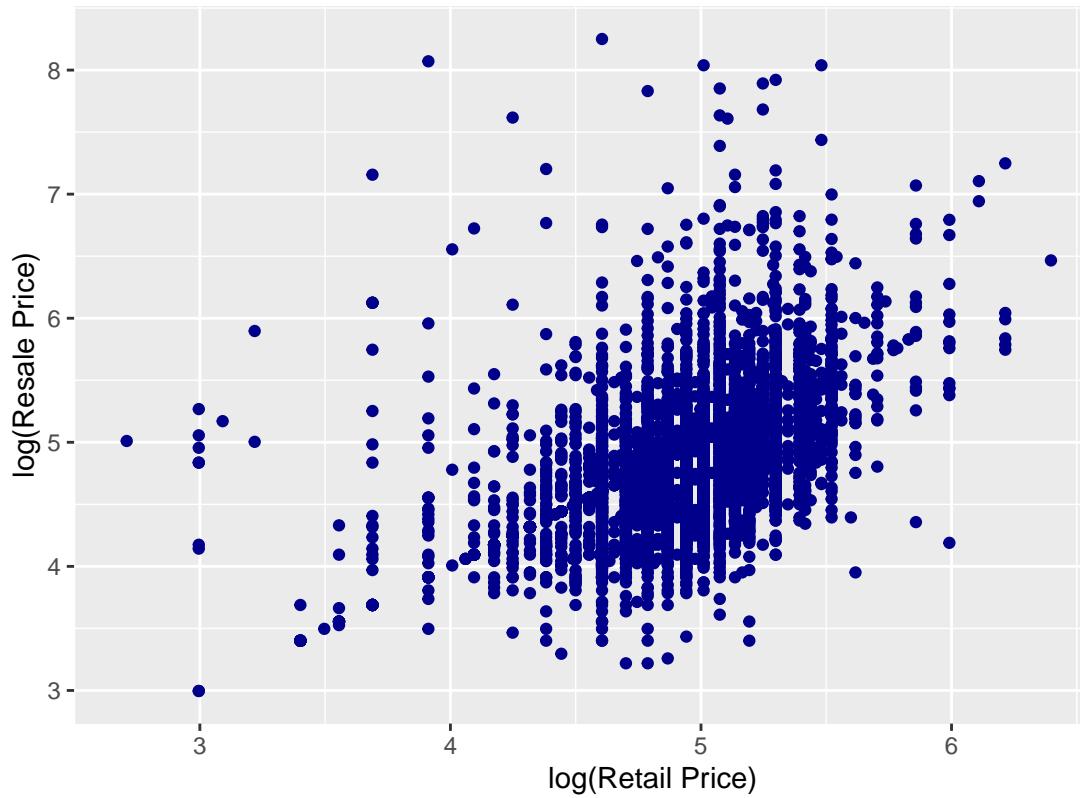
log(Resale Prices) vs Sentiment by Kid's Shoe



log(Resale Prices) vs Sentiment by Retro

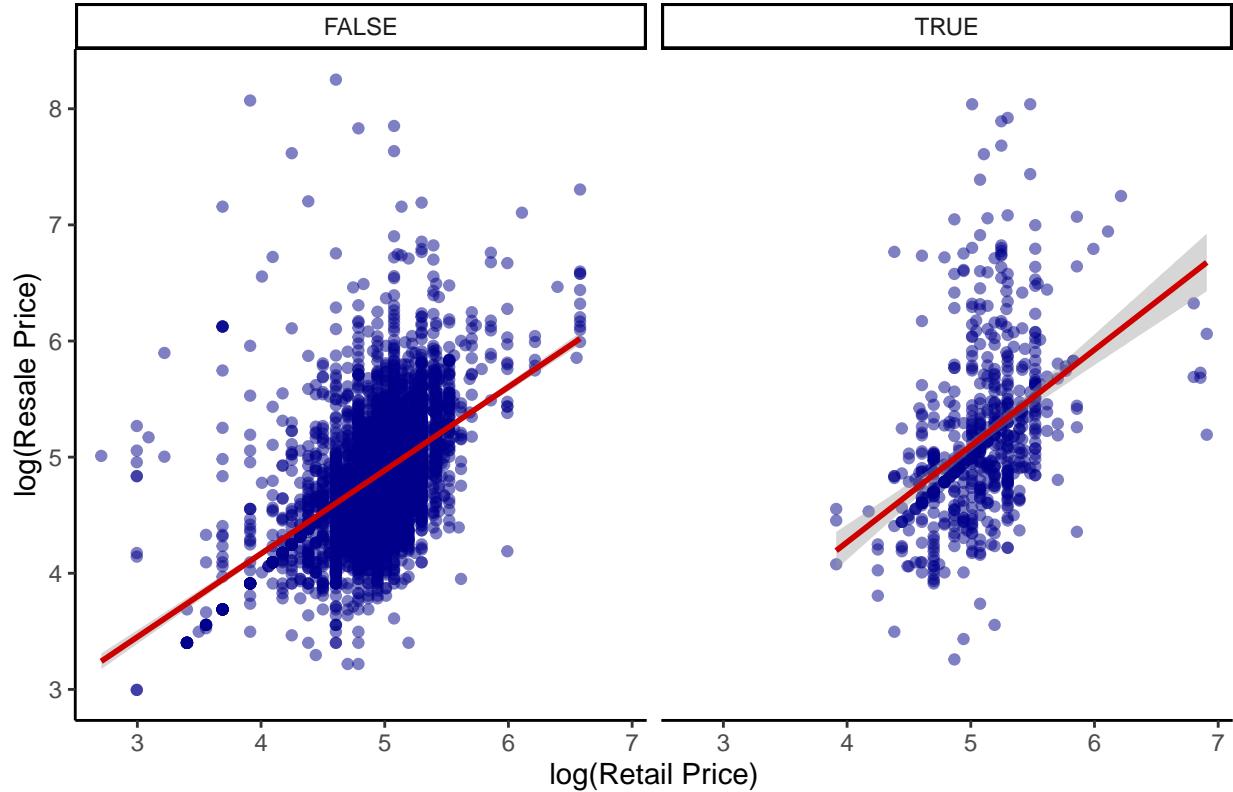


log(Resale Price) vs log(Retail Price)

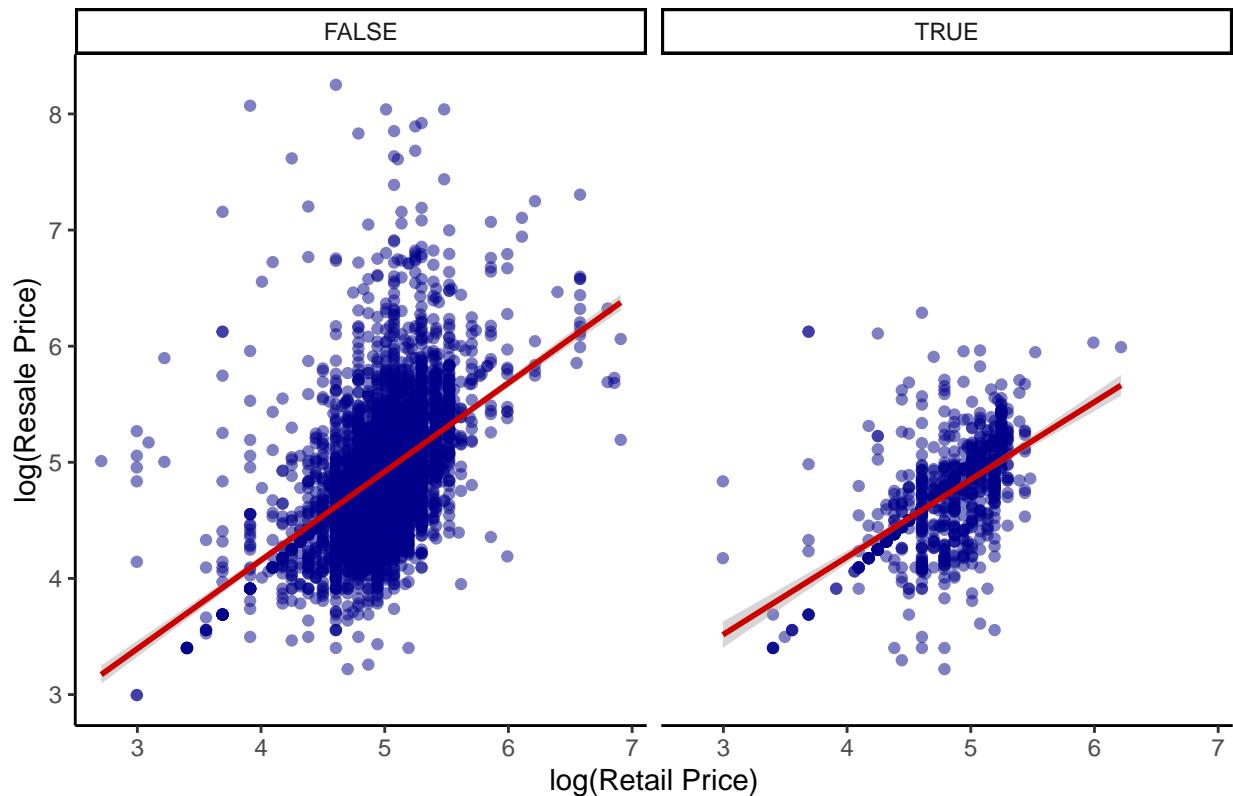


EDA for log resale vs log retail

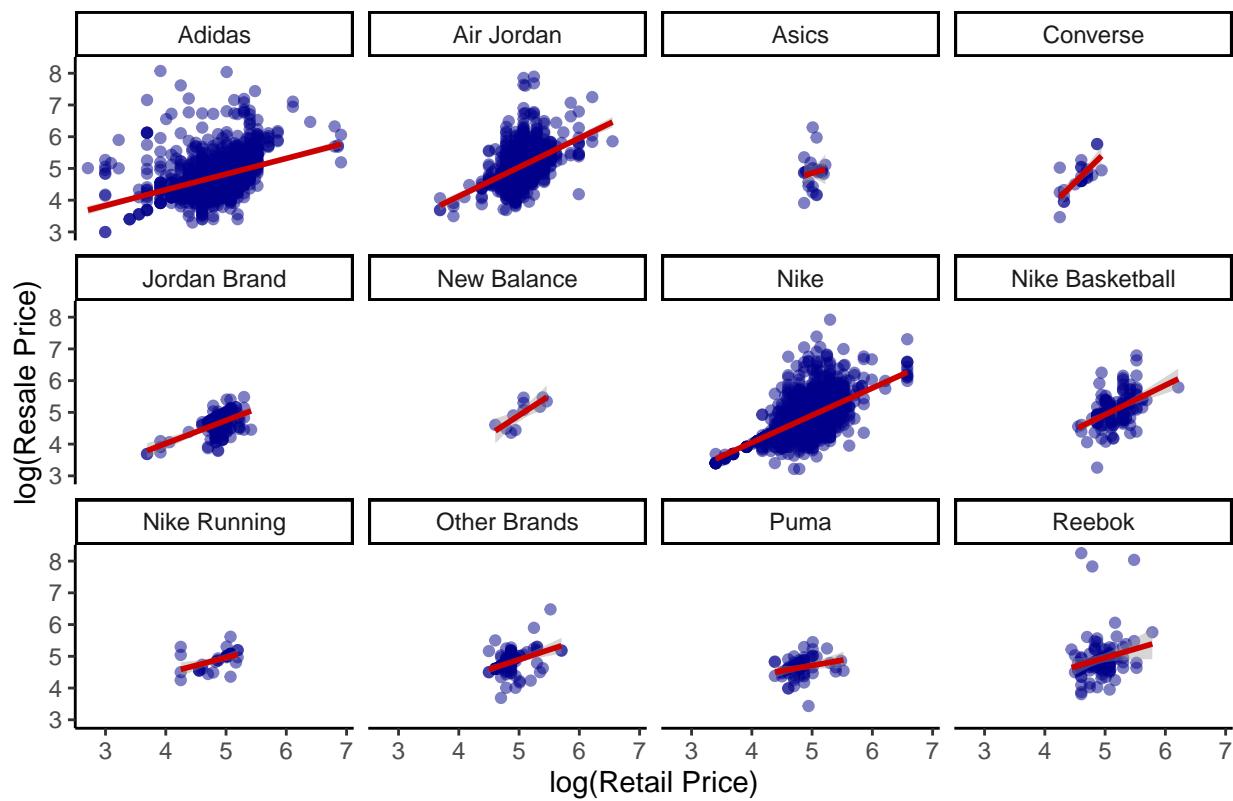
log(Resale Price) vs log(Retail Price) by Collab



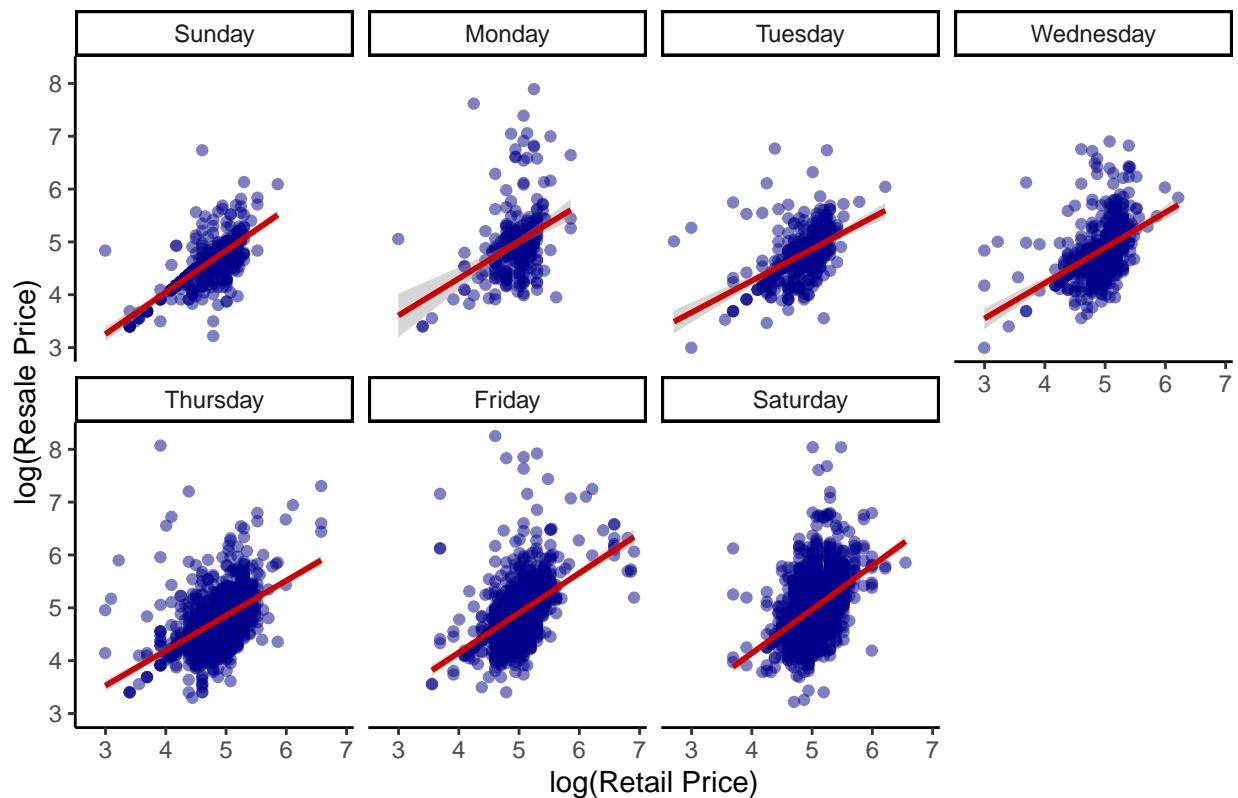
$\log(\text{Resale Price})$  vs  $\log(\text{Retail Price})$  by Sex



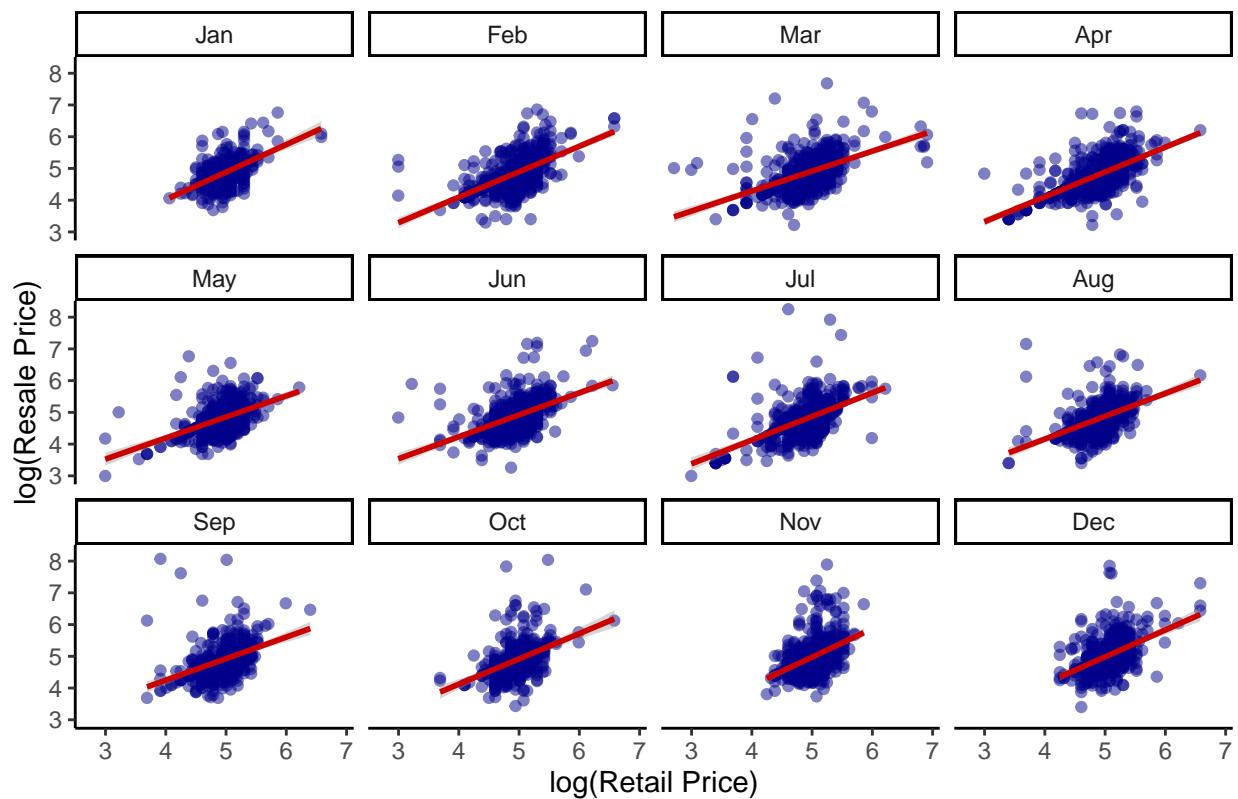
$\log(\text{Resale Price})$  vs  $\log(\text{Retail Price})$  by Brand



$\log(\text{Resale Price})$  vs  $\log(\text{Retail Price})$  by Release DOW



$\log(\text{Resale Price})$  vs  $\log(\text{Retail Price})$  by Release Month



Model

```

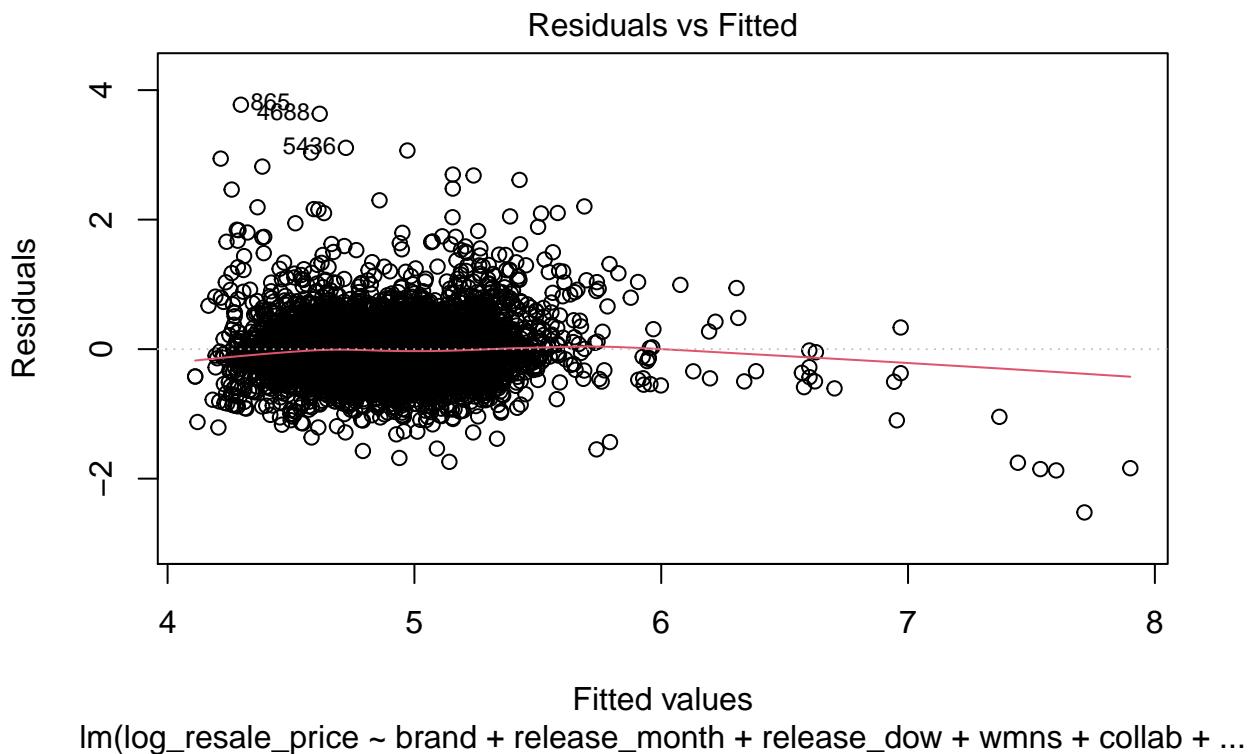
## 
## Call:
## lm(formula = log_resale_price ~ brand + release_month + release_dow +
##      wmns + collab + retro + kids + main_color + bin_wants + retail_price,
##      data = sneakers)
## 
## Residuals:
##    Min      1Q  Median      3Q     Max 
## -2.5217 -0.2455 -0.0107  0.2084  3.7741 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)                4.0792824  0.0385592 105.793 < 2e-16 ***
## brandAir Jordan            0.1403510  0.0216334   6.488 9.40e-11 ***
## brandAsics                 -0.1597796  0.0901347  -1.773 0.076332 .  
## brandConverse               -0.0131283  0.0877316  -0.150 0.881052  
## brandJordan Brand          -0.0834422  0.0397535  -2.099 0.035859 *  
## brandNew Balance            -0.0980314  0.1314188  -0.746 0.455728  
## brandNike                  0.0523806  0.0144458   3.626 0.000290 *** 
## brandNike Basketball        0.0401751  0.0404242   0.994 0.320342  
## brandNike Running           0.1332712  0.0776873   1.715 0.086308 .  
## brandOther Brands           -0.0214001  0.0455201  -0.470 0.638283  
## brandPuma                  -0.2229885  0.0594071  -3.754 0.000176 *** 
## brandReebok                0.0217633  0.0463381   0.470 0.638612  
## release_monthFeb            0.0214823  0.0297217   0.723 0.469842  
## release_monthMar            0.0553728  0.0296907   1.865 0.062231 .  
## release_monthApr            0.0200584  0.0301602   0.665 0.506036  
## release_monthMay            -0.0313537  0.0315031  -0.995 0.319650  
## release_monthJun            0.0292981  0.0304838   0.961 0.336539  
## release_monthJul            -0.0024515  0.0310468  -0.079 0.937066  
## release_monthAug            0.0223310  0.0307258   0.727 0.467386  
## release_monthSep            0.0661192  0.0317232   2.084 0.037178 *  
## release_monthOct            0.0424801  0.0324080   1.311 0.189978  
## release_monthNov            0.0910831  0.0306954   2.967 0.003016 ** 
## release_monthDec            0.0709438  0.0310805   2.283 0.022489 *  
## release_dowMonday           0.1773772  0.0358024   4.954 7.45e-07 *** 
## release_dowTuesday          0.0686351  0.0332976   2.061 0.039320 *  
## release_dowWednesday        0.0626654  0.0306779   2.043 0.041126 *  
## release_dowThursday          0.0471950  0.0270069   1.748 0.080598 .  
## release_dowFriday            0.0443193  0.0283175   1.565 0.117614  
## release_dowSaturday          0.0783300  0.0276095   2.837 0.004568 ** 
## wmnsTRUE                    0.0331839  0.0164615   2.016 0.043860 *  
## collabTRUE                  0.2660243  0.0196380  13.546 < 2e-16 *** 
## retroTRUE                   0.1481206  0.0330190   4.486 7.39e-06 *** 
## kidsTRUE                     -0.0635748  0.0228878  -2.778 0.005492 ** 
## main_colorBlue               0.0018315  0.0165285   0.111 0.911770  
## main_colorBrown              -0.0623182  0.0355700  -1.752 0.079825 .  
## main_colorGray               -0.0096130  0.0280403  -0.343 0.731741  
## main_colorGreen              0.0159876  0.0376303   0.425 0.670954  
## main_colorMulti-Color        0.0612667  0.0401180   1.527 0.126772  
## main_colorOrange              -0.0287045  0.0356582  -0.805 0.420856  
## main_colorPurple              -0.0219321  0.0354176  -0.619 0.535780  
## main_colorRed                0.0214855  0.0234209   0.917 0.358989  
## main_colorWhite              0.0266488  0.0145803   1.828 0.067638 . 

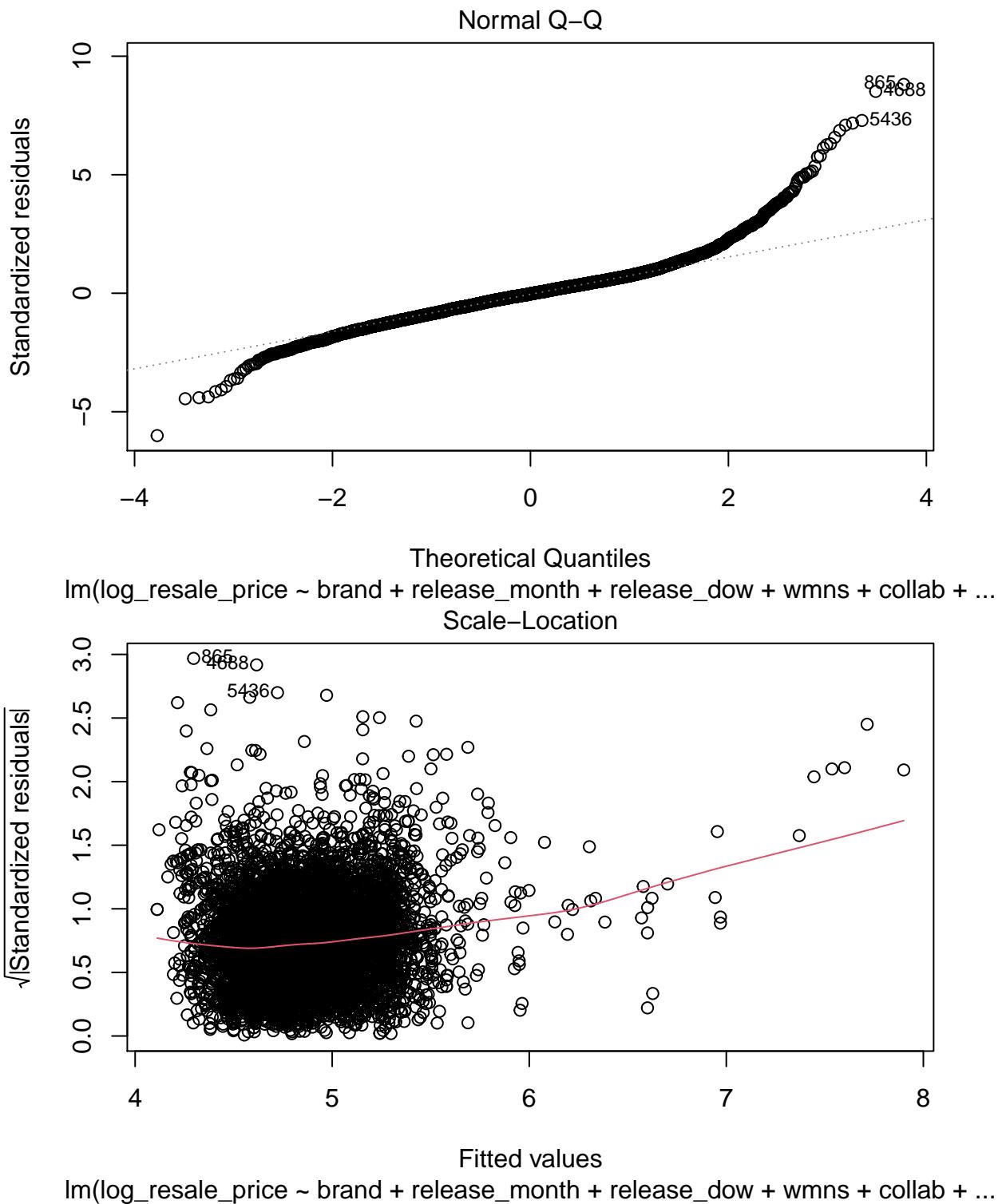
```

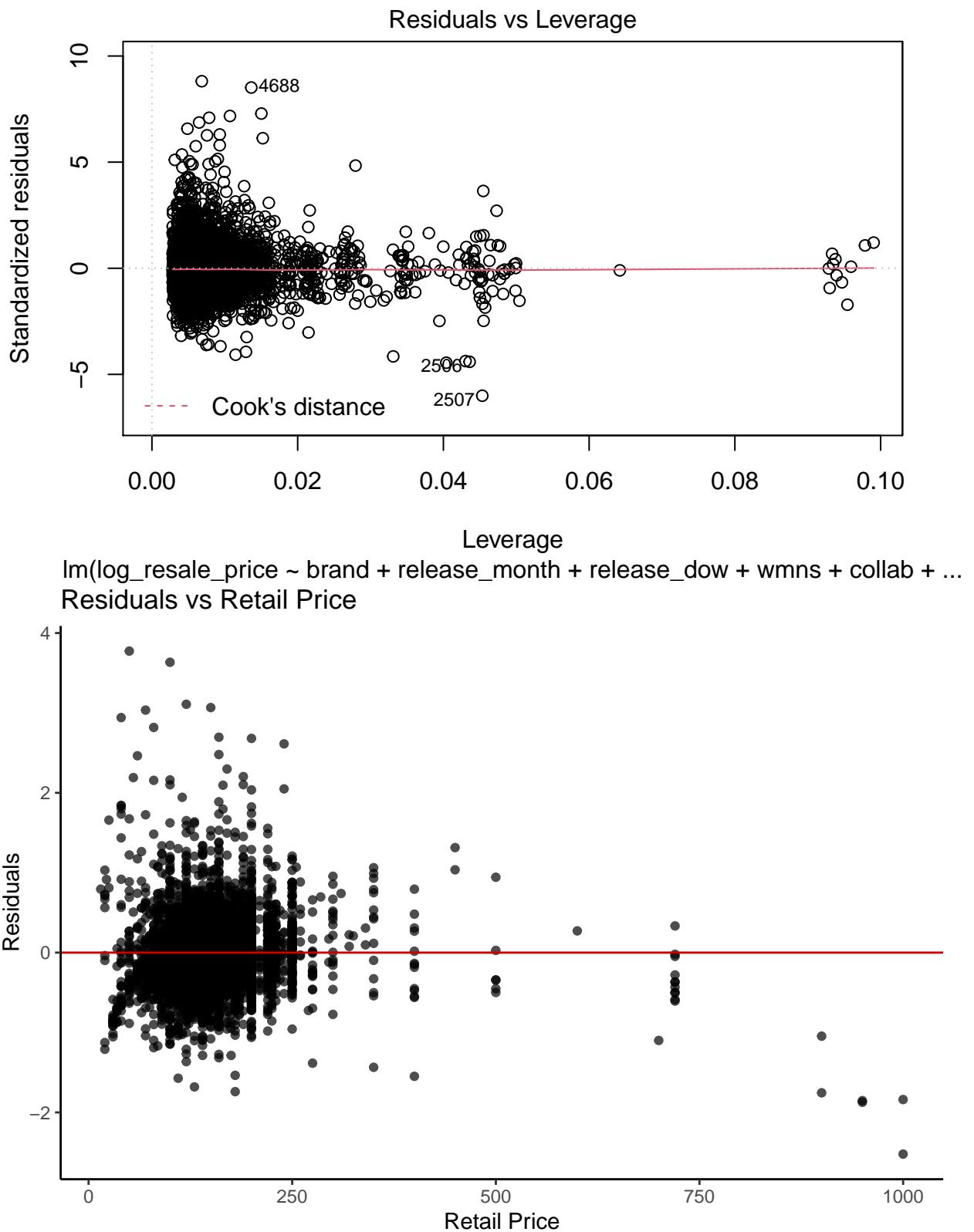
```

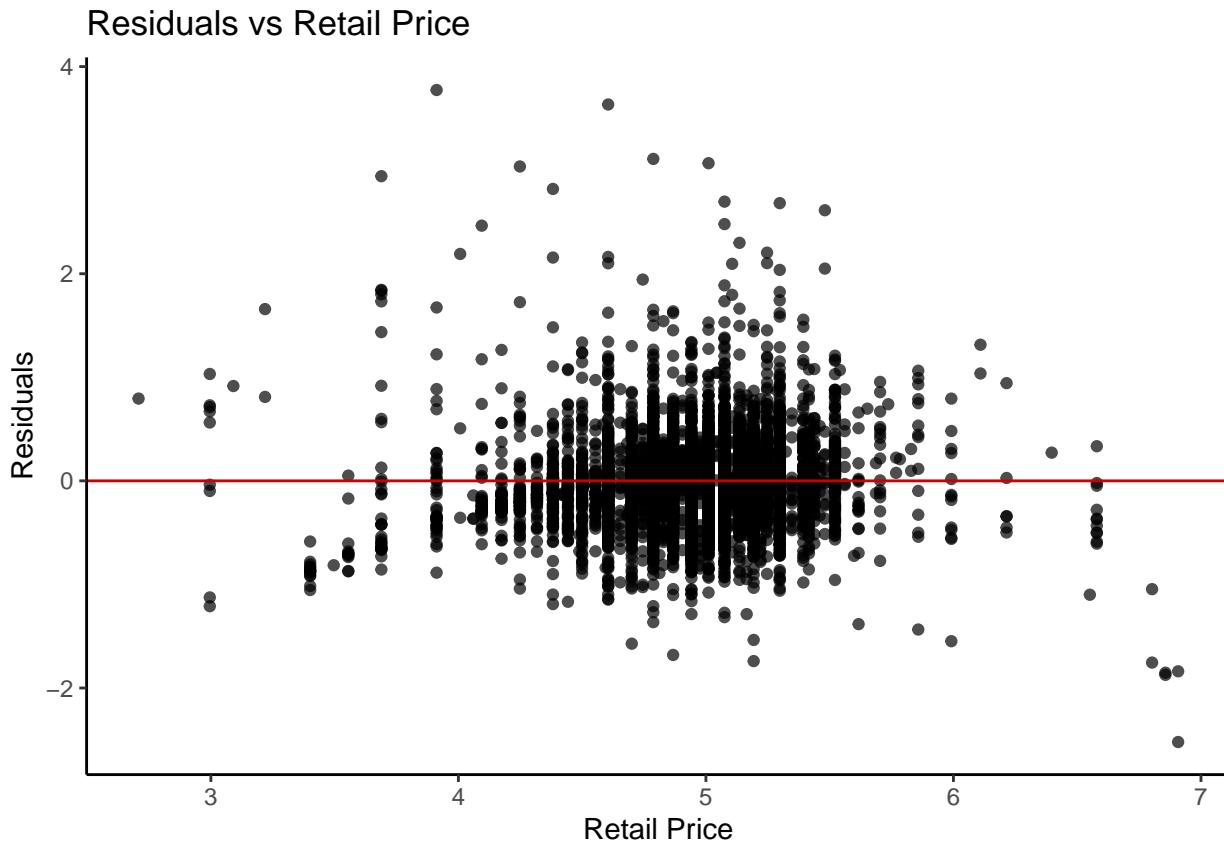
## main_colorYellow      -0.0998767  0.0659459  -1.515  0.129944
## bin_wantsSomewhat Popular  0.0126271  0.0170421   0.741  0.458763
## bin_wantsVery Popular   0.1147260  0.0176036   6.517  7.74e-11 ***
## bin_wantsExtremely Popular  0.3037893  0.0192095  15.815 < 2e-16 ***
## retail_price           0.0033194  0.0001017  32.633 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4298 on 6117 degrees of freedom
## Multiple R-squared:  0.3494, Adjusted R-squared:  0.3445
## F-statistic:  71.4 on 46 and 6117 DF,  p-value: < 2.2e-16

```









```

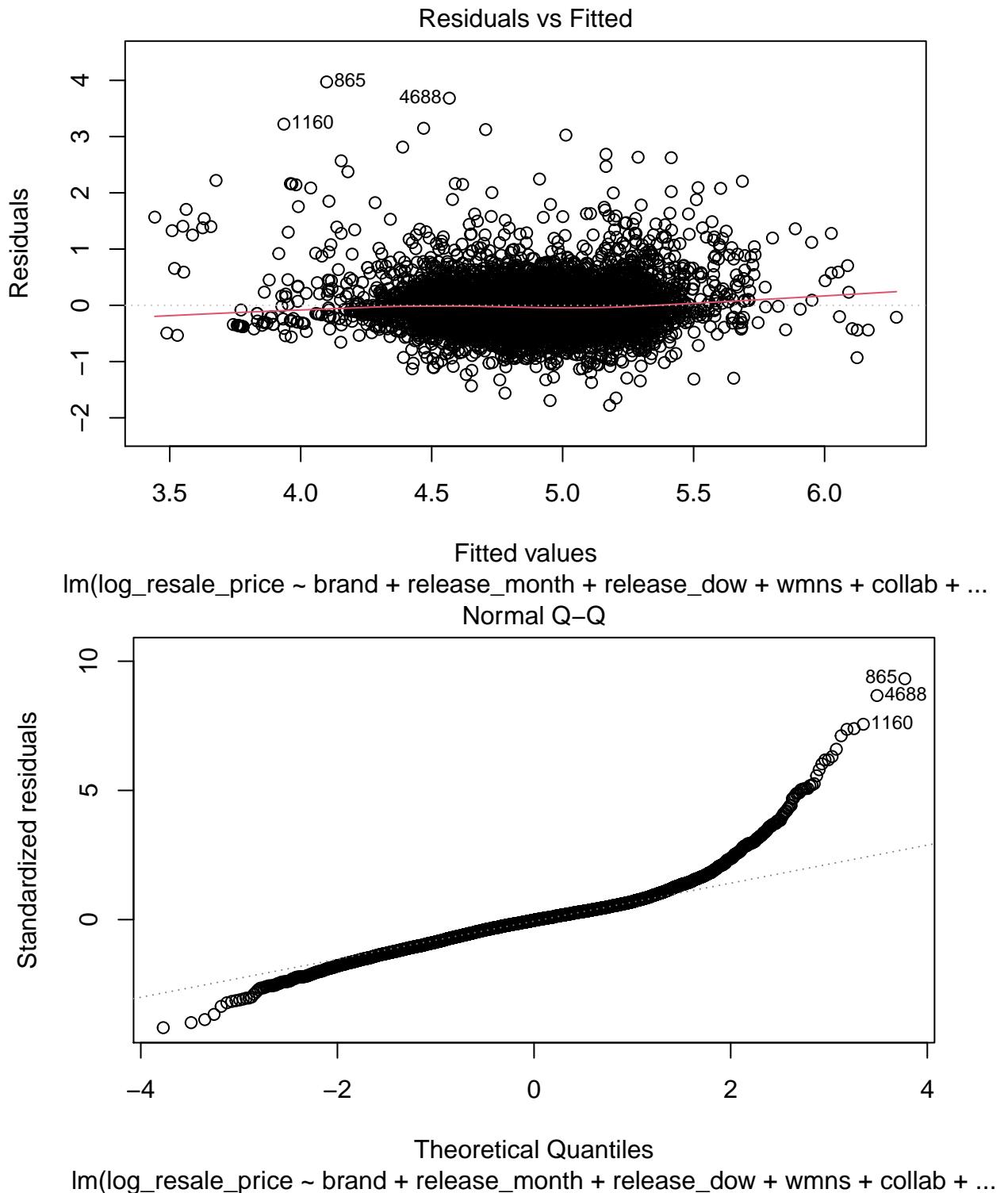
## 
## Call:
## lm(formula = log_resale_price ~ brand + release_month + release_dow +
##     wmnns + collab + retro + kids + main_color + bin_wants + log_retail_price,
##     data = sneakers)
## 
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -1.7783 -0.2377 -0.0097  0.1857  3.9719 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)             1.686911  0.089893 18.766 < 2e-16 ***
## brandAir Jordan        0.113248  0.021603  5.242 1.64e-07 ***
## brandAsics              -0.200110  0.089656 -2.232 0.025652 *  
## brandConverse            0.020547  0.087356  0.235 0.814054    
## brandJordan Brand      -0.098477  0.039542 -2.490 0.012786 *  
## brandNew Balance        -0.123857  0.130756 -0.947 0.343554    
## brandNike                0.040374  0.014372  2.809 0.004982 ** 
## brandNike Basketball    0.021146  0.040244  0.525 0.599295    
## brandNike Running        0.140815  0.077306  1.822 0.068574 .  
## brandOther Brands       -0.027090  0.045276 -0.598 0.549648    
## brandPuma                -0.218746  0.059111 -3.701 0.000217 *** 
## brandReebok              0.004719  0.046078  0.102 0.918427    
## release_monthFeb         0.027915  0.029574  0.944 0.345255    
## release_monthMar         0.072354  0.029539  2.449 0.014334 *  
## release_monthApr         0.027865  0.030012  0.928 0.353194 

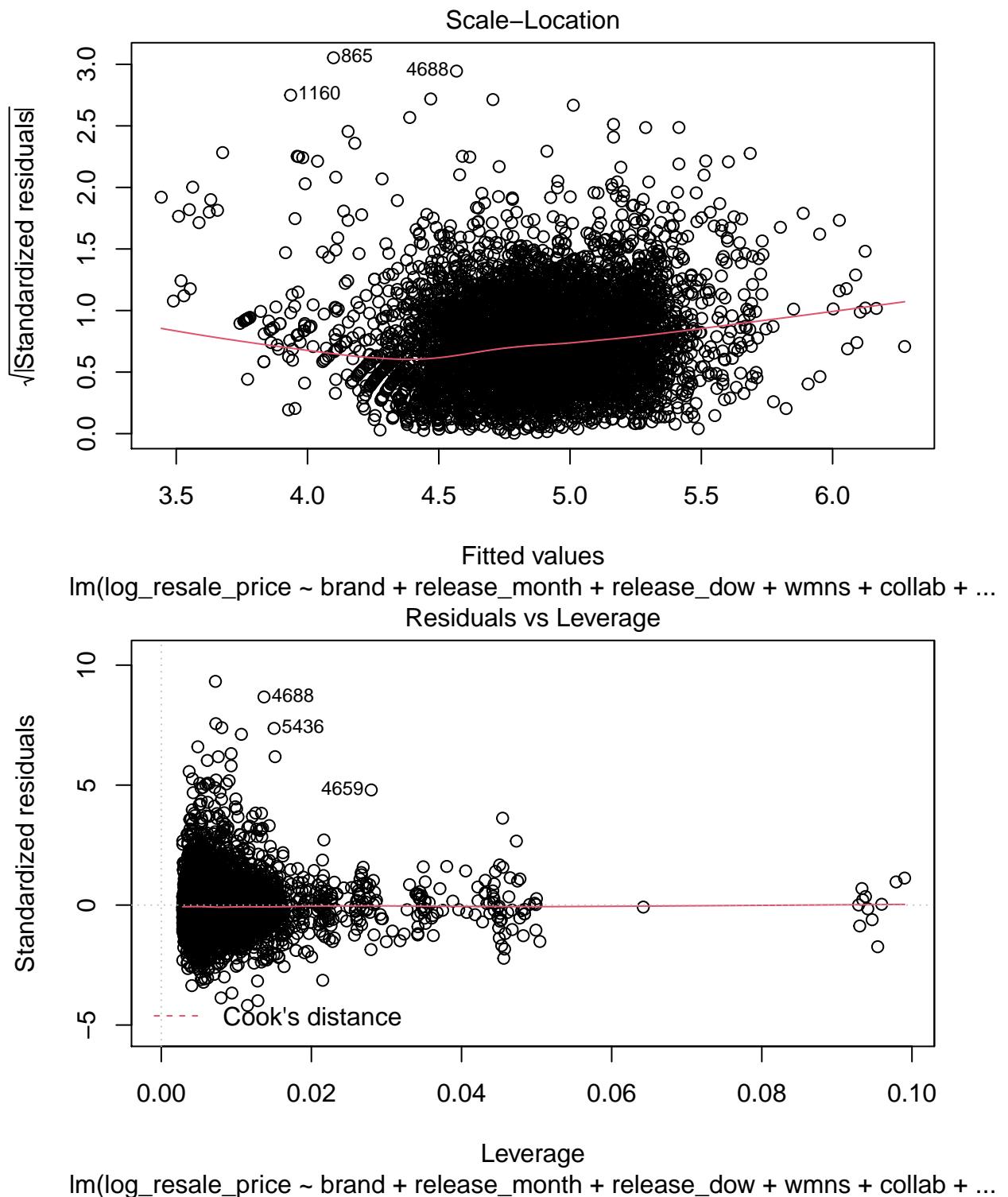
```

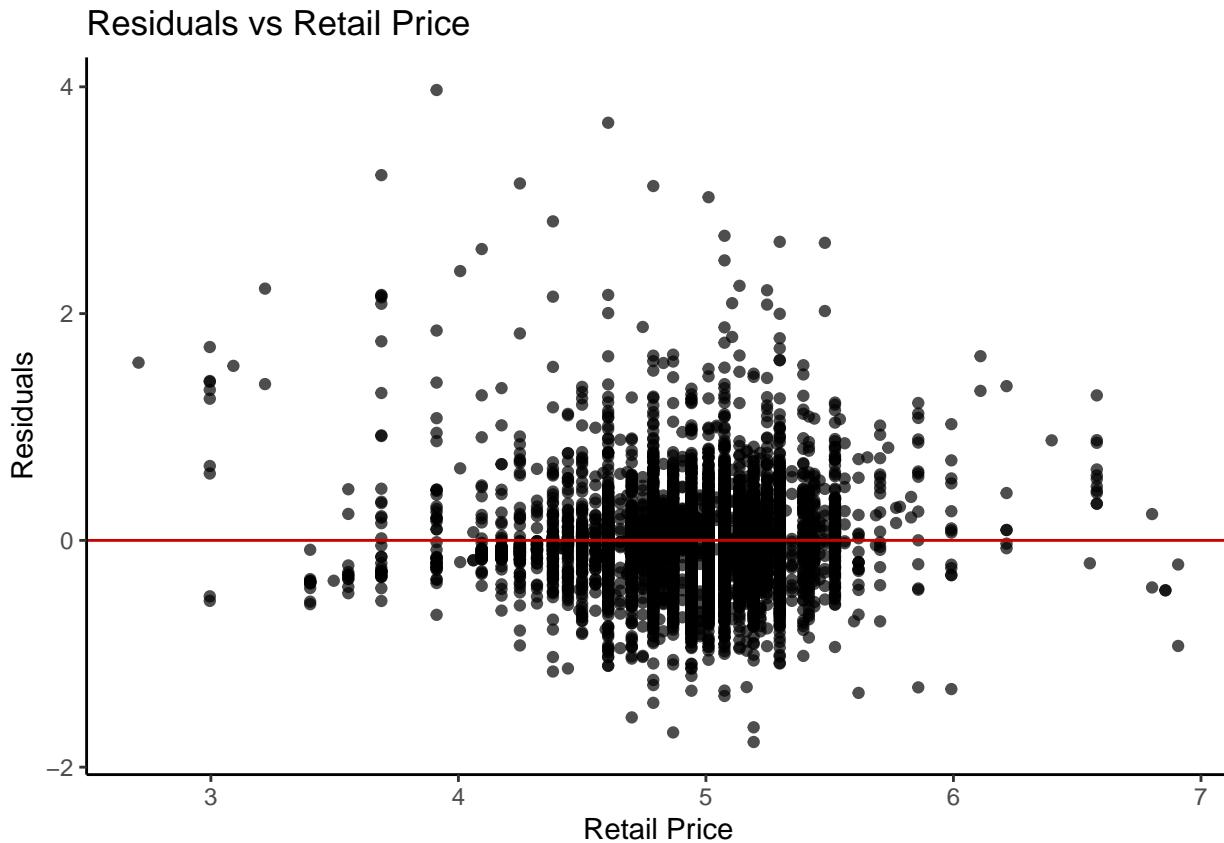
```

## release_monthMay      -0.027424  0.031348 -0.875 0.381706
## release_monthJun     0.041084  0.030342  1.354 0.175780
## release_monthJul     0.009847  0.030901  0.319 0.750007
## release_monthAug     0.023808  0.030573  0.779 0.436170
## release_monthSep     0.066245  0.031565  2.099 0.035884 *
## release_monthOct     0.041892  0.032246  1.299 0.193949
## release_monthNov     0.080164  0.030542  2.625 0.008693 **
## release_monthDec     0.070657  0.030926  2.285 0.022362 *
## release_dowMonday    0.148086  0.035665  4.152 3.34e-05 ***
## release_dowTuesday   0.053595  0.033142  1.617 0.105901
## release_dowWednesday 0.038266  0.030548  1.253 0.210373
## release_dowThursday  0.020888  0.026910  0.776 0.437654
## release_dowFriday    0.030982  0.028200  1.099 0.271962
## release_dowSaturday  0.049302  0.027518  1.792 0.073235 .
## wmnstrue              0.029162  0.016375  1.781 0.074975 .
## collabtrue             0.272387  0.019503  13.966 < 2e-16 ***
## retrotrue              0.147183  0.032850  4.481 7.58e-06 ***
## kidstrue               -0.015373  0.023028 -0.668 0.504436
## main_colorBlue         -0.002759  0.016447 -0.168 0.866763
## main_colorBrown        -0.044499  0.035362 -1.258 0.208307
## main_colorGray          -0.028693  0.027914 -1.028 0.304033
## main_colorGreen         0.008407  0.037442  0.225 0.822342
## main_colorMulti-Color  0.062279  0.039917  1.560 0.118761
## main_colorOrange        -0.031986  0.035482 -0.901 0.367373
## main_colorPurple        -0.024294  0.035242 -0.689 0.490634
## main_colorRed            0.020981  0.023304  0.900 0.367993
## main_colorWhite          0.023514  0.014504  1.621 0.105040
## main_colorYellow         -0.110867  0.065620 -1.690 0.091169 .
## bin_wantsSomewhat Popular -0.031493  0.017210 -1.830 0.067315 .
## bin_wantsVery Popular    0.053276  0.017934  2.971 0.002982 **
## bin_wantsExtremely Popular 0.242763  0.019599  12.387 < 2e-16 ***
## log_retail_price         0.598942  0.017763  33.719 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4276 on 6117 degrees of freedom
## Multiple R-squared:  0.3558, Adjusted R-squared:  0.351
## F-statistic: 73.46 on 46 and 6117 DF,  p-value: < 2.2e-16

```







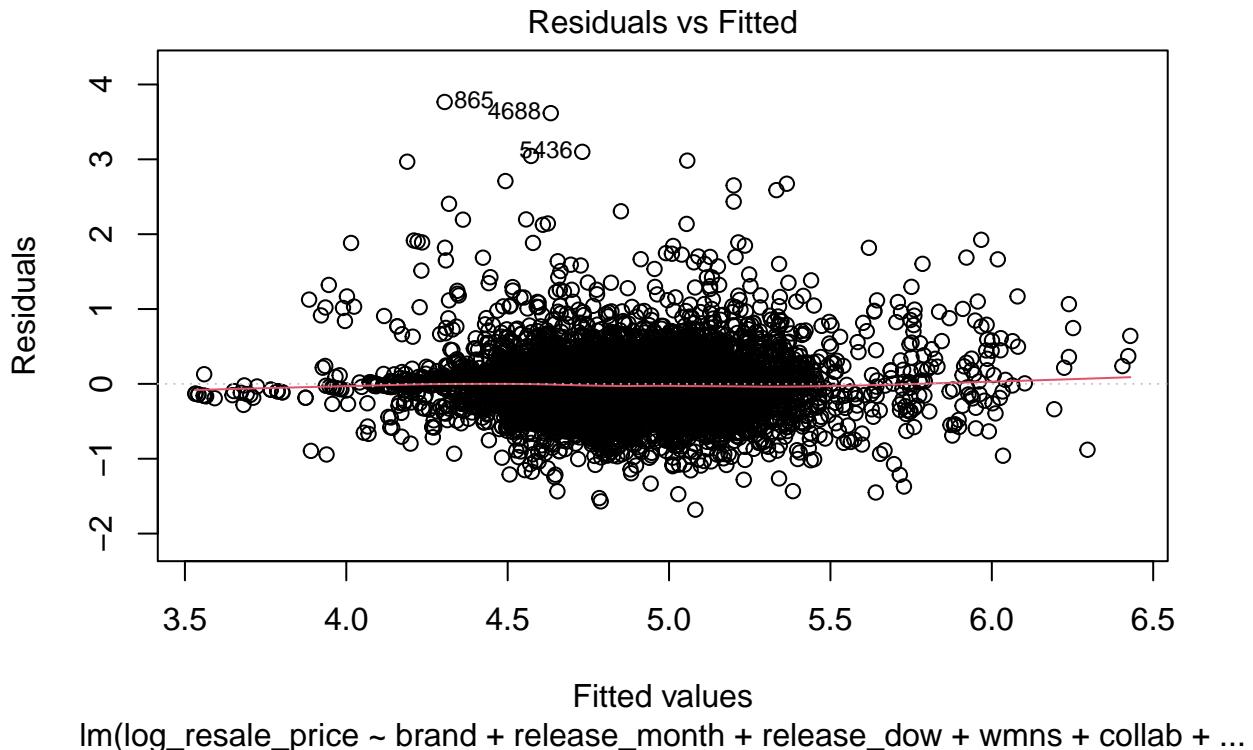
```
##
## Call:
## lm(formula = log_resale_price ~ brand + release_month + release_dow +
##     wmn + collab + retro + kids + main_color + bin_wants + log_retail_price +
##     bin_wants:collab + log_retail_price:brand + collab:main_color,
##     data = sneakers)
##
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -1.6802 -0.2265  0.0077  0.1738  3.7662 
## 
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)                2.722025  0.130994 20.780 < 2e-16 ***
## brandAir Jordan          -1.473625  0.279543 -5.272 1.40e-07 ***
## brandAsics                  5.829293  3.999498  1.458  0.14503  
## brandConverse             -3.882669  1.913258 -2.029  0.04247 *  
## brandJordan Brand        -1.019329  0.656250 -1.553  0.12041  
## brandNew Balance         -3.774932  2.526902 -1.494  0.13525  
## brandNike                 -1.785393  0.162617 -10.979 < 2e-16 ***
## brandNike Basketball     -2.129501  0.724786 -2.938  0.00331 ** 
## brandNike Running          -0.979368  1.224182 -0.800  0.42373  
## brandOther Brands          0.042078  0.901270  0.047  0.96276  
## brandPuma                  0.059702  1.064690  0.056  0.95528  
## brandReebok              -0.216155  0.826933 -0.261  0.79380  
## release_monthFeb           0.026353  0.028997  0.909  0.36349  
## release_monthMar          0.078751  0.028974  2.718  0.00659 **
```

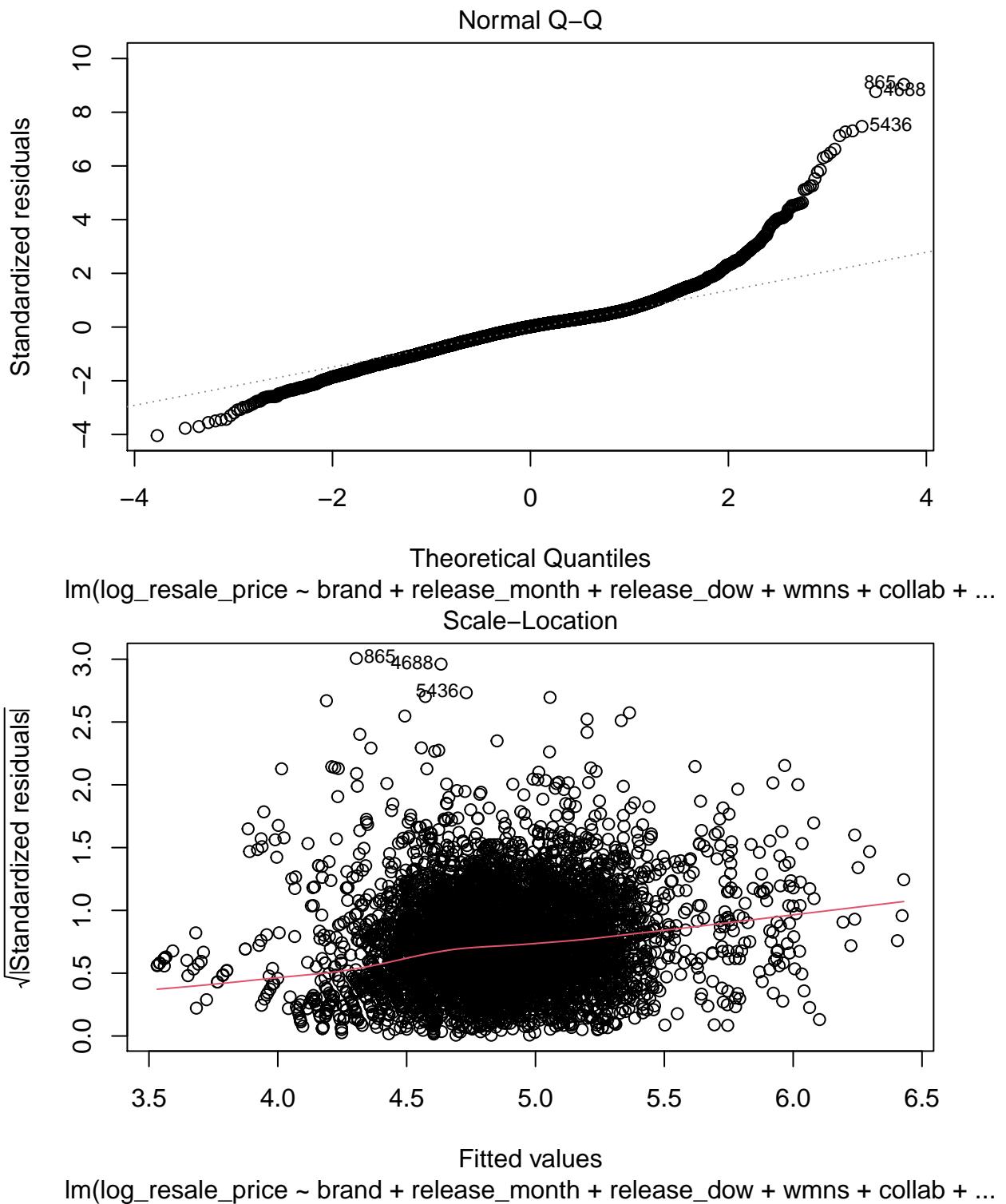
## release_monthApr	0.024644	0.029415	0.838	0.40219
## release_monthMay	-0.019829	0.030754	-0.645	0.51910
## release_monthJun	0.041338	0.029781	1.388	0.16516
## release_monthJul	0.016787	0.030345	0.553	0.58014
## release_monthAug	0.026235	0.029991	0.875	0.38174
## release_monthSep	0.068583	0.030940	2.217	0.02668 *
## release_monthOct	0.040194	0.031619	1.271	0.20370
## release_monthNov	0.087263	0.029958	2.913	0.00359 **
## release_monthDec	0.082666	0.030369	2.722	0.00651 **
## release_dowMonday	0.100859	0.035154	2.869	0.00413 **
## release_dowTuesday	0.022550	0.032794	0.688	0.49172
## release_dowWednesday	0.025127	0.030058	0.836	0.40322
## release_dowThursday	-0.010973	0.026615	-0.412	0.68014
## release_dowFriday	0.009132	0.027837	0.328	0.74288
## release_dowSaturday	0.035923	0.027096	1.326	0.18497
## wmnstTRUE	0.026282	0.016063	1.636	0.10185
## collabTRUE	0.071658	0.056392	1.271	0.20388
## retroTRUE	0.162027	0.032354	5.008	5.66e-07 ***
## kidsTRUE	-0.015392	0.022871	-0.673	0.50096
## main_colorBlue	0.006201	0.017030	0.364	0.71576
## main_colorBrown	-0.027372	0.038186	-0.717	0.47352
## main_colorGray	-0.009841	0.028099	-0.350	0.72618
## main_colorGreen	-0.002170	0.038621	-0.056	0.95519
## main_colorMulti-Color	0.083314	0.042578	1.957	0.05042 .
## main_colorOrange	-0.062806	0.038431	-1.634	0.10226
## main_colorPurple	-0.029296	0.036978	-0.792	0.42824
## main_colorRed	0.008396	0.023833	0.352	0.72463
## main_colorWhite	0.014741	0.015004	0.982	0.32591
## main_colorYellow	-0.097213	0.073038	-1.331	0.18324
## bin_wantsSomewhat Popular	-0.024841	0.017630	-1.409	0.15889
## bin_wantsVery Popular	0.049457	0.018301	2.702	0.00690 **
## bin_wantsExtremely Popular	0.177199	0.019965	8.876	< 2e-16 ***
## log_retail_price	0.392191	0.026351	14.883	< 2e-16 ***
## collabTRUE:bin_wantsSomewhat Popular	0.119931	0.059272	2.023	0.04308 *
## collabTRUE:bin_wantsVery Popular	0.112029	0.058509	1.915	0.05558 .
## collabTRUE:bin_wantsExtremely Popular	0.524896	0.061577	8.524	< 2e-16 ***
## brandAir Jordan:log_retail_price	0.323806	0.055380	5.847	5.26e-09 ***
## brandAsics:log_retail_price	-1.194097	0.796247	-1.500	0.13376
## brandConverse:log_retail_price	0.838467	0.418115	2.005	0.04497 *
## brandJordan Brand:log_retail_price	0.189860	0.134195	1.415	0.15717
## brandNew Balance:log_retail_price	0.735342	0.499897	1.471	0.14135
## brandNike:log_retail_price	0.373645	0.033337	11.208	< 2e-16 ***
## brandNike Basketball:log_retail_price	0.435210	0.140664	3.094	0.00198 **
## brandNike Running:log_retail_price	0.232153	0.252051	0.921	0.35706
## brandOther Brands:log_retail_price	-0.012741	0.184963	-0.069	0.94509
## brandPuma:log_retail_price	-0.063721	0.220288	-0.289	0.77239
## brandReebok:log_retail_price	0.050249	0.167932	0.299	0.76478
## collabTRUE:main_colorBlue	-0.086387	0.053453	-1.616	0.10612
## collabTRUE:main_colorBrown	-0.025852	0.091344	-0.283	0.77717
## collabTRUE:main_colorGray	-0.334800	0.124236	-2.695	0.00706 **
## collabTRUE:main_colorGreen	0.134577	0.123672	1.088	0.27656
## collabTRUE:main_colorMulti-Color	-0.087244	0.108713	-0.803	0.42229
## collabTRUE:main_colorOrange	0.160857	0.091839	1.752	0.07991 .
## collabTRUE:main_colorPurple	0.055075	0.105454	0.522	0.60151

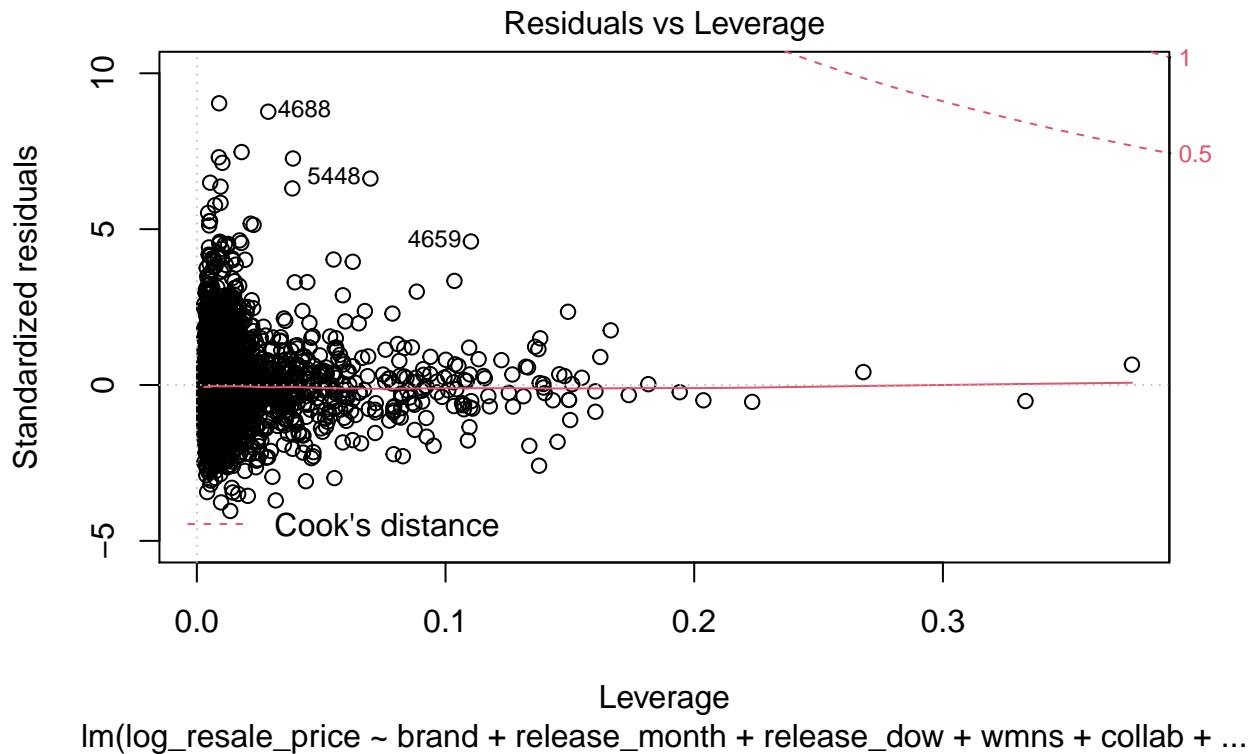
```

## collabTRUE:main_colorRed          0.070942   0.083420   0.850  0.39513
## collabTRUE:main_colorWhite        0.110080   0.047026   2.341  0.01927 *
## collabTRUE:main_colorYellow       0.045307   0.155297   0.292  0.77049
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4186 on 6093 degrees of freedom
## Multiple R-squared:  0.3851, Adjusted R-squared:  0.378
## F-statistic: 54.51 on 70 and 6093 DF,  p-value: < 2.2e-16

```







```

## Analysis of Variance Table
##
## Model 1: log_resale_price ~ brand + release_month + release_dow + wmn...
##           collab + retro + kids + main_color + bin_wants + log_retail_price
## Model 2: log_resale_price ~ brand + release_month + release_dow + wmn...
##           collab + retro + kids + main_color + bin_wants + log_retail_price +
##           bin_wants:collab + log_retail_price:brand + collab:main_color
##   Res.Df   RSS Df Sum of Sq    F    Pr(>F)
## 1   6117 1118.6
## 2   6093 1067.8 24      50.809 12.08 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

##
## Call:
## lm(formula = log_resale_price ~ collab + log_retail_price + bin_wants +
##     brand + retro + release_month + release_dow + wmn... + collab:bin_wants +
##     log_retail_price:brand, data = sneakers)
##
## Residuals:
##       Min     1Q Median     3Q    Max 
## -1.6163 -0.2313  0.0087  0.1751  3.7529 
##
## Coefficients:
## (Intercept) 2.733536  0.129370  21.130 < 2e-16 ***
## collabTRUE  0.114659  0.049252   2.328  0.01994 *
## log_retail_price 0.389646  0.026034  14.967 < 2e-16 ***
## bin_wantsSomewhat Popular -0.023223  0.017589  -1.320  0.18677

```

```

## bin_wantsVery Popular          0.052436  0.018223  2.878  0.00402 ** 
## bin_wantsExtremely Popular    0.180985  0.019853  9.116 < 2e-16 *** 
## brandAir Jordan              -1.500470  0.276037 -5.436 5.67e-08 *** 
## brandAsics                   5.534953  3.993674  1.386  0.16582 
## brandConverse                -4.169570  1.911670 -2.181  0.02921 *  
## brandJordan Brand            -1.045891  0.656973 -1.592  0.11144 
## brandNew Balance             -4.481266  2.523946 -1.775  0.07587 .  
## brandNike                    -1.793524  0.162459 -11.040 < 2e-16 *** 
## brandNike Basketball         -2.197946  0.724823 -3.032  0.00244 ** 
## brandNike Running            -0.983794  1.224816 -0.803  0.42188 
## brandOther Brands            0.041601  0.897408  0.046  0.96303 
## brandPuma                     0.375869  1.056407  0.356  0.72200 
## brandReebok                  -0.319454  0.824582 -0.387  0.69846 
## retroTRUE                    0.163526  0.032267  5.068  4.14e-07 *** 
## release_monthFeb             0.027853  0.028986  0.961  0.33663 
## release_monthMar             0.077363  0.028946  2.673  0.00755 ** 
## release_monthApr             0.026515  0.029396  0.902  0.36710 
## release_monthMay             -0.019191  0.030739 -0.624  0.53242 
## release_monthJun             0.041827  0.029781  1.404  0.16022 
## release_monthJul             0.017751  0.030354  0.585  0.55872 
## release_monthAug             0.025042  0.030003  0.835  0.40394 
## release_monthSep             0.069895  0.030961  2.258  0.02401 *  
## release_monthOct             0.039128  0.031611  1.238  0.21584 
## release_monthNov             0.085086  0.029963  2.840  0.00453 ** 
## release_monthDec             0.082409  0.030361  2.714  0.00666 ** 
## release_dowMonday            0.105823  0.035145  3.011  0.00261 ** 
## release_dowTuesday           0.022403  0.032776  0.684  0.49430 
## release_dowWednesday         0.021926  0.030088  0.729  0.46620 
## release_dowThursday          -0.009759  0.026616 -0.367  0.71387 
## release_dowFriday            0.007491  0.027830  0.269  0.78782 
## release_dowSaturday          0.034916  0.027094  1.289  0.19755 
## wmnstrue                     0.026267  0.015809  1.662  0.09665 .  
## collabTRUE:bin_wantsSomewhat Popular 0.093380  0.058934  1.584  0.11314 
## collabTRUE:bin_wantsVery Popular   0.084190  0.058063  1.450  0.14712 
## collabTRUE:bin_wantsExtremely Popular 0.508422  0.061075  8.325 < 2e-16 *** 
## log_retail_price:brandAir Jordan 0.328881  0.054844  5.997 2.13e-09 *** 
## log_retail_price:brandAsics      -1.136952  0.795104 -1.430  0.15279 
## log_retail_price:brandConverse   0.906474  0.417630  2.171  0.03001 *  
## log_retail_price:brandJordan Brand 0.195821  0.134331  1.458  0.14496 
## log_retail_price:brandNew Balance 0.874204  0.499361  1.751  0.08006 .  
## log_retail_price:brandNike       0.375747  0.033291 11.287 < 2e-16 *** 
## log_retail_price:brandNike Basketball 0.447987  0.140705  3.184  0.00146 ** 
## log_retail_price:brandNike Running 0.232884  0.252175  0.923  0.35578 
## log_retail_price:brandOther Brands -0.012604  0.184143 -0.068  0.94543 
## log_retail_price:brandPuma       -0.132029  0.218608 -0.604  0.54590 
## log_retail_price:brandReebok     0.068942  0.167460  0.412  0.68058 
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 
## 
## Residual standard error: 0.4194 on 6114 degrees of freedom 
## Multiple R-squared: 0.3807, Adjusted R-squared: 0.3757 
## F-statistic: 76.7 on 49 and 6114 DF, p-value: < 2.2e-16 

## 

```

```

## Call:
## lm(formula = log_resale_price ~ collab + log_retail_price + bin_wants +
##      retro + collab:bin_wants, data = sneakers)
##
## Residuals:
##    Min      1Q  Median      3Q     Max 
## -1.7486 -0.2353  0.0000  0.1787  3.9516 
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)                1.63925   0.07945 20.632 < 2e-16 ***
## collabTRUE                  0.07159   0.04964  1.442 0.149312    
## log_retail_price              0.63395   0.01698 37.341 < 2e-16 ***
## bin_wantsSomewhat Popular   -0.03505   0.01701 -2.061 0.039390 *  
## bin_wantsVery Popular        0.05897   0.01714  3.440 0.000586 *** 
## bin_wantsExtremely Popular   0.21847   0.01767 12.364 < 2e-16 *** 
## retroTRUE                   0.19876   0.03155  6.300 3.19e-10 *** 
## collabTRUE:bin_wantsSomewhat Popular 0.07812   0.05956  1.312 0.189690    
## collabTRUE:bin_wantsVery Popular   0.07705   0.05829  1.322 0.186251    
## collabTRUE:bin_wantsExtremely Popular 0.50417   0.06165  8.178 3.49e-16 *** 
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4277 on 6154 degrees of freedom
## Multiple R-squared:  0.3517, Adjusted R-squared:  0.3508 
## F-statistic: 371 on 9 and 6154 DF,  p-value: < 2.2e-16

## Analysis of Variance Table
##
## Model 1: log_resale_price ~ collab + log_retail_price + bin_wants + retro +
##           collab:bin_wants
## Model 2: log_resale_price ~ collab + log_retail_price + bin_wants + brand +
##           retro + release_month + release_dow + wmnss + collab:bin_wants +
##           log_retail_price:brand
##   Res.Df   RSS Df Sum of Sq    F    Pr(>F)    
## 1   6154 1125.7
## 2   6114 1075.4 40    50.319 7.152 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Analysis of Variance Table
##
## Model 1: log_resale_price ~ collab + log_retail_price + bin_wants + brand +
##           retro + release_month + release_dow + wmnss + collab:bin_wants +
##           log_retail_price:brand
## Model 2: log_resale_price ~ brand + release_month + release_dow + wmnss +
##           collab + retro + kids + main_color + bin_wants + log_retail_price +
##           bin_wants:collab + log_retail_price:brand + collab:main_color
##   Res.Df   RSS Df Sum of Sq    F    Pr(>F)    
## 1   6114 1075.4
## 2   6093 1067.8 21    7.6161 2.0695 0.002817 ** 
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

	2.5 %	97.5 %
##		
## (Intercept)	1.176620e+01	1.966458e+01
## brandAir Jordan	1.324398e-01	3.962844e-01
## brandAsics	1.338366e-01	8.643403e+05
## brandConverse	4.840458e-04	8.763348e-01
## brandJordan Brand	9.967784e-02	1.306241e+00
## brandNew Balance	1.618964e-04	3.250112e+00
## brandNike	1.219457e-01	2.307072e-01
## brandNike Basketball	2.871492e-02	4.923019e-01
## brandNike Running	3.407481e-02	4.139029e+00
## brandOther Brands	1.782210e-01	6.103646e+00
## brandPuma	1.316686e-01	8.558040e+00
## brandReebok	1.592570e-01	4.075225e+00
## release_monthFeb	9.699678e-01	1.086757e+00
## release_monthMar	1.022194e+00	1.145166e+00
## release_monthApr	9.675182e-01	1.085790e+00
## release_monthMay	9.230073e-01	1.041289e+00
## release_monthJun	9.831023e-01	1.104860e+00
## release_monthJul	9.581985e-01	1.079259e+00
## release_monthAug	9.679660e-01	1.088748e+00
## release_monthSep	1.007962e+00	1.137958e+00
## release_monthOct	9.784459e-01	1.107580e+00
## release_monthNov	1.028946e+00	1.157187e+00
## release_monthDec	1.023402e+00	1.152807e+00
## release_dowMonday	1.032461e+00	1.185036e+00
## release_dowTuesday	9.591209e-01	1.090720e+00
## release_dowWednesday	9.667666e-01	1.087685e+00
## release_dowThursday	9.388039e-01	1.042063e+00
## release_dowFriday	9.555792e-01	1.065774e+00
## release_dowSaturday	9.829524e-01	1.093124e+00
## wmnstrue	9.948065e-01	1.059472e+00
## collabTRUE	9.618569e-01	1.199861e+00
## retroTRUE	1.103626e+00	1.252890e+00
## kidsTRUE	9.415511e-01	1.029880e+00
## main_colorBlue	9.731827e-01	1.040380e+00
## main_colorBrown	9.028227e-01	1.048631e+00
## main_colorGray	9.371387e-01	1.046281e+00
## main_colorGreen	9.250752e-01	1.076311e+00
## main_colorMulti-Color	9.998458e-01	1.181497e+00
## main_colorOrange	8.709724e-01	1.012612e+00
## main_colorPurple	9.032237e-01	1.044140e+00
## main_colorRed	9.623995e-01	1.056666e+00
## main_colorWhite	9.854352e-01	1.045143e+00
## main_colorYellow	7.863189e-01	1.047039e+00
## bin_wantsSomewhat Popular	9.423282e-01	1.009768e+00
## bin_wantsVery Popular	1.013673e+00	1.089080e+00
## bin_wantsExtremely Popular	1.148046e+00	1.241521e+00
## log_retail_price	1.405697e+00	1.558695e+00
## collabTRUE:bin_wantsSomewhat Popular	1.003744e+00	1.266332e+00
## collabTRUE:bin_wantsVery Popular	9.973331e-01	1.254489e+00
## collabTRUE:bin_wantsExtremely Popular	1.498079e+00	1.907147e+00
## brandAir Jordan:log_retail_price	1.240162e+00	1.540905e+00
## brandAsics:log_retail_price	6.360763e-02	1.443149e+00
## brandConverse:log_retail_price	1.018993e+00	5.249431e+00

```

## brandJordan Brand:log_retail_price      9.294067e-01 1.572913e+00
## brandNew Balance:log_retail_price       7.829926e-01 5.558431e+00
## brandNike:log_retail_price              1.361099e+00 1.551150e+00
## brandNike Basketball:log_retail_price   1.172875e+00 2.035948e+00
## brandNike Running:log_retail_price      7.695449e-01 2.067337e+00
## brandOther Brands:log_retail_price      6.870602e-01 1.418858e+00
## brandPuma:log_retail_price               6.092268e-01 1.445018e+00
## brandReebok:log_retail_price             7.565723e-01 1.461488e+00
## collabTRUE:main_colorBlue                8.259890e-01 1.018569e+00
## collabTRUE:main_colorBrown               8.147132e-01 1.165576e+00
## collabTRUE:main_colorGray                5.608252e-01 9.127867e-01
## collabTRUE:main_colorGreen               8.977489e-01 1.457931e+00
## collabTRUE:main_colorMulti-Color         7.405521e-01 1.134137e+00
## collabTRUE:main_colorOrange              9.810038e-01 1.406204e+00
## collabTRUE:main_colorPurple              8.592863e-01 1.299269e+00
## collabTRUE:main_colorRed                9.115668e-01 1.264243e+00
## collabTRUE:main_colorWhite              1.018054e+00 1.224174e+00
## collabTRUE:main_colorYellow              7.717226e-01 1.418703e+00

## brandAir Jordan                         brandAsics
##                               353.059584          2182.109071
## brandConverse                           brandJordan Brand
##                               520.080647          319.790886
## brandNew Balance                         brandNike
##                               400.075956          232.428448
## brandNike Basketball                     brandNike Running
##                               401.539087          272.226211
## brandOther Brands                        brandPuma
##                               451.504644          365.287879
## brandReebok                            release_monthFeb
##                               372.539592          2.698560
## release_monthMar                         release_monthApr
##                               2.758851          3.063686
## release_monthMay                         release_monthJun
##                               2.352315          2.510071
## release_monthJul                         release_monthAug
##                               2.383284          2.524564
## release_monthSep                         release_monthOct
##                               2.231865          2.108956
## release_monthNov                         release_monthDec
##                               2.391471          2.320492
## release_dowMonday                        release_dowTuesday
##                               1.814133          2.268680
## release_dowWednesday                     release_dowThursday
##                               2.704698          4.628991
## release_dowFriday                        release_dowSaturday
##                               4.155572          5.407437
## wmnstrue                                collabTRUE
##                               1.186176          10.522385
## retroTRUE                                kidsTRUE
##                               1.116743          1.227197
## main_colorBlue                          main_colorBrown
##                               1.441675          1.304606
## main_colorGray                          main_colorGreen

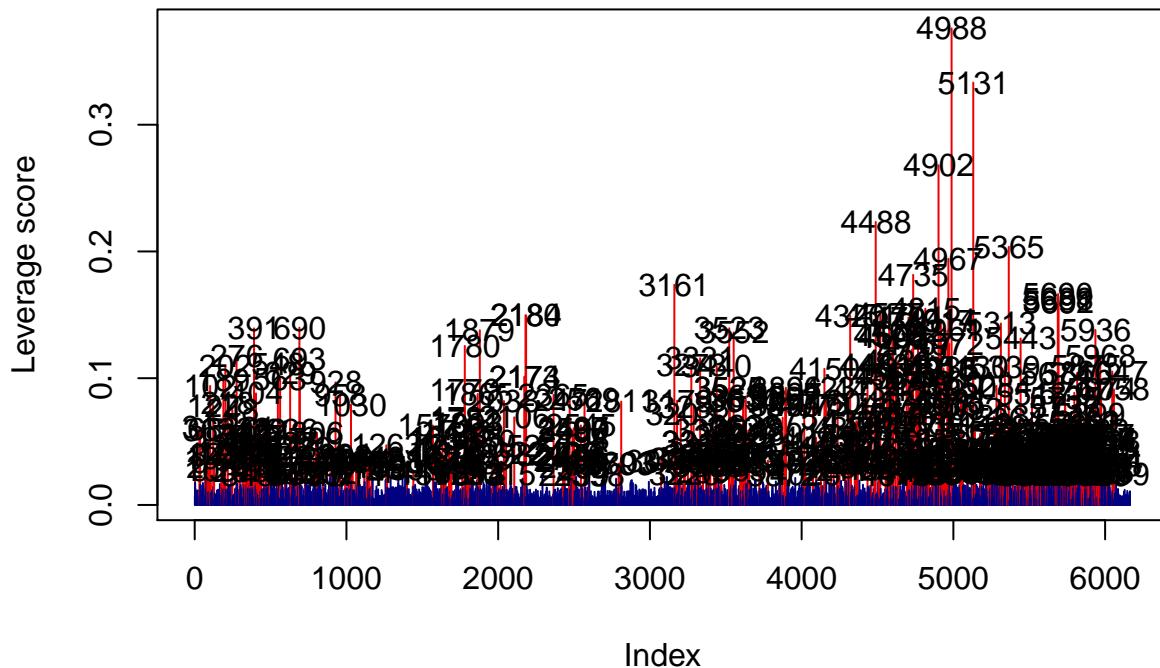
```

```

##                                1.154905
##      main_colorMulti-Color      1.256948
##                                main_colorPurple
##                                1.230762
##      main_colorWhite           1.480763
##                                bin_wantsSomewhat Popular
##                                1.920047
##      bin_wantsExtremely Popular 2.665832
##  collabTRUE:bin_wantsSomewhat Popular
##                                3.729120
##  collabTRUE:bin_wantsExtremely Popular
##                                3.187039
##      brandAsics:log_retail_price 2182.882839
##      brandJordan Brand:log_retail_price
##                                319.826771
##      brandNike:log_retail_price   brandNike Basketball:log_retail_price
##                                238.020203                           402.871264
##      brandNike Running:log_retail_price 272.192130
##      brandPuma:log_retail_price        364.962463
##  collabTRUE:main_colorBlue       1.839961
##  collabTRUE:main_colorGray      1.142537
##  collabTRUE:main_colorMulti-Color 1.344403
##  collabTRUE:main_colorPurple    1.328049
##  collabTRUE:main_colorWhite     2.193171
##                                1.172617
##      main_colorOrange          1.305476
##      main_colorRed             1.246164
##      main_colorYellow          1.329789
##      bin_wantsVery Popular     2.200202
##      log_retail_price          3.313898
##  collabTRUE:bin_wantsVery Popular 4.252918
##  brandAir Jordan:log_retail_price
##                                357.990262
##  brandConverse:log_retail_price 520.426173
##  brandNew Balance:log_retail_price 400.074258
##  brandOther Brands:log_retail_price 451.642426
##  brandReebok:log_retail_price   372.424046
##  collabTRUE:main_colorBrown    1.421393
##  collabTRUE:main_colorGreen    1.219088
##  collabTRUE:main_colorOrange   1.436819
##  collabTRUE:main_colorRed      1.342645
##  collabTRUE:main_colorYellow   1.373942

```

## Leverage Scores for all observations



```

## Linear mixed model fit by REML ['lmerMod']
## Formula: log_resale_price ~ (1 | brand) + release_month + release_dow +
##           wmnss + collab + retro + kids + main_color + bin_wants + retail_price
## Data: sneakers
##
## REML criterion at convergence: 7286.3
##
## Scaled residuals:
##   Min     1Q   Median     3Q    Max 
## -5.8785 -0.5723 -0.0271  0.4832  8.7730
##
## Random effects:
##   Groups   Name        Variance Std.Dev.
##   brand    (Intercept) 0.008084 0.08991
##   Residual           0.184705 0.42977
## Number of obs: 6164, groups: brand, 12
##
## Fixed effects:
##              Estimate Std. Error t value
## (Intercept) 4.0736543  0.0476133 85.557
## release_monthFeb 0.0213021  0.0297161  0.717
## release_monthMar 0.0547314  0.0296867  1.844
## release_monthApr 0.0192001  0.0301579  0.637
## release_monthMay -0.0329924  0.0314958 -1.048
## release_monthJun 0.0284872  0.0304721  0.935
## release_monthJul -0.0028104  0.0310392 -0.091
## release_monthAug 0.0217993  0.0307140  0.710
## release_monthSep 0.0668168  0.0317158  2.107
## release_monthOct 0.0417167  0.0324003  1.288

```

## release_monthNov	0.0916576	0.0306865	2.987
## release_monthDec	0.0709083	0.0310721	2.282
## release_dowMonday	0.1779192	0.0357938	4.971
## release_dowTuesday	0.0684542	0.0332779	2.057
## release_dowWednesday	0.0629387	0.0306676	2.052
## release_dowThursday	0.0472275	0.0269842	1.750
## release_dowFriday	0.0448672	0.0282779	1.587
## release_dowSaturday	0.0791715	0.0276000	2.869
## wmnstrue	0.0336349	0.0164518	2.044
## collabtrue	0.2580805	0.0193282	13.353
## retrotrue	0.1511631	0.0329742	4.584
## kidstrue	-0.0610148	0.0228466	-2.671
## main_colorBlue	0.0022677	0.0165131	0.137
## main_colorBrown	-0.0620913	0.0355652	-1.746
## main_colorGray	-0.0089108	0.0280363	-0.318
## main_colorGreen	0.0147141	0.0376136	0.391
## main_colorMulti-Color	0.0616943	0.0401102	1.538
## main_colorOrange	-0.0289575	0.0356443	-0.812
## main_colorPurple	-0.0233059	0.0353917	-0.659
## main_colorRed	0.0205475	0.0234084	0.878
## main_colorWhite	0.0272792	0.0145749	1.872
## main_colorYellow	-0.1027996	0.0658986	-1.560
## bin_wantsSomewhat Popular	0.0117084	0.0170289	0.688
## bin_wantsVery Popular	0.1137923	0.0175774	6.474
## bin_wantsExtremely Popular	0.3047638	0.0191639	15.903
## retail_price	0.0033335	0.0001014	32.859

---