CSC433 Scripting for Data Analysis Assignment, Part 4b)

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1 Data Source (This Dataset is Too Hot To Handle Comfortably)

This is a dataset that you absolutely cannot talk about at parties; it focuses on all of the prohibited topics (religion, money, politics, race). But those things are all extremely influential in shaping human behavior, so they're worth studying, even if it made me uncomfortable. Even still, I didn't dig into the data collection methods and I'm just interpreting the numbers.

1.1 Bible Interpretation By Gender

This was the most vanilla question I investigated. I plotted bible interpretation grouped by gender, and per the Chi-Square value of 22.967 $(p-value: 0.00013)$, there is a statistically significant association of gender and bible interpretation.
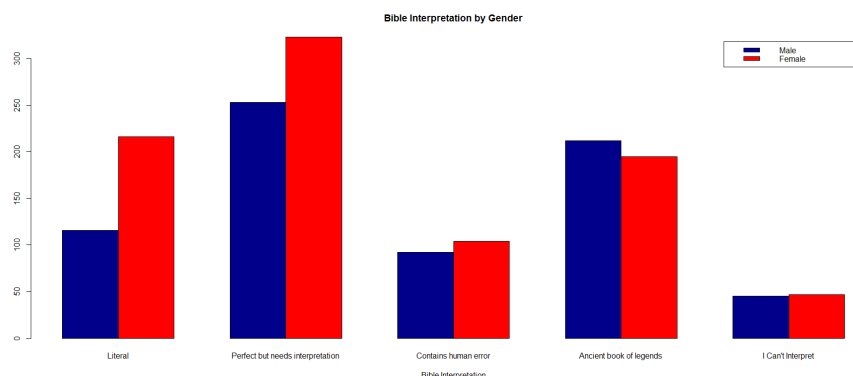

Figure 1: Bible Interpretation By Gender: Barplot

```
> chisq.test(counts_bib_int_gend)

        Pearson's Chi-squared test

data:  counts_bib_int_gend
X-squared = 22.967, df = 4, p-value = 0.0001286

> CrossTable(counts_bib_int_gend)


   Cell Contents
|-------------------------|
```

```
|                     N |
| Chi-square contribution |
|         N / Row Total |
|         N / Col Total |
|       N / Table Total |
|-----------------------|
```
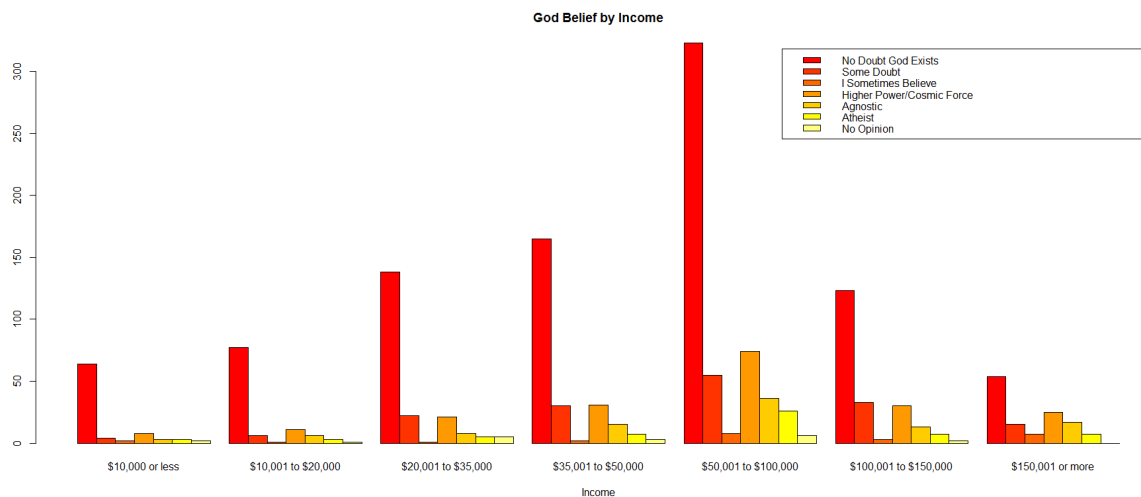
Total Observations in Table: 1603

	Literal	Needs Int-erpretation	contains Human Error	Ancient Book of Legends	I Can't Interpret	Row Total
Male	116	253	92	212	45	718
	7.193	0.097	0.202	4.839	0.349	
	0.162	0.352	0.128	0.295	0.063	0.448
	0.349	0.439	0.469	0.521	0.489	
	0.072	0.158	0.057	0.132	0.028	
Female	216	323	104	195	47	885
	5.836	0.078	0.164	3.926	0.283	
	0.244	0.365	0.118	0.220	0.053	0.552
	0.651	0.561	0.531	0.479	0.511	
	0.135	0.201	0.065	0.122	0.029	
Column Total	332	576	196	407	92	1603
	0.207	0.359	0.122	0.254	0.057	

1.2   God-Belief By Income

To explore the relationship between belief-in-god and income, I plotted the people's statement on their faith and their asserted incomes, using the bins already provided. For all income brackets, firm faith in god is the most frequent belief. From the row percents on the table, we see that as income increases, the percentage of responses indicating firm faith decreases, but remains clearly dominant. Interestingly, at the highest income bracket, the proportion of respondents that believe in a 'Higher Power or Cosmic Force' peaks at nearly half the proportion that describes that higher power as 'God'.

From the $0.0005 p-value$ on the Chi-Square analysis table, we can infer that there is a statistically significant association between income and belief-in-god.

God Belief by Income

```
> chisq.test(counts_belief_income)

        Pearson's Chi-squared test

data:  counts_belief_income
X-squared = 70.602, df = 36, p-value = 0.0004982

Warning message:
In chisq.test(counts_belief_income) :
  Chi-squared approximation may be incorrect
> CrossTable(counts_belief_income)


   Cell Contents
|-----------------------|
|                     N |
| Chi-square contribution |
|         N / Row Total |
|         N / Col Total |
|       N / Table Total |
|-----------------------|

',
                ' to ',
                '$20,001 to $35,000',
                '$35,001 to $50,000',
                '$50,001 to $100,000',
                '$100,001 to $150,000',
                '$150,001 or more')


Total Observations in Table:  1508
```

	$10,000 or less	$10,000 - $20,000	$20,001 - $35,000	$35,001 - $50,000	$50,001 - $100,000	$100,001 - $150,000	$150,001 or more	R
No Doubt God Exists	64	77	138	165	323	123	54	
	1.919	1.933	1.309	0.277	0.171	0.625	7.515	
	0.068	0.082	0.146	0.175	0.342	0.130	0.057	

3

```
             |   0.744 |   0.733 |   0.690 |   0.652 |   0.612 |   0.583 |   0.432 |
             |   0.042 |   0.051 |   0.092 |   0.109 |   0.214 |   0.082 |   0.036 |
-------------|---------|---------|---------|---------|---------|---------|---------|--
 Some Doubt  |       4 |       6 |      22 |      30 |      55 |      33 |      15 |
             |   3.110 |   2.622 |   0.001 |   0.194 |   0.133 |   4.257 |   0.128 |
             |   0.024 |   0.036 |   0.133 |   0.182 |   0.333 |   0.200 |   0.091 |
             |   0.047 |   0.057 |   0.110 |   0.119 |   0.104 |   0.156 |   0.120 |
             |   0.003 |   0.004 |   0.015 |   0.020 |   0.036 |   0.022 |   0.010 |
-------------|---------|---------|---------|---------|---------|---------|---------|--
 I Sometimes |       2 |       1 |       1 |       2 |       8 |       3 |       7 |
   Believe   |   0.291 |   0.270 |   1.497 |   1.020 |   0.019 |   0.038 |  12.620 |
             |   0.083 |   0.042 |   0.042 |   0.083 |   0.333 |   0.125 |   0.292 |
             |   0.023 |   0.010 |   0.005 |   0.008 |   0.015 |   0.014 |   0.056 |
             |   0.001 |   0.001 |   0.001 |   0.001 |   0.005 |   0.002 |   0.005 |
-------------|---------|---------|---------|---------|---------|---------|---------|--
Higher Power |       8 |      11 |      21 |      31 |      74 |      30 |      25 |
Cosmic Force |   1.017 |   0.615 |   1.151 |   0.194 |   0.225 |   0.145 |   4.278 |
             |   0.040 |   0.055 |   0.105 |   0.155 |   0.370 |   0.150 |   0.125 |
             |   0.093 |   0.105 |   0.105 |   0.123 |   0.140 |   0.142 |   0.200 |
             |   0.005 |   0.007 |   0.014 |   0.021 |   0.049 |   0.020 |   0.017 |
-------------|---------|---------|---------|---------|---------|---------|---------|--
  Agnostic   |       3 |       6 |       8 |      15 |      36 |      13 |      17 |
             |   1.199 |   0.099 |   1.921 |   0.126 |   0.083 |   0.037 |   9.700 |
             |   0.031 |   0.061 |   0.082 |   0.153 |   0.367 |   0.133 |   0.173 |
             |   0.035 |   0.057 |   0.040 |   0.059 |   0.068 |   0.062 |   0.136 |
             |   0.002 |   0.004 |   0.005 |   0.010 |   0.024 |   0.009 |   0.011 |
-------------|---------|---------|---------|---------|---------|---------|---------|--
  Atheist    |       3 |       3 |       5 |       7 |      26 |       7 |       7 |
             |   0.029 |   0.267 |   0.942 |   0.766 |   1.596 |   0.153 |   1.000 |
             |   0.052 |   0.052 |   0.086 |   0.121 |   0.448 |   0.121 |   0.121 |
             |   0.035 |   0.029 |   0.025 |   0.028 |   0.049 |   0.033 |   0.056 |
             |   0.002 |   0.002 |   0.003 |   0.005 |   0.017 |   0.005 |   0.005 |
-------------|---------|---------|---------|---------|---------|---------|---------|--
 No Opinion  |       2 |       1 |       5 |       3 |       6 |       2 |       0 |
             |   0.775 |   0.079 |   2.441 |   0.011 |   0.064 |   0.163 |   1.575 |
             |   0.105 |   0.053 |   0.263 |   0.158 |   0.316 |   0.105 |   0.000 |
             |   0.023 |   0.010 |   0.025 |   0.012 |   0.011 |   0.009 |   0.000 |
             |   0.001 |   0.001 |   0.003 |   0.002 |   0.004 |   0.001 |   0.000 |
-------------|---------|---------|---------|---------|---------|---------|---------|--
Column Total |      86 |     105 |     200 |     253 |     528 |     211 |     125 |
             |   0.057 |   0.070 |   0.133 |   0.168 |   0.350 |   0.140 |   0.083 |
-------------|---------|---------|---------|---------|---------|---------|---------|--
```

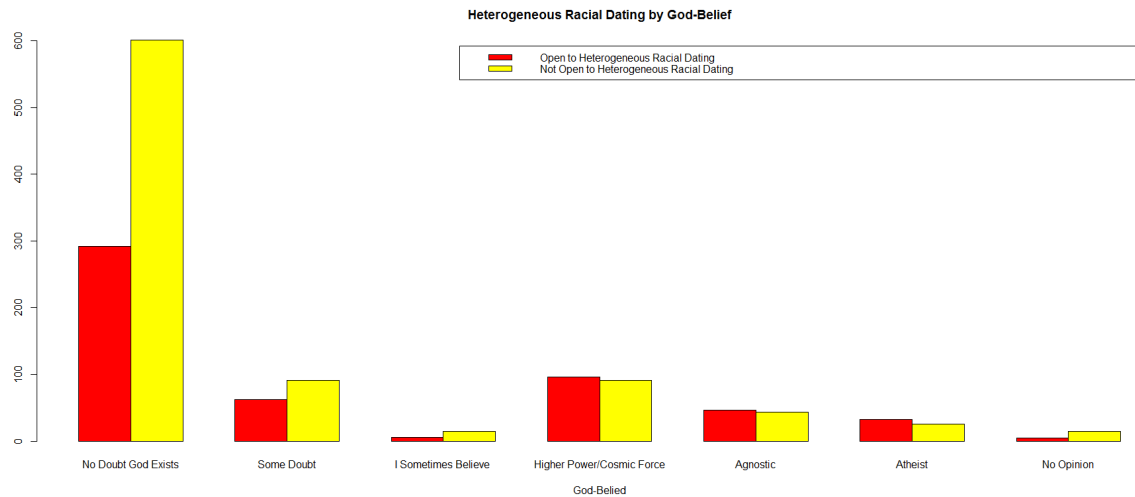## 1.3   Heterogeneous Dating Experiences by God-Belief

This question made me the most uncomfortable, but while reviewing the study booklet, I noticed question 55, which kind of offended me. This reaction made me reflect and wonder why (presumably) real data would offend me, so I decided to see what the data said and test a hypothesis: is there a statistically significant association between racially heterogeneous dating and belief in god.

Granted, this analysis says nothing about causation and can't disentangle factors like local demographics, local culture, motivations for belief in god, or (most importantly) honesty of the respondent.

That being said, there was near parity in the (self-reported) yes and no responses of Agnostics or believers in a Higher Power/Cosmic Force (both slightly on the affirmative side). Atheists were even more progressive in their answers, with the largest proportion responding in the affirmative. Aside

from those with 'No Opinion' (only 19 respondents, so potentially not a representative sample of any population), those who firmly believe in God were the least likely to have a racially heterogeneous romantic partner.

From the $< .000001 p-value$ on the Chi-Square analysis table, we can infer that there is a statistically significant association between reporting a racially heterogeneous dating experience and belief-in-god.

Heterogeneous Racial Dating by God-Belief

```
> chisq.test(counts_racedate_belief)

        Pearson's Chi-squared test

data:  counts_racedate_belief
X-squared = 41.859, df = 6, p-value = 1.96e-07


> CrossTable(counts_racedate_belief)


   Cell Contents
|-------------------------|
|                       N |
| Chi-square contribution |
|           N / Row Total |
|           N / Col Total |
|         N / Table Total |
|-------------------------|


Total Observations in Table:  1418


             | No Doubt  |           |I Sometimes|HigherPower|
             |God Exists |Some Doubt |  Believe  |CosmicForce| Agnostic  | Atheist   |No Opinion | R
-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--
   Open to   |       292 |        62 |         6 |        96 |        46 |        32 |         5 |
Heterogeneous|     6.630 |     0.254 |     0.338 |     8.736 |     4.378 |     4.928 |     0.684 |
Racial Dating|     0.542 |     0.115 |     0.011 |     0.178 |     0.085 |     0.059 |     0.009 |
             |     0.327 |     0.405 |     0.300 |     0.513 |     0.517 |     0.561 |     0.263 |
             |     0.206 |     0.044 |     0.004 |     0.068 |     0.032 |     0.023 |     0.004 |
-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--
```

```
 Not Open to |       601 |        91 |        14 |        91 |        43 |        25 |        14 |
Heterogeneous|     4.066 |     0.156 |     0.207 |     5.357 |     2.685 |     3.022 |     0.419 |
Racial Dating|     0.684 |     0.104 |     0.016 |     0.104 |     0.049 |     0.028 |     0.016 |
             |     0.673 |     0.595 |     0.700 |     0.487 |     0.483 |     0.439 |     0.737 |
             |     0.424 |     0.064 |     0.010 |     0.064 |     0.030 |     0.018 |     0.010 |
-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--
Column Total |       893 |       153 |        20 |       187 |        89 |        57 |        19 |
             |     0.630 |     0.108 |     0.014 |     0.132 |     0.063 |     0.040 |     0.013 |
-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--
```