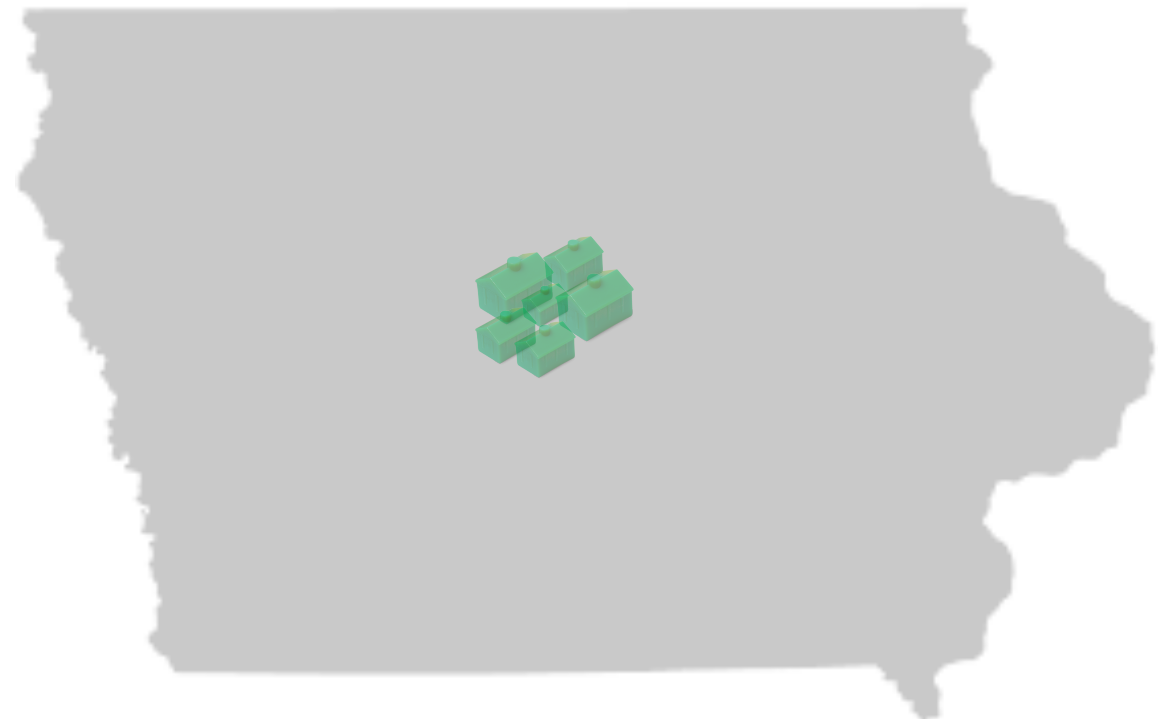


# Increasing the Value of an Ames, IA home

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June 27, 2019



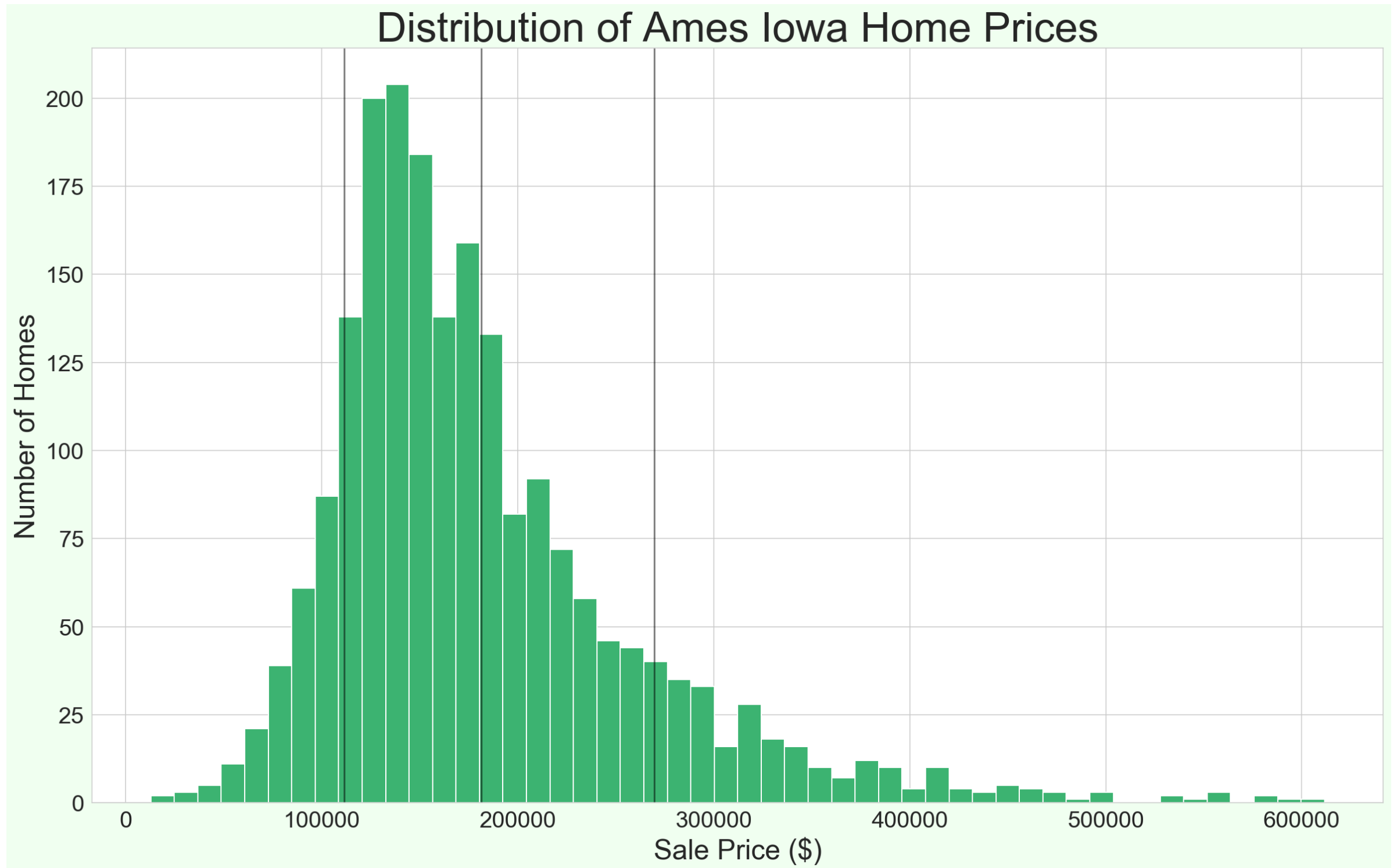
# Overview

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- Summarize Ames, Iowa sale prices
- Understand how we can predict sale prices
- Investigate modifiable home features which may increase sale price. These include:
  - Overall quality
  - Recent remodel
  - Attached garage
  - Paved Driveway

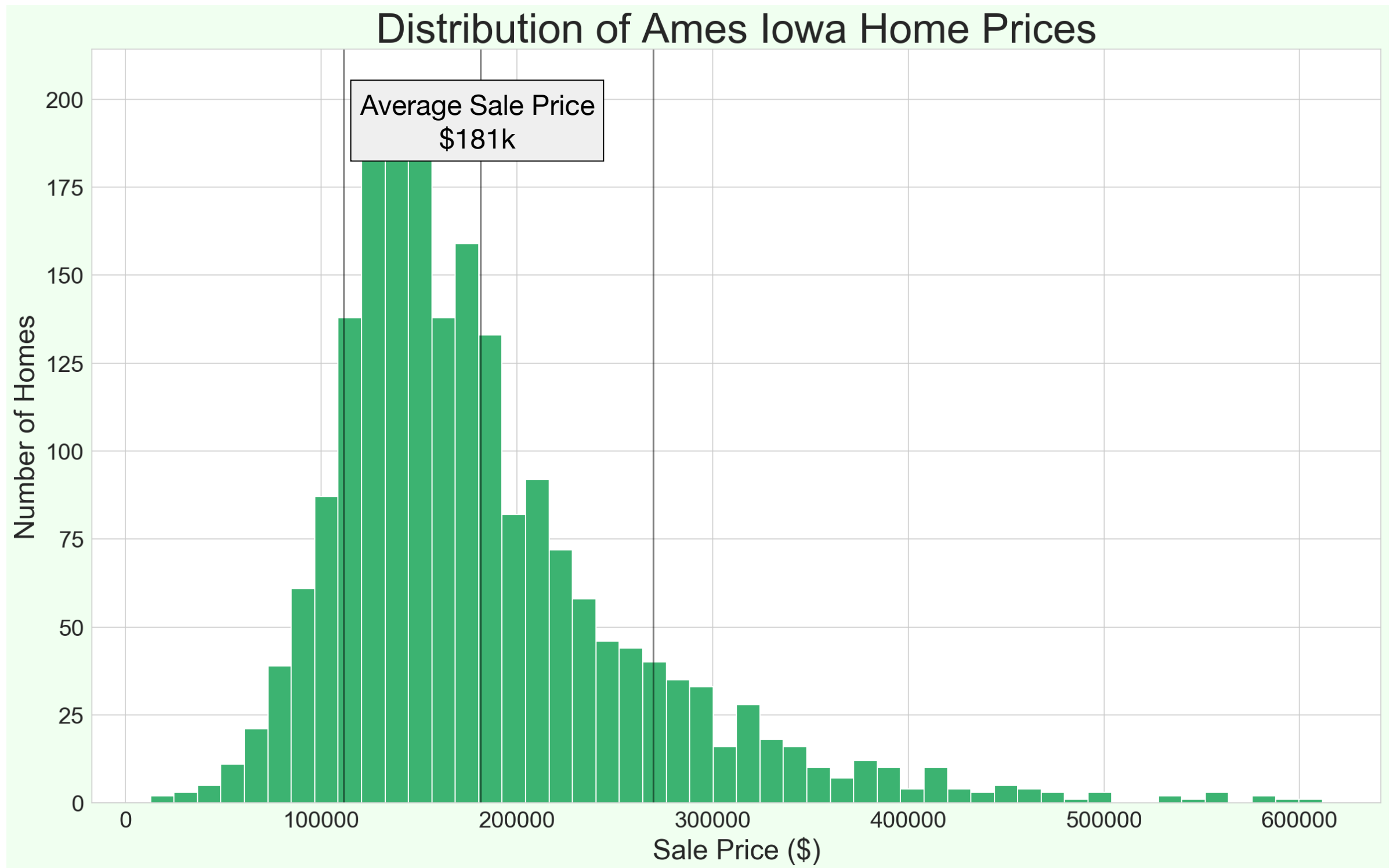
# Ames Iowa Market at a Glance

- With a broad range of home values in the city of Ames, it can be hard to know what your home is currently worth.



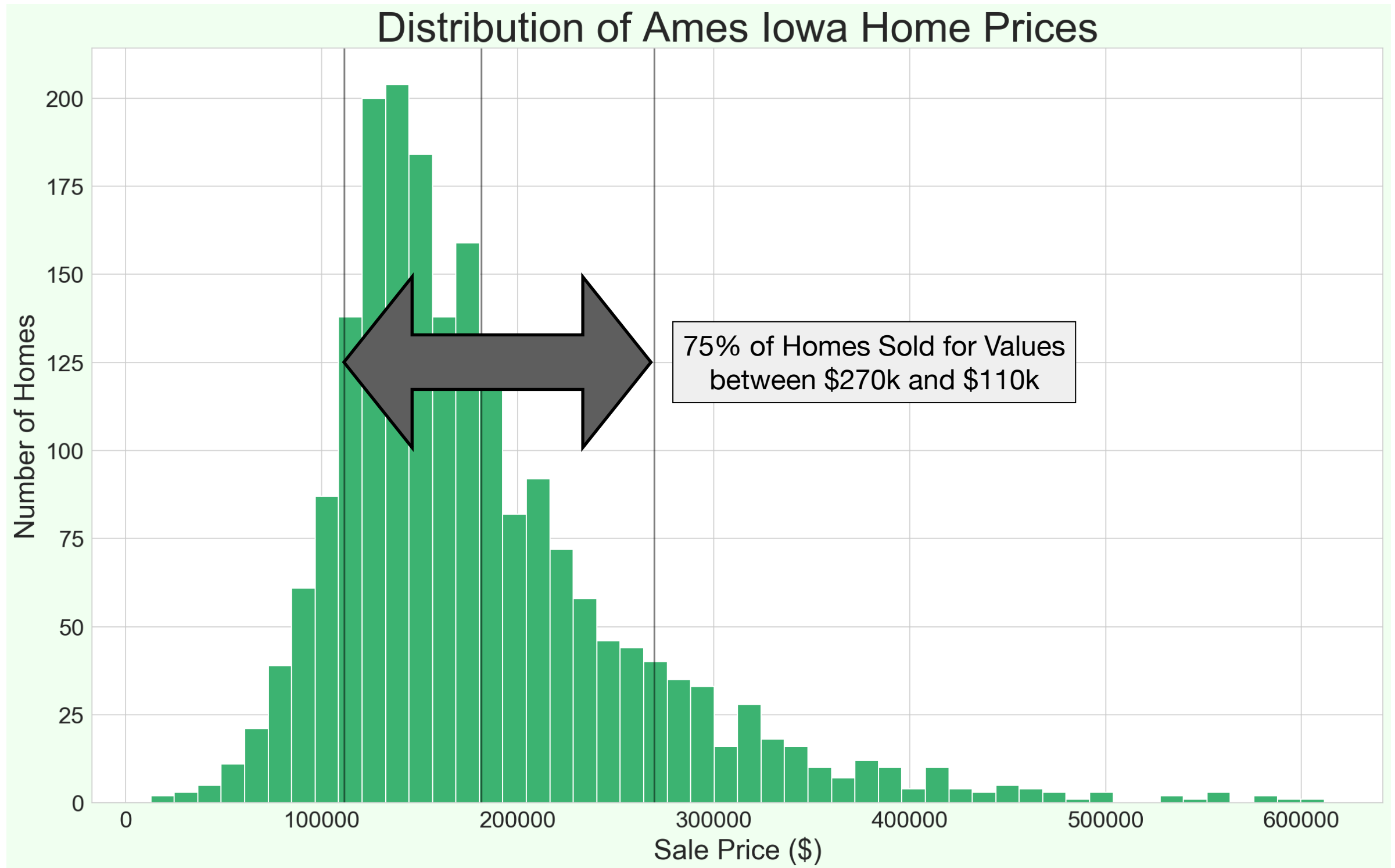
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# How to Estimate the Value of a Home

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- Using **13 attributes** of a property - and **7 interactions** between them - I created a model to predict the value of a home.

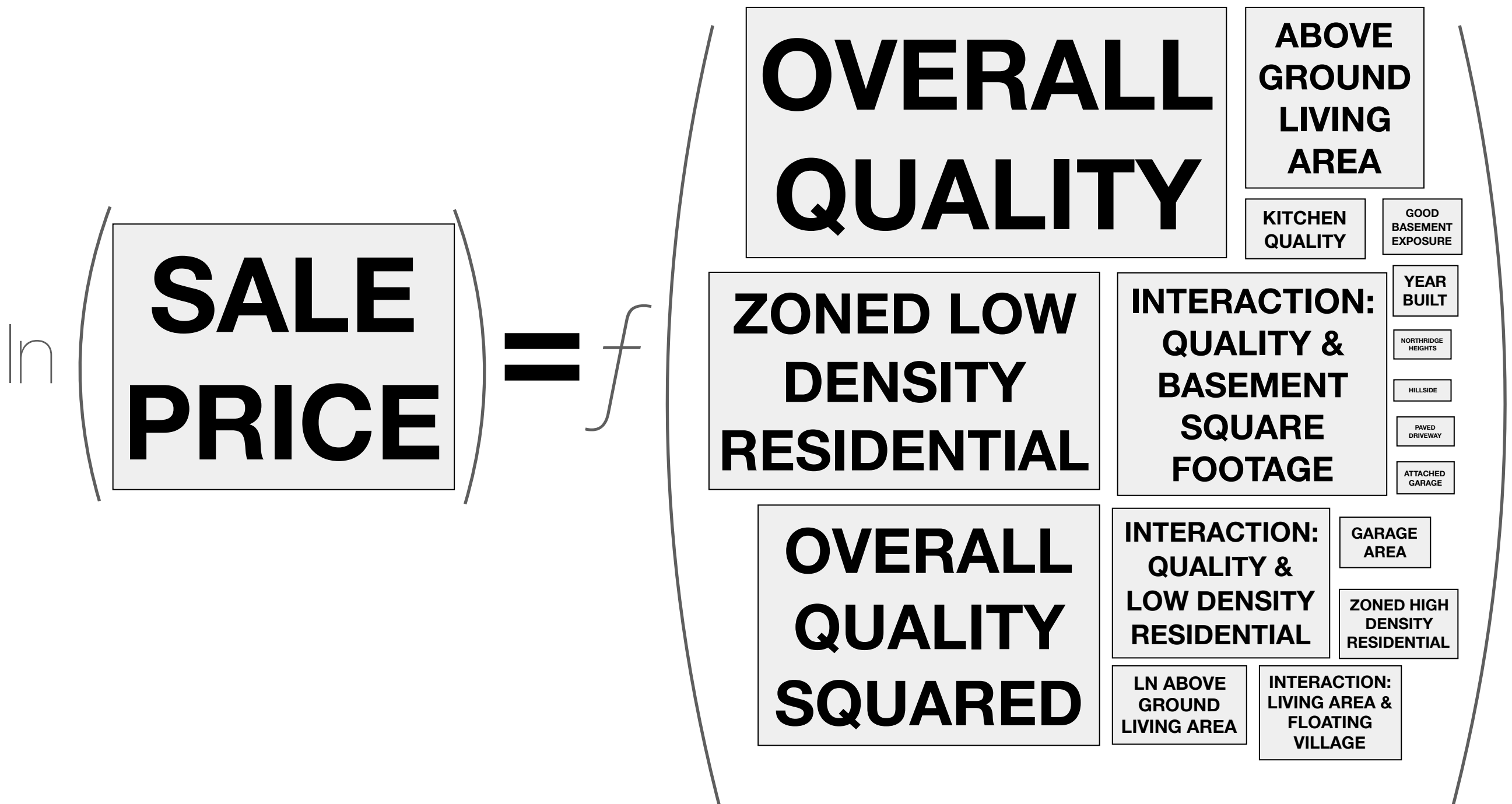
# How to Estimate the Value of a Home

- Using **13 attributes** of a property - and **7 interactions** between them - I created a model to predict the value of a home.

Feature	Description
overall_qual	Overall Quality of Home, scale from 10 (Very Excellent) to 1 (Very Poor), unmodified from original dataset
year_built	Original Construction Year, unmodified from original dataset
exter_cond	Exterior Condition, scale from 5 (Excellent) to 1 (Poor), modified from original dataset
bsmt_exposure	Good = 1, Less than good exposure or no basement = 0, modified from original dataset
gr_liv_area	Above Ground Living Area in Square Feet, unmodified from original dataset
kitchen_qual	Kitchen Quality, scale from 5 (Excellent) to 1 (Poor), modified from original dataset
garage_area	Garage Area in Square Feet, unmodified from original dataset
paved_drive	Fully Paved Driveway = 1, Partially Paved, Unpaved or No Driveway = 0, modified from original dataset
saleprice	Sale Price of Home, unmodified from original dataset
attached_garage	Built In or Attached = 1, All other types or none = 0, modified from garage_type
residential_low	Zoned as Low Density Residential = 1, Otherwise = 0, modified from ms_zoning
residential_other	Zoned as Residential: Medium Density, High Density or Park = 1, Otherwise = 0, modified from ms_zoning
northridge_hts	Located in Northridge Heights = 1, Otherwise = 0, modified from neighborhood
---	---
log_gr_liv_area	Natural Log of gr_liv_area Variable
square_overall_qual	Square of overall_qual
inter_qual_rl	Interaction between overall_qual and residential_low
inter_area_fv	Interaction between gr_liv_area and floating_village
inter_qual_bsmt_sf	Interaction between overall_qual and total_bsmt_sf

# How to Estimate the Value of a Home

- Using **13 attributes** of a property - and **7 interactions** between them - I created a model to predict the value of a home.

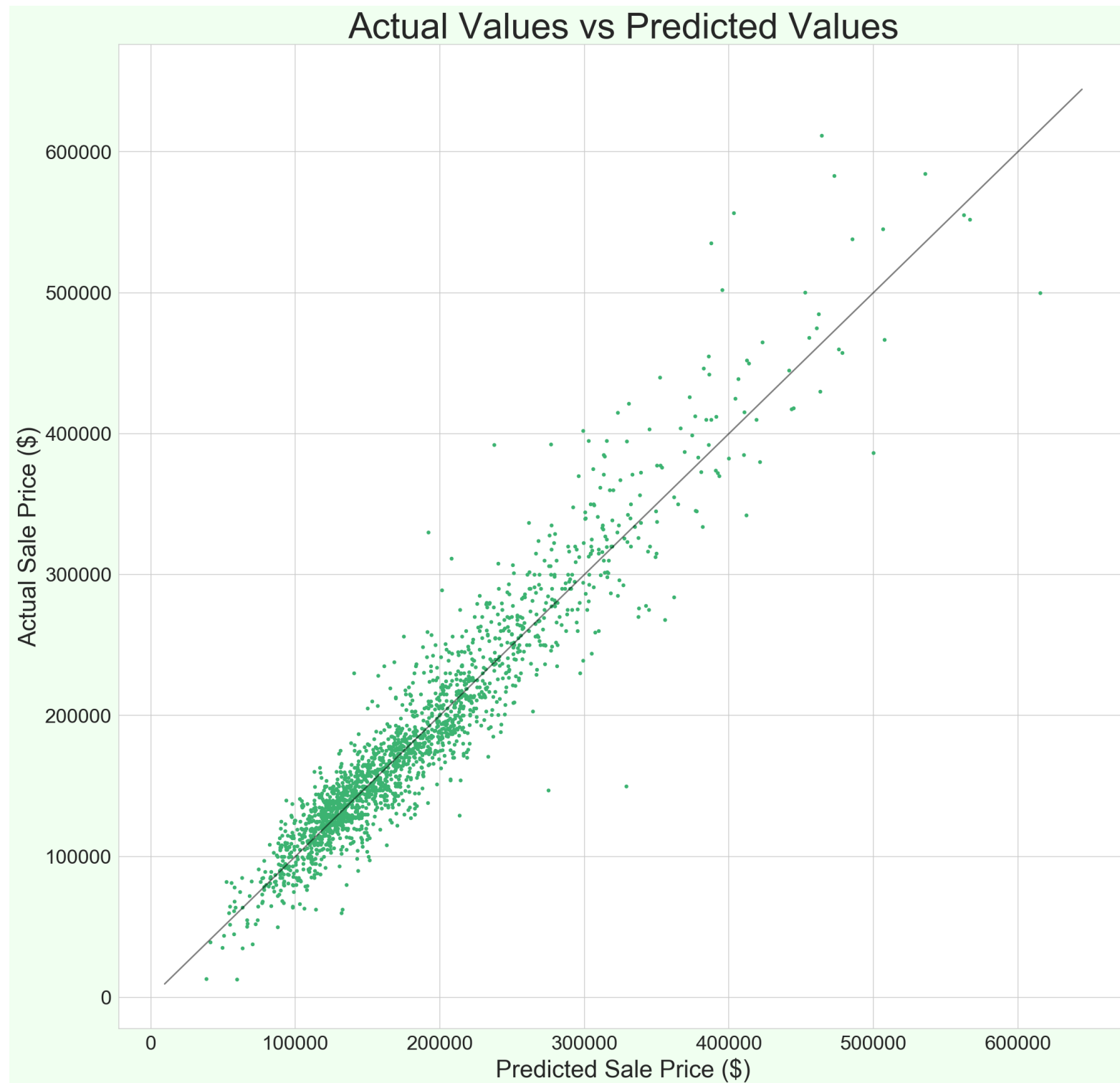


Font sizes directly proportional to scaled coefficients for variables (not box sizes)



# How to Estimate the Value of a Home

- The estimate from this model will explain a property sale price's difference from the average sale price **accurately over 90% of the time.**



# A Closer Look at the Contributing Attributes

Impractical or Expensive Changes

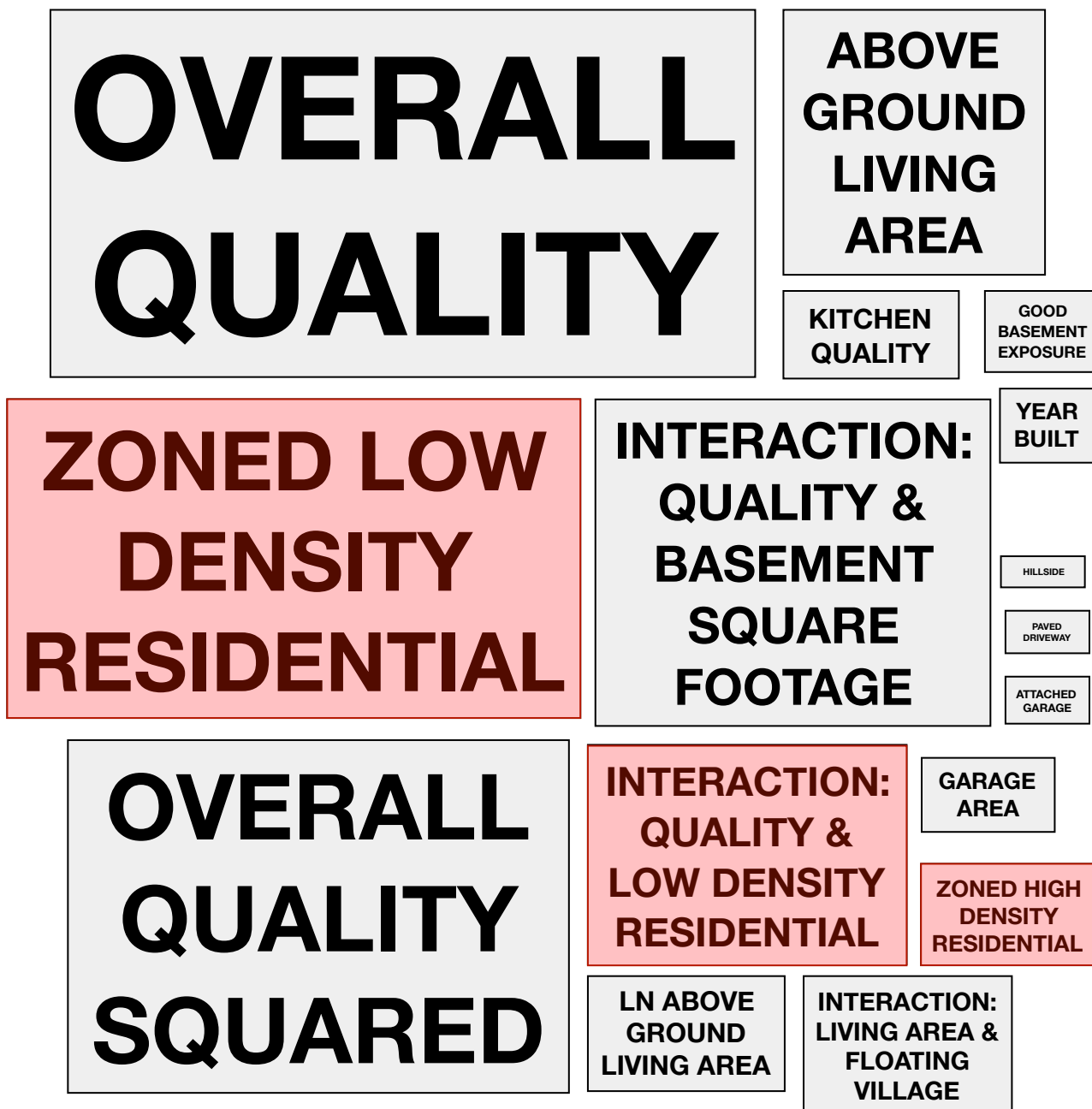


\*Source: <https://www.discover.com/home-equity-loans/blog/costs-home-renovations-expansions-additions/>

# A Closer Look at the Contributing Attributes

## Impractical or Expensive Changes

- You could petition to change the zoning of your location, but that would be a long and difficult process.
- Worse, you might find that even with different zoning, your home is still valued as though in its previous zoning.



\*Source: <https://www.discover.com/home-equity-loans/blog/costs-home-renovations-expansions-additions/>

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- Worse, you might find that even with different zoning, your home is still valued as though in its previous zoning.
- If you have the land available, you can add square footage by building out. This typically isn't too costly and allows you to live in your home, but you will lose backyard space and could encounter zoning issues.\*
- You could build another floor, but this is typically expensive and requires you to move out of your home.
- On average, this costs of an addition are 10% more than a remodel

\*Source: <https://www.discover.com/home-equity-loans/blog/costs-home-renovations-expansions-additions/>

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- On average, this costs 10% more than a remodel
- You can't change the location of your home or when it was built.

\*Source: <https://www.discover.com/home-equity-loans/blog/costs-home-renovations-expansions-additions/>

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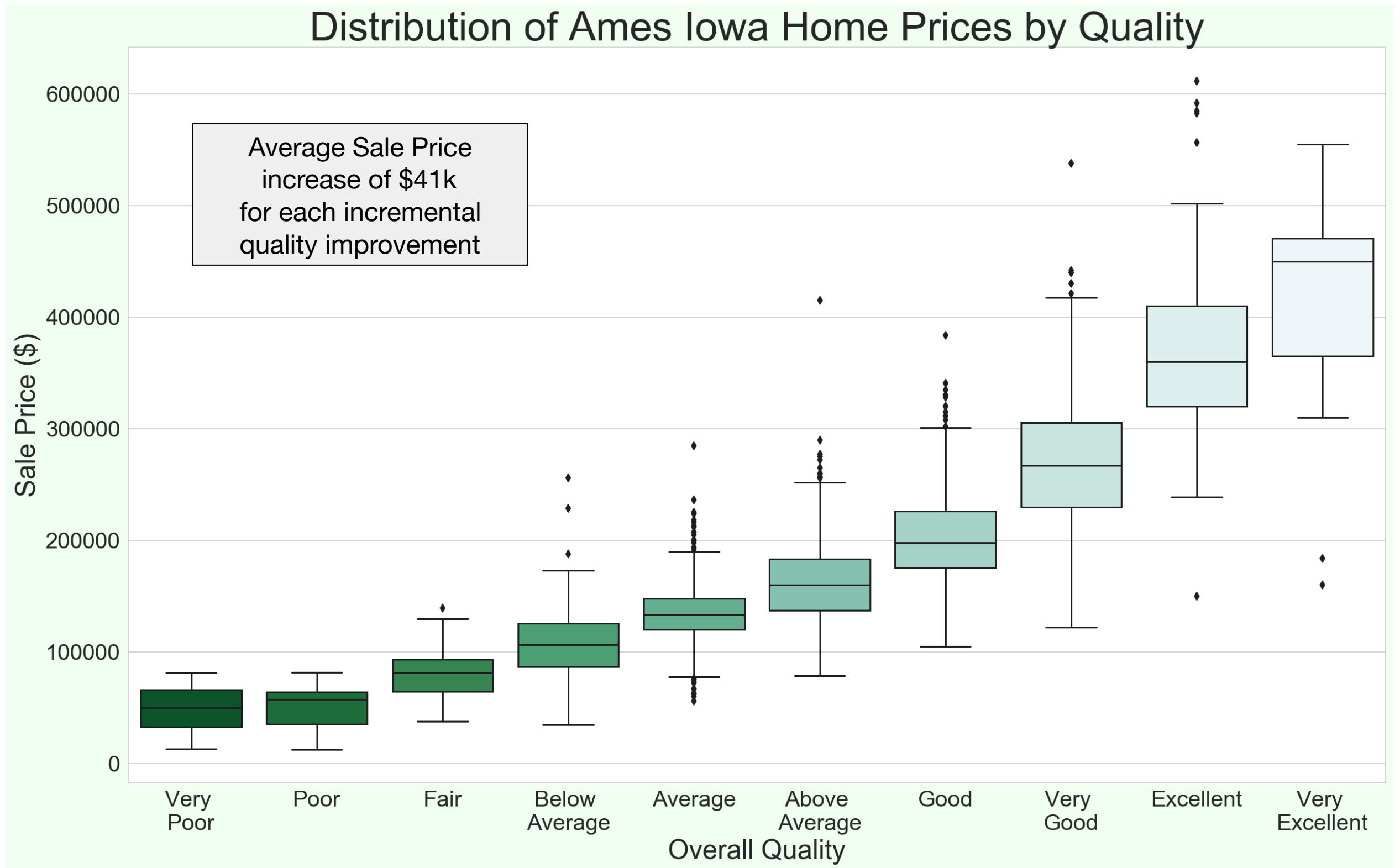


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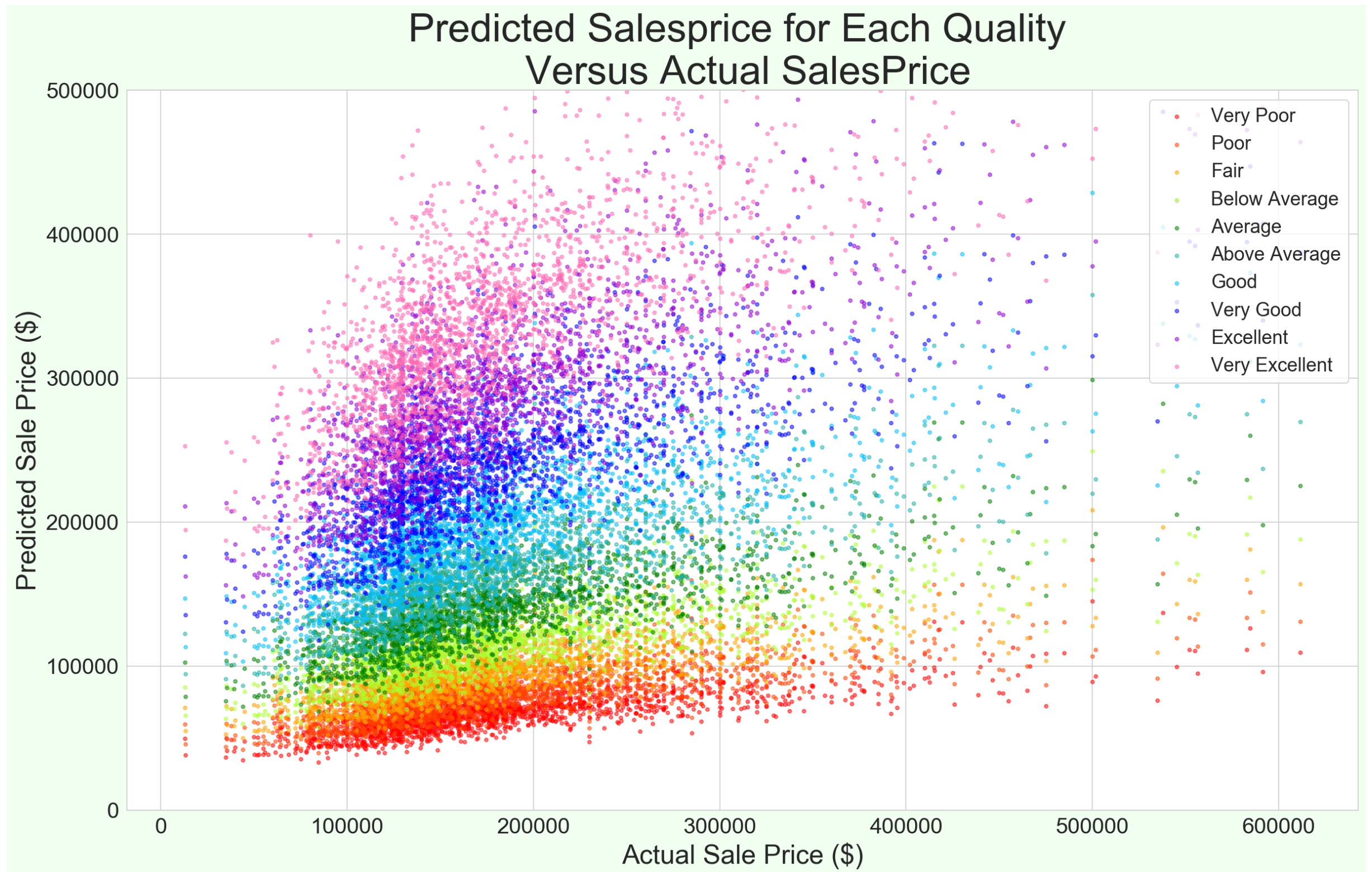
\*Source: <https://www.discover.com/home-equity-loans/blog/costs-home-renovations-expansions-additions/>

# Improving Home Quality Increases Sale Price



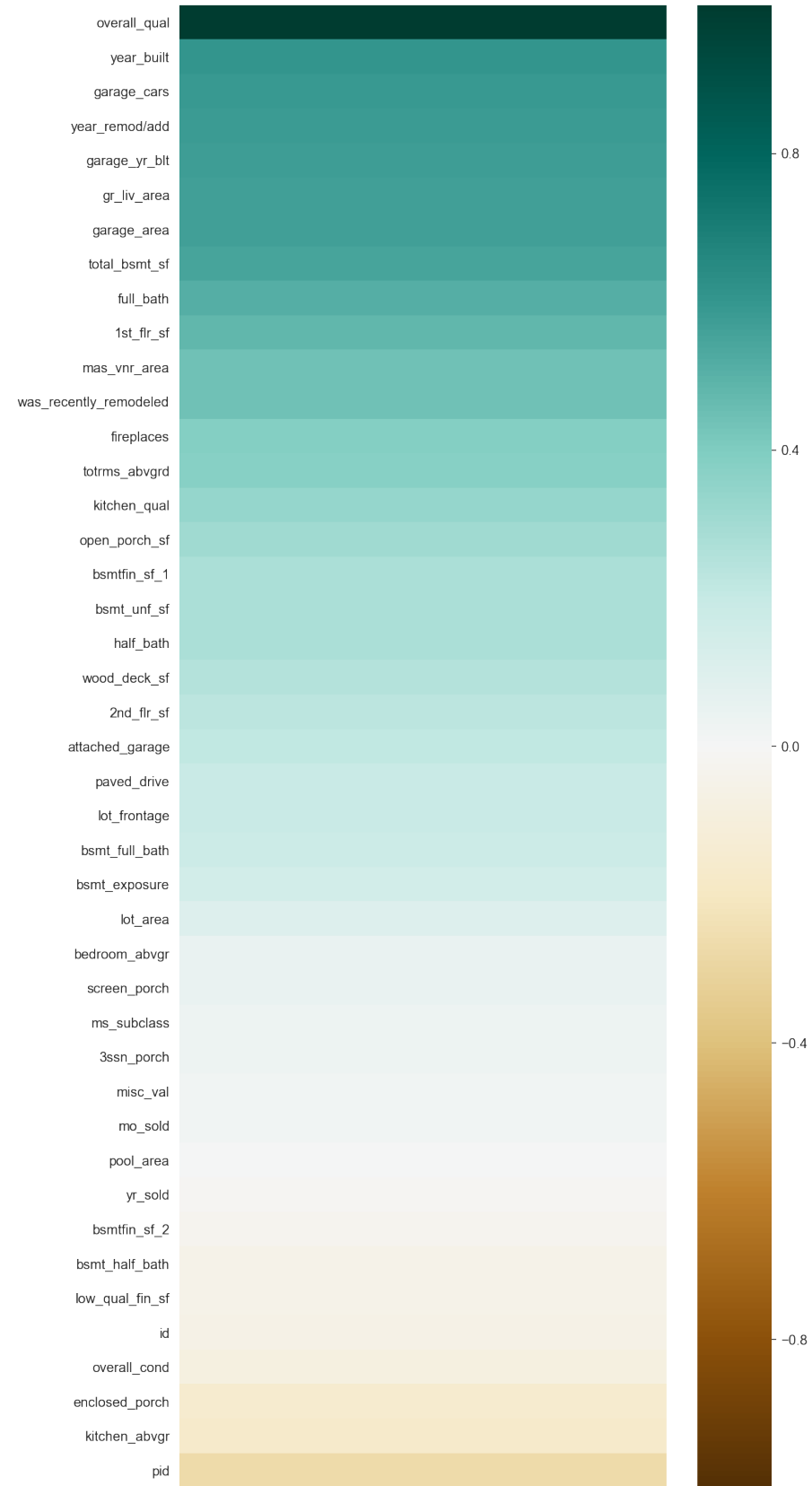


# Improving Home Quality Increases Sale Price



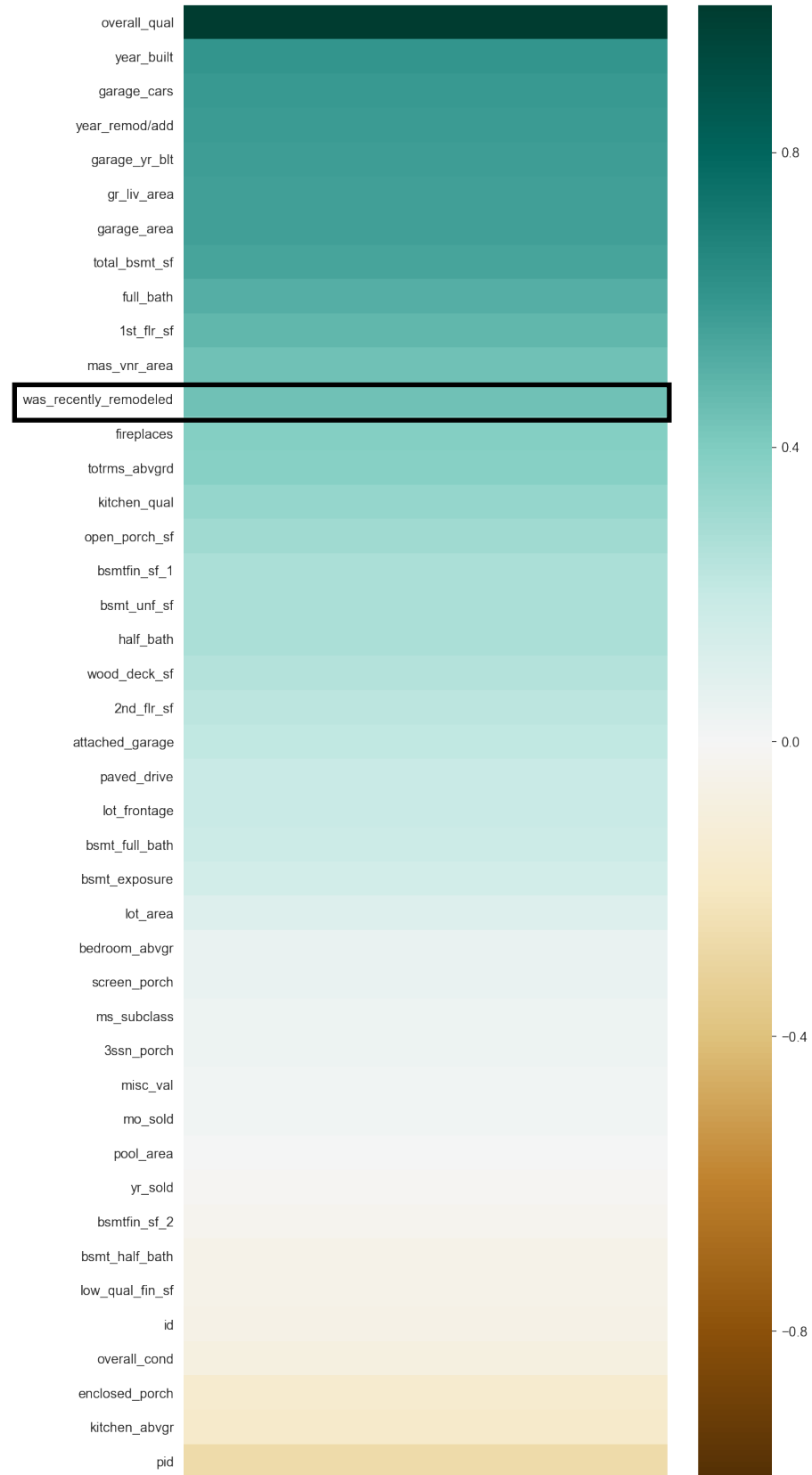


# Improving Home Quality: Remodeling



\*Source: <https://www.manta.com/cost-home-renovation-companies-ames-ia>

# Improving Home Quality: Remodeling

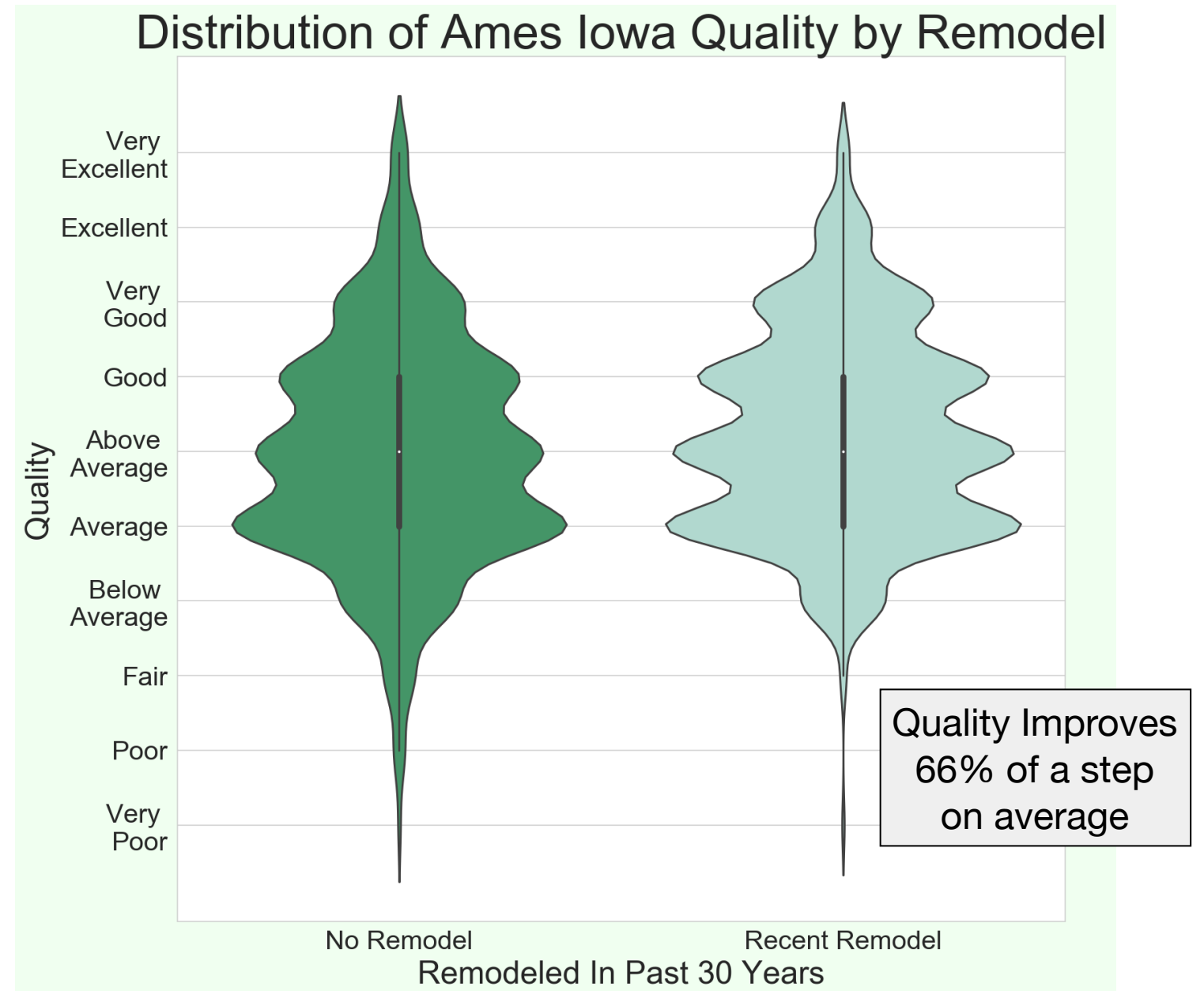
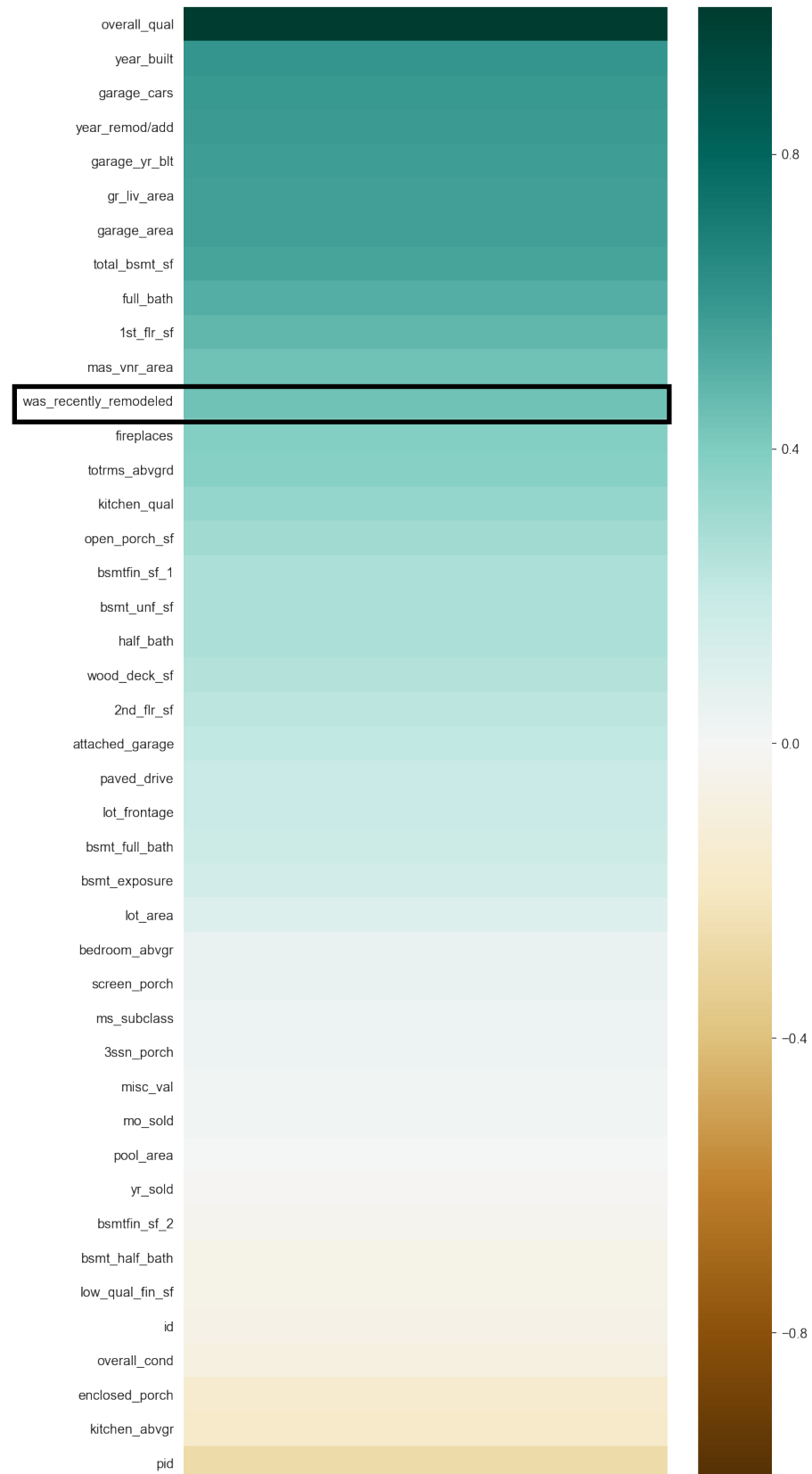


- Homes remodeled in the past 30 years have a positive correlation with overall quality.

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# Improving Home Quality: Remodeling

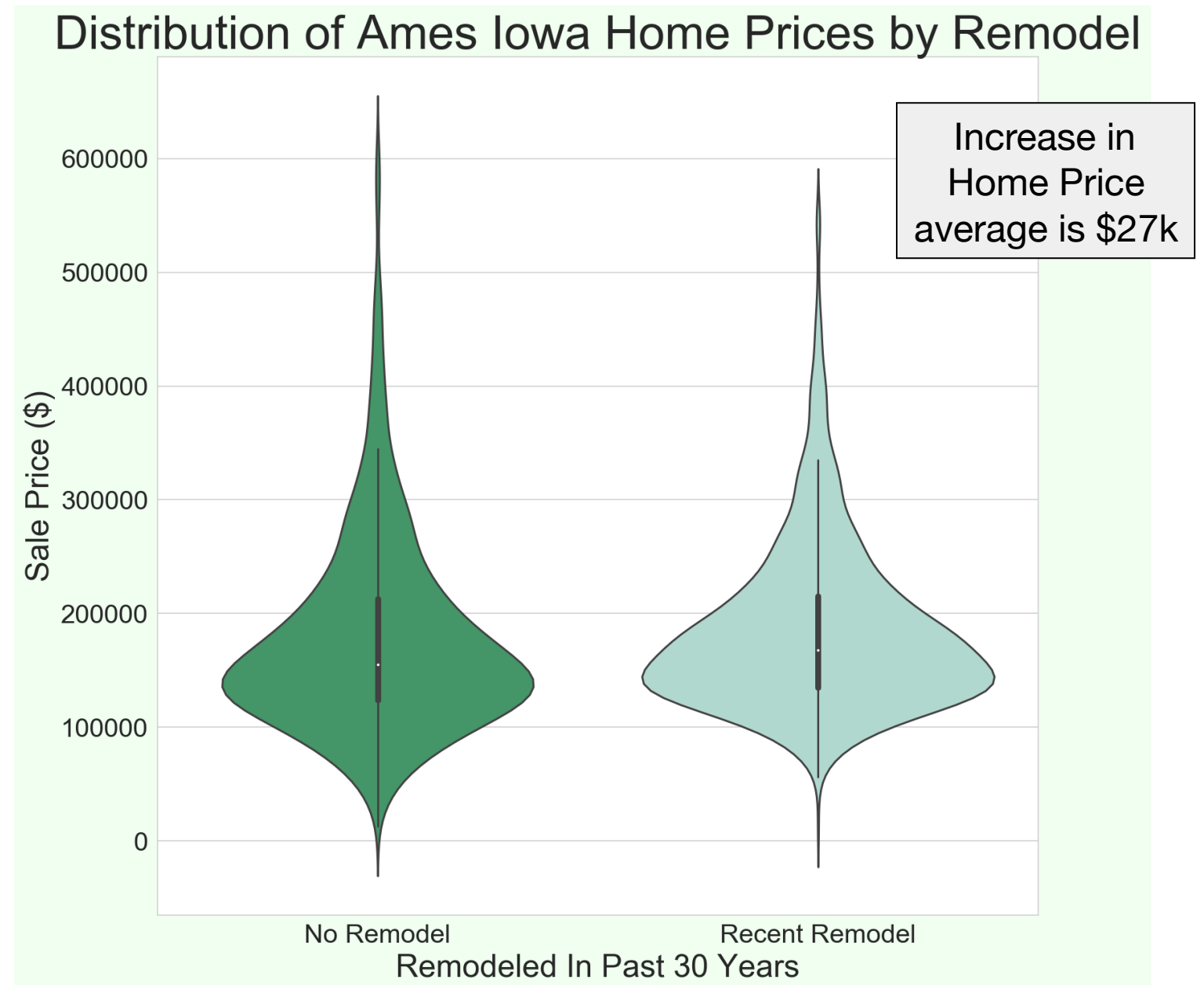
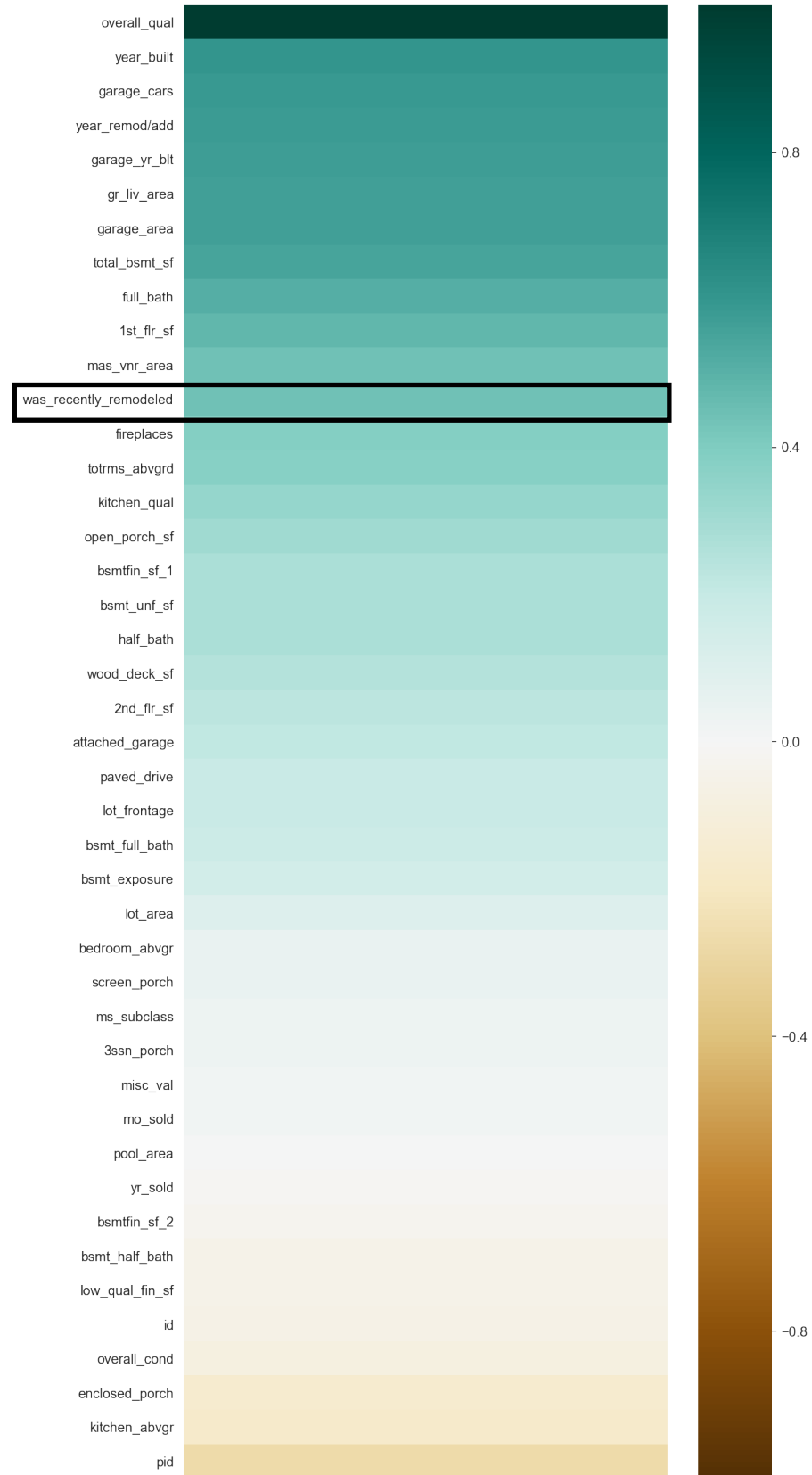
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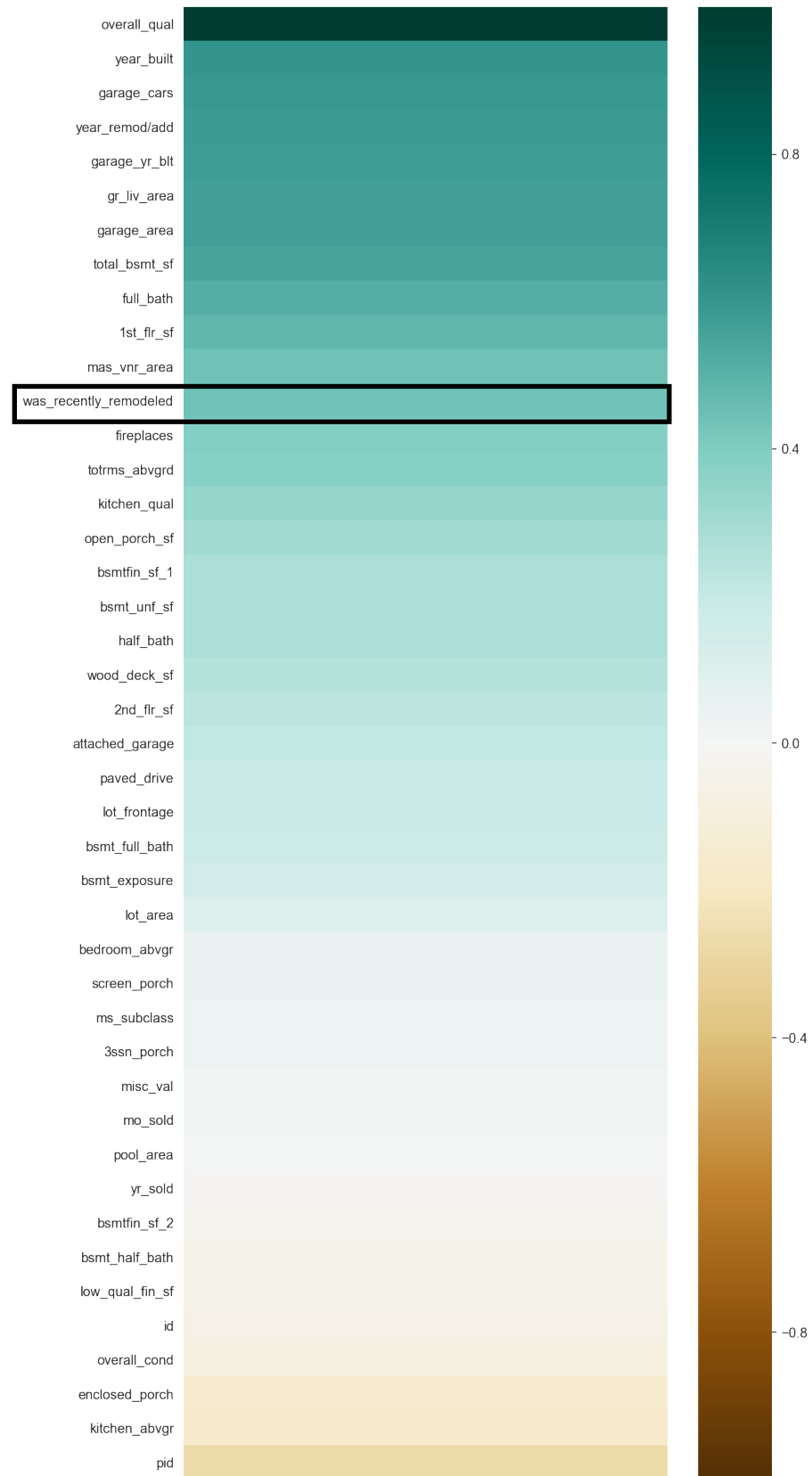
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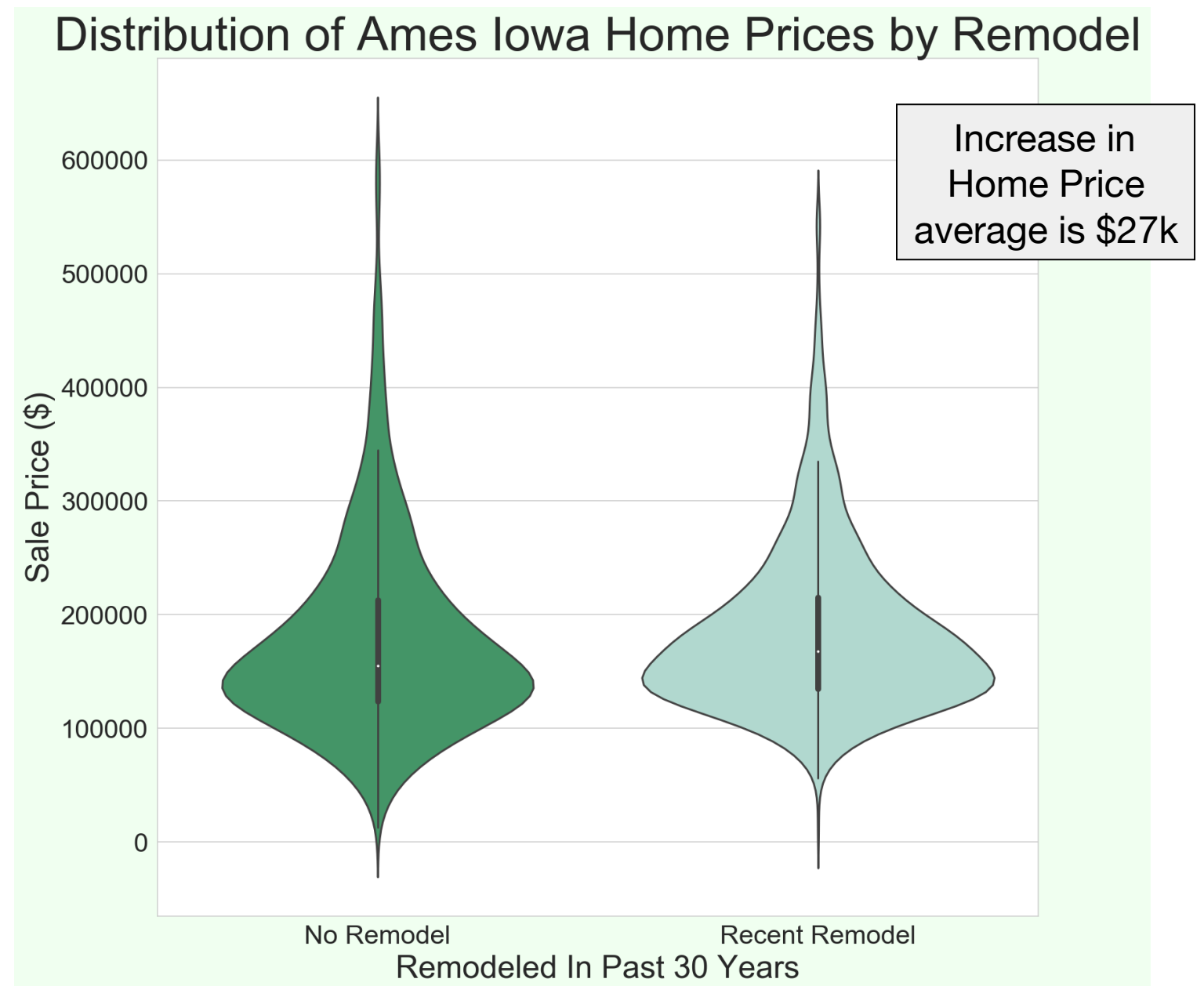


\*Source: <https://www.manta.com/cost-home-renovation-companies-ames-ia>

# Improving Home Quality: Remodeling

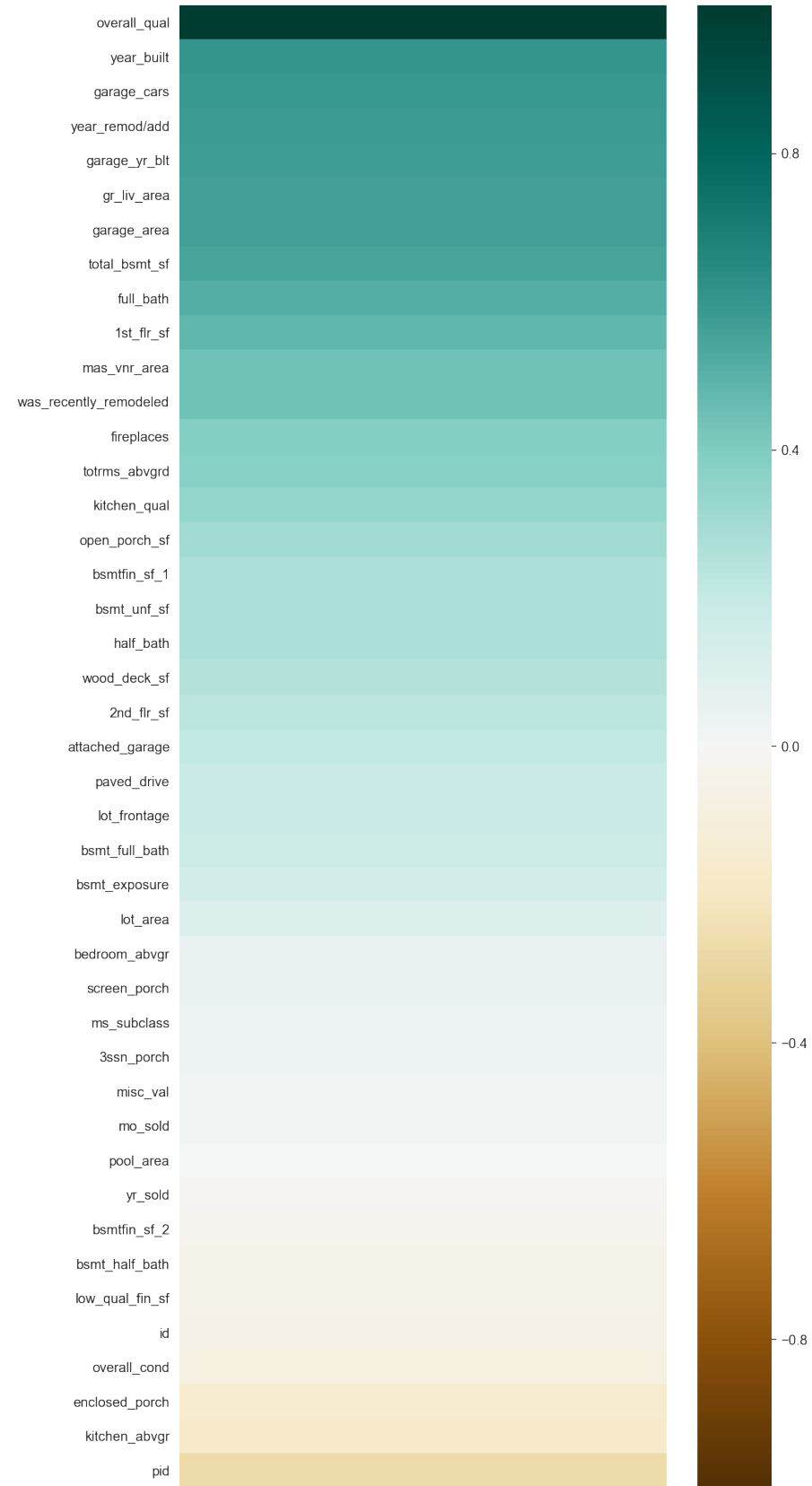


- Homes remodeled in the past 30 years have a positive correlation with overall quality.
- The average cost of a home renovation in Ames in 2019 is \$45k\*



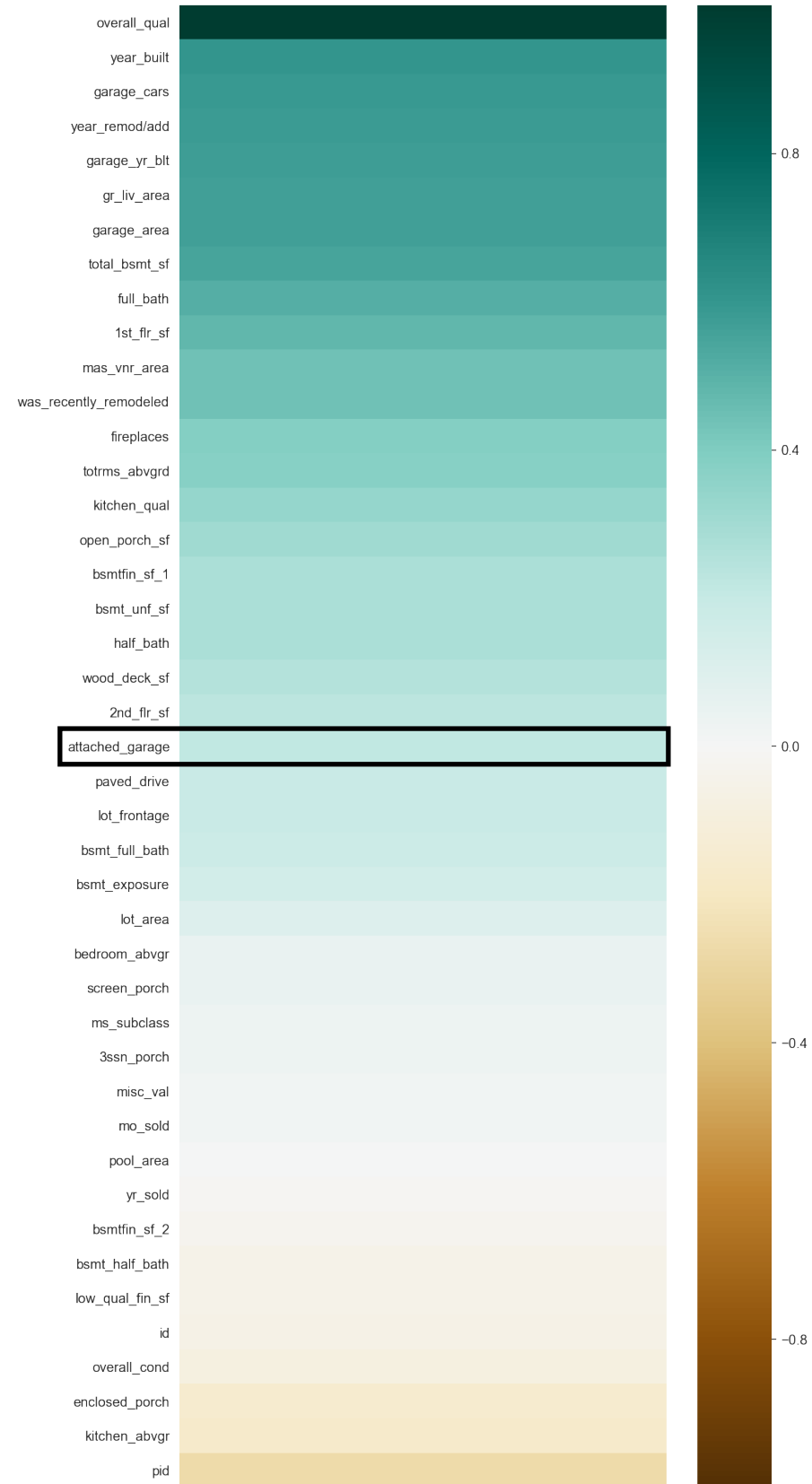
\*Source: <https://www.manta.com/cost-home-renovation-companies-ames-ia>

# Improving Home Quality: Garage Type



\*Source: <https://www.fixr.com/costs/build-attached-garage>

# Improving Home Quality: Garage Type

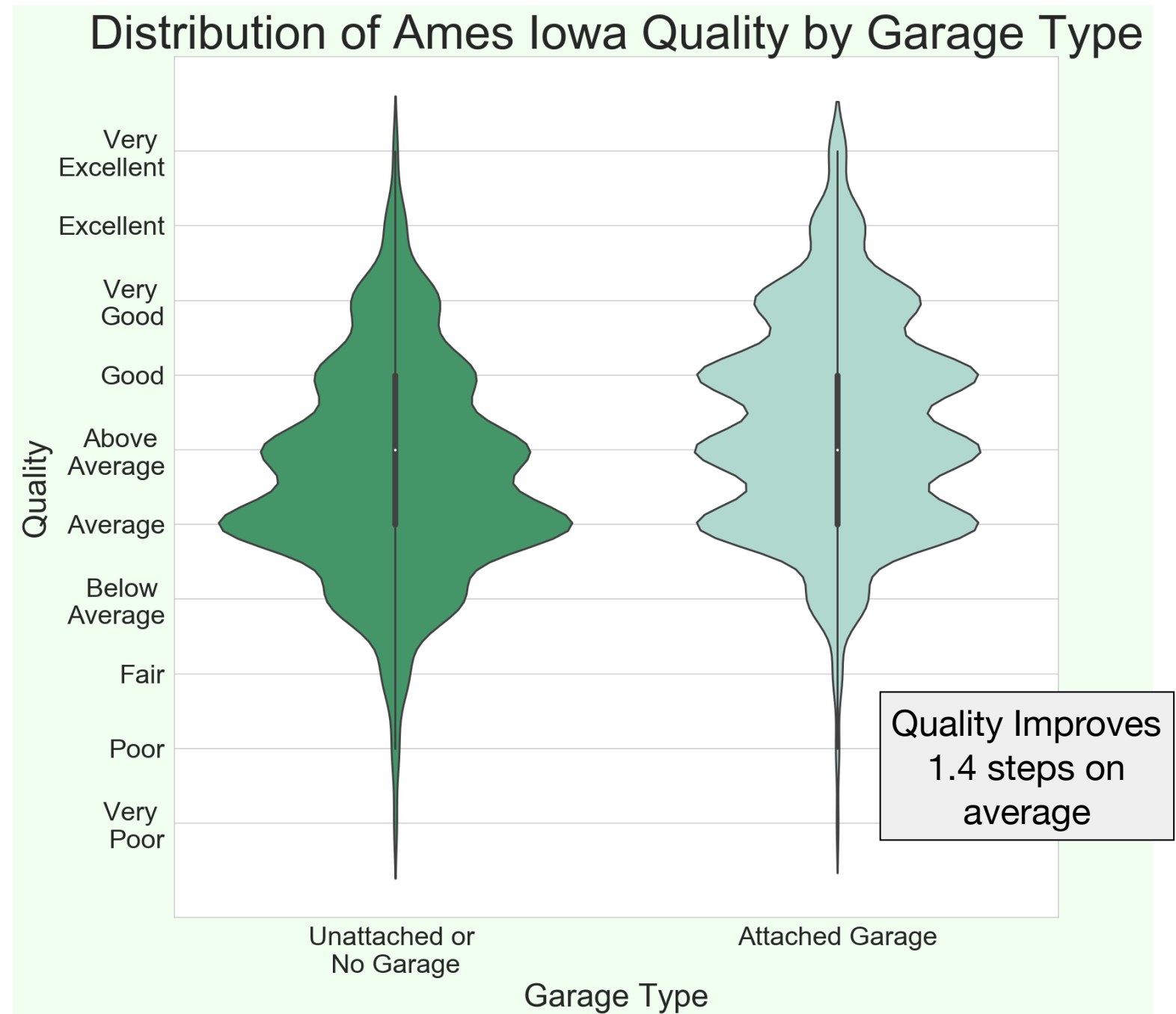
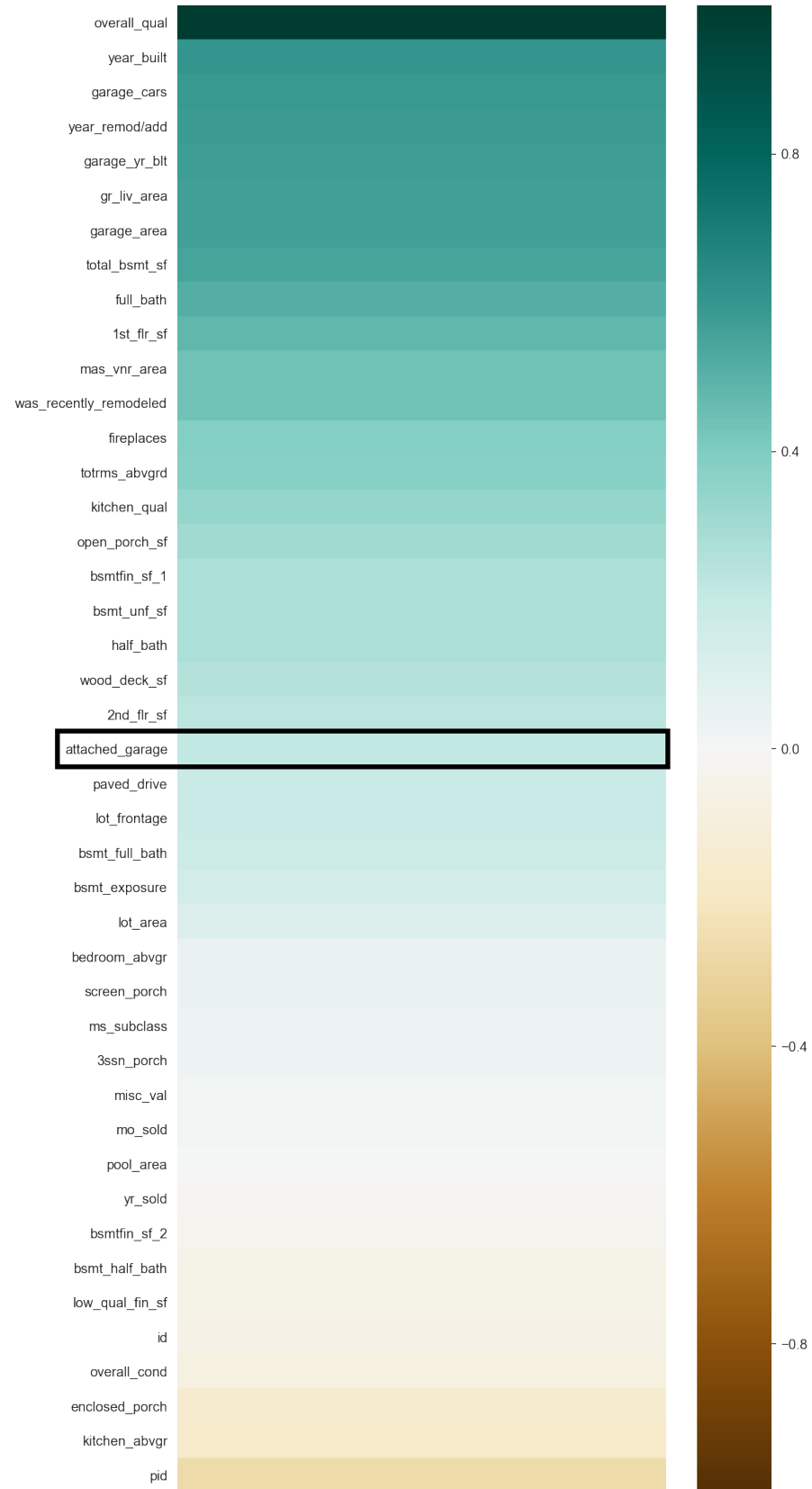


- Homes with an attached garage have a positive correlation with overall quality.

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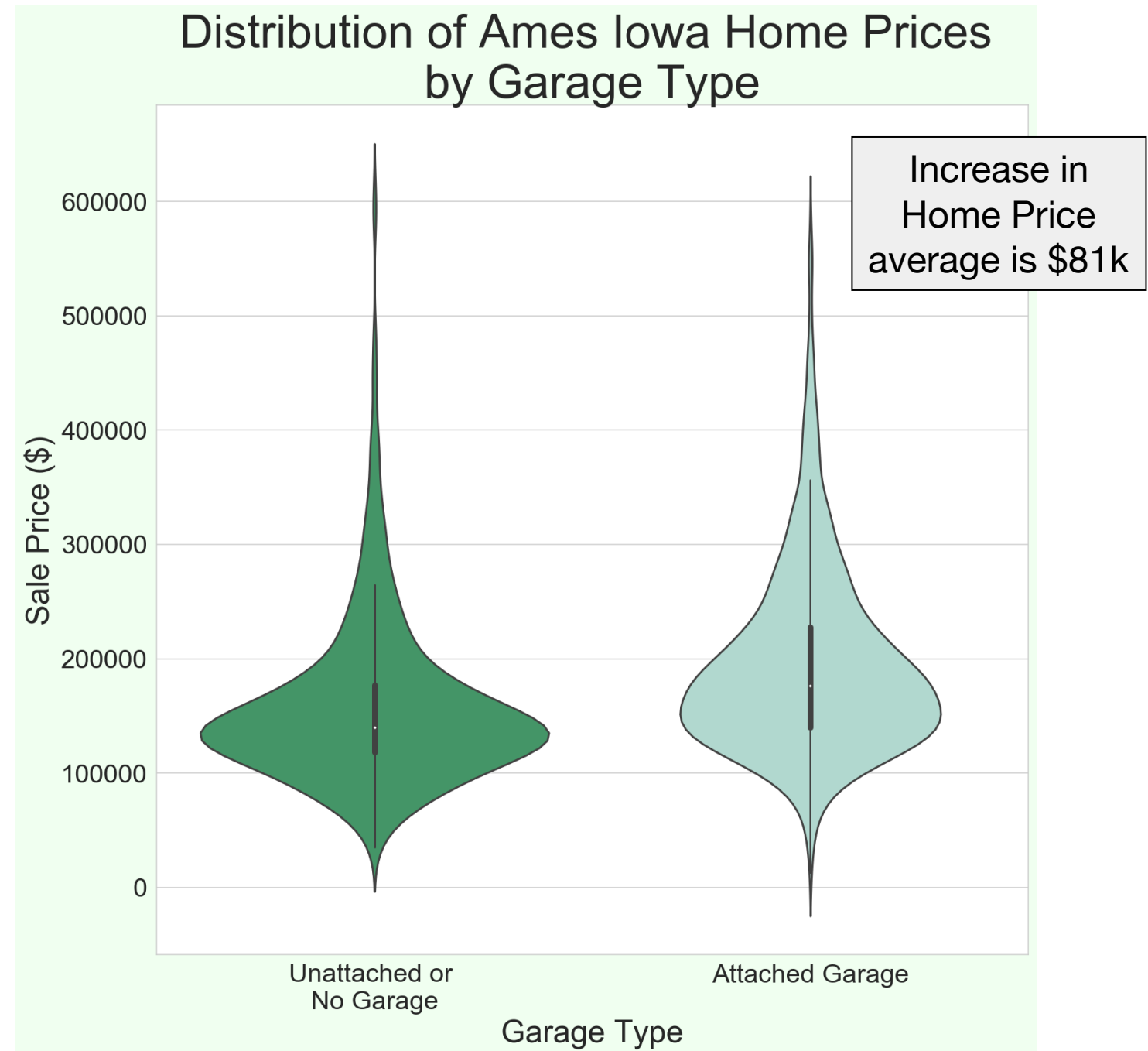
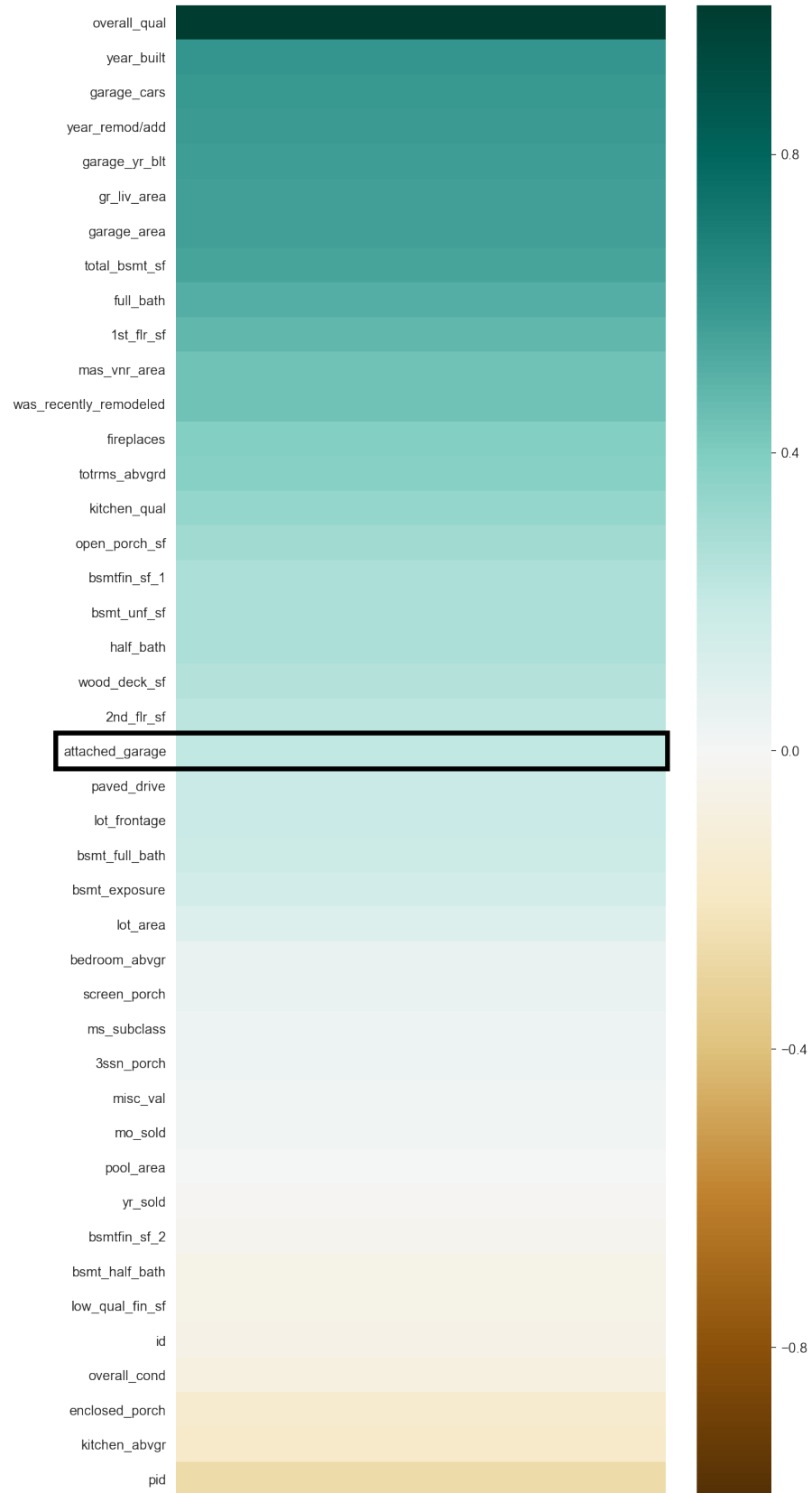


\*Source: <https://www.fixr.com/costs/build-attached-garage>



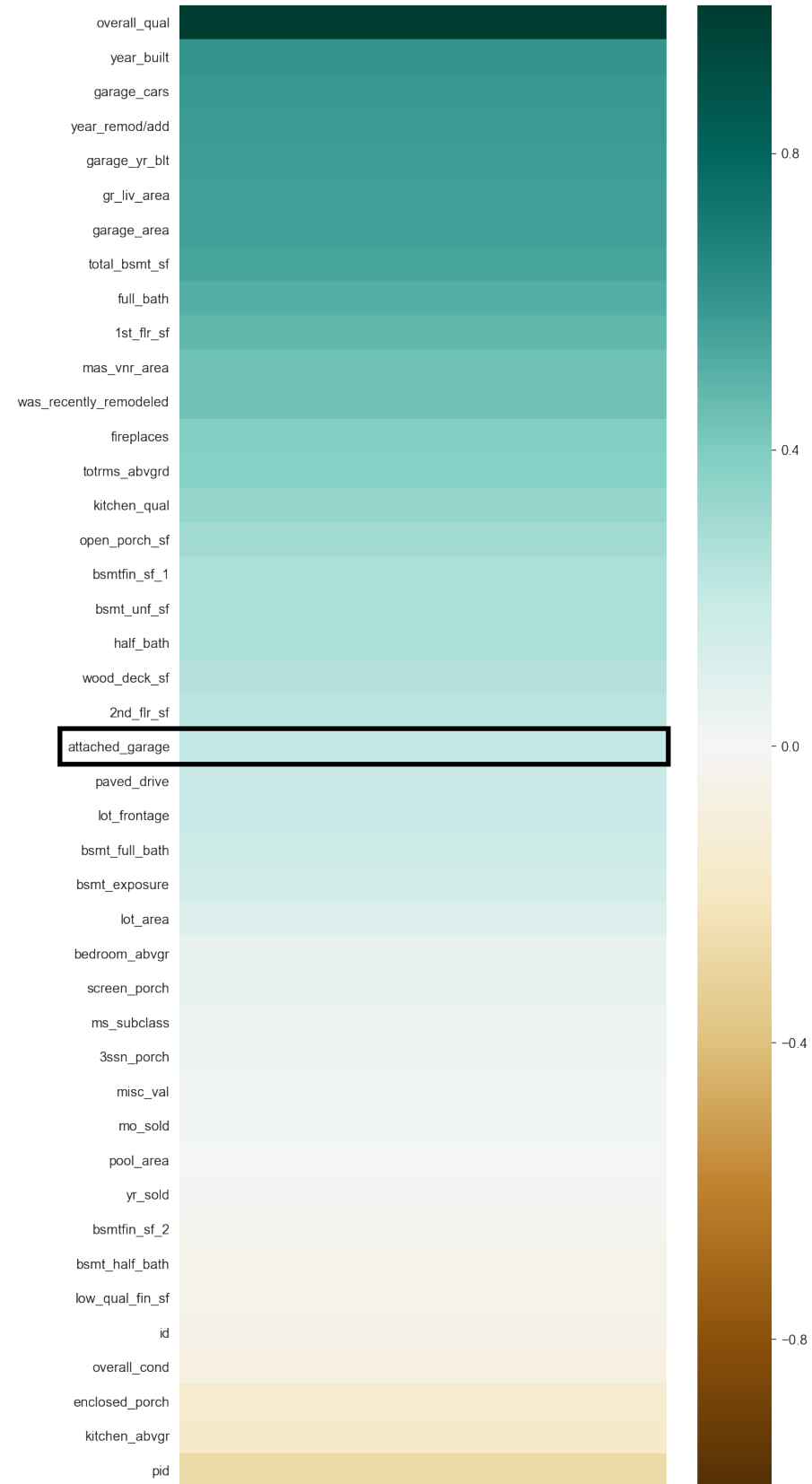
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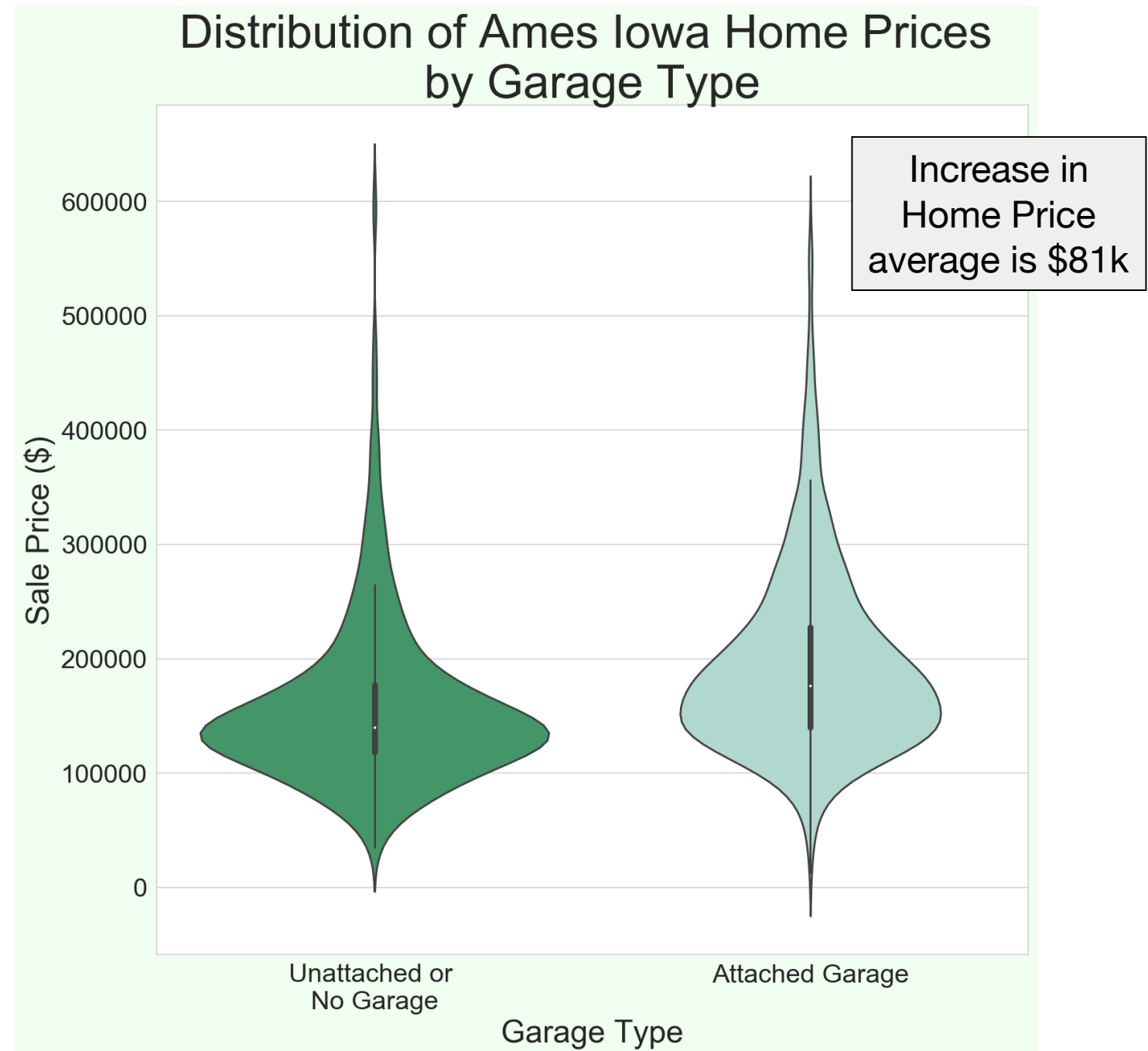


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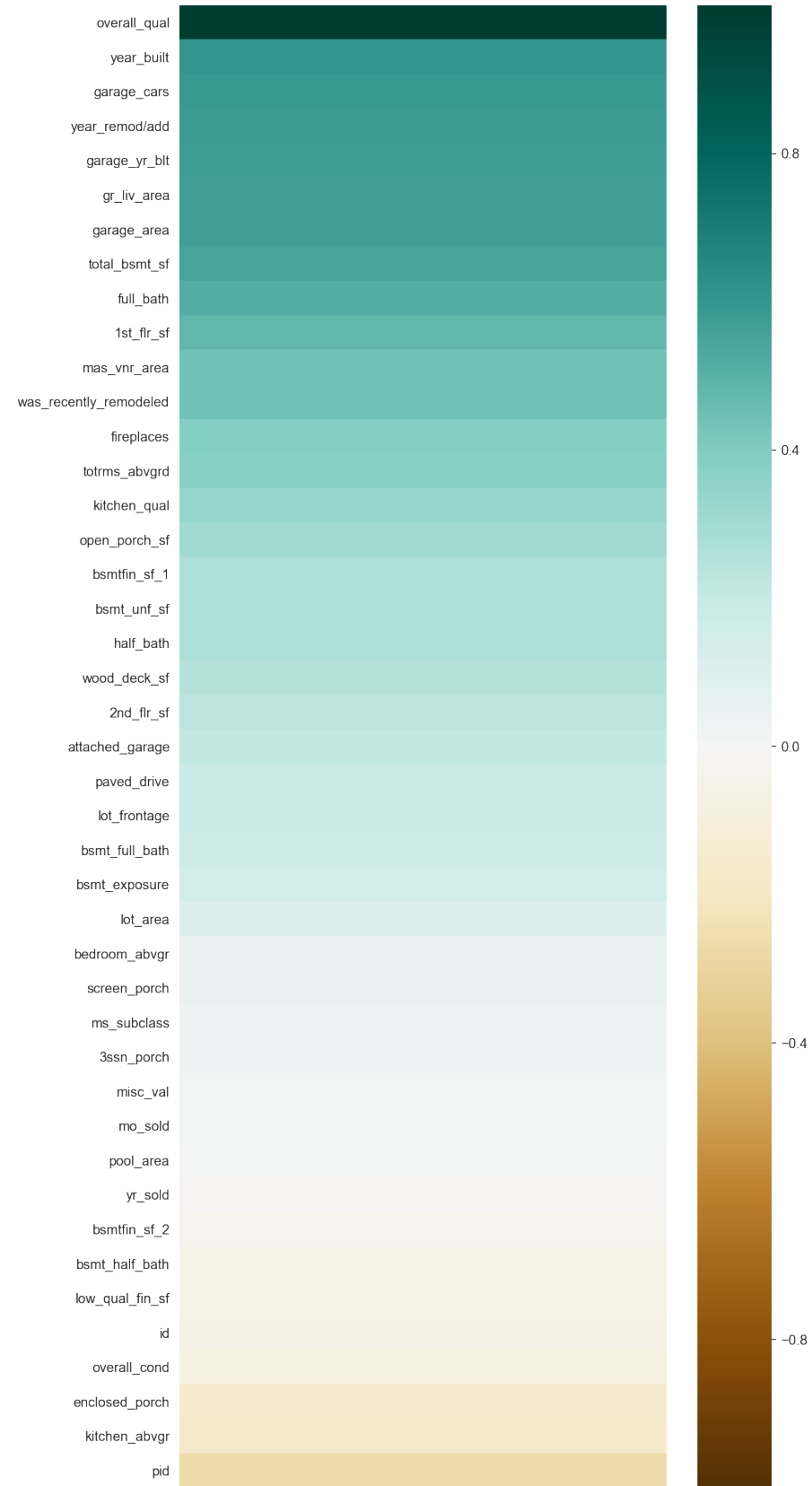


- Homes with an attached garage have a positive correlation with overall quality.
- The average cost of adding an attached garage is \$7500\*



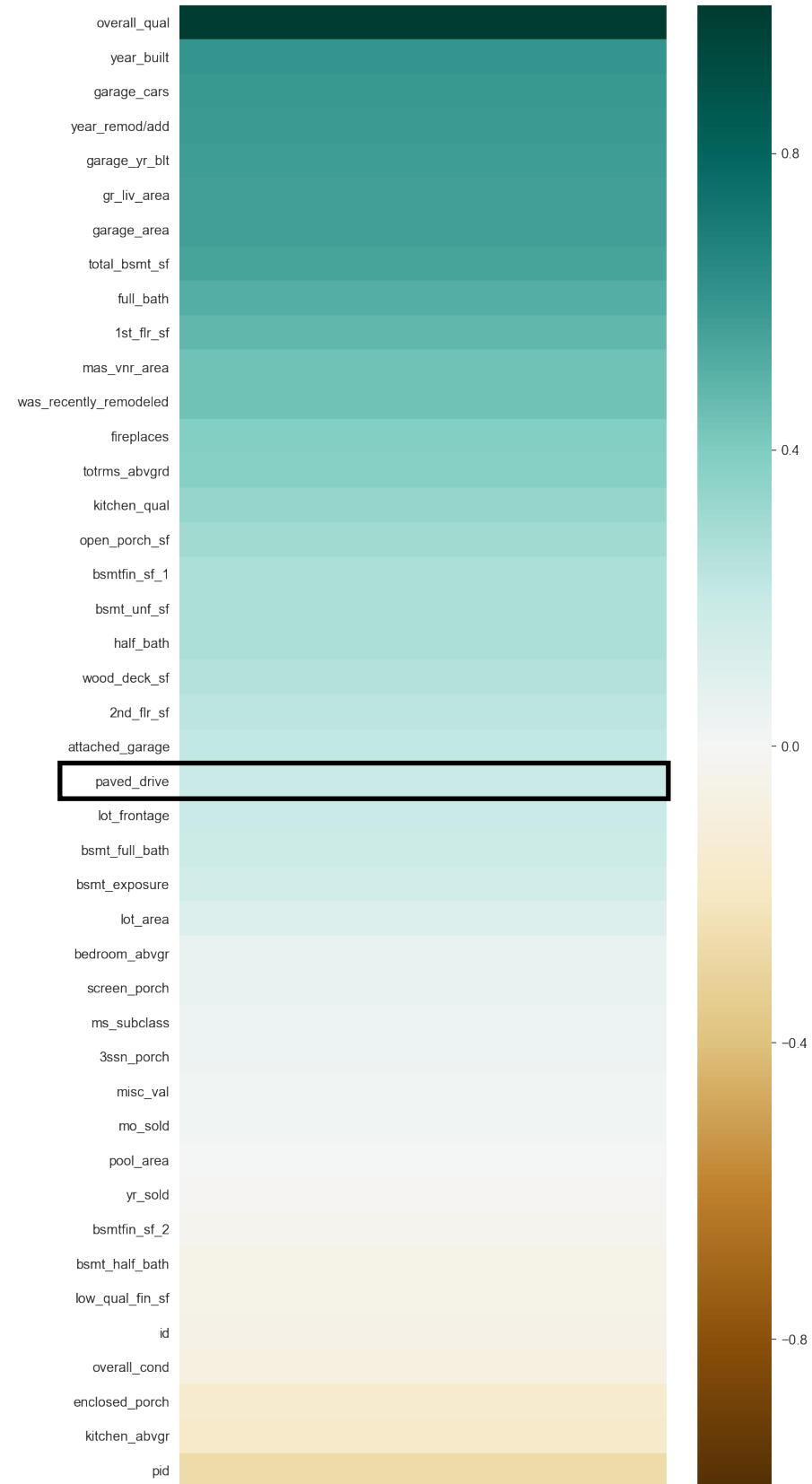
\*Source: <https://www.fixr.com/costs/build-attached-garage>

# Improving Home Quality: Driveway Type



\*Source: <https://www.fixr.com/costs/pave-driveway#sQ1>

# Improving Home Quality: Driveway Type

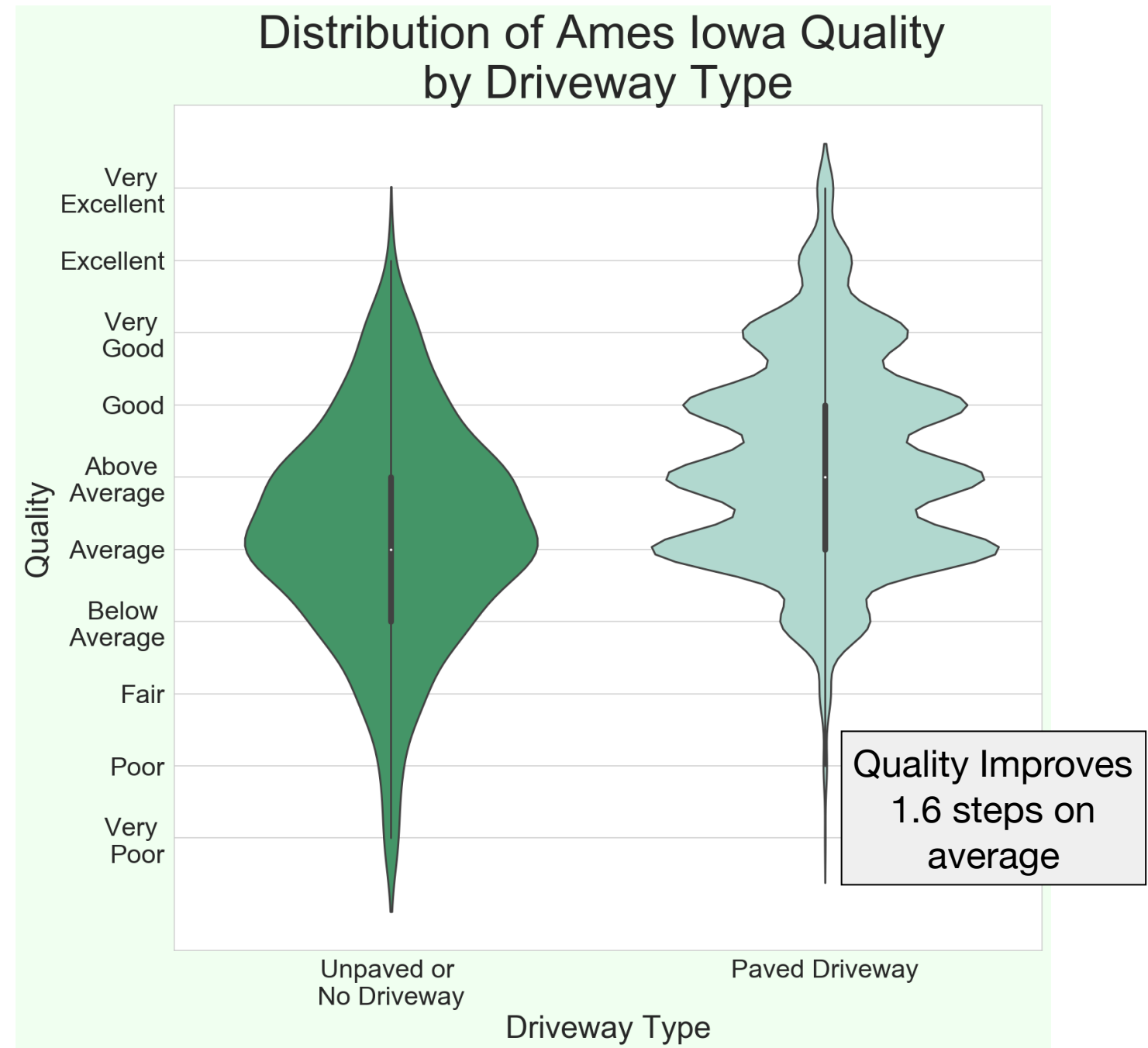
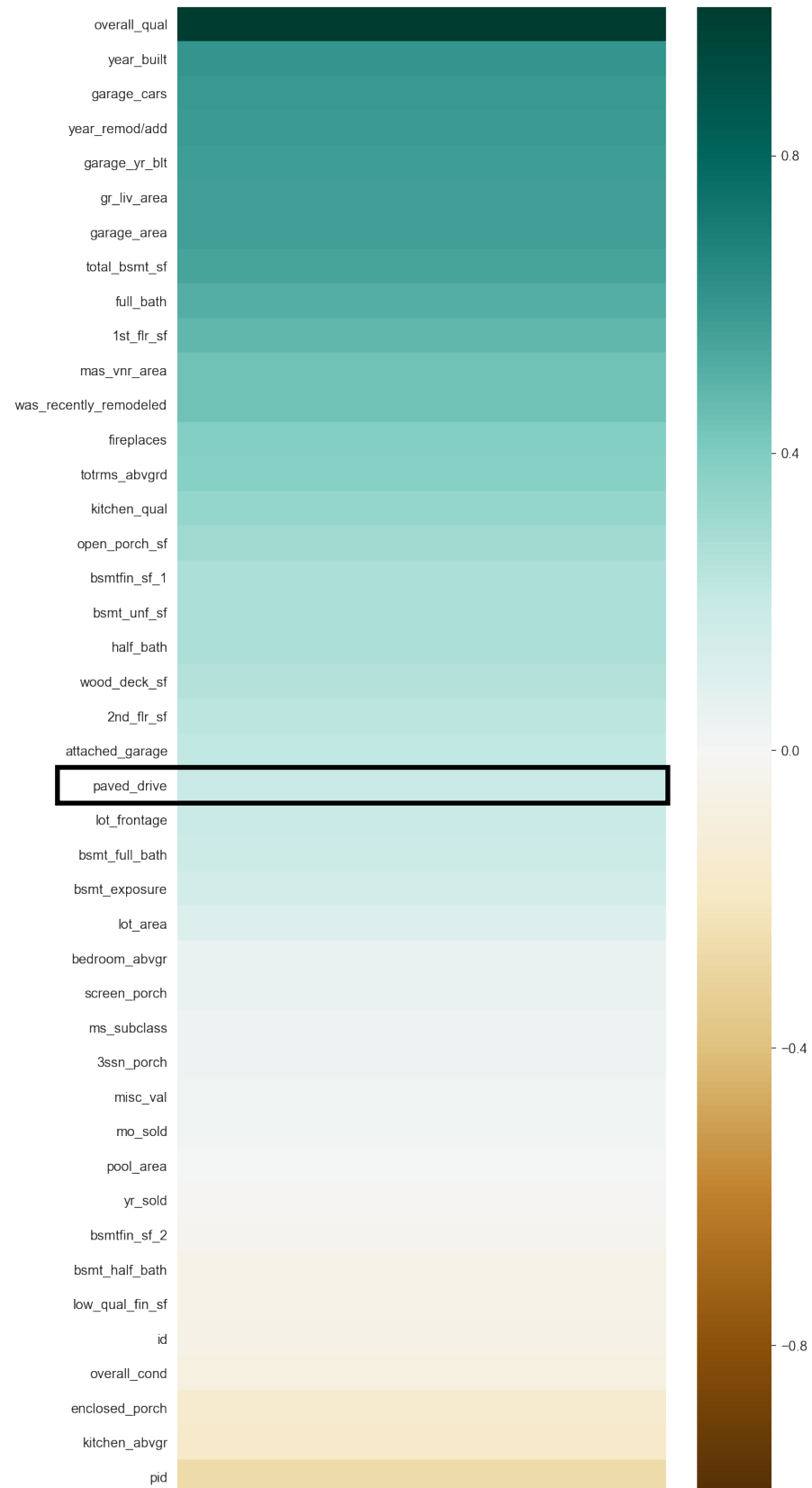


- Homes with a paved driveway have a positive correlation with overall quality.

\*Source: <https://www.fixr.com/costs/pave-driveway#sQ1>

# Improving Home Quality: Driveway Type

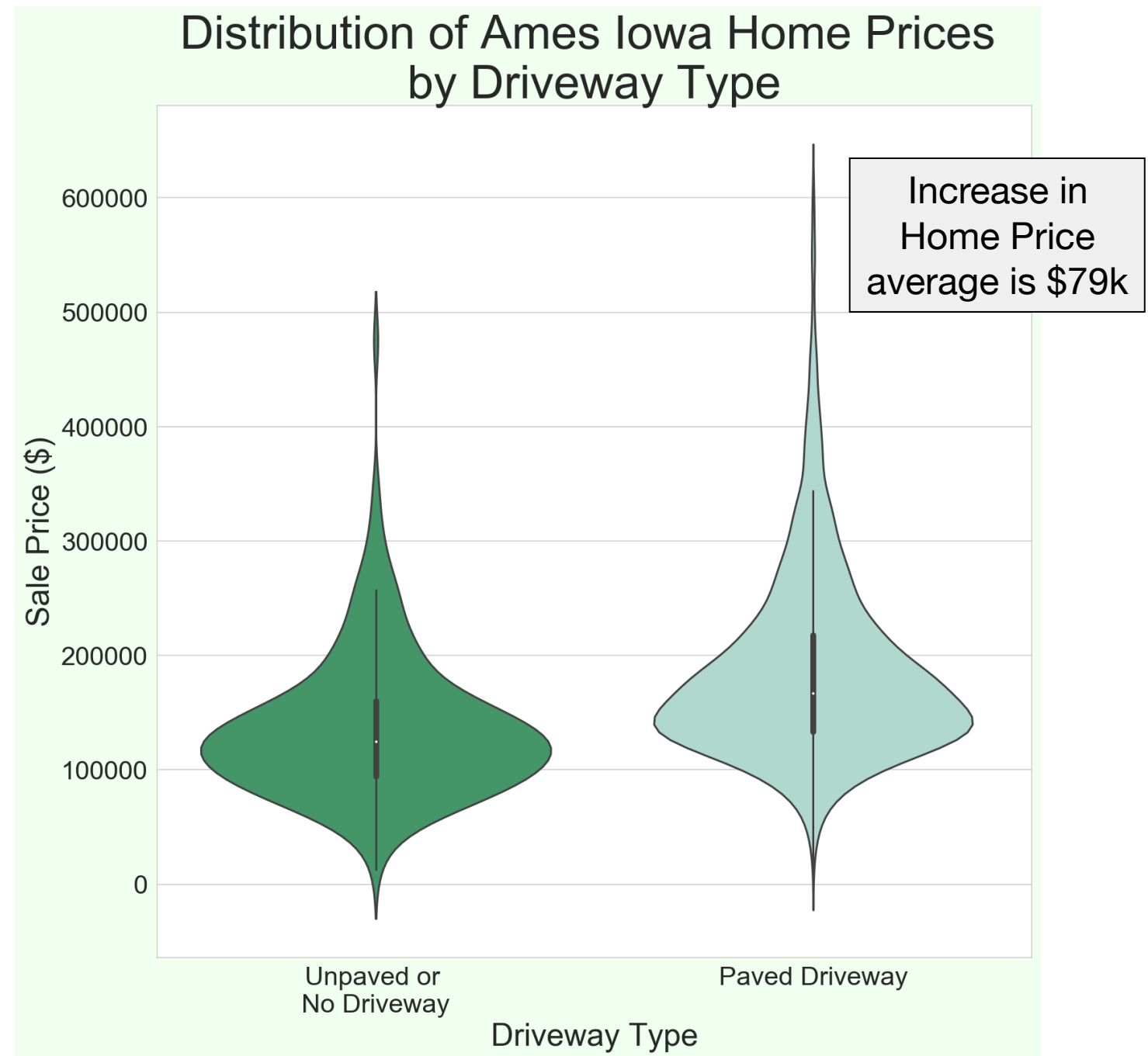
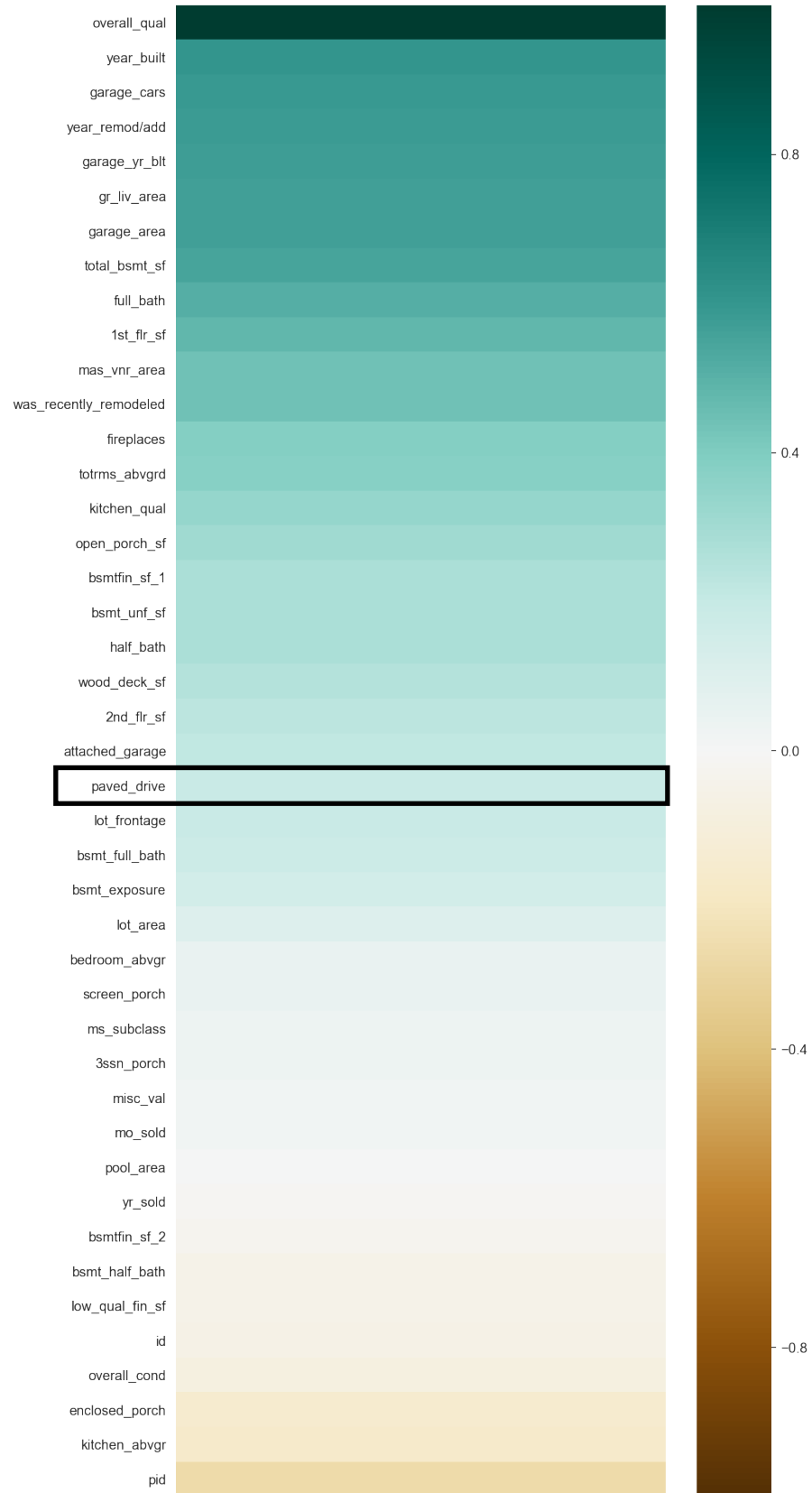
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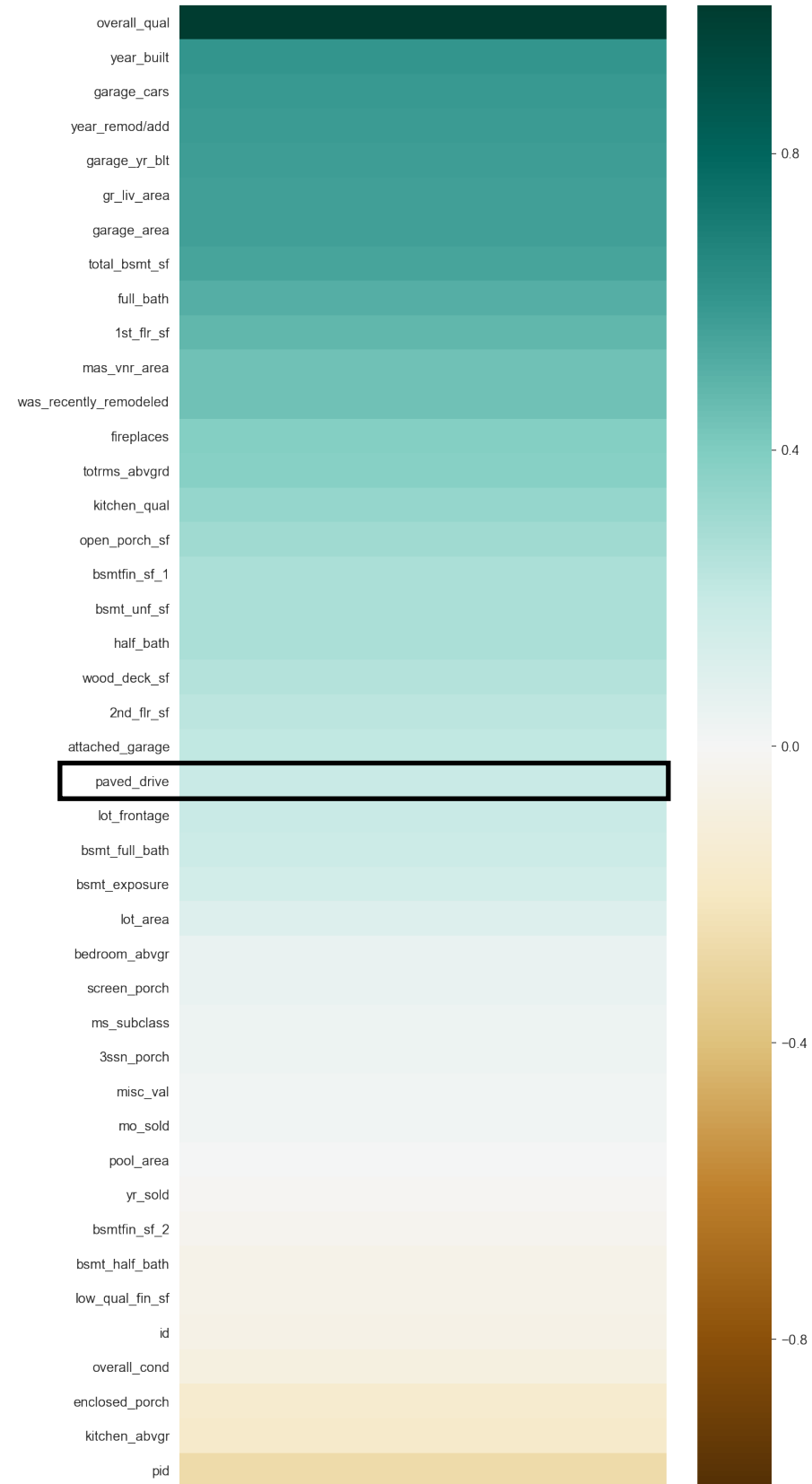
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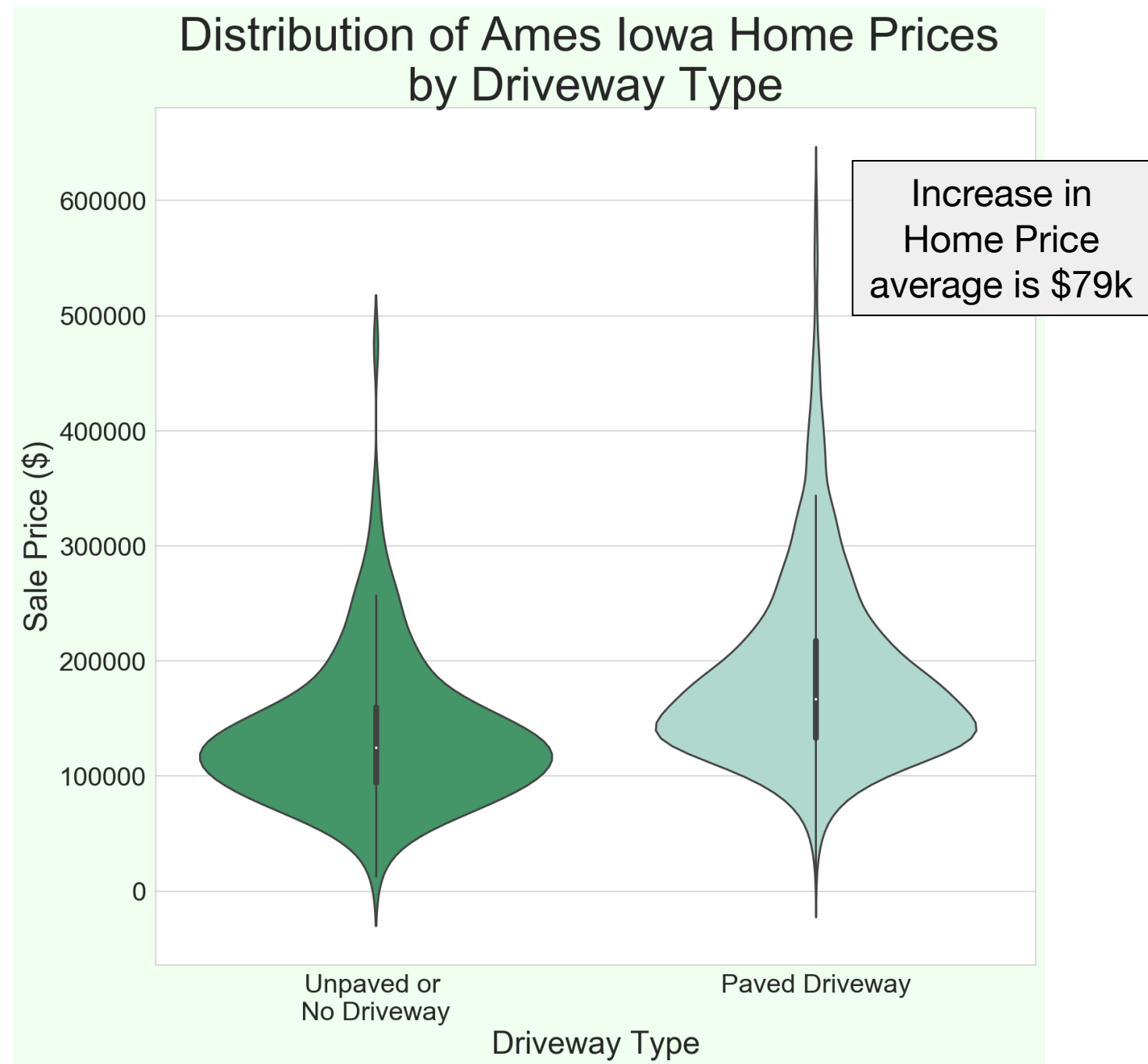


\*Source: <https://www.fixr.com/costs/pave-driveway#sQ1>

# Improving Home Quality: Driveway Type



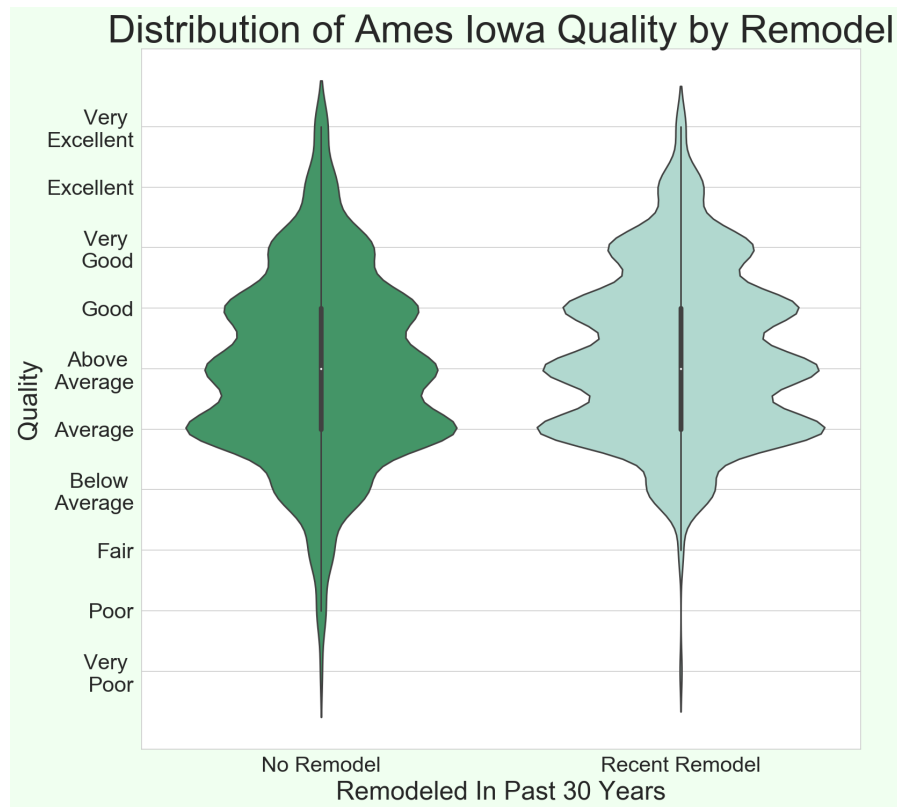
- Homes with a paved driveway have a positive correlation with overall quality.
- The average cost of paving a driveway is \$1500\*



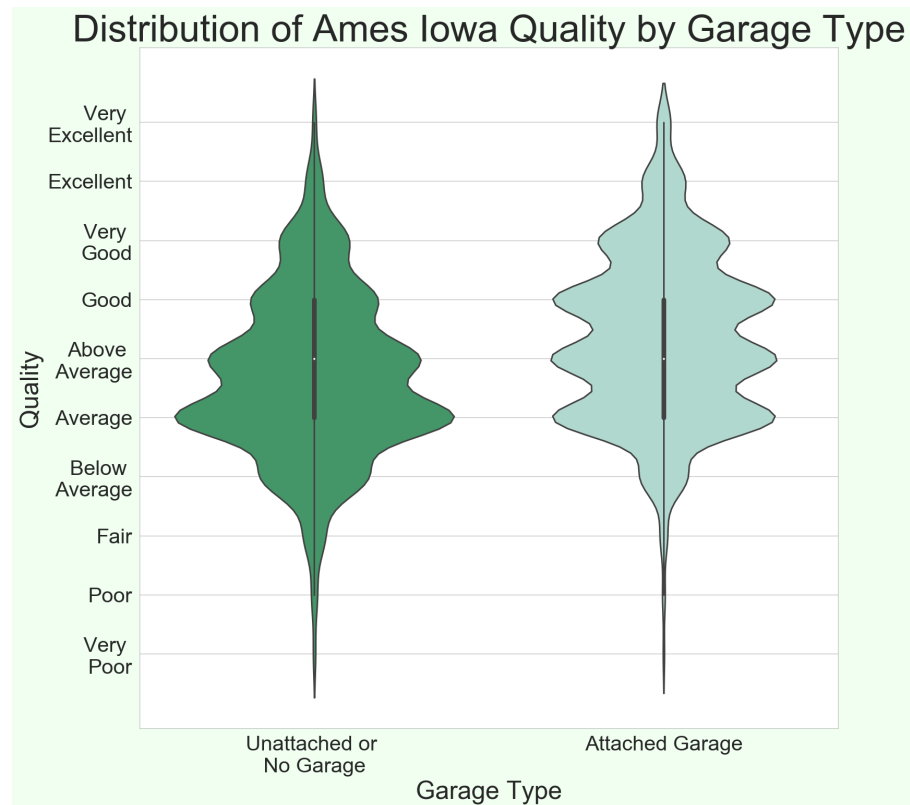
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# Quality Improvements - Further Investigations

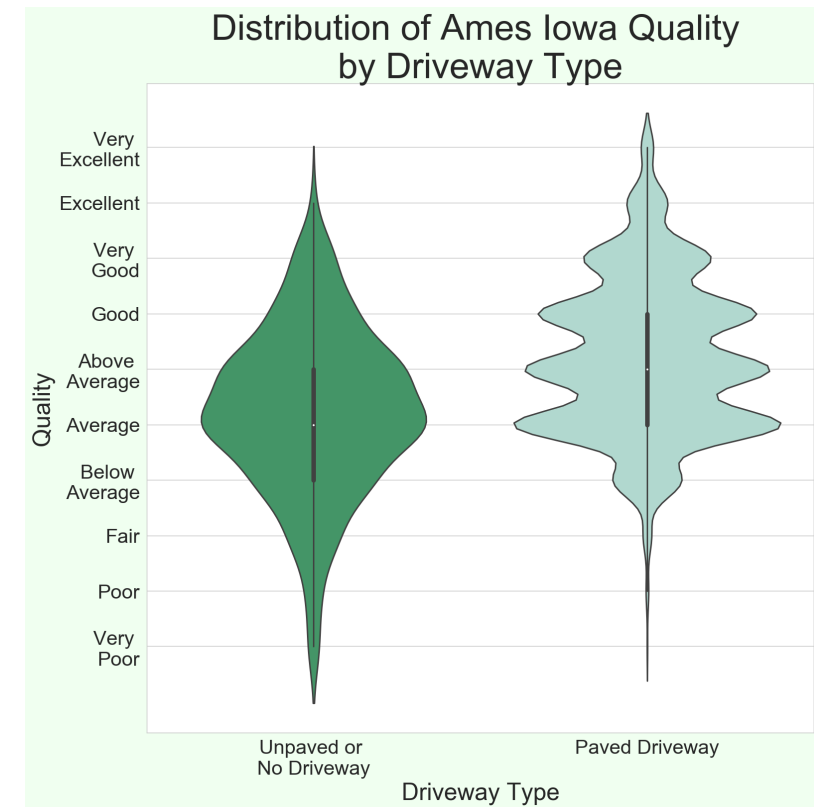
## Recent Remodel



## Attached Garage



## Driveway Type



- Our violin plots appear to indicate that depending on the current quality and value of a home, the impact of any given change will be more or less dramatic.
- I would like to look more closely at how current home condition plays a role in what changes make the most sense

\*Source: <https://www.fixr.com/costs/pave-driveway#sQ1>



# Further Research

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- In conjunction with looking at how existing home quality changes the impact of a remodel, I would include more variables for home changes.
- Costs given for each change were based on limited internet research and were average amounts. Information available to us in this data set can likely also predict the cost of making a change to a home. To give the best advice, I would want to model the cost of a change relative to the home as well.

# Conclusion

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- Ames Iowa Housing Market:
  - Homes sell for \$181,000 on average
  - Distribution has a right skew
- Predicting sale prices
  - Overall quality, zoning and usable home area are the biggest factors in predicting a home sale price
- Improving overall quality is the most straightforward way to increase home sale price
  - Remodeling improves quality and sale price, but likely is not worth the cost
  - Adding an attached garage improves quality and sale price and is worth the cost
  - Paving a driveway improves quality and sale price and is worth the cost