Modeling Employee Attrition on Variables Related to Associate Satisfaction & Engagement

Categorical Data Analysis Final Project

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Abstract

Employee engagement and satisfaction have been determined to impact business outcomes in many ways. This analysis sought to use the logistic regression model to determine the impact of multiple factors related to satisfaction and engagement on employee attrition for one specific company. The following factors were considered: environment satisfaction, job satisfaction, work-life balance, manager rating, level of manager job involvement, years since last promotion, amount of training received in the last year, and department. A model incorporating interaction effects was chosen; all of the base variables were found to be significant in the model, with the exception of years since last promotion. However, multiple years since last promotion interaction terms were significant, as were many others. The area under the curve (AUC) of the final model was 0.745, suggesting a moderate relationship between the variables and attrition.

Introduction

Employee engagement (the extent to which an employee is engaged with their work and invested in their company and its values) has become a topic of great interest for human relations in recent history. Engagement has been linked to better outcomes for employers multiple times. Gallup's State of the American Workplace 2017 report compared companies in the highest quartile of employee engagement to companies in the lowest quartile and found that the highest quartile companies had 17% higher productivity and 21% higher profitability. A previous Gallup study from 2007 concluded that companies with a ratio of engaged to actively disengaged employees of 4 or higher experienced 2.6 times the growth in earnings per share of companies with a ratio around 1. Even as far back as 1998, a study at Sears department stores found that a 5 point increase in employee attitudes led to a corresponding 1.3 point increase in customer satisfaction.

Engagement is also thought to be beneficial to employees and closely linked with employee satisfaction. In 2004, the Corporate Leadership Council found that in a sample of 50,000 employees from 59 organizations, those with higher engagement were four times less likely to quit their jobs than those with lower engagement. The Society for Human Resource Management (SHRM) has posited that employee engagement can be optimized by increasing certain aspects of overall employee satisfaction; these aspects include: the work itself, relationship with immediate supervisor, autonomy and independence, the organization's financial stability, opportunity for advancement, job specific training, and career development opportunities. With these aspects in mind, this paper aims to test the relationship between employee attrition and various factors related to job satisfaction and engagement for Company A. Specifically, the impact of the following factors on employee attrition was examined for 4,327 employees:

- Self-reported environment satisfaction (scale of 1-4)
- Self-reported job satisfaction (scale of 1-4)
- Self-reported work-life balance (scale of 1-4)
- Self-reported manager rating (scale of 1-4)
- Self-reported level of manager job involvement (scale of 1-4)
- Years since last promotion
- Amount of training received in the last year (in hours)
- Department (Sales or Research & Development)

Data Source

The data for this analysis were obtained from Kaggle Datasets. The complete data set is available here. The data contain files on employees': answers to a general satisfaction survey, general information, clock-in times, clock-out times, and answers to a manager feedback survey. Clock-in and clock-out times were not used for this analysis.

The data were collected for 4,410 employees at Company A. There were some missing values in the data sets. For the variables analyzed, 25 employees had no recorded response on environment satisfaction, 20 had no response on job satisfaction, and 38 had no response on work-life balance. Any employee with a missing data point was excluded from the analysis, leaving 4,327 total associates in the analysed pool. There were 83 total employees removed, or 1.9% of the data set; due to the small percentage excluded, concerns about skewing the data by removing missing values were minimal.

Method

Exploratory Analysis

First, the variables that were hypothesized to be relevant to attrition were explored (environmental satisfaction, job satisfaction, work-life balance, manager rating, rating of manager involvement, years since promotion, amount of training in the last year, and department). Plots were produced for the independent and dependent variables, to examine their distributions (see: supplementary output, "Variable Proportion Plots"). Next, correlations between the numeric variables were measured. Spearman's correlation coefficient was used, due to the ranked nature of the majority of the variables and many of the variables having non-normal-appearing distributions (see Chapter 2 of Kutner, Nachtsheim, & Neter (2014) for more information on Spearman's rank correlation coefficient).

Model Building

A logistic regression model was built, modeling the log odds of an employee attriting on the seven identified independent variables. The model took the form:

$$\text{logit}[\text{P(Attrition)}] = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 s_{11} + \beta_4 s_{12} + \beta_5 s_{13} + \beta_6 s_{14} + \ldots + \beta_{20} s_{54}$$

where:
x_1 was Hours of Training
x_2 was Years since Last Promotion
s_1. was Environmental Satisfaction
s_2. was Job Satisfaction
s_3. was Work-Life Balance
s_4. was Manager Job Involvement
s_5. was Manager Performance Rating

The Likelihood Ratio Test was performed to test the hypothesis, H_0: $\beta_1 = \beta_2 = \ldots = \beta_{22} = 0$. The ROC curve was produced and the Area Under the Curve (AUC) was calculated.

Refining the Model

Variable selection was used to determine if any/which input variables could be removed from the model. In a supplementary analysis, model plots were employed to explore the impact of each variable in the model and an additional model was built in which the scoring of some variables was changed to binary (see: supplementary output, "Variable Scoring Exploration"). A model incorporating interaction terms was built, analysed, and pruned.

Results

Exploratory Analysis

In the plots of variable distributions, both measures of satisfaction were right-skewed, while work-life balance and manager involvement followed a more bell-shaped distribution. Manager ratings were high, with only ratings of 3 and 4 being reported. (Note that this is why the original model only has 20 β instead of 22.) Training was somewhat bell-shaped, with the majority of employees receiving 2 to 3 hours. Years since promotion was severely left-tailed, with the largest bucket being the 0 year bucket. Finally, the majority of employees did not attrit, at 84%. The plots can be found in the supplementary output, "Variable Proportion Plots".

The Spearman's correlations between variables were generally very small. A significance test was performed on the correlations, to test the null hypothesis, H_0: ρ=0 against the alternative hypothesis, H_1: ρ<>0. The null hypothesis was rejected at the 0.05 level of significance for only one pair of variables- job satisfaction and manager performance rating. This pair achieved a p-value of 0.0013 on a reported correlation coefficient of 0.05.

The correlation matrix and the p-values for the significance tests are provided below, in Tables 1 and 2, respectively.

Table 1: Correlation Matrix

	Env. Sat.	**Job Sat.**	**Work Life Bal.**	**Manager Job Inv.**	**Manager Rating**	**Training**	**Years Since Promo.**
Env. Sat.	1.00	0.00	0.02	0.02	0.01	0.02	0.03
Job Sat.	0.00	1.00	-0.03	0.01	0.05	-0.02	0.01
Work Life Bal.	0.02	-0.03	1.00	-0.02	-0.02	-0.02	0.00
Manager Job Inv.	0.02	0.01	-0.02	1.00	0.01	-0.01	0.02
Manager Rating	0.01	0.05	-0.02	0.01	1.00	-0.02	-0.01
Training	0.02	-0.02	-0.02	-0.01	-0.02	1.00	0.00
Years Since Promo.	0.03	0.01	0.00	0.02	-0.01	0.00	1.00

Table 2: Correlation Matrix p-values

	Env. Sat.	**Job Sat.**	**Work Life Bal.**	**Manager Job Inv.**	**Manager Rating**	**Training**	**Years Since Promo.**
Env. Sat.	NA	0.961	0.133	0.281	0.392	0.240	0.098
Job Sat.	0.961	NA	0.065	0.537	0.001	0.136	0.647
Work Life Bal.	0.133	0.065	NA	0.119	0.103	0.269	0.956
Manager Job Inv.	0.281	0.537	0.119	NA	0.575	0.512	0.163
Manager Rating	0.392	0.001	0.103	0.575	NA	0.111	0.376
Training	0.240	0.136	0.269	0.512	0.111	NA	0.801
Years Since Promo.	0.098	0.647	0.956	0.163	0.376	0.801	NA

Model Building

The initial logistic regression model was built, treating the survey data as factor variables, and the training hours and years since last promotion variables as continuous variables. The model summary is provided below, in Table 3. Almost all levels of all variables were significant at the 0.05 level of significance; the only exceptions were manager job involvement rating level 4, manager performance rating level 4, and years since last promotion.

Table 3: Initial Logistic Regression Model Coefficients Summary

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	1.689	0.304	5.552	0.000
factor(Env.Sat)2	-0.619	0.128	-4.841	0.000
factor(Env.Sat)3	-0.709	0.115	-6.148	0.000
factor(Env.Sat)4	-0.797	0.116	-6.844	0.000
factor(Job.Sat)2	-0.448	0.127	-3.523	0.000
factor(Job.Sat)3	-0.453	0.114	-3.985	0.000
factor(Job.Sat)4	-0.893	0.122	-7.339	0.000
factor(Work.Life.Bal)2	-0.791	0.169	-4.678	0.000
factor(Work.Life.Bal)3	-0.981	0.155	-6.308	0.000
factor(Work.Life.Bal)4	-0.690	0.192	-3.601	0.000
factor(M.Job.Involve)2	-0.374	0.181	-2.062	0.039
factor(M.Job.Involve)3	-0.433	0.170	-2.544	0.011
factor(M.Job.Involve)4	-0.206	0.207	-0.994	0.320
factor(M.Perf.Rating)4	0.205	0.114	1.804	0.071
factor(Dep)Research & Development	-0.862	0.172	-5.001	0.000
factor(Dep)Sales	-0.879	0.182	-4.822	0.000

Training	-0.103	0.034	-3.053	0.002
Years.Promo	-0.021	0.014	-1.548	0.122

The Likelihood Ratio Test to test the hypothesis that Y was jointly independent of all of the explanatory variables was calculated by using the difference between the null deviance and the residual deviance (3833.6-3636.9) as the test statistic and running it through a Chi-squared distribution with degrees of freedom equal to the difference in degrees of freedom in the null model and the chosen model (4326-4309). The resulting p-value was 0, showing very strong evidence that at least one of the variables was significant and rejecting the null hypothesis at the 0.05 level of significance.

The test results for the individual variables showed that every variable was significant at the 0.05 level of significance except manager job involvement, manager performance rating, and years since last promotion. The null hypothesis of $\beta = 0$ was rejected for all other variables. The results of the Likelihood Ratio Tests for the individual variables are shown in Table 4.

Table 4: Likelihood Ratio Test

	LR Chisq	Df	Pr(>Chisq)
factor(Env.Sat)	55.038	3	0.000
factor(Job.Sat)	54.610	3	0.000
factor(Work.Life.Bal)	38.154	3	0.000
factor(M.Job.Involve)	7.774	3	0.051
factor(M.Perf.Rating)	3.170	1	0.075
factor(Dep)	23.464	2	0.000
Training	9.495	1	0.002
Years.Promo	2.472	1	0.116

The ROC curve was created for the model, shown in Figure 1. The area under the curve (AUC) was 0.665. This indicated that the model was better than random guessing, but not by much.

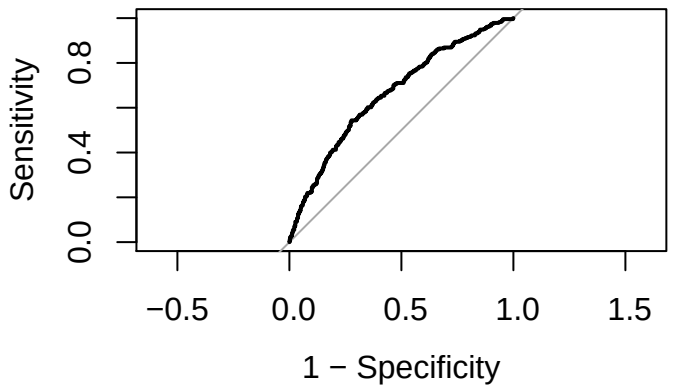

Figure 1: ROC Plot

Refining the Model

When variable selection was performed on the model, using the forward stepwise method and the Akaike Information Criteria (AIC), none of the variables in the model were removed (see Chapter 5 of Agresti (2019) for more information on forward stepwise selection and the AIC). Removing any variable at any stage would raise the AIC, so all the variables were left in the model, even though some of them had previously been found to be insignificant.

The scoring of variables was explored and changed, in order to measure the impact on model fit. There was no significant change in fit; this analysis can be found in the supplementary document, "Variable Scoring Exploration". It has no bearing on the analysis presented here.

A second model was built, including all interaction terms, to see if the interactions between the variables contributed meaningfully to the probability of attrition. The Likelihood Ratio Test was performed, comparing the new model to the null model. Once again, the p-value for the overall model was 0, rejecting the null hypothesis.

The Likelihood Ratio Test comparing the model with interaction terms to the model without them also had a p-value of 0, indicating that the more complex model was a better fit than the simpler one.

The results for the test of the individual variables against the null are in Table 5.

Table 5: Likelihood Ratio Test

	LR Chisq	Df	Pr(>Chisq)
factor(Env.Sat)	63.517	3	0.000
factor(Job.Sat)	56.867	3	0.000
factor(Work.Life.Bal)	38.844	3	0.000
factor(M.Job.Involve)	9.298	3	0.026
factor(M.Perf.Rating)	4.803	1	0.028
factor(Dep)	22.362	2	0.000
Training	7.042	1	0.008
Years.Promo	2.712	1	0.100
factor(Env.Sat):factor(Job.Sat)	25.107	9	0.003
factor(Env.Sat):factor(Work.Life.Bal)	33.718	9	0.000
factor(Env.Sat):factor(M.Job.Involve)	30.951	9	0.000
factor(Env.Sat):factor(M.Perf.Rating)	32.619	3	0.000
factor(Env.Sat):factor(Dep)	13.172	6	0.040
factor(Env.Sat):Training	5.858	3	0.119
factor(Env.Sat):Years.Promo	11.181	3	0.011
factor(Job.Sat):factor(Work.Life.Bal)	40.484	9	0.000
factor(Job.Sat):factor(M.Job.Involve)	11.506	9	0.243
factor(Job.Sat):factor(M.Perf.Rating)	33.862	3	0.000
factor(Job.Sat):factor(Dep)	18.577	6	0.005
factor(Job.Sat):Training	13.884	3	0.003
factor(Job.Sat):Years.Promo	9.679	3	0.021
factor(Work.Life.Bal):factor(M.Job.Involve)	34.269	9	0.000
factor(Work.Life.Bal):factor(M.Perf.Rating)	8.227	3	0.042

factor(Work.Life.Bal):factor(Dep)	19.184	6	0.004
factor(Work.Life.Bal):Training	6.873	3	0.076
factor(Work.Life.Bal):Years.Promo	6.241	3	0.100
factor(M.Job.Involve):factor(M.Perf.Rating)	6.301	3	0.098
factor(M.Job.Involve):factor(Dep)	12.105	6	0.060
factor(M.Job.Involve):Training	4.766	3	0.190
factor(M.Job.Involve):Years.Promo	5.355	3	0.148
factor(M.Perf.Rating):factor(Dep)	0.900	2	0.638
factor(M.Perf.Rating):Training	1.572	1	0.210
factor(M.Perf.Rating):Years.Promo	2.820	1	0.093
factor(Dep):Training	7.293	2	0.026
factor(Dep):Years.Promo	15.836	2	0.000
Training:Years.Promo	3.247	1	0.072

Many of the interaction terms were found to be significant in the Likelihood Ratio Test, and some of the base terms that had been insignificant in the original model became significant when the interaction terms were considered. Once again, variable selection was performed using forward stepwise selection and the AIC, but no variables were removed by that criteria.

Instead, the author decided to remove from the model any variables that were not found to be significant at the 0.05 level of significance in the Likelihood Ratio Test. This reduced the number of variables and interactions in the model from 36 to 23, which made the model more parsimonious and easy to understand and reduced the chances of overfit and multicollinearity. The Likelihood Ratio Test was run for the model variables on this final model, with the following results (Table 6).

Table 6: Likelihood Ratio Test

	LR Chisq	Df	Pr(>Chisq)
factor(Env.Sat)	60.641	3	0.000
factor(Job.Sat)	51.624	3	0.000
factor(Work.Life.Bal)	35.934	3	0.000
factor(M.Job.Involve)	9.145	3	0.027
factor(M.Perf.Rating)	4.387	1	0.036
factor(Dep)	22.227	2	0.000
Training	8.589	1	0.003
factor(Env.Sat):factor(Job.Sat)	22.804	9	0.007
factor(Env.Sat):factor(Work.Life.Bal)	34.211	9	0.000
factor(Env.Sat):factor(M.Job.Involve)	34.869	9	0.000
factor(Env.Sat):factor(M.Perf.Rating)	31.572	3	0.000
factor(Env.Sat):factor(Dep)	13.688	6	0.033
factor(Env.Sat):Years.Promo	21.299	4	0.000
factor(Job.Sat):factor(Work.Life.Bal)	39.507	9	0.000
factor(Job.Sat):factor(M.Perf.Rating)	35.803	3	0.000
factor(Job.Sat):factor(Dep)	13.990	6	0.030
factor(Job.Sat):Training	14.360	3	0.002
factor(Job.Sat):Years.Promo	8.519	3	0.036

factor(Work.Life.Bal):factor(M.Job.Involve)	31.464	9	0.000
factor(Work.Life.Bal):factor(M.Perf.Rating)	9.127	3	0.028
factor(Work.Life.Bal):factor(Dep)	26.462	6	0.000
factor(Dep):Training	5.943	2	0.051
factor(Dep):Years.Promo	10.523	2	0.005

The ROC curve for this final model (Figure 2) was much improved from the original curve, and the final AUC was 0.745.

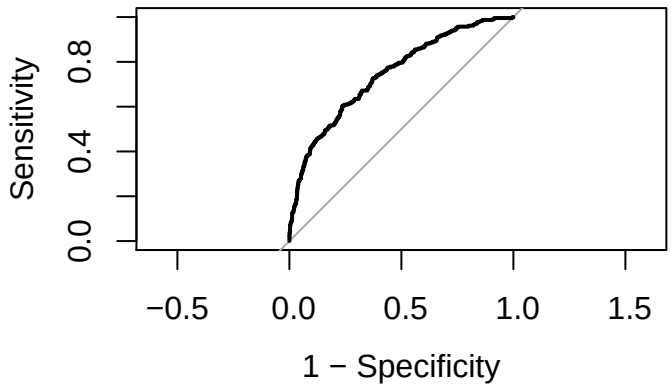

Figure 2: ROC Plot

The model summary of the final model is included in Table 7 in the Appendix.

Discussions

It had been assumed that workers who were more satisfied with their jobs would also be more satisfied with their environment, work-life balance, etc., but there was almost no evidence to support that theory when the correlation matrix was assessed. However, the lack of correlations simplified model building by reducing any concerns about multicollinearity; and almost all variables in all models showed significance in the Likelihood Ratio Test. It can hardly be doubted that there is some relationship between employees' feelings about their jobs and their bosses and their propensity to leave Company A. That being said, the relationship was much stronger when interaction terms were considered than in just the base effects model. This suggests that the connection is complex and depends on how many factors combine. Additionally, the relationship was not as strong as it could have been. There are still many reasons that employees leave Company A that have not been identified by this analysis. Further research could be done on the data that Company A provided that is less related to employee satisfaction and engagement, such as distance between home and office, education, marital status, income, and clock-in/clock-out times. There is no guarantee that the results of this study are applicable to companies outside of Company A.

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Document Information

All of the statistical analyses in this document were performed using R version 3.6.1 (2019-07-05).

Appendix

Table 7: Final Logistic Regression Model Coefficients Summary

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	2.768	1.880	1.473	0.141
factor(Env.Sat)2	-3.397	1.183	-2.871	0.004
factor(Env.Sat)3	-0.105	0.984	-0.107	0.915
factor(Env.Sat)4	-0.576	0.908	-0.634	0.526
factor(Job.Sat)2	0.100	0.892	0.113	0.910
factor(Job.Sat)3	-1.530	0.827	-1.851	0.064
factor(Job.Sat)4	-0.691	0.915	-0.755	0.450
factor(Work.Life.Bal)2	-5.069	1.595	-3.178	0.001
factor(Work.Life.Bal)3	-2.390	1.549	-1.543	0.123
factor(Work.Life.Bal)4	-1.710	1.709	-1.001	0.317
factor(M.Job.Involve)2	-2.215	1.067	-2.076	0.038
factor(M.Job.Involve)3	-2.449	1.024	-2.392	0.017
factor(M.Job.Involve)4	-2.258	1.148	-1.967	0.049
factor(M.Perf.Rating)4	-1.863	0.572	-3.260	0.001
factor(Dep)Research & Development	1.111	1.461	0.761	0.447
factor(Dep)Sales	2.253	1.519	1.483	0.138
Training	0.041	0.207	0.196	0.844
factor(Env.Sat)2:factor(Job.Sat)2	-0.588	0.413	-1.423	0.155
factor(Env.Sat)3:factor(Job.Sat)2	0.073	0.391	0.187	0.852
factor(Env.Sat)4:factor(Job.Sat)2	-0.252	0.399	-0.632	0.527
factor(Env.Sat)2:factor(Job.Sat)3	0.011	0.366	0.031	0.976
factor(Env.Sat)3:factor(Job.Sat)3	0.332	0.348	0.954	0.340
factor(Env.Sat)4:factor(Job.Sat)3	0.783	0.335	2.339	0.019
factor(Env.Sat)2:factor(Job.Sat)4	-0.726	0.420	-1.728	0.084
factor(Env.Sat)3:factor(Job.Sat)4	0.526	0.366	1.437	0.151
factor(Env.Sat)4:factor(Job.Sat)4	-0.080	0.392	-0.203	0.839
factor(Env.Sat)2:factor(Work.Life.Bal)2	1.249	0.608	2.055	0.040
factor(Env.Sat)3:factor(Work.Life.Bal)2	1.435	0.599	2.395	0.017
factor(Env.Sat)4:factor(Work.Life.Bal)2	0.449	0.504	0.889	0.374
factor(Env.Sat)2:factor(Work.Life.Bal)3	0.335	0.562	0.596	0.551
factor(Env.Sat)3:factor(Work.Life.Bal)3	0.455	0.560	0.814	0.416
factor(Env.Sat)4:factor(Work.Life.Bal)3	-0.763	0.457	-1.671	0.095
factor(Env.Sat)2:factor(Work.Life.Bal)4	-0.156	0.686	-0.228	0.820
factor(Env.Sat)3:factor(Work.Life.Bal)4	-0.725	0.665	-1.091	0.275
factor(Env.Sat)4:factor(Work.Life.Bal)4	-1.572	0.605	-2.598	0.009
factor(Env.Sat)2:factor(M.Job.Involve)2	0.910	0.658	1.383	0.167
factor(Env.Sat)3:factor(M.Job.Involve)2	-0.905	0.536	-1.689	0.091
factor(Env.Sat)4:factor(M.Job.Involve)2	0.677	0.578	1.172	0.241
factor(Env.Sat)2:factor(M.Job.Involve)3	1.651	0.626	2.636	0.008

factor(Env.Sat)3:factor(M.Job.Involve)3	-0.988	0.507	-1.946	0.052
factor(Env.Sat)4:factor(M.Job.Involve)3	0.597	0.550	1.086	0.277
factor(Env.Sat)2:factor(M.Job.Involve)4	1.745	0.742	2.351	0.019
factor(Env.Sat)3:factor(M.Job.Involve)4	-0.781	0.620	-1.259	0.208
factor(Env.Sat)4:factor(M.Job.Involve)4	-0.204	0.666	-0.306	0.760
factor(Env.Sat)2:factor(M.Perf.Rating)4	1.505	0.401	3.757	0.000
factor(Env.Sat)3:factor(M.Perf.Rating)4	1.728	0.356	4.862	0.000
factor(Env.Sat)4:factor(M.Perf.Rating)4	0.471	0.384	1.226	0.220
factor(Env.Sat)2:factor(Dep)Research & Development	0.847	0.820	1.032	0.302
factor(Env.Sat)3:factor(Dep)Research & Development	-1.028	0.611	-1.683	0.092
factor(Env.Sat)4:factor(Dep)Research & Development	-0.945	0.588	-1.608	0.108
factor(Env.Sat)2:factor(Dep)Sales	1.375	0.846	1.625	0.104
factor(Env.Sat)3:factor(Dep)Sales	-0.897	0.638	-1.404	0.160
factor(Env.Sat)4:factor(Dep)Sales	-0.819	0.621	-1.319	0.187
factor(Env.Sat)1:Years.Promo	-0.402	0.115	-3.485	0.000
factor(Env.Sat)2:Years.Promo	-0.405	0.118	-3.421	0.001
factor(Env.Sat)3:Years.Promo	-0.357	0.113	-3.156	0.002
factor(Env.Sat)4:Years.Promo	-0.283	0.113	-2.510	0.012
factor(Job.Sat)2:factor(Work.Life.Bal)2	0.810	0.636	1.275	0.202
factor(Job.Sat)3:factor(Work.Life.Bal)2	0.496	0.570	0.871	0.384
factor(Job.Sat)4:factor(Work.Life.Bal)2	0.787	0.583	1.349	0.177
factor(Job.Sat)2:factor(Work.Life.Bal)3	0.728	0.581	1.253	0.210
factor(Job.Sat)3:factor(Work.Life.Bal)3	0.416	0.530	0.785	0.432
factor(Job.Sat)4:factor(Work.Life.Bal)3	-0.102	0.561	-0.181	0.856
factor(Job.Sat)2:factor(Work.Life.Bal)4	2.506	0.711	3.524	0.000
factor(Job.Sat)3:factor(Work.Life.Bal)4	0.204	0.689	0.297	0.767
factor(Job.Sat)4:factor(Work.Life.Bal)4	1.427	0.666	2.142	0.032
factor(Job.Sat)2:factor(M.Perf.Rating)4	-0.774	0.488	-1.587	0.113
factor(Job.Sat)3:factor(M.Perf.Rating)4	1.437	0.365	3.938	0.000
factor(Job.Sat)4:factor(M.Perf.Rating)4	0.974	0.368	2.648	0.008
factor(Job.Sat)2:factor(Dep)Research & Development	-1.115	0.597	-1.866	0.062
factor(Job.Sat)3:factor(Dep)Research & Development	-0.488	0.567	-0.861	0.389
factor(Job.Sat)4:factor(Dep)Research & Development	-1.661	0.625	-2.657	0.008
factor(Job.Sat)2:factor(Dep)Sales	-1.585	0.628	-2.523	0.012
factor(Job.Sat)3:factor(Dep)Sales	-1.051	0.592	-1.774	0.076
factor(Job.Sat)4:factor(Dep)Sales	-1.999	0.650	-3.075	0.002
factor(Job.Sat)2:Training	-0.089	0.115	-0.772	0.440
factor(Job.Sat)3:Training	0.232	0.097	2.385	0.017
factor(Job.Sat)4:Training	0.247	0.104	2.365	0.018
factor(Job.Sat)2:Years.Promo	0.104	0.048	2.167	0.030
factor(Job.Sat)3:Years.Promo	0.082	0.043	1.909	0.056
factor(Job.Sat)4:Years.Promo	0.122	0.045	2.701	0.007
factor(Work.Life.Bal)2:factor(M.Job.Involve)2	1.643	1.052	1.562	0.118
factor(Work.Life.Bal)3:factor(M.Job.Involve)2	2.036	1.020	1.997	0.046

factor(Work.Life.Bal)4:factor(M.Job.Involve)2	1.702	1.171	1.453	0.146
factor(Work.Life.Bal)2:factor(M.Job.Involve)3	1.783	1.001	1.781	0.075
factor(Work.Life.Bal)3:factor(M.Job.Involve)3	2.250	0.977	2.303	0.021
factor(Work.Life.Bal)4:factor(M.Job.Involve)3	1.448	1.120	1.293	0.196
factor(Work.Life.Bal)2:factor(M.Job.Involve)4	3.268	1.134	2.883	0.004
factor(Work.Life.Bal)3:factor(M.Job.Involve)4	2.063	1.120	1.843	0.065
factor(Work.Life.Bal)4:factor(M.Job.Involve)4	1.793	1.405	1.276	0.202
factor(Work.Life.Bal)2:factor(M.Perf.Rating)4	-0.022	0.526	-0.042	0.967
factor(Work.Life.Bal)3:factor(M.Perf.Rating)4	0.710	0.497	1.430	0.153
factor(Work.Life.Bal)4:factor(M.Perf.Rating)4	1.009	0.583	1.731	0.083
factor(Work.Life.Bal)2:factor(Dep)Research & Development	1.435	1.079	1.330	0.183
factor(Work.Life.Bal)3:factor(Dep)Research & Development	-0.865	1.050	-0.824	0.410
factor(Work.Life.Bal)4:factor(Dep)Research & Development	-0.643	1.154	-0.557	0.578
factor(Work.Life.Bal)2:factor(Dep)Sales	0.880	1.143	0.769	0.442
factor(Work.Life.Bal)3:factor(Dep)Sales	-1.500	1.107	-1.355	0.175
factor(Work.Life.Bal)4:factor(Dep)Sales	-2.010	1.254	-1.602	0.109
factor(Dep)Research & Development:Training	-0.226	0.206	-1.094	0.274
factor(Dep)Sales:Training	-0.399	0.215	-1.857	0.063
factor(Dep)Research & Development:Years.Promo	0.250	0.107	2.327	0.020
factor(Dep)Sales:Years.Promo	0.305	0.108	2.823	0.005