

# The Effects of Marriage and Children on Career Progression

W241.5 Final Project

Chi long Ansjory, Joseph Mercer, Kai Qi Lim, Pritesh Patel

## Introduction

Our project was based on trying to estimate the effects of marriage and children on career progression. With more people getting married and having children later in life, we were interested in whether those life choices would have a career impact. Life changes dramatically with more focus on children with parents often taking time off from their careers to bond and raise their children. This is often especially true of new mothers. We wanted to understand whether taking time off specifically to bond and raise with a child had an impact on a job candidates positive responses from job applications.

The paper that we based our project off intended to conduct a large survey and collect responses, and analyze the survey results. This has some issues in that there is no particular experiment being conducted. Given the time constraints, we narrowed our scope to research if there is a bias in companies hiring when children are explicitly mentioned in a resume.

We posed the question: ***“How does taking a sabbatical to travel versus taking a sabbatical and explicitly mentioning children affect job-seeking success rate?”***

To understand this question we intend to gather response data from a pool of resumes and applications and compare responses to each resume. This is the same experimental approach used to determine discrimination in Bertrand and Mullainathan, 2004 and in subsequent studies discussed in Baert 2017.

## Experimental Design

Each team member represented one persona and all applied for the same set of “Data Scientist” job positions. We used a spreadsheet to track feedback from recruiters, such as next step phone calls/interviews, rejections, or non-responses. The four roles (as shown in Appendix A) that were represented in our step were ‘Male with no children’, ‘Male with children’, ‘Female with no children’, and ‘Female with children’. To ensure that all resumes were as similar as possible for an apples-to-apples comparison, all resumes had similar education background,

work experience in comparable companies within the same industry, and a one year sabbatical. The treatment in our experiment is the mention of ‘children’ in the resumes: the one year sabbatical mentioned ‘children’ specifically in their one year sabbatical as opposed to just traveling (as shown in Figure 1 below) and indication of volunteer at child’s elementary school in the personal interest section.

DEREK WEPLER <a href="mailto:derekwepler@gmail.com">derekwepler@gmail.com</a>		JASON VINSANT <a href="mailto:jasonvinsant@gmail.com">jasonvinsant@gmail.com</a>	
<b>EDUCATION</b>		<b>EDUCATION</b>	
University of California, Berkeley - Master of Information and Data Science	May 2019	University of California, Berkeley - Master of Information and Data Science	May 2019
• Data Vis, A/B Testing, Time Series, Machine Learning, Natural Language Processing		• Data Vis, A/B Testing, Time Series, Machine Learning, Natural Language Processing	
University of California, San Diego - Bachelor of Science in Computer Science	Jun 2010	University of California, Berkeley - Bachelor of Science in Computer Science	Jun 2010
<b>EXPERIENCE</b>		<b>EXPERIENCE</b>	
<b>Analysis Group</b> Senior Analyst Economic Modeling	Jul 14 - Present	<b>Evidation</b> Senior Analyst Economic Modeling	Jul 14 - Present
• Coordinate projects to inform and build models related to the estimation of harm reduction and cost impact of the hypothetical introduction of new prescription drugs		• Coordinate projects to inform and build models related to the estimation of harm reduction and cost impact of the hypothetical introduction of new prescription drugs	
• Build market simulation models for energy markets to inform expected future capacity market prices and viability of potential new products		• Build market simulation models for energy markets to inform expected future capacity market prices and viability of potential new products	
• Managed process to collect and categorize data to inform an econometric model to estimate the effect of e-Privacy regulation in the EU on venture capital investment in various online industries		• Managed process to collect and categorize data to inform an econometric model to estimate the effect of e-Privacy regulation in the EU on venture capital investment in various online industries	
<b>Programming &amp; Development</b>		<b>Programming &amp; Development</b>	
• Developed module for client web-apps to allow for dynamic graphical exploration of patient treatment sequencing patterns		• Developed module for client web-apps to allow for dynamic graphical exploration of patient treatment sequencing patterns	
• Built code to read, parse, and categorize over 1 million lines of at-issue source code in a software intellectual property litigation		• Built code to read, parse, and categorize over 1 million lines of at-issue source code in a software intellectual property litigation	
<b>Sabbatical</b> Took a one year leave to travel and explore the world	Jul 13 - Jul 14	<b>Sabbatical</b> Took a one year leave to travel and explore the world with my children	Jul 13 - Jul 14
<b>Root Capital</b> Lending Analyst	Feb 10 - Jul 13	<b>First Republic</b> Lending Analyst	Feb 10 - Jul 13

Figure 1. Sample of resumes showing treatment

For the purposes of our experiment, we captured the site which we found the job posting, the company name, a URL link to the job posting, the date for each persona applying and the response date for each persona. There were a few reasons for capturing the data this way. The first few fields allowed us to coordinate and ensure that all of us were applying to the same positions. The second half of fields allowed us to track response rates of the applied positions.

Randomization of treatment was done through job search platforms and job industries. Each team member would search a plethora of job posting sites (CareerBuilder, Indeed, Monster, etc) for a ‘Data Scientist’ job. The experiment design is also represented in ROXO grammar in Table 1 below, where Experiment Group refers to the group with treatment. Potential outcomes from the Experiment group after receiving the resumes with children mentioned would be compared to the Control group receiving resumes without children mentioned.

Experiment Group	R X O
Control Group	R - O

Table 1. Experimental design using ROXO grammar

We did not limit our research to any industry or specialty area. Geographically, we limited our search to the San Francisco bay area. Given the size of our team and the length of time on the project, we chose San Francisco as it has a large number of 'Data Scientist' positions. For further expansion on this project, the area could be widened to include other geographic locations like Los Angeles, New York and Seattle.

## Outcome Measures

Given that our experiment has binomial outcomes, we can assume a Bernoulli distribution. This means that to achieve a statistically powerful outcome, we require about 50 responses (at 80% power and 95% confidence level). Across all positions found, we found 49 job postings and completed 186 applications. Some job postings were taken down while we were in the process of applying and lowered the number of applications, so then 6 potential applications were considered as attrition. On the other hand, there were 4 job positions that one of our 4 roles didn't submit before our experiment cutoff as non-compliance. Ideally, all 49 job postings would have received all 4 resumes. We were attempting to spread out our application times in an attempt to conceal our experiment to recruiters. This is a breakdown of our applications:

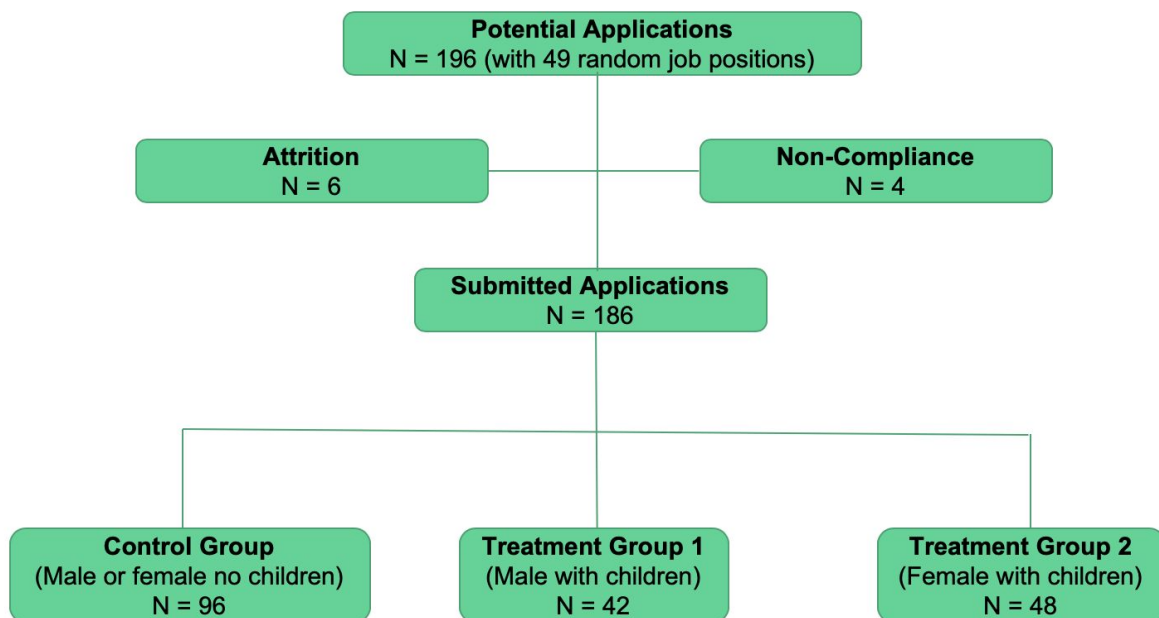


Figure 2. Flow chart showing a breakdown of treatment and control groups

## Analysis & Results

We recorded feedback from recruiters, such as next step phone calls/interviews, rejections, or non-responses to estimate treatment effect. We regressed response rate,

acceptance rate and rejection rate by the applicant type (as shown in Figure 3 below). Appendix B exhibits the complete set of the experiment data.

Company	Applied	Response	Accept	Reject	Applicant
Yelp	7/19/2019	0	0	0	male_sabbatical
Square	7/19/2019	0	0	0	male_sabbatical
eHealth	7/19/2019	0	0	0	male_sabbatical
ASML	7/19/2019	0	0	0	male_sabbatical
c3.ai	7/19/2019	1	0	7/25/2019	male_sabbatical

Figure 3. Sample of outcome measures showing various responses

## Response Rate

Response here refers to an email from the hiring manager, whether it is an acceptance or rejection for the job post. On the other hand, a non-response would be the typical automatically-generated email from the company indicating that an application was received. Figure 4 shows that the role of female with no children has a higher response rate than three other roles. However, from the results of the regression model, it was not statistically significant. This makes sense as the overall response rate is very low.

```

{r}
model_basic <- lm(Response ~ Applicant, data=d)
summary(model_basic)

```

```

Call:
lm(formula = Response ~ Applicant, data = d)

Residuals:
    Min       1Q   Median       3Q      Max
-0.12245 -0.10204 -0.06667 -0.04082  0.95918

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    0.10204    0.03964   2.574  0.0108 *
Applicantfemale_sabbatical 0.02041    0.05606   0.364  0.7162
Applicantmale_children -0.03537    0.05729  -0.617  0.5377
Applicantmale_sabbatical -0.06122    0.05606  -1.092  0.2761
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.2775 on 188 degrees of freedom
Multiple R-squared:  0.01317, Adjusted R-squared:  -0.002575
F-statistic: 0.8365 on 3 and 188 DF, p-value: 0.4754

```

Figure 4. Linear regression model of responses vs. applicants

## Acceptance Rate

Acceptance refers to an email from the hiring manager with a positive response indicating progress towards an actual interview. Figure 5 shows that male with children and female with no children have higher acceptance rates than two other roles, and female with no children is statistically significant.

```
```{r}
d$Accept_bi <- ifelse(d$Accept == 0, 0, 1)
model_acc <- lm(Accept_bi ~ Applicant, data=d)
summary(model_acc)
```
```

Call:  
lm(formula = Accept\_bi ~ Applicant, data = d)

Residuals:

|  | Min      | 1Q       | Median  | 3Q      | Max     |
|--|----------|----------|---------|---------|---------|
|  | -0.06122 | -0.02222 | 0.00000 | 0.00000 | 0.97778 |

Coefficients:

|                            | Estimate  | Std. Error | t value | Pr(> t ) |
|----------------------------|-----------|------------|---------|----------|
| (Intercept)                | 2.404e-17 | 2.029e-02  | 0.000   | 1.0000   |
| Applicantfemale_sabbatical | 6.122e-02 | 2.870e-02  | 2.133   | 0.0342 * |
| Applicantmale_children     | 2.222e-02 | 2.933e-02  | 0.758   | 0.4496   |
| Applicantmale_sabbatical   | 1.183e-17 | 2.870e-02  | 0.000   | 1.0000   |

---  
Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1421 on 188 degrees of freedom  
Multiple R-squared: 0.03129, Adjusted R-squared: 0.01583  
F-statistic: 2.024 on 3 and 188 DF, p-value: 0.112

Figure 5. Linear regression model of acceptance responses vs. applicants

## Rejection Rate

Rejection refers to an email from the hiring manager with a response indicating that no further interest is with the candidate, or there is no response 14 days after the application submitted. Figure 6 shows that male with no children and female has a higher rejection rates than three other roles:

```

```{r}
d$NonRespRej <- ifelse(d$Reject == 0, 0, 1)
model_rej <- lm(NonRespRej ~ Applicant, data=d)
summary(model_rej)
```

Call:
lm(formula = NonRespRej ~ Applicant, data = d)

Residuals:
    Min       1Q   Median       3Q      Max
-0.10204 -0.06122 -0.04444 -0.04082  0.95918

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)      0.10204    0.03477   2.935  0.00375 **
Applicantfemale_sabbatical -0.04082    0.04917  -0.830  0.40753
Applicantmale_children  -0.05760    0.05025  -1.146  0.25317
Applicantmale_sabbatical -0.06122    0.04917  -1.245  0.21462
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.2434 on 188 degrees of freedom
Multiple R-squared:  0.01017, Adjusted R-squared:  -0.005626
F-statistic: 0.6438 on 3 and 188 DF, p-value: 0.5878

```

Figure 6. Linear regression model of rejection responses vs. applicants

## Early vs. Late Application

Out of the total 49 companies that we randomly identified and submitted applications, there were only 7 from which we received at least 1 response. Figure 7 highlights a summary.

| Company    | Applied   | Response | Accept            | Reject    | Applicant           |
|------------|-----------|----------|-------------------|-----------|---------------------|
| Airbnb     | 7/17/2019 | 0        | 0                 | 0         | 0 female_sabbatical |
| Airbnb     | 7/17/2019 | 1        | 0                 | 7/22/2019 | female_children     |
| Airbnb     |           | 0        | 0                 | 0         | 0 male_sabbatical   |
| Airbnb     |           | 0        | 0                 | 0         | 0 male_children     |
| c3.ai      | 7/17/2019 | 1        | 7/25/2019         | 0         | 0 female_sabbatical |
| c3.ai      | 7/19/2019 | 1        | 0                 | 7/25/2019 | male_sabbatical     |
| c3.ai      | 7/19/2019 | 1        | 0                 | 7/25/2019 | female_children     |
| c3.ai      | 7/20/2019 | 0        | 0                 | 0         | 0 male_children     |
| Disney     | 7/19/2019 | 1        | 0                 | 8/02/2019 | female_children     |
| Disney     | 7/20/2019 | 0        | 0                 | 0         | 0 male_sabbatical   |
| Disney     | 7/20/2019 | 1        | 0                 | 8/02/2019 | male_children       |
| Disney     | 7/24/2019 | 1        | 0                 | 8/02/2019 | female_sabbatical   |
| Ebay       | 7/20/2019 | 0        | 0                 | 0         | 0 male_sabbatical   |
| Ebay       | 7/20/2019 | 0        | 0                 | 0         | 0 male_children     |
| Ebay       | 7/24/2019 | 1        | 0                 | 8/02/2019 | female_sabbatical   |
| Ebay       | 7/25/2019 | 1        | 0                 | 8/02/2019 | female_children     |
| Hamham     | 7/20/2019 | 0        | 0                 | 0         | 0 male_sabbatical   |
| Hamham     | 7/20/2019 | 0        | 0                 | 0         | 0 male_children     |
| Hamham     | 7/24/2019 | 1        | 7/24/2019         | 0         | 0 female_sabbatical |
| Hamham     | 7/25/2019 | 0        | 0                 | 0         | 0 female_children   |
| Uber       | 7/19/2019 | 1        | 0                 | 7/24/2019 | female_children     |
| Uber       | 7/20/2019 | 1        | 0                 | 7/25/2019 | male_sabbatical     |
| Uber       | 7/20/2019 | 1        | 0                 | 7/23/2019 | male_children       |
| Uber       | 7/24/2019 | 1        | 0                 | 7/30/2019 | female_sabbatical   |
| Windstream | 8/6/2019  | 1        | 8/7/2019          | 0         | 0 female_sabbatical |
| Windstream | 8/6/2019  | 1        | 8/6/2019          | 0         | 0 male_children     |
| Windstream | 8/6/2019  | 0        | 0                 | 0         | 0 female_children   |
| Windstream | 8/7/2019  | 0        | 0                 | 0         | 0 male_sabbatical   |
|            |           |          | Early Application |           |                     |
|            |           |          | Late Application  |           |                     |

Figure 7. Responses showing early and late applications

Regardless of the roles of the applicants, there are no indications that early applications have the advantage of getting a response early or even getting a response. There were late applicants receiving responses where early applicants did not. Based on our experiment, applications submitted early did not gain any benefit against applications submitted late.

## Issues / Complications

Based on the results from our analysis, there are no observable inference of having children or not that will affect the job-seeking success rate. We also tried to rule out the possibilities of early application advantage.

During the experiment, we had a low response rate from recruiters ( $< 10\%$ ). To offset this, we would need to increase the number of applications to about 500 to receive the necessary 50 responses that provides our experiment enough statistical power. Given that most of our applications receive an auto-response that the application is submitted and to expect no response unless the company decides to move forward with the application, we could assume rejection about 14 days to increase the overall response rate.

In addition, during our experiment, one company did call us as they had received four similar resumes in a short amount of time. If this happened at other places and all resumes were thrown out together, this would make it harder to detect an actual effect, but is also a dangerous assumption to make generally.

## References

Baert, Stijn, 2017, "Hiring Discrimination: An Overview of (Almost) All Correspondence Experiments Since 2005", Institute of Labor Economics, IZA DP No. 10738 <http://ftp.iza.org/dp10738.pdf>

Bertrand, Marianne and Sendhil Mullainathan, 2004. "Are Emily and Greg More Employable than Lakisha and Jamil? A Field Experiment on Labor Market Discrimination". The American Economic Review 94. <https://www.nber.org/papers/w9873.pdf>



# Appendix A

Resume 1 - Male, no child - Derek Weppler

Resume 2 - Female, no child - Stephanie Blakkan

Resume 3 - Male, with children - Jason Vinsant

Resume 4 - Female, with children - Jennifer Waldroof



# DEREK WEPPLER

[derekweppler@gmail.com](mailto:derekweppler@gmail.com)

## EDUCATION

|   |          |
|---|----------|
| University of California, Berkeley - Master of Information and Data Science <ul style="list-style-type: none"><li>Data Vis, A/B Testing, Time Series, Machine Learning, Natural Language Processing</li></ul> | May 2019 |
| University of California, San Diego - Bachelor of Science in Computer Science   | Jun 2010 |

## EXPERIENCE

|   |                  |
|---|------------------|
| <b>Analysis Group</b><br><i>Senior Analyst</i><br>Economic Modeling <ul style="list-style-type: none"><li>Coordinate projects to inform and build models related to the estimation of harm reduction and cost impact of the hypothetical introduction of new prescription drugs</li><li>Build market simulation models for energy markets to inform expected future capacity market prices and viability of potential new products</li><li>Managed process to collect and categorize data to inform an econometric model to estimate the effect of e-Privacy regulation in the EU on venture capital investment in various online industries</li></ul> Programming & Development <ul style="list-style-type: none"><li>Developed module for client web-apps to allow for dynamic graphical exploration of patient treatment sequencing patterns</li><li>Built code to read, parse, and categorize over 1 million lines of at-issue source code in a software intellectual property litigation</li></ul> | Jul 14 - Present |
| <b>Sabbatical</b><br>Took a one year leave to travel and explore the world  | Jul 13 - Jul 14  |
| <b>Root Capital</b><br><i>Lending Analyst</i> <ul style="list-style-type: none"><li>Designed and built loan-level lending projections model within relational database management system for a multi-national social lending institution; model included sensitivity functionality and live reporting dashboards</li><li>Designed and built tools to support foreign currency lending activity gain/loss calculations and calculation of Incentive Compensation payouts</li></ul>   | Feb 10 - Jul 13  |

## SKILLS

- Programming** - Python, JavaScript, HTML/CSS, SQL, NoSQL, R, C/C++, Java, Spark, Hadoop, Kafka
- Functional** – Machine Learning, Deep Learning, Data Visualization, Software Architecture, Project Management, Object-Oriented Programming, Scrum/Agile Development, Hardware Simulation & Performance Analysis
- Software**—Git, SVN, Perforce, Docker, VisualStudio, TensorFlow

## INTERESTS

- Hiking, Volunteer Data Scientist for Samaritans, a suicide hotline in Boston

# STEPHANIE BLAKKAN

[stephanieblakkan@gmail.com](mailto:stephanieblakkan@gmail.com)

## EDUCATION

|   |          |
|---|----------|
| University of California, Berkeley - Master of Information and Data Science <ul style="list-style-type: none"><li>Data Vis, A/B Testing, Time Series, Machine Learning, Natural Language Processing</li></ul> | May 2019 |
| University of California, San Diego - Bachelor of Science in Computer Science   | Jun 2010 |

## EXPERIENCE

|   |                  |
|---|------------------|
| <b>Analysis Group</b><br><i>Senior Analyst</i><br>Economic Modeling <ul style="list-style-type: none"><li>Coordinate projects to inform and build models related to the estimation of harm reduction and cost impact of the hypothetical introduction of new prescription drugs</li><li>Build market simulation models for energy markets to inform expected future capacity market prices and viability of potential new products</li><li>Managed process to collect and categorize data to inform an econometric model to estimate the effect of e-Privacy regulation in the EU on venture capital investment in various online industries</li></ul> Programming & Development <ul style="list-style-type: none"><li>Developed module for client web-apps to allow for dynamic graphical exploration of patient treatment sequencing patterns</li><li>Built code to read, parse, and categorize over 1 million lines of at-issue source code in a software intellectual property litigation</li></ul> | Jul 14 - Present |
| <b>Sabbatical</b><br>Took a one year leave to travel and explore the world  | Jul 13 - Jul 14  |
| <b>Root Capital</b><br><i>Lending Analyst</i> <ul style="list-style-type: none"><li>Designed and built loan-level lending projections model within relational database management system for a multi-national social lending institution; model included sensitivity functionality and live reporting dashboards</li><li>Designed and built tools to support foreign currency lending activity gain/loss calculations and calculation of Incentive Compensation payouts</li></ul>   | Feb 10 - Jul 13  |

## SKILLS

- Programming** - Python, JavaScript, HTML/CSS, SQL, NoSQL, R, C/C++, Java, Spark, Hadoop, Kafka
- Functional** – Machine Learning, Deep Learning, Data Visualization, Software Architecture, Project Management, Object-Oriented Programming, Scrum/Agile Development, Hardware Simulation & Performance Analysis
- Software**—Git, SVN, Perforce, Docker, VisualStudio, TensorFlow

## INTERESTS

- Hiking, Volunteer Data Scientist for Samaritans, a suicide hotline in Boston

# JASON VINSANT

[jasonvinsant@gmail.com](mailto:jasonvinsant@gmail.com)

## EDUCATION

|   |          |
|---|----------|
| University of California, Berkeley - Master of Information and Data Science   | May 2019 |
| <ul style="list-style-type: none"><li>• Data Vis, A/B Testing, Time Series, Machine Learning, Natural Language Processing</li></ul> |          |
| University of California, Berkeley - Bachelor of Science in Computer Science  | Jun 2010 |

## EXPERIENCE

|  |                  |
|--|------------------|
| <b>Evidation</b><br><i>Senior Analyst</i><br>Economic Modeling <ul style="list-style-type: none"><li>• Coordinate projects to inform and build models related to the estimation of harm reduction and cost impact of the hypothetical introduction of new prescription drugs</li><li>• Build market simulation models for energy markets to inform expected future capacity market prices and viability of potential new products</li><li>• Managed process to collect and categorize data to inform an econometric model to estimate the effect of e-Privacy regulation in the EU on venture capital investment in various online industries</li></ul> Programming & Development <ul style="list-style-type: none"><li>• Developed module for client web-apps to allow for dynamic graphical exploration of patient treatment sequencing patterns</li><li>• Built code to read, parse, and categorize over 1 million lines of at-issue source code in a software intellectual property litigation</li></ul> | Jul 14 - Present |
| <b>Sabbatical</b><br>Took a one year leave to travel and explore the world with my children  | Jul 13 - Jul 14  |
| <b>First Republic</b><br><i>Lending Analyst</i> <ul style="list-style-type: none"><li>• Designed and built loan-level lending projections model within relational database management system for a multi-national social lending institution; model included sensitivity functionality and live reporting dashboards</li><li>• Designed and built tools to support foreign currency lending activity gain/loss calculations and calculation of Incentive Compensation payouts</li></ul>  | Feb 10 - Jul 13  |

## SKILLS

- **Programming** - Python, JavaScript, HTML/CSS, SQL, NoSQL, R, C/C++, Java, Spark, Hadoop, Kafka
- **Functional** – Machine Learning, Deep Learning, Data Visualization, Software Architecture, Project Management, Object-Oriented Programming, Scrum/Agile Development, Hardware Simulation & Performance Analysis
- **Software**—Git, SVN, Perforce, Docker, VisualStudio, TensorFlow

## INTERESTS

- Hiking, Volunteer Data Scientist for Samaritans, a suicide hotline in Boston

# JENNIFER WALDROOF

[jenniferwaldroof@gmail.com](mailto:jenniferwaldroof@gmail.com)

## EDUCATION

|   |          |
|---|----------|
| University of California, Berkeley - Master of Information and Data Science   | May 2019 |
| <ul style="list-style-type: none"><li>• Data Vis, A/B Testing, Time Series, Machine Learning, Natural Language Processing</li></ul> |          |
| University of California, Davis - Bachelor of Science in Computer Science   | Jun 2010 |

## EXPERIENCE

|  |                  |
|--|------------------|
| <b>CRA International</b><br><i>Senior Analyst</i><br>Economic Modeling <ul style="list-style-type: none"><li>• Coordinate projects to inform and build models related to the estimation of harm reduction and cost impact of the hypothetical introduction of new prescription drugs</li><li>• Build market simulation models for energy markets to inform expected future capacity market prices and viability of potential new products</li><li>• Managed process to collect and categorize data to inform an econometric model to estimate the effect of e-Privacy regulation in the EU on venture capital investment in various online industries</li></ul> Programming & Development <ul style="list-style-type: none"><li>• Developed module for client web-apps to allow for dynamic graphical exploration of patient treatment sequencing patterns</li><li>• Built code to read, parse, and categorize over 1 million lines of at-issue source code in a software intellectual property litigation</li></ul> | Jul 14 - Present |
| <b>Sabbatical</b><br>Took one year off to raise two young children   | Jul 13 - Jul 14  |
| <b>Growafrica</b><br><i>Lending Analyst</i> <ul style="list-style-type: none"><li>• Designed and built loan-level lending projections model within relational database management system for a multi-national social lending institution; model included sensitivity functionality and live reporting dashboards</li><li>• Designed and built tools to support foreign currency lending activity gain/loss calculations and calculation of Incentive Compensation payouts</li></ul>  | Feb 10 - Jul 13  |

## SKILLS

- **Programming** - Python, JavaScript, HTML/CSS, SQL, NoSQL, R, C/C++, Java, Spark, Hadoop, Kafka
- **Functional** – Machine Learning, Deep Learning, Data Visualization, Software Architecture, Project Management, Object-Oriented Programming, Scrum/Agile Development, Hardware Simulation & Performance Analysis
- **Software**—Git, SVN, Perforce, Docker, VisualStudio, TensorFlow

## INTERESTS

- Hiking, Volunteer at Central Elementary School

# Appendix B

Complete set of experiment data

| Company          | Applied | Response | Accept | Reject  | Applicant       |
|------------------|---------|----------|--------|---------|-----------------|
| Yelp             | 7/19/19 | 0        | 0      | 0       | male_sabbatical |
| Square           | 7/19/19 | 0        | 0      | 0       | male_sabbatical |
| eHealth          | 7/19/19 | 0        | 0      | 0       | male_sabbatical |
| ASML             | 7/19/19 | 0        | 0      | 0       | male_sabbatical |
| c3.ai            | 7/19/19 | 1        | 0      | 7/25/19 | male_sabbatical |
| Trianz           | 7/19/19 | 0        | 0      | 0       | male_sabbatical |
| Cognate          | 7/19/19 | 0        | 0      | 0       | male_sabbatical |
| Proofpoint       | 7/19/19 | 0        | 0      | 0       | male_sabbatical |
| HCL America Inc  | 7/19/19 | 0        | 0      | 0       | male_sabbatical |
| GCS              | 7/19/19 | 0        | 0      | 0       | male_sabbatical |
| Airbnb           |         | 0        | 0      | 0       | male_sabbatical |
| Salesforce       | 7/19/19 | 0        | 0      | 0       | male_sabbatical |
| Visa             | 7/19/19 | 0        | 0      | 0       | male_sabbatical |
| Dropbox          | 7/20/19 | 0        | 0      | 0       | male_sabbatical |
| Slack            | 7/20/19 | 0        | 0      | 0       | male_sabbatical |
| Uber             | 7/20/19 | 1        | 0      | 7/25/19 | male_sabbatical |
| Shutterfly       | 7/20/19 | 0        | 0      | 0       | male_sabbatical |
| Oracle           | 7/20/19 | 0        | 0      | 0       | male_sabbatical |
| Disney           | 7/20/19 | 0        | 0      | 0       | male_sabbatical |
| Twitter          | 7/20/19 | 0        | 0      | 0       | male_sabbatical |
| Facebook/Coreapp | 7/20/19 | 0        | 0      | 0       | male_sabbatical |
| Wish             | 7/20/19 | 0        | 0      | 0       | male_sabbatical |

|                      |         |   |   |   |                 |
|----------------------|---------|---|---|---|-----------------|
| Harnham              | 7/20/19 | 0 | 0 | 0 | male_sabbatical |
| Google               | 7/20/19 | 0 | 0 | 0 | male_sabbatical |
| Ebay                 | 7/20/19 | 0 | 0 | 0 | male_sabbatical |
| Apex                 | 7/20/19 | 0 | 0 | 0 | male_sabbatical |
| Jefferson Frank      | 7/20/19 | 0 | 0 | 0 | male_sabbatical |
| VortexLink           | 7/20/19 | 0 | 0 | 0 | male_sabbatical |
| Engage Partners      | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| Facebook             | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| Danaher              | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| Windstream           | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| Stealth Mode Startup | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| TextNow, Inc         | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| SelfDecode           | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| Cogitativo           | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| Ascent               | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| Study.com            | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| Theorem              | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| Livongo              |         | 0 | 0 | 0 | male_sabbatical |
| Plume                | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| Samsung Reseach      | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| Alliance for Health  | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| IntelliPro Group     | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| Linc Global          | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| CyberCoders          | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| CyberCoders          | 8/7/19  | 0 | 0 | 0 | male_sabbatical |
| Suning               | 8/7/19  | 0 | 0 | 0 | male_sabbatical |

|                  |         |   |         |         |                   |
|------------------|---------|---|---------|---------|-------------------|
| Zentech          | 8/7/19  | 0 | 0       | 0       | male_sabbatical   |
| Yelp             | 7/17/19 | 0 | 0       | 0       | female_sabbatical |
| Square           | 7/17/19 | 0 | 0       | 0       | female_sabbatical |
| eHealth          | 7/17/19 | 0 | 0       | 0       | female_sabbatical |
| ASML             | 7/17/19 | 0 | 0       | 0       | female_sabbatical |
| c3.ai            | 7/17/19 | 1 | 7/25/19 | 0       | female_sabbatical |
| Trianz           | 7/17/19 | 0 | 0       | 0       | female_sabbatical |
| Cognate          | 7/17/19 | 0 | 0       | 0       | female_sabbatical |
| Proofpoint       | 7/17/19 | 0 | 0       | 0       | female_sabbatical |
| HCL America Inc  | 7/17/19 | 0 | 0       | 0       | female_sabbatical |
| GCS              | 7/17/19 | 0 | 0       | 0       | female_sabbatical |
| Airbnb           | 7/17/19 | 0 | 0       | 0       | female_sabbatical |
| Salesforce       | 7/17/19 | 0 | 0       | 0       | female_sabbatical |
| Visa             | 7/17/19 | 0 | 0       | 0       | female_sabbatical |
| Dropbox          | 7/17/19 | 0 | 0       | 0       | female_sabbatical |
| Slack            | 7/24/19 | 0 | 0       | 0       | female_sabbatical |
| Uber             | 7/24/19 | 1 | 0       | 7/30/19 | female_sabbatical |
| Shutterfly       | 7/24/19 | 0 | 0       | 0       | female_sabbatical |
| Oracle           | 7/24/19 | 0 | 0       | 0       | female_sabbatical |
| Disney           | 7/24/19 | 1 | 0       | 8/2/19  | female_sabbatical |
| Twitter          | 7/24/19 | 0 | 0       | 0       | female_sabbatical |
| Facebook/Coreapp | 7/24/19 | 0 | 0       | 0       | female_sabbatical |
| Wish             | 7/24/19 | 0 | 0       | 0       | female_sabbatical |
| Harnham          | 7/24/19 | 1 | 7/24/19 | 0       | female_sabbatical |
| Google           | 7/24/19 | 0 | 0       | 0       | female_sabbatical |
| Ebay             | 7/24/19 | 1 | 0       | 8/2/19  | female_sabbatical |



|                      |         |   |        |   |                   |
|----------------------|---------|---|--------|---|-------------------|
| Apex                 | 7/24/19 | 0 | 0      | 0 | female_sabbatical |
| Jefferson Frank      | 7/24/19 | 0 | 0      | 0 | female_sabbatical |
| VortexLink           | 7/24/19 | 0 | 0      | 0 | female_sabbatical |
| Engage Partners      | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| Facebook             | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| Danaher              | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| Windstream           | 8/6/19  | 1 | 8/7/19 | 0 | female_sabbatical |
| Stealth Mode Startup | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| TextNow, Inc         | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| SelfDecode           | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| Cogitativo           | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| Ascent               | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| Study.com            | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| Theorem              | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| Livongo              | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| Plume                | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| Samsung Reseach      | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| Alliance for Health  | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| IntelliPro Group     | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| Linc Global          | 8/6/19  | 0 | 0      | 0 | female_sabbatical |
| CyberCoders          | 8/7/19  | 0 | 0      | 0 | female_sabbatical |
| CyberCoders          | 8/7/19  | 0 | 0      | 0 | female_sabbatical |
| Suning               | 8/7/19  | 0 | 0      | 0 | female_sabbatical |
| Zentech              | 8/7/19  | 0 | 0      | 0 | female_sabbatical |
| Yelp                 | 7/20/19 | 0 | 0      | 0 | male_children     |
| Square               | 7/20/19 | 0 | 0      | 0 | male_children     |

|                  |         |   |   |         |               |
|------------------|---------|---|---|---------|---------------|
| eHealth          | 7/20/19 | 0 | 0 | 0       | male_children |
| ASML             | 7/20/19 | 0 | 0 | 0       | male_children |
| c3.ai            | 7/20/19 | 0 | 0 | 0       | male_children |
| Trianz           | 7/20/19 | 0 | 0 | 0       | male_children |
| Cognate          | 7/20/19 | 0 | 0 | 0       | male_children |
| Proofpoint       | 7/20/19 | 0 | 0 | 0       | male_children |
| HCL America Inc  |         | 0 | 0 | 0       | male_children |
| GCS              | 7/20/19 | 0 | 0 | 0       | male_children |
| Airbnb           |         | 0 | 0 | 0       | male_children |
| Salesforce       | 7/20/19 | 0 | 0 | 0       | male_children |
| Visa             | 7/20/19 | 0 | 0 | 0       | male_children |
| Dropbox          | 7/20/19 | 0 | 0 | 0       | male_children |
| Slack            | 7/20/19 | 0 | 0 | 0       | male_children |
| Uber             | 7/20/19 | 1 | 0 | 7/23/19 | male_children |
| Shutterfly       | 7/20/19 | 0 | 0 | 0       | male_children |
| Oracle           | 7/20/19 | 0 | 0 | 0       | male_children |
| Disney           | 7/20/19 | 1 | 0 | 8/2/19  | male_children |
| Twitter          | 7/20/19 | 0 | 0 | 0       | male_children |
| Facebook/Coreapp | 7/20/19 | 0 | 0 | 0       | male_children |
| Wish             | 7/20/19 | 0 | 0 | 0       | male_children |
| Harnham          | 7/20/19 | 0 | 0 | 0       | male_children |
| Google           | 7/20/19 | 0 | 0 | 0       | male_children |
| Ebay             | 7/20/19 | 0 | 0 | 0       | male_children |
| Apex             | 8/6/19  | 0 | 0 | 0       | male_children |
| Jefferson Frank  | 8/6/19  | 0 | 0 | 0       | male_children |
| VortexLink       | 8/6/19  | 0 | 0 | 0       | male_children |

|                      |         |   |        |         |                 |
|----------------------|---------|---|--------|---------|-----------------|
| Engage Partners      | 8/6/19  | 0 | 0      | 0       | male_children   |
| Facebook             | 8/6/19  | 0 | 0      | 0       | male_children   |
| Danaher              | 8/6/19  | 0 | 0      | 0       | male_children   |
| Windstream           | 8/6/19  | 1 | 8/6/19 | 0       | male_children   |
| Stealth Mode Startup | 8/6/19  | 0 | 0      | 0       | male_children   |
| TextNow, Inc         | 8/6/19  | 0 | 0      | 0       | male_children   |
| SelfDecode           | 8/6/19  | 0 | 0      | 0       | male_children   |
| Cogitativo           | 8/6/19  | 0 | 0      | 0       | male_children   |
| Ascent               | 8/6/19  | 0 | 0      | 0       | male_children   |
| Study.com            | 8/7/19  | 0 | 0      | 0       | male_children   |
| Theorem              | 8/7/19  | 0 | 0      | 0       | male_children   |
| Livongo              |         | 0 | 0      | 0       | male_children   |
| Plume                | 8/7/19  | 0 | 0      | 0       | male_children   |
| Samsung Reseach      | 8/7/19  | 0 | 0      | 0       | male_children   |
| Alliance for Health  | 8/7/19  | 0 | 0      | 0       | male_children   |
| IntelliPro Group     | 8/7/19  | 0 | 0      | 0       | male_children   |
| Linc Global          | 8/7/19  | 0 | 0      | 0       | male_children   |
| Yelp                 | 7/19/19 | 0 | 0      | 0       | female_children |
| Square               | 7/19/19 | 0 | 0      | 0       | female_children |
| eHealth              | 7/19/19 | 0 | 0      | 0       | female_children |
| ASML                 | 7/19/19 | 0 | 0      | 0       | female_children |
| c3.ai                | 7/19/19 | 1 | 0      | 7/25/19 | female_children |
| Trianz               | 7/19/19 | 0 | 0      | 0       | female_children |
| Cognate              | 7/19/19 | 0 | 0      | 0       | female_children |
| Proofpoint           | 7/19/19 | 0 | 0      | 0       | female_children |
| HCL America Inc      | 7/19/19 | 0 | 0      | 0       | female_children |

|                      |         |   |   |         |                 |
|----------------------|---------|---|---|---------|-----------------|
| GCS                  | 7/19/19 | 0 | 0 | 0       | female_children |
| Airbnb               | 7/17/19 | 1 | 0 | 7/22/19 | female_children |
| Salesforce           | 7/17/19 | 0 | 0 | 0       | female_children |
| Visa                 | 7/17/19 | 0 | 0 | 0       | female_children |
| Dropbox              | 7/19/19 | 0 | 0 | 0       | female_children |
| Slack                | 7/19/19 | 0 | 0 | 0       | female_children |
| Uber                 | 7/19/19 | 1 | 0 | 7/24/19 | female_children |
| Shutterfly           | 7/19/19 | 0 | 0 | 0       | female_children |
| Oracle               | 7/19/19 | 0 | 0 | 0       | female_children |
| Disney               | 7/19/19 | 1 | 0 | 8/2/19  | female_children |
| Twitter              | 7/19/19 | 0 | 0 | 0       | female_children |
| Facebook/Coreapp     | 7/19/19 | 0 | 0 | 0       | female_children |
| Wish                 | 7/19/19 | 0 | 0 | 0       | female_children |
| Harnham              | 7/25/19 | 0 | 0 | 0       | female_children |
| Google               | 7/25/19 | 0 | 0 | 0       | female_children |
| Ebay                 | 7/25/19 | 1 | 0 | 8/2/19  | female_children |
| Apex                 | 7/26/19 | 0 | 0 | 0       | female_children |
| Jefferson Frank      | 7/26/19 | 0 | 0 | 0       | female_children |
| VortexLink           | 7/26/19 | 0 | 0 | 0       | female_children |
| Engage Partners      | 8/6/19  | 0 | 0 | 0       | female_children |
| Facebook             | 8/6/19  | 0 | 0 | 0       | female_children |
| Danaher              | 8/6/19  | 0 | 0 | 0       | female_children |
| Windstream           | 8/6/19  | 0 | 0 | 0       | female_children |
| Stealth Mode Startup | 8/7/19  | 0 | 0 | 0       | female_children |
| TextNow, Inc         | 8/7/19  | 0 | 0 | 0       | female_children |
| SelfDecode           | 8/7/19  | 0 | 0 | 0       | female_children |

|                     |        |   |   |   |                 |
|---------------------|--------|---|---|---|-----------------|
| Cogitativo          | 8/7/19 | 0 | 0 | 0 | female_children |
| Ascent              | 8/7/19 | 0 | 0 | 0 | female_children |
| Study.com           | 8/7/19 | 0 | 0 | 0 | female_children |
| Theorem             | 8/7/19 | 0 | 0 | 0 | female_children |
| Livongo             |        | 0 | 0 | 0 | female_children |
| Plume               | 8/7/19 | 0 | 0 | 0 | female_children |
| Samsung Reseach     | 8/7/19 | 0 | 0 | 0 | female_children |
| Alliance for Health | 8/7/19 | 0 | 0 | 0 | female_children |
| IntelliPro Group    | 8/7/19 | 0 | 0 | 0 | female_children |
| Linc Global         | 8/7/19 | 0 | 0 | 0 | female_children |
| CyberCoders         | 8/7/19 | 0 | 0 | 0 | female_children |
| CyberCoders         | 8/7/19 | 0 | 0 | 0 | female_children |
| Suning              | 8/7/19 | 0 | 0 | 0 | female_children |
| Zentech             | 8/7/19 | 0 | 0 | 0 | female_children |