



Human Resources Case – Analysis on Company’s Attrition Rate

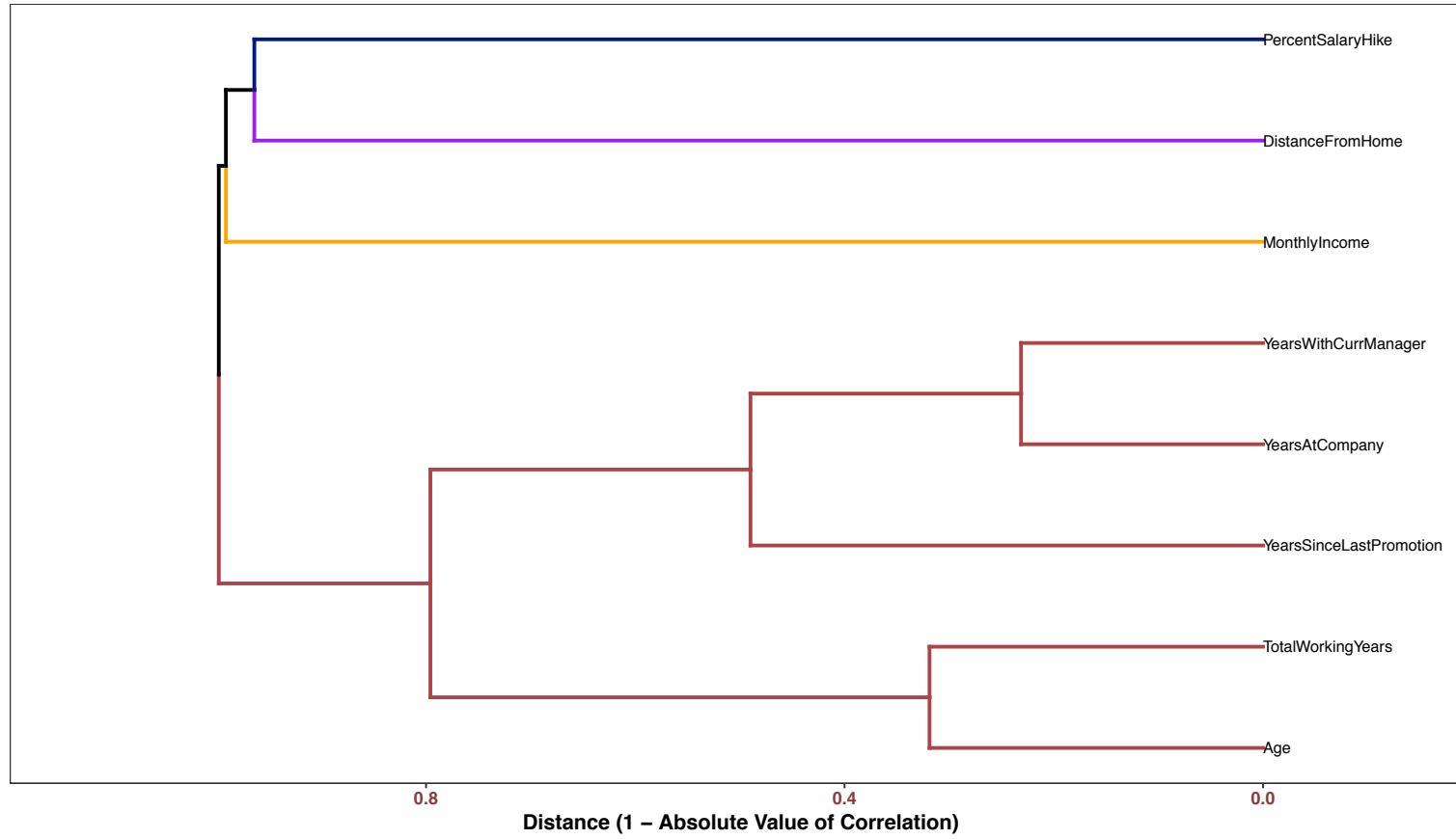
Anna Shao, Qian Weng, Dipak Krishnan, John Schuman

Background

- A large company XYZ has over 4,000 employees and a high attrition rate (the rate of employees leaving) of 16.2%
- The dataset contains information about the company's employees with 24 variables - a mix of categorical and continuous variables - of which attrition rate is our main response
- In the dataset, Education is scaled from 1 to 5 in terms of degree type on an increasing scale from 1:Below College to 5: Doctors
- Environment Satisfaction is scaled from 1 to 4 in terms of satisfaction from 1: Low to 4: Very High, as is Job Satisfaction, Job Involvement, Work Life Balance, and Performance Rating
- Job Level is scaled form 1 to 5, from lowest to highest position in the company
- Our first goal is to examine the effect of multiple variables on attrition rate
- Our second goal is to examine the effect of multiple variables on each other
- Variables we examined for possible effect on attrition are Monthly Income, Job Satisfaction, and Department
- Variables we examined for effect on each other in comparison to Attrition are Monthly Income, Job Satisfaction, Work Life Balance, Education, and Job level

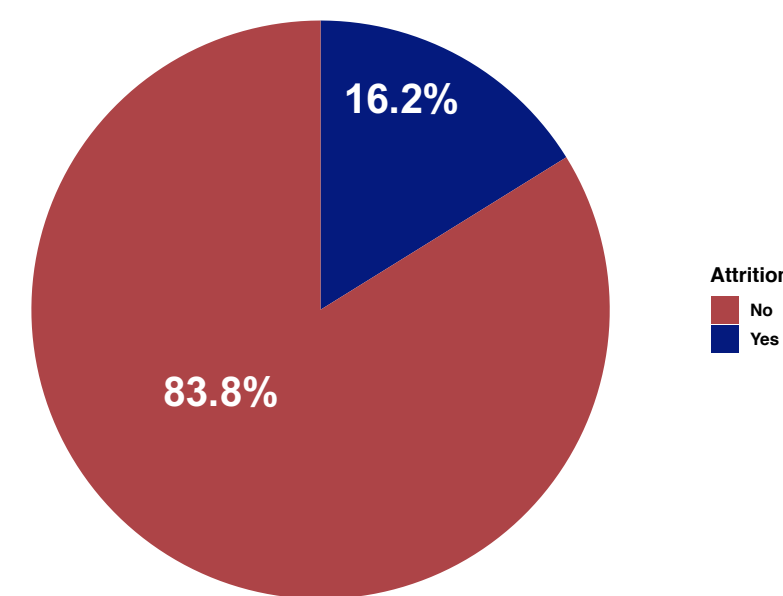
General Insight

Dendrogram of Continuous Variables in Dataset



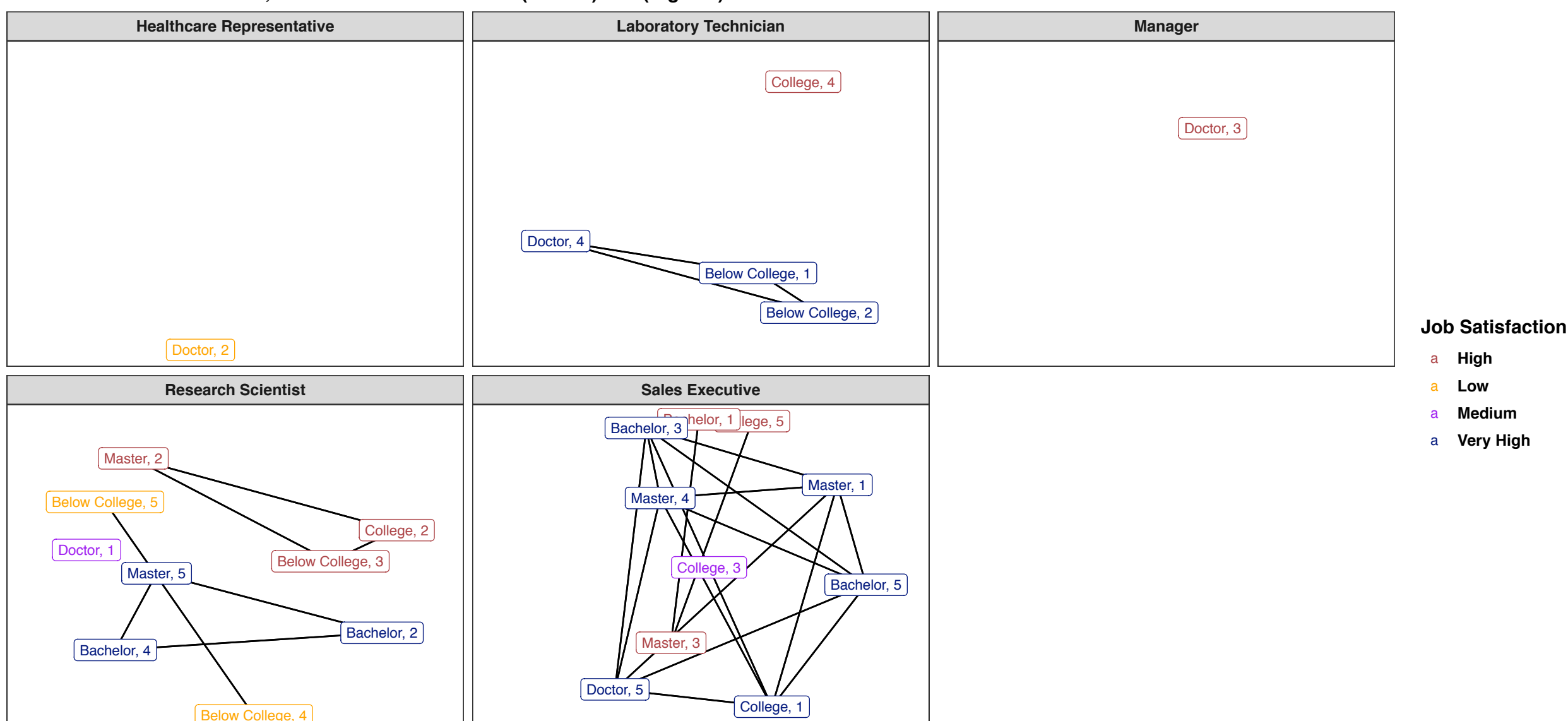
- The company seems to have a problem in retaining employees, with a high attrition rate of 16.2%, in which we would like to find out what attributes to this problem
- We first randomly explore the correlations among continuous variables to get general insight and these continuous variables are not very much correlated
- Time variables with Years are in the same cluster, where other variables are most likely in their own cluster

Attrition Rate in the Company



Problem in the Company

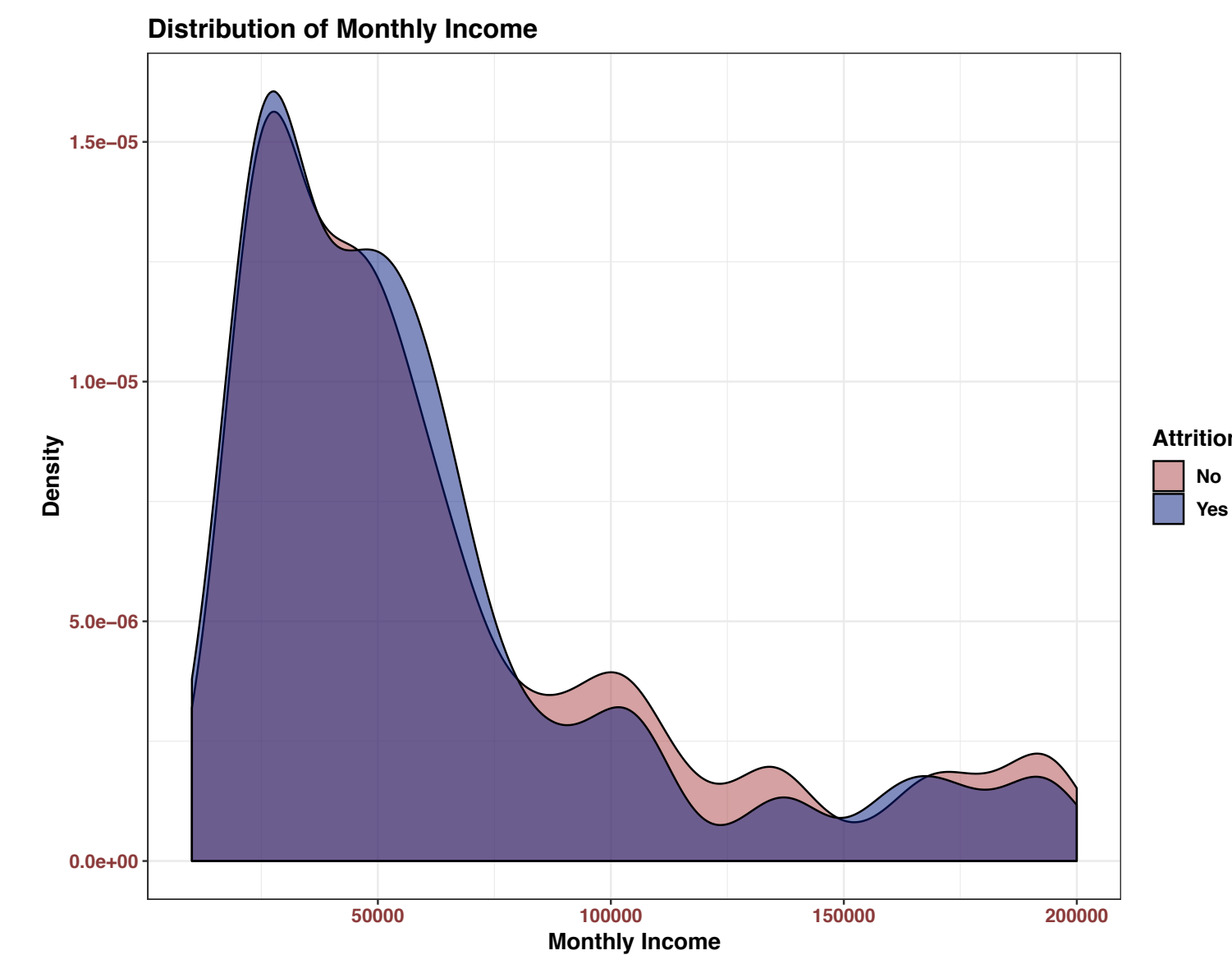
Network of Employees with Different Education and Job Level
Node Label: Education Level, Job Level with a Scale of 1 (Lowest) to 5 (Highest)



- The company has a problem with matching employees' education with their job level
- Many Research Scientists have low education but high job levels, and they still seem to be unsatisfied
- Most Sales Executive are satisfied and they generally have better education and higher job levels

Exploratory Data Analysis

Monthly Income & Attrition



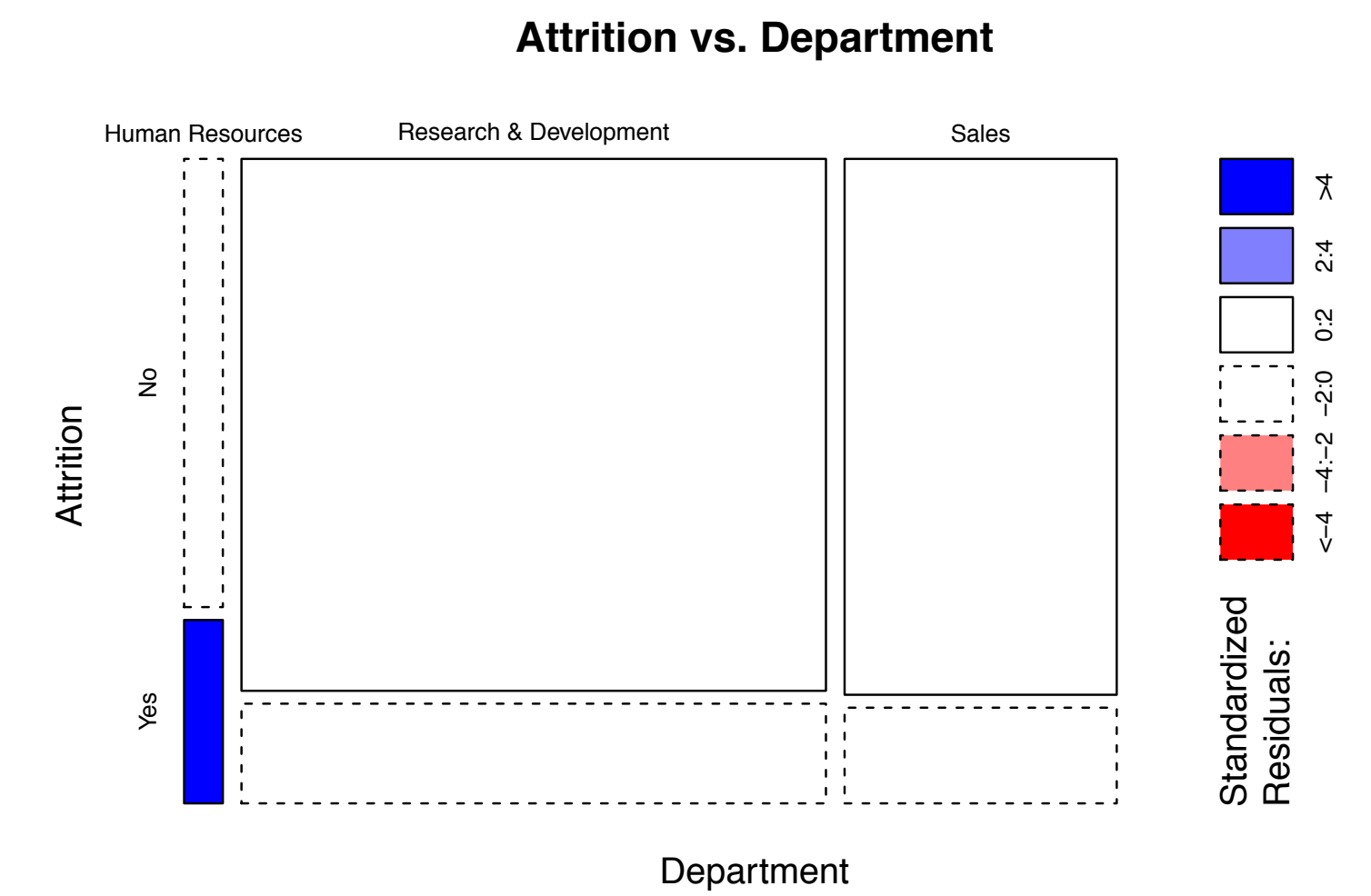
- For employees with income less than \$50,000, there is no substantial difference between people who left and those who stayed
- For employees who earn \$50,000 - \$80,000, there is a slight tendency towards leaving
- For employees with income higher than \$80,000, more people tend to stay in the company

Job Satisfaction & Attrition



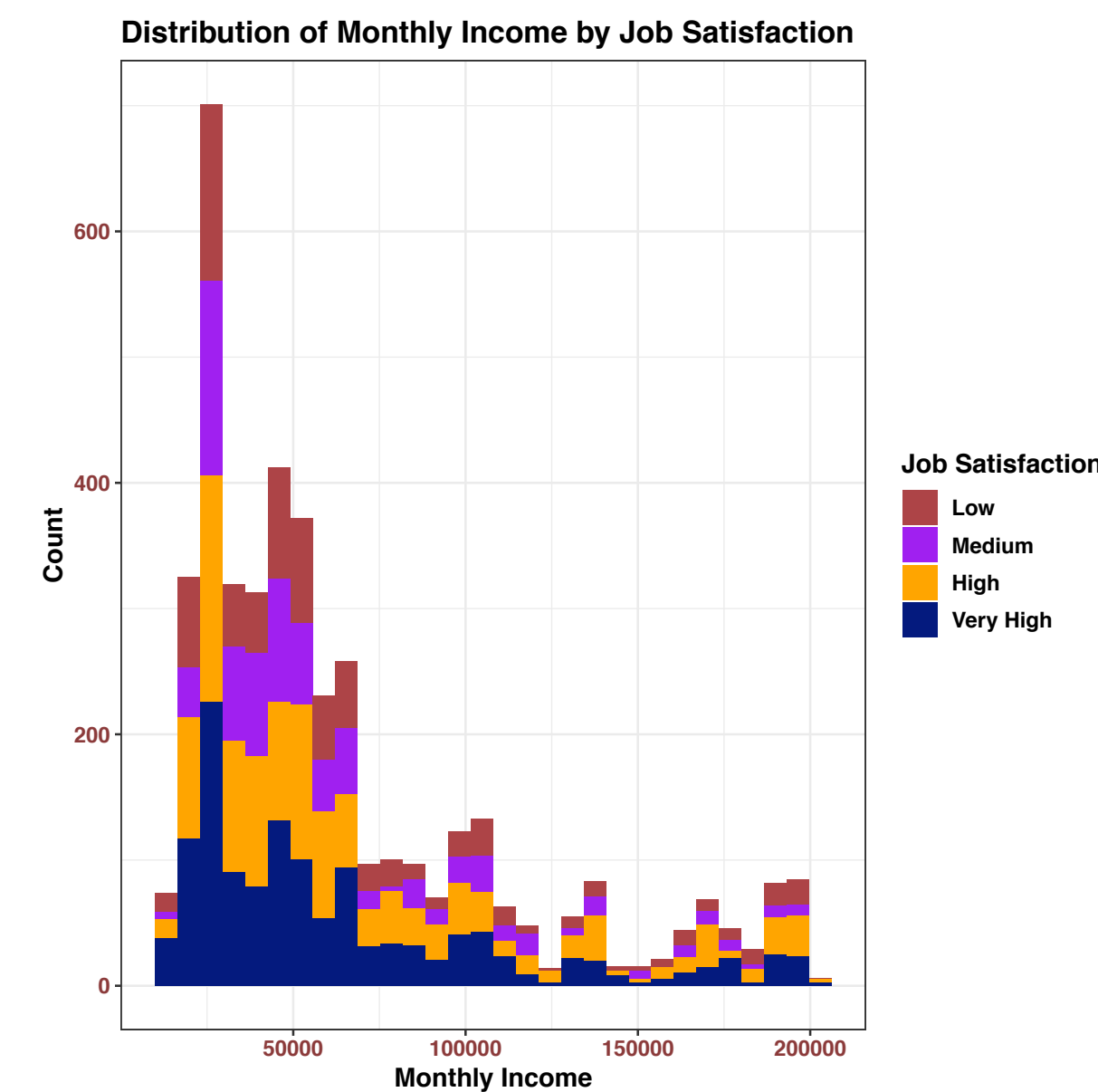
- We can reject the null hypothesis of independence between Job Satisfaction and Attrition
- Higher job satisfaction level indicates lower attrition rate, and lower job satisfaction leads to higher attrition rate
- Medium and high job satisfaction seem to be independent from attrition rate

Department & Attrition



- Employees in Human Resources Department has a higher attrition rate
- Research & Development and Sales Department seem to be independent from attrition rate

What Affects Monthly Income



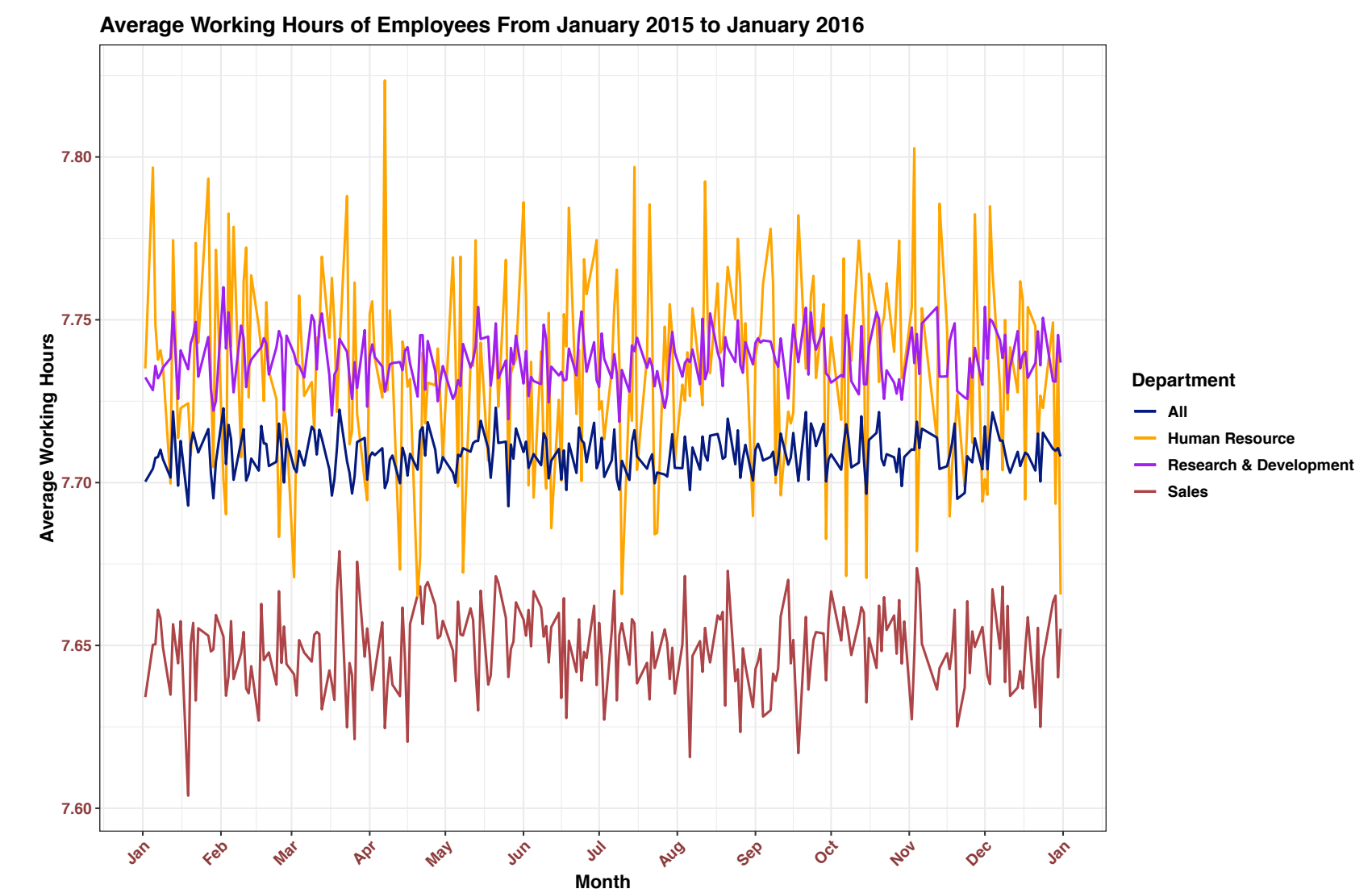
- More people with lower income tend to have low job satisfaction level
- The proportion of people who are more satisfied is larger when income is higher

What Affects Job Satisfaction



- For employees with lower job level, a bad work life balance is associated with lower job satisfaction
- It is interesting that for employees with higher job level, a better work life balance is associated with lower job satisfaction

Within Each Department



- On average, employees from HR Department seem to be working longer hours
- On average, all employees seem to be working under the standard 8 hour
- In general, this graph indicates that company XYZ might some problems with employee motivation and attrition rate

Conclusion

- Generally, higher monthly income indicates a slightly lower attrition rate
- Higher job satisfaction indicates a lower attrition rate and vice versa
- The effect of work life balance on job satisfaction is dependent on job level
- Job level influences monthly income and environment satisfaction influences job satisfaction
- Certain departments in particular - i.e. HR have much higher attrition rate as compared to other departments
- Some departments - i.e. R&D and sales - are independent from attrition rate
- Chi-Square tests and a linear regression model, along with our graphs, show that Job Satisfaction, Monthly Income and Work Life Balance are significant predictors for Attrition