



SDS 3386

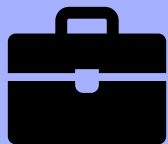
FALL 2022

FINAL PROJECT PRESENTATION

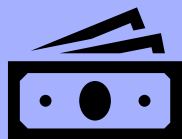


By: Tamara, Elli, Coralie and Tanner





Introduction



“

*What are the main
factors that influence
job satisfaction?*

A similar study:

Evaluation of Factors Influencing Job Satisfaction

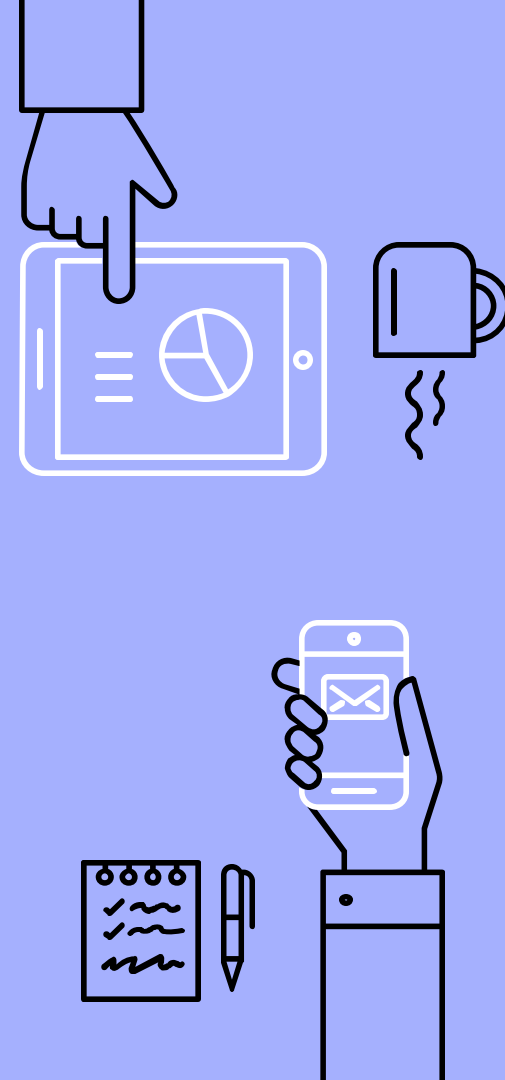
A study by Barbara Sypniewska at the University of Finance and Management in Warsaw, Poland

Most important

- ▶ Atmosphere at work
- ▶ Stability of employment
- ▶ Good relations with co-workers
- ▶ Good relations with superiors
- ▶ Communication with management

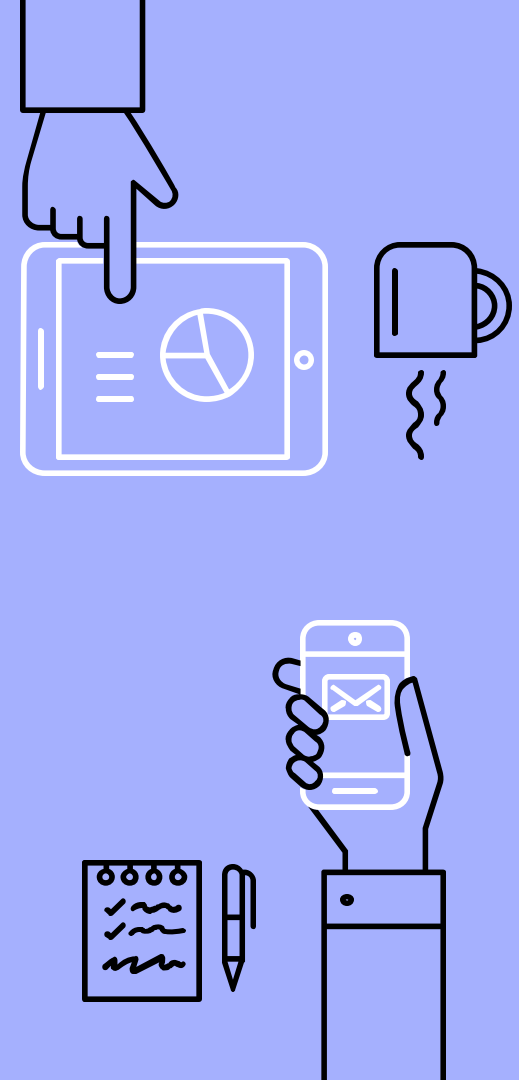
Least important

- ▶ Communication with management
- ▶ Content of work
- ▶ Possibility of development

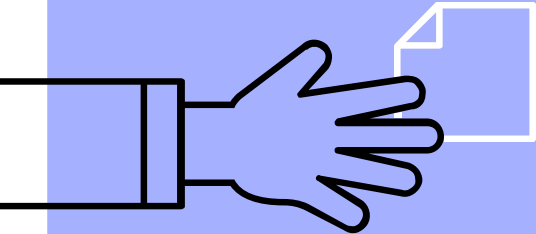
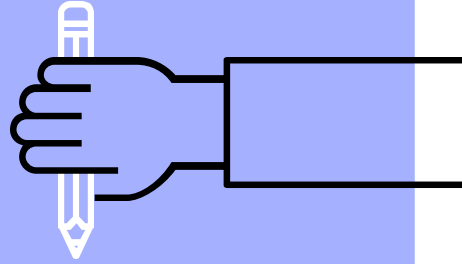


Two other studies:

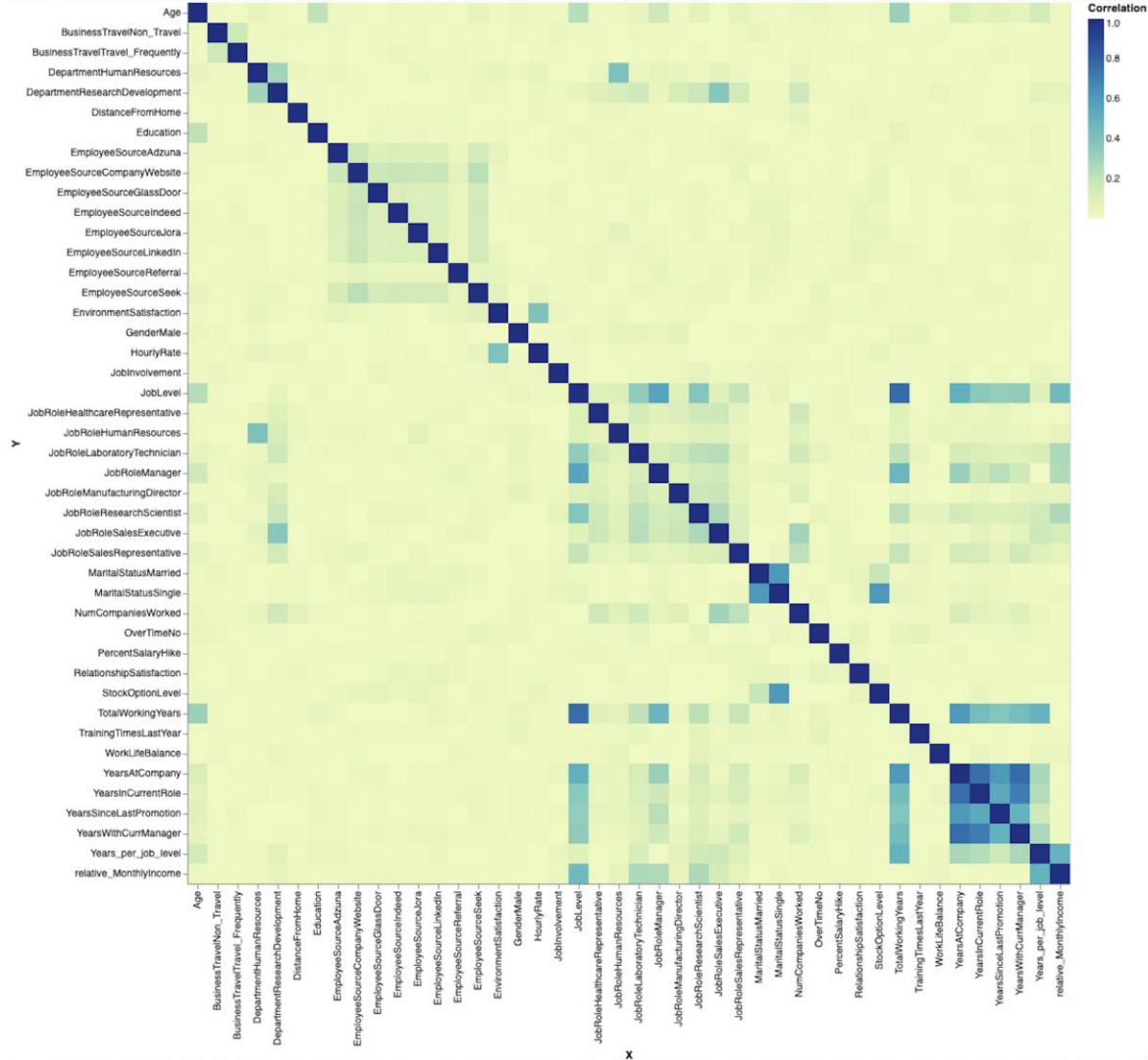
- ▶ Is salary the most important factor?
- ▶ [9 Out of 10 People Are Willing to Earn Less Money to Do More-Meaningful Work\(hbr.org\)](#)
- ▶ Are remote workers more satisfied?
- ▶ [Survey: On average, remote workers are about 20% happier | HR Dive](#)



Modeling IBM data



Correlation table



Contingency Tables

JobSatisfaction	1	2	3	4
JobRole				
Healthcare Representative	348	260	602	575
Human Resources	122	218	172	176
Laboratory Technician	654	659	942	1092
Manager	291	286	381	485
Manufacturing Director	358	468	730	513
Research Director	231	230	383	311
Research Scientist	663	657	1214	1304
Sales Executive	889	702	1111	1517
Sales Representative	120	232	305	277

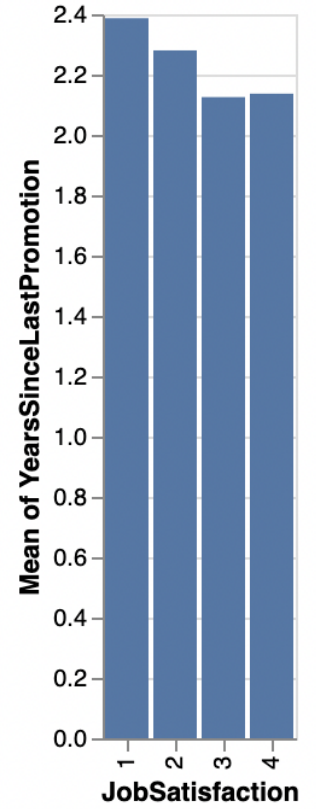
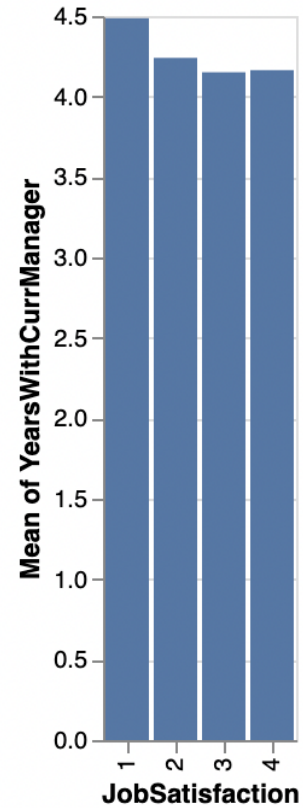
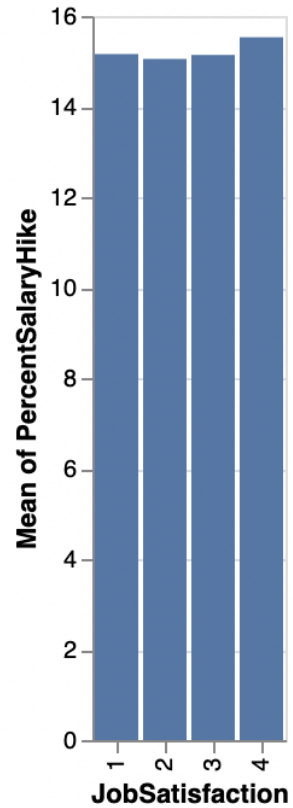
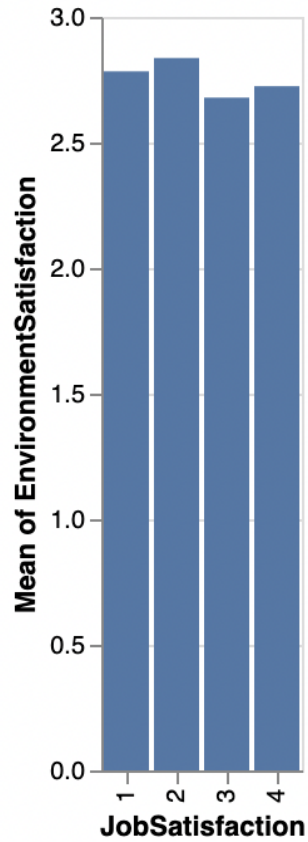
JobSatisfaction	1	2	3	4
MaritalStatus				
Divorced	977	879	1271	1433
Married	1715	1809	2886	2768
Single	984	1024	1683	2049

Contingency Tables

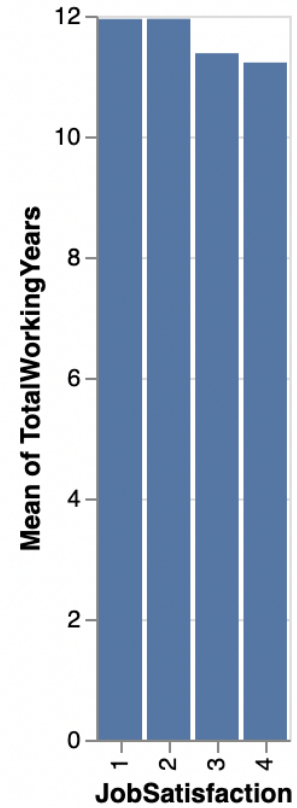
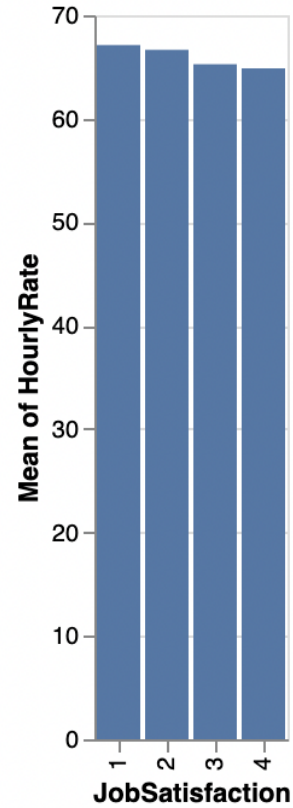
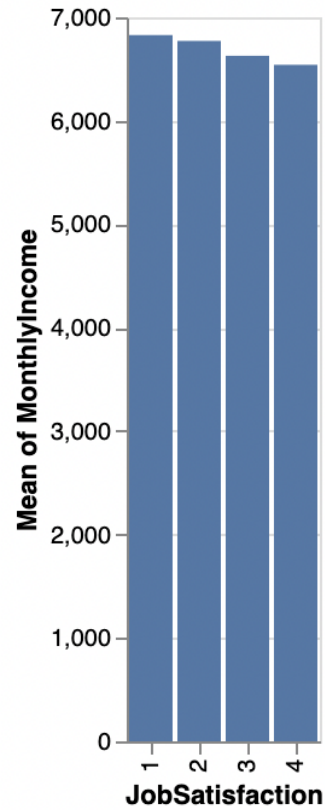
JobSatisfaction	1	2	3	4
RelationshipSatisfaction				
1	652	624	1134	1146
2	732	785	1299	1338
3	1168	1065	1729	2055
4	1124	1238	1678	1711

JobSatisfaction	1	2	3	4
Employee Source				
Adzuna	223	368	653	560
Company Website	881	746	1327	1455
GlassDoor	316	399	600	508
Indeed	411	492	608	653
Jora	341	438	568	601
LinkedIn	501	279	569	649
Recruit.net	386	422	544	618
Referral	22	88	109	113
Seek	595	480	862	1093

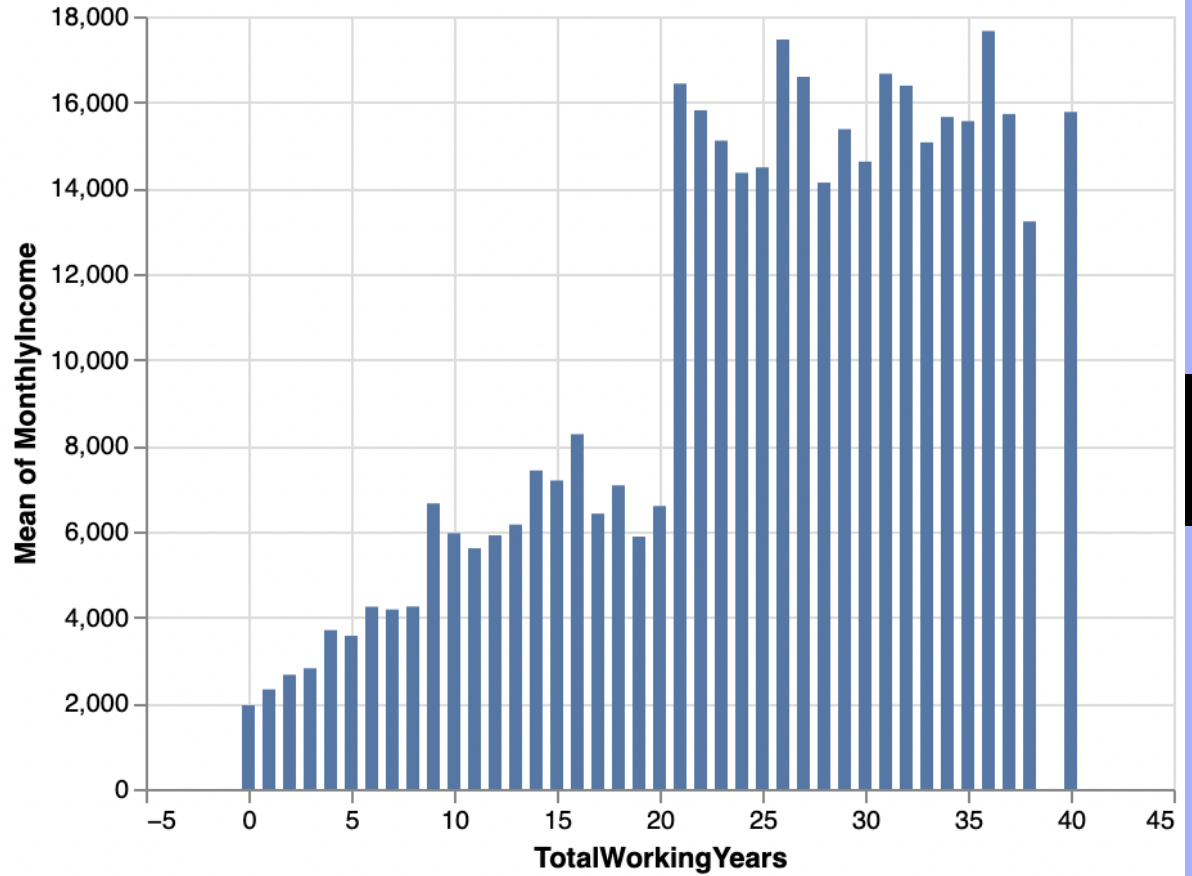
Graphs



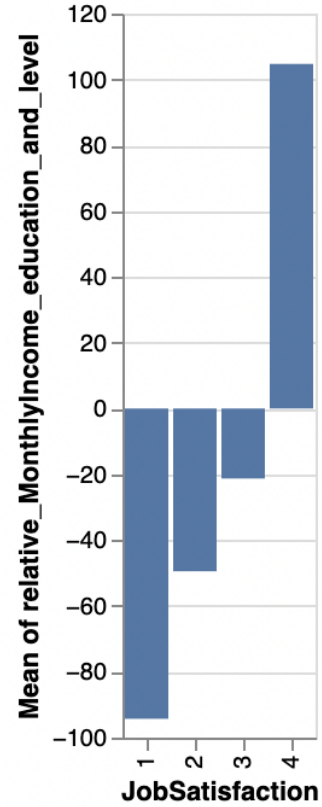
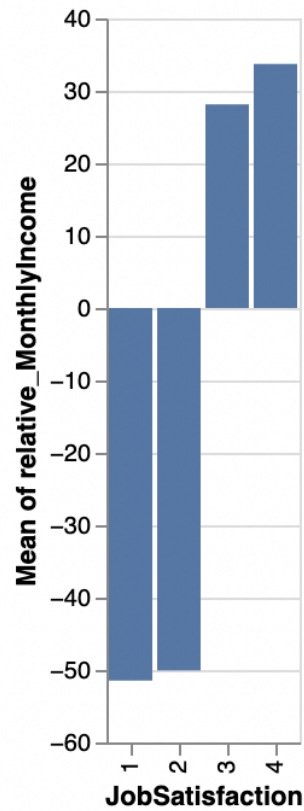
Graphs



Graphs



Graphs



```

reg8.score(test1[['Age', 'DailyRate', 'DistanceFromHome', 'EnvironmentSatisfaction',
    'HourlyRate', 'JobInvolvement', 'JobLevel',
    'NumCompaniesWorked', 'relative_MonthlyIncome',
    'PercentSalaryHike', 'RelationshipSatisfaction', 'StandardHours',
    'StockOptionLevel', 'TotalWorkingYears', 'TrainingTimesLastYear',
    'WorkLifeBalance', 'YearsAtCompany', 'YearsInCurrentRole',
    'YearsSinceLastPromotion', 'YearsWithCurrManager',
    'BusinessTravelTravel_Frequently', 'BusinessTravelNon_Travel',
    'DepartmentResearchDevelopment', 'DepartmentHumanResources',
    'Education', 'GenderMale',
    'JobRoleResearchScientist', 'JobRoleManufacturingDirector',
    'JobRoleLaboratoryTechnician', 'JobRoleSalesRepresentative',
    'JobRoleSalesExecutive', 'JobRoleManager', 'JobRoleHumanResources',
    'JobRoleHealthcareRepresentative', 'MaritalStatusMarried',
    'MaritalStatusSingle', 'OverTimeNo', 'EmployeeSourceSeek',
    'EmployeeSourceIndeed', 'EmployeeSourceReferral',
    'EmployeeSourceCompanyWebsite', 'EmployeeSourceAdzuna',
    'EmployeeSourceGlassDoor', 'EmployeeSourceJora',
    'EmployeeSourceLinkedIn']],
    test1[['JobSatisfaction']])

```

: -0.02849923490876094

OLS Regression Results

```
=====
Dep. Variable:          JobSatisfaction      R-squared (uncentered):          0.721
Model:                  OLS                 Adj. R-squared (uncentered):      0.720
Method:                 Least Squares       F-statistic:                     1217.
Date:                   Mon, 05 Dec 2022    Prob (F-statistic):              0.00
Time:                   08:16:17           Log-Likelihood:                  -7883.9
No. Observations:      19358              AIC:                            1.585e+04
Df Residuals:          19317              BIC:                            1.617e+04
Df Model:               41
Covariance Type:       nonrobust
```

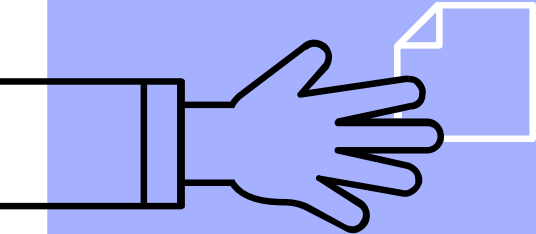
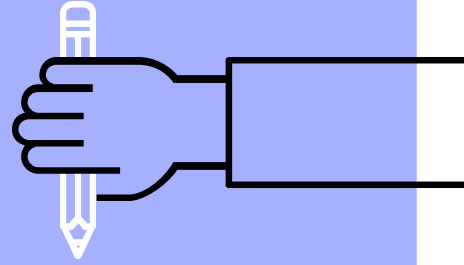

OLS Regression Results

Dep. Variable:	JobSatisfaction	R-squared (uncentered):	0.719
Model:	OLS	Adj. R-squared (uncentered):	0.719
Method:	Least Squares	F-statistic:	2360.
Date:	Mon, 05 Dec 2022	Prob (F-statistic):	0.00
Time:	11:00:37	Log-Likelihood:	-7937.4
No. Observations:	19358	AIC:	1.592e+04
Df Residuals:	19337	BIC:	1.608e+04
Df Model:	21		
Covariance Type:	nonrobust		

0.025023285079994406

	coef	std err	t	P> t	[0.025	0.975]
PercentSalaryHike	0.0710	0.010	7.057	0.000	0.051	0.091
RelationshipSatisfaction	-0.0181	0.007	-2.485	0.013	-0.032	-0.004
StockOptionLevel	0.0797	0.012	6.535	0.000	0.056	0.104
YearsAtCompany	0.1453	0.024	6.155	0.000	0.099	0.192
YearsSinceLastPromotion	-0.0640	0.015	-4.148	0.000	-0.094	-0.034
relative_MonthlyIncome	0.6272	0.021	30.415	0.000	0.587	0.668
Years_per_job_level	0.1036	0.038	2.750	0.006	0.030	0.177
BusinessTravelTravel_Frequently	0.0510	0.007	7.189	0.000	0.037	0.065
BusinessTravelNon_Travel	0.0504	0.008	5.938	0.000	0.034	0.067
GenderMale	0.0277	0.005	5.155	0.000	0.017	0.038
JobRoleResearchScientist	0.1954	0.011	17.854	0.000	0.174	0.217
JobRoleManufacturingDirector	0.1213	0.012	10.087	0.000	0.098	0.145
JobRoleLaboratoryTechnician	0.1757	0.011	15.661	0.000	0.154	0.198
JobRoleSalesRepresentative	0.1858	0.015	12.331	0.000	0.156	0.215
JobRoleSalesExecutive	0.1484	0.011	13.940	0.000	0.128	0.169
JobRoleManager	0.0949	0.014	6.831	0.000	0.068	0.122
JobRoleHumanResources	0.1203	0.017	7.207	0.000	0.088	0.153
JobRoleHealthcareRepresentative	0.1601	0.012	12.814	0.000	0.136	0.185
MaritalStatusMarried	0.0389	0.007	5.676	0.000	0.025	0.052
MaritalStatusSingle	0.0960	0.009	10.301	0.000	0.078	0.114
OverTimeNo	-0.0276	0.006	-4.577	0.000	-0.039	-0.016

Employee Satisfaction Index



The dataset:

	Unnamed: 0	emp_id	age	Dept	location	education	recruitment_type	job_level	rating	onsite	awards	certifications	salary	satisfied
0	0	HR8270	28	HR	Suburb	PG	Referral	5	2	0	1	0	86750	1
1	1	TECH1860	50	Technology	Suburb	PG	Walk-in	3	5	1	2	1	42419	0
2	2	TECH6390	43	Technology	Suburb	UG	Referral	4	1	0	2	0	65715	0
3	3	SAL6191	44	Sales	City	PG	On-Campus	2	3	1	0	0	29805	1
4	4	HR6734	33	HR	City	UG	Recruitment Agency	2	1	0	5	0	29805	1
5	5	PUR7265	40	Purchasing	Suburb	UG	Referral	3	3	0	7	1	42419	1
6	6	PUR1466	26	Purchasing	Suburb	UG	Referral	5	5	0	2	0	86750	0
7	7	TECH5426	25	Technology	City	UG	Recruitment Agency	1	1	0	4	0	24076	0
8	8	HR6578	35	HR	City	PG	Referral	3	4	0	0	0	42419	1
9	9	TECH9322	45	Technology	City	PG	Referral	3	3	0	9	0	42419	0
10	10	MKT2685	31	Marketing	City	UG	Walk-in	4	4	1	6	0	65715	1

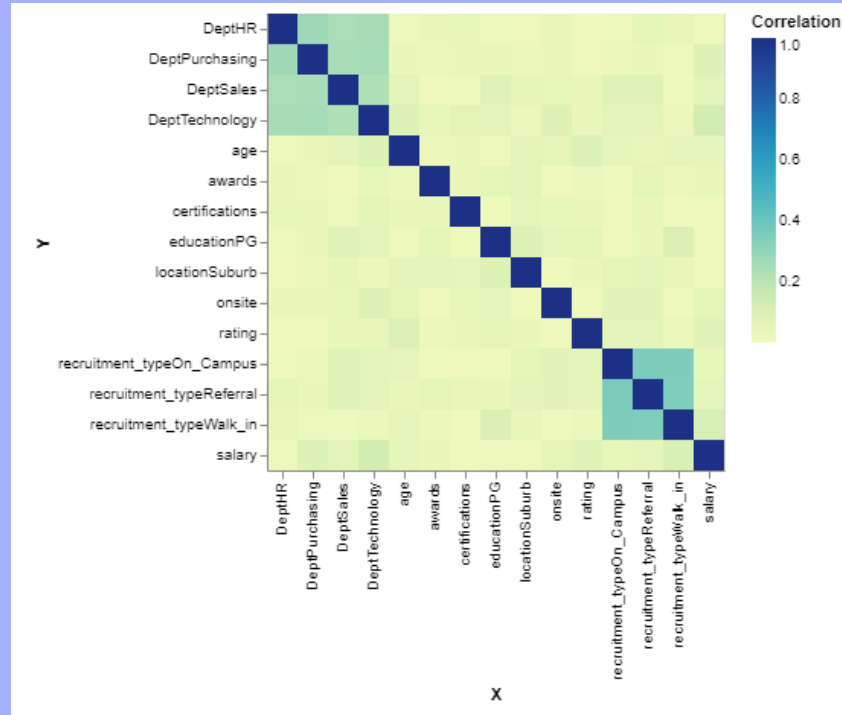
Contingency Tables

satisfied	0	1
Dept		
HR	53	53
Marketing	51	44
Purchasing	47	62
Sales	41	51
Technology	45	53

satisfied	0	1
job_level		
1	41	54
2	57	53
3	41	41
4	53	57
5	45	58

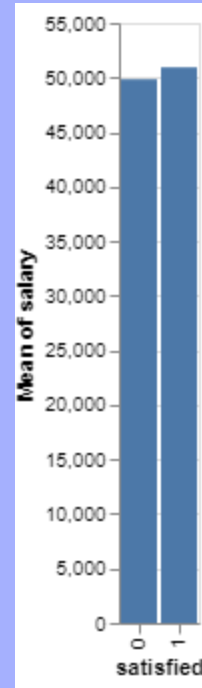
satisfied	0	1
awards		
0	20	32
1	20	21
2	29	19
3	32	25
4	22	29
5	25	27
6	19	27
7	18	32
8	30	26
9	22	25

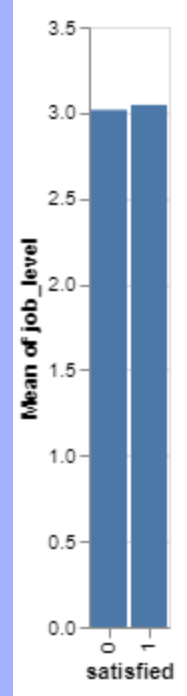
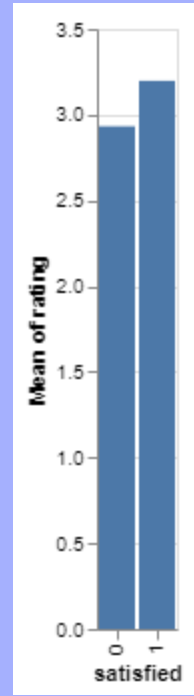
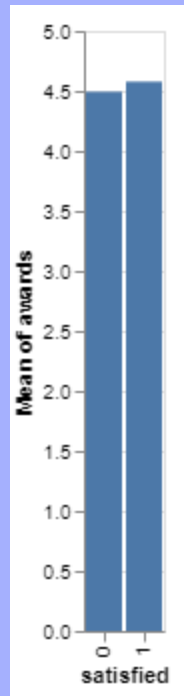
Correlation matrix:

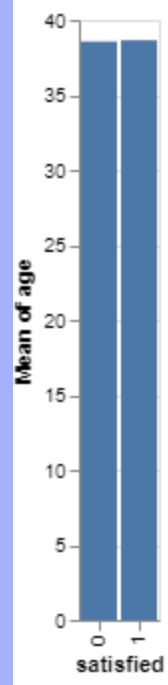
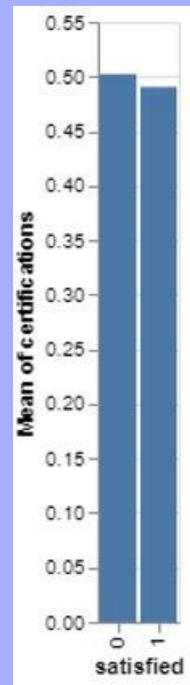
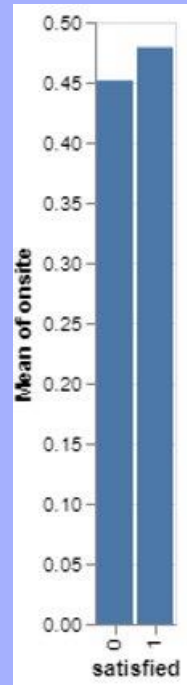


People who are satisfied have, on average, a higher salary.

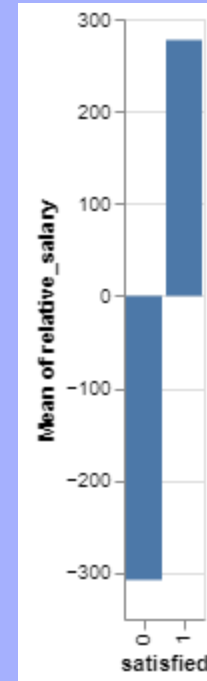
As expected!



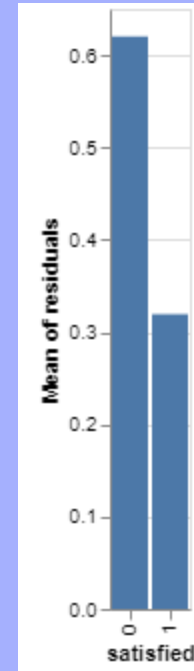




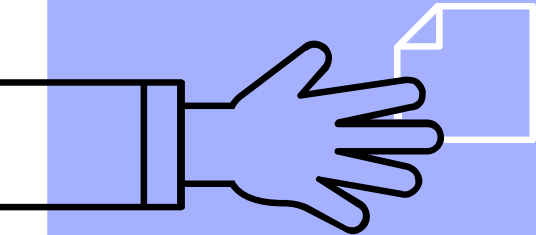
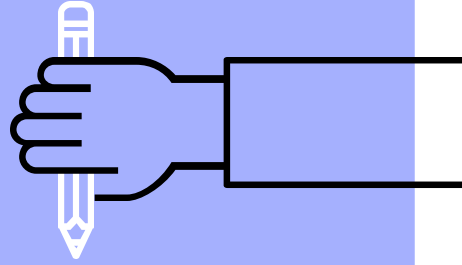
People with a higher salary than their coworkers who are the same age, are more satisfied.

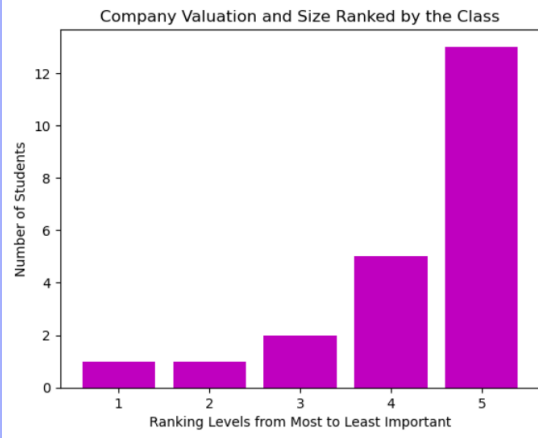
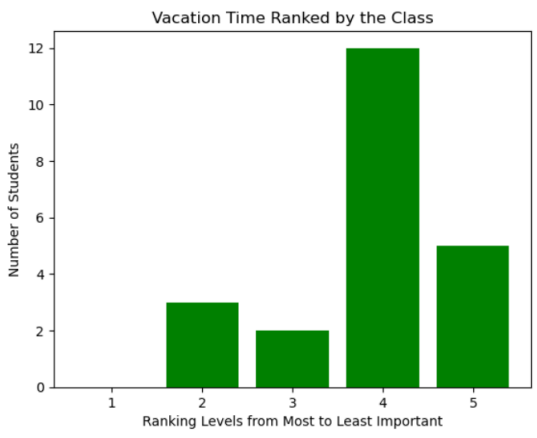
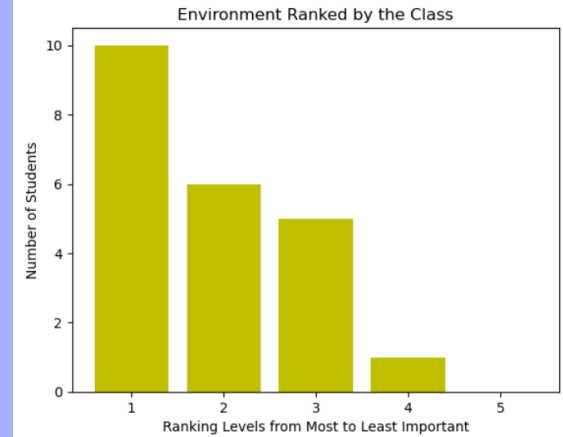
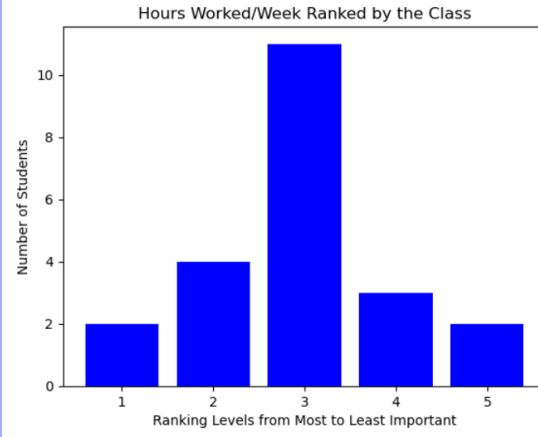
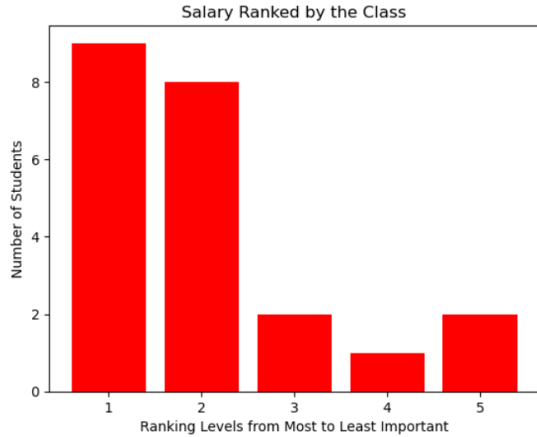


Logistic Regression: $R^2 = 0.552$



Survey Results

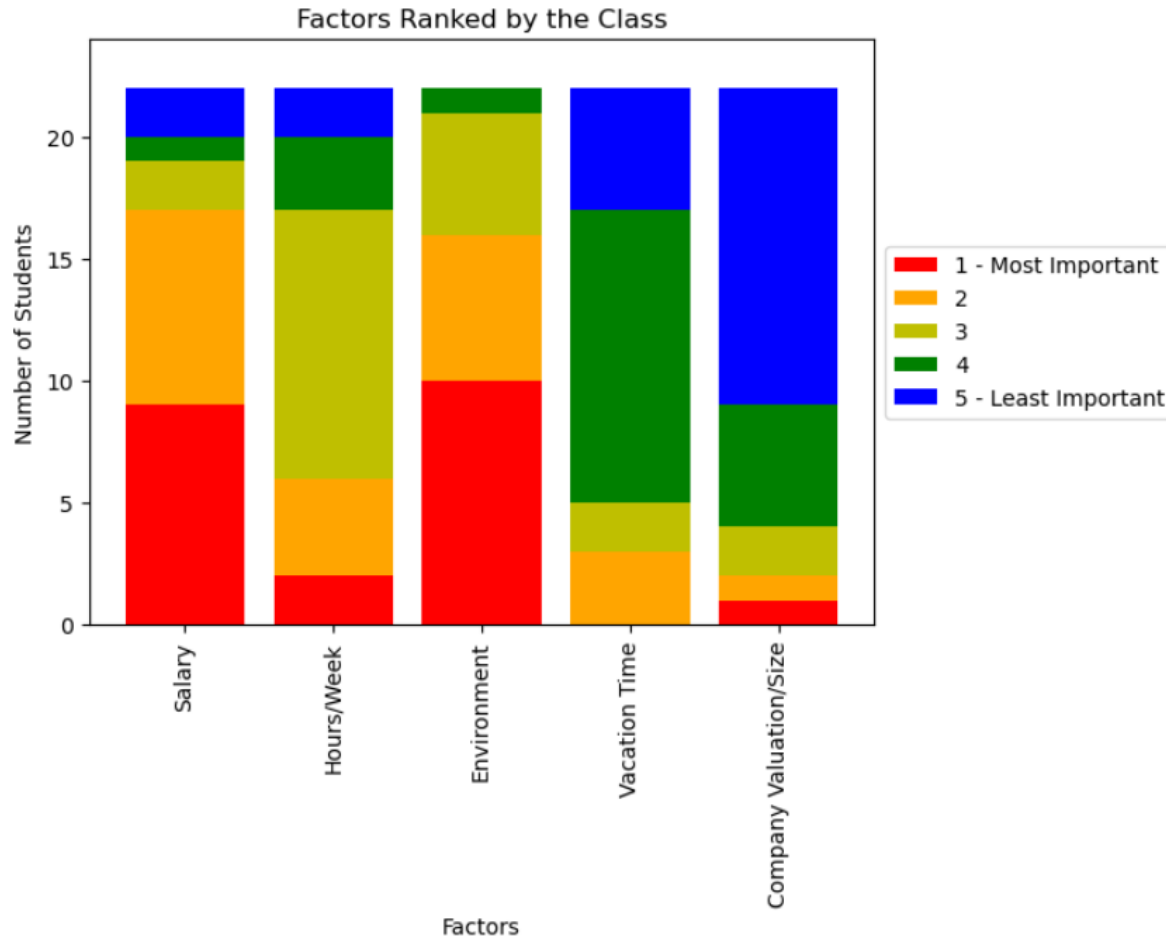




Reminder: The lower the score, the more important the factor!

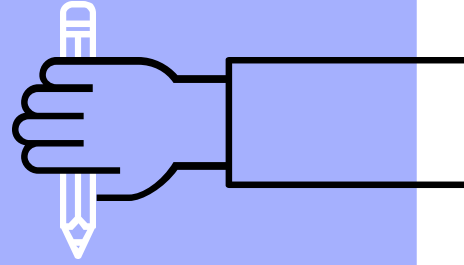
Average Scores:

- ▶ Salary: 2.045
- ▶ Hours Worked/Week: 2.954
- ▶ Environment: 1.863
- ▶ Vacation Time: 3.863
- ▶ Company Valuation and Size: 4.273



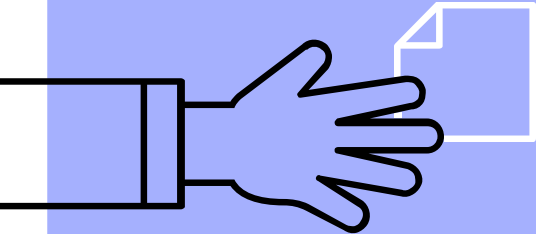
Summary

- ▶ Environment and Salary are your most important factors
- ▶ Company Valuation/Size is of least importance to you, followed by Vacation Time



Comparison

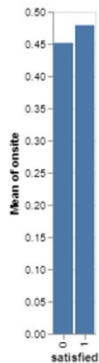
Comparing the Class Survey Results to our Results



LET'S LOOK AT WHAT OUR DATASETS HAVE TO SAY ABOUT THE FACTORS YOU INDICATED AS THE MOST IMPORTANT

Environment

As shown earlier in the Employee Satisfaction Index, it seems as though people who work onsite are more satisfied with their job!



Salary

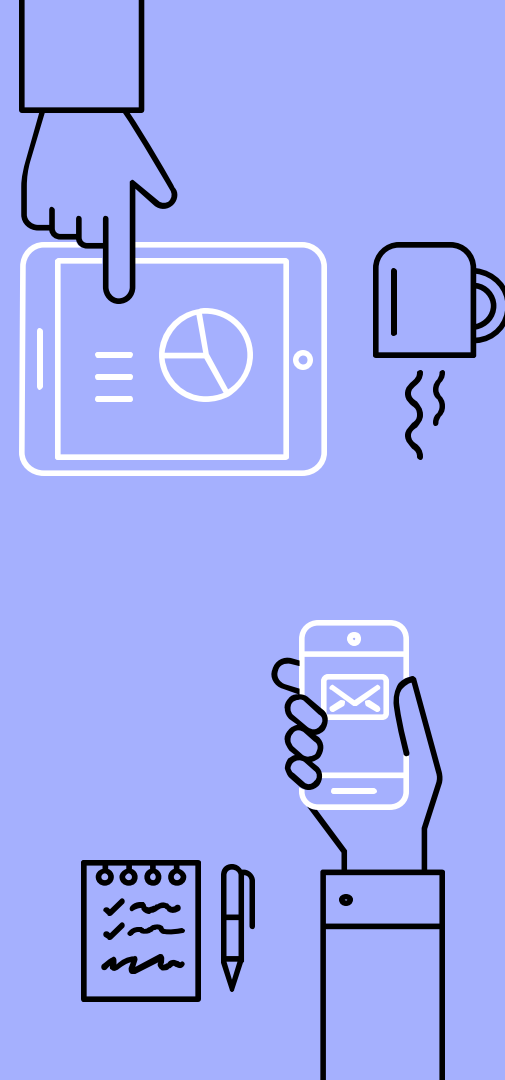
No surprise! We saw in both datasets that there is a link between salary and job satisfaction.

However, it's about more than just the amount of money you make. Both datasets indicate that people who make more money compared to others around their age are more satisfied with their job.

Role

Though role was not a factor we had the class rate, we thought it could be interesting to see if people with roles similar to our possible future roles are satisfied with their jobs!

JobSatisfaction	1	2	3	4
JobRole				
Healthcare Representative	348	260	602	575
Human Resources	122	218	172	176
Laboratory Technician	654	659	942	1092
Manager	291	286	381	485
Manufacturing Director	358	468	730	513
Research Director	231	230	383	311
Research Scientist	663	657	1214	1304
Sales Executive	889	702	1111	1517
Sales Representative	120	232	305	277



ROLE

JOB SATISFACTION

Let's take a look at one of our IBM dataset contingency tables...

Research Scientist

Laboratory Technician



JobSatisfaction	1	2	3	4
JobRole				
Healthcare Representative	348	260	602	575
Human Resources	122	218	172	176
Laboratory Technician	654	659	942	1092
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Manufacturing Director	358	468	730	513
Research Director	231	230	383	311
Research Scientist	663	657	1214	1304
Sales Executive	889	702	1111	1517
Sales Representative	120	232	305	277



Does sex have an
effect on job
satisfaction?



Does sex have an effect on job satisfaction?

Based on the IBM dataset (which used a satisfaction scale of 1 to 4), the average satisfaction rating increases by about 0.03 for male employees.

- ✓ Male employees are a bit more satisfied.



Summary

IBM

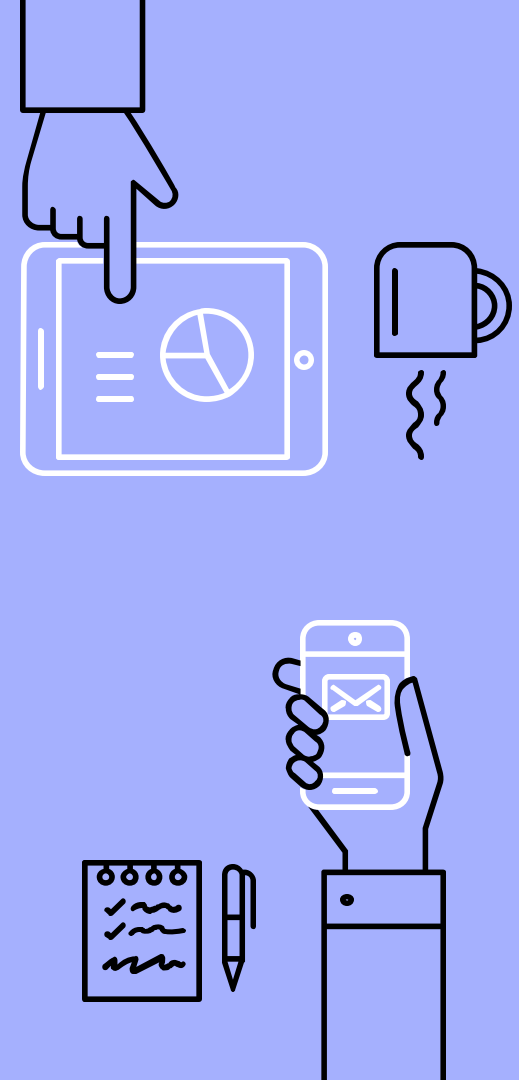
The most important factor influencing job satisfaction is “how much money you are making relative to people your age”.

IBM

Other important (and interesting) factors include your position or role and how long you’ve been working at the company for.

Employee Satisfaction Index

This dataset also showed that in general, the people who are more satisfied with their jobs have a higher salary. It also showed that people who are making more money than their coworkers (who are the same age), are more satisfied.



THANKS!

Any questions?



References

- ▶ Sypniewska, Barbara, Evaluation of Factors Influencing Job Satisfaction (March 31, 2014). Contemporary Economics, Vol. 8, No. 1, pp. 57-72, 2014, Available at SSRN: <https://ssrn.com/abstract=2435040>
- ▶ Bańka, A. (2002). Psychologia organizacji [Psychology of the organization]. In J. Strelau (Ed.), Psychologia. Podręcznik Akademicki [Psychology. Academic Handbook]. (Vol. 3) (pp. 321-350). Gdańsk: GWP.

