

Applying Behavioural Economics to Underwriting

Or How to Make Millions Without Trying Too Hard

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Research Feedback

- ... *this dissertation provides an **important contribution to behavioural science** in many ways. First, it takes behavioural science interventions into the field of insurance **where they have not yet been exploited**. Second, it tests paradigms such as moral priming or loss framing in a large field study, thus **yielding new insights into ecological validity**. Also, the author approached the topic in a **rigorous** way, by reviewing the relevant literatures, providing power calculation [and] address[ed] potential limitations of the findings...*
- <http://blogs.lse.ac.uk/behaviouralscience/2017/04/28/would-i-lie-to-you/>

Behavioural Economics Primer

- Psychology
 - Exploratory Data Analysis (EDA)
 - The scientific method
 - Philosophy
 - Power Calculations
 - Statistical Analysis
 - Reporting
- Economics
 - Cost-benefit analysis
 - Economic impact

What Undermines Behavioural Economics

- A failure to properly identify dependent variables through EDA
- Absence of power calculations: the probability that the experiment will correctly reject the null hypothesis. Will inform the numbers required for an outcome.
- Multiple hypotheses uncorrected by Bonferroni calculations
- Philosophically invalid or inconsistent application of the theory
- Methodological failures with randomisation
- Incorrect statistical application e.g. t-tests on dichotomous outcomes
- Applications of insights with no outcome testing: Regretting 'no regrets'; tricky studies from labs that haven't been validated or appropriate to this context
- An absence of modeling impact and costs

My Experiment

- EDA

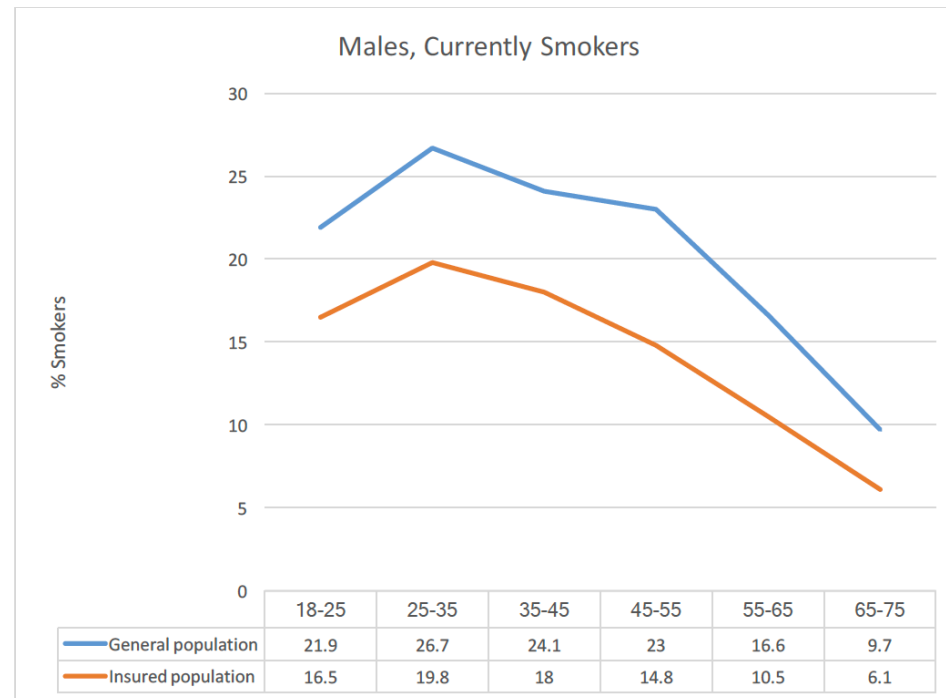
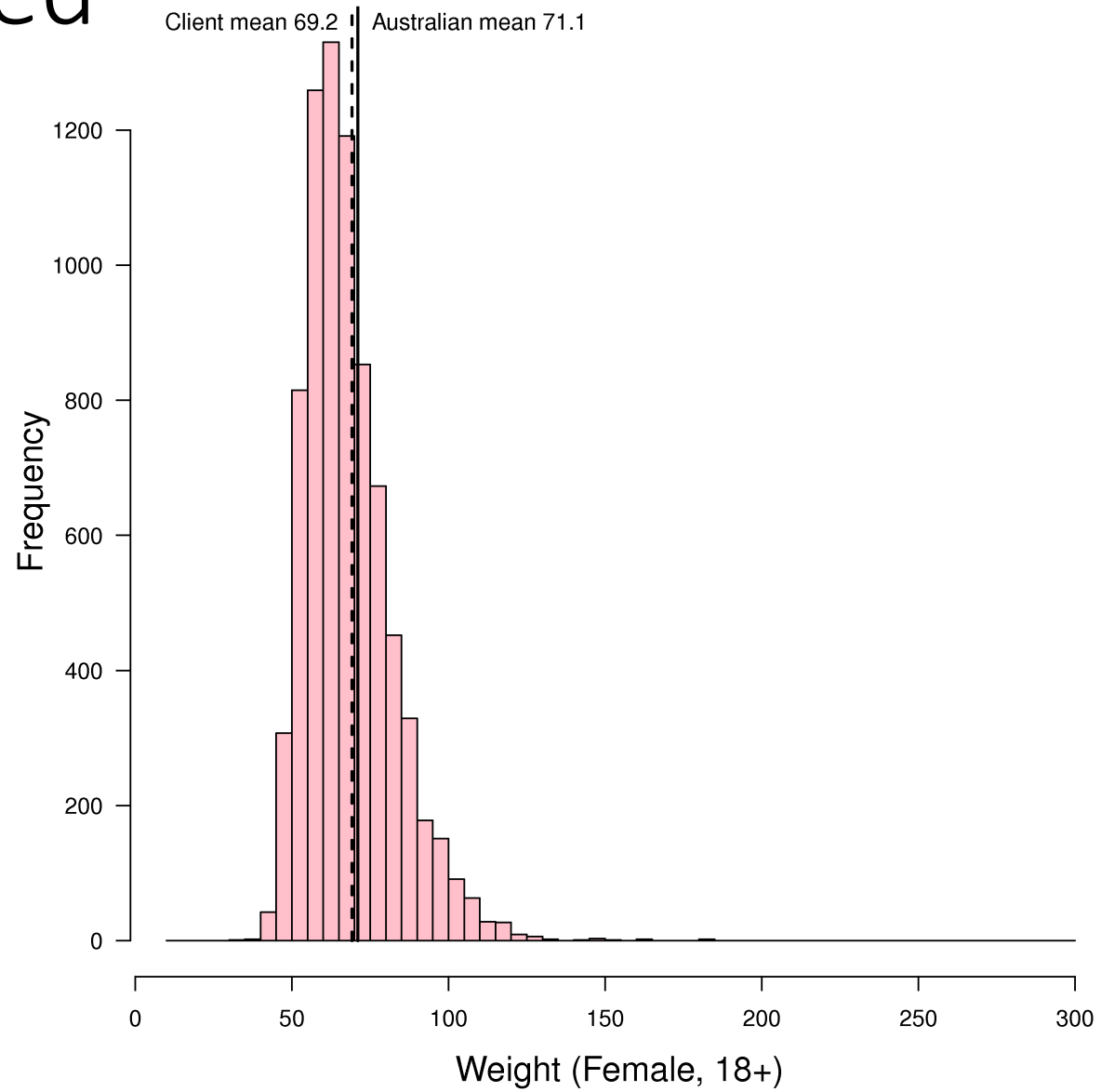
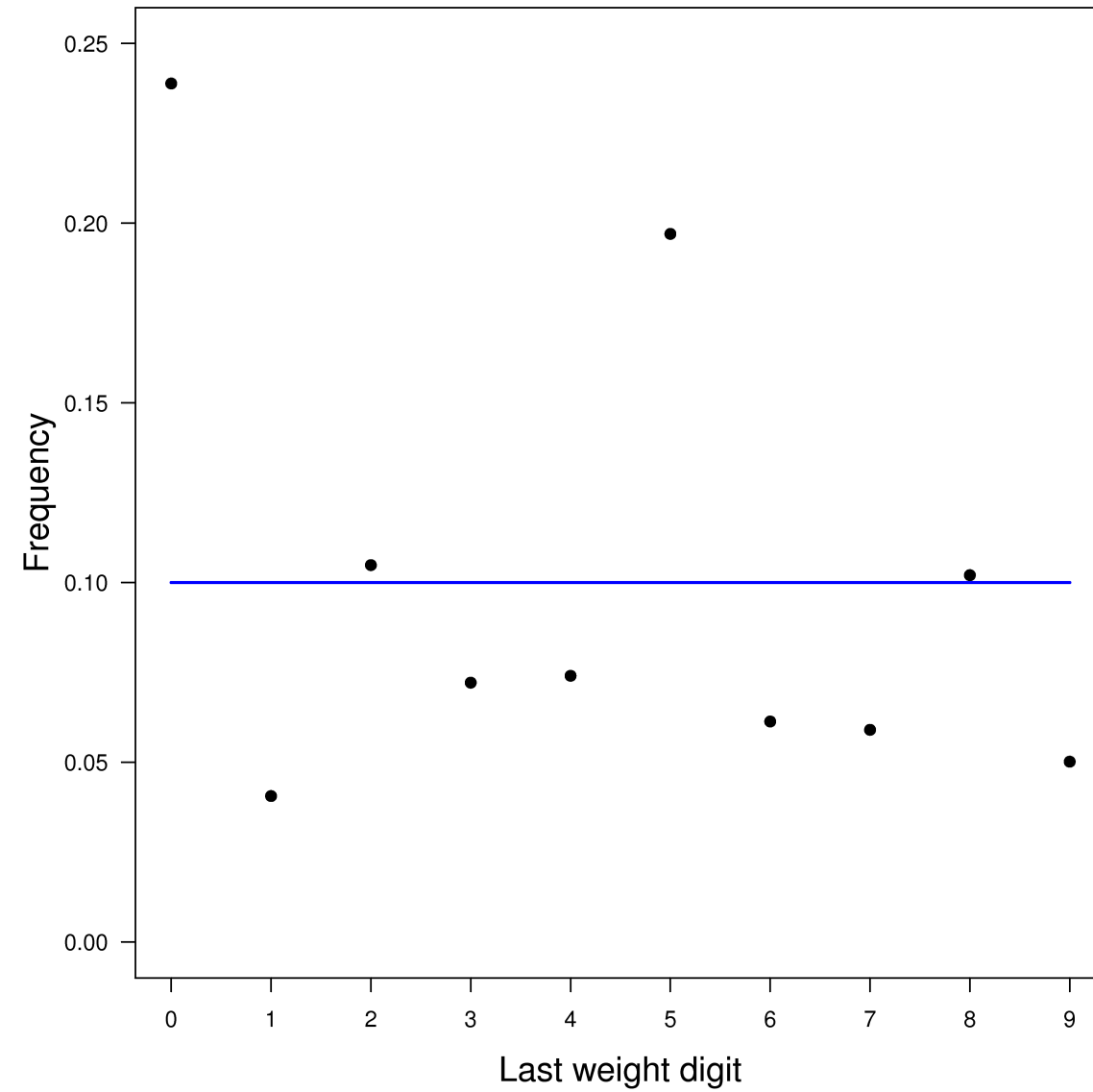


Figure 1: Males Currently Smoking

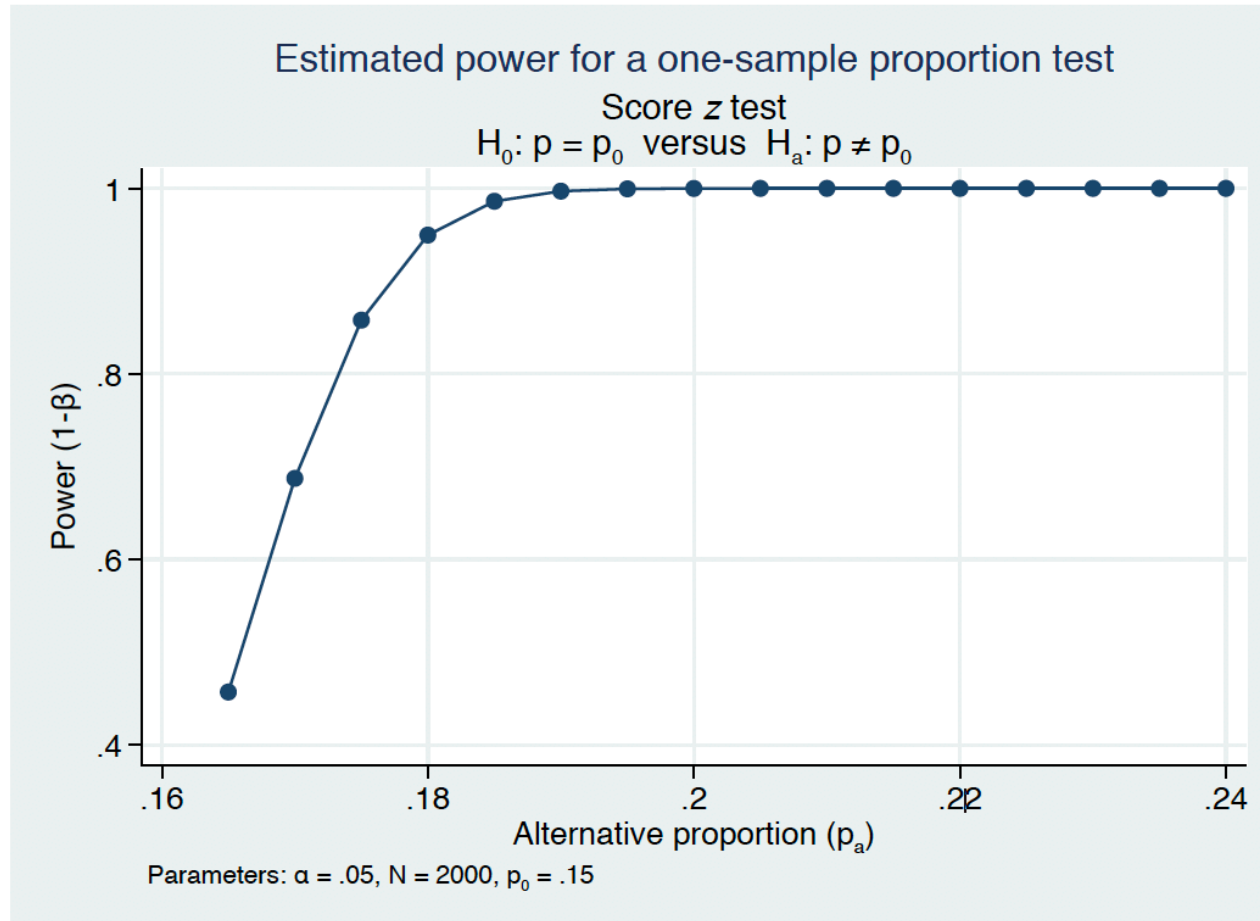
EDA continued



EDA Continued



Smoking Chosen as Dependent Variable



Treatments

- Informed by what I thought may be motivating false-negative self disclosures (FNSD) AND what would be effective remedies for these
- One treatment made it normative to disclose
- One treatment made the risks of FNSD more salient
- One treatment relied on the human desire for moral consistency

RCT

- 3 treatments and control applied to consecutive telephone underwriting interviews
- Some technical problems with randomisation process, but each of the treatment and control groups were identical for several factors
- Data analysed with Stata using logistic regressions for the dichotomous outcomes.
- Data presented on other potential variables

Results

- Smoking outcomes

	Control	Social Norms	Loss Aversion	Moral Priming	Average
Male	0.15	0%	7%+	7%+	0%
Female	0.06	67%+	150%+	50%+	50%+
Total	0.12	8.3%+	33%+	8.3%+	8.3%+

Odds ratio 2.56, p=0.01, CI 1.2-5.5

Other Outcomes

		Control	Social Norms	Loss Aversion	Moral Priming	Total
Weight						
	Male mean (SD)	87.1 (13.2)	3%+	1.2%+	1.3%+	1%+
	Female mean (SD)	70.7(16.5)	0%	1.9%-	0%	0%
Height						
	Male mean (SD)	178.8 (7.6)	0%	0%	0%	0%
	Female mean (SD)	165.6 (8)	0.7%-	0%	0.7%-	0%
Mental Health Disclosures						
	Male (%)	20.72	7.1%+	8.1%+	17%-	0%
	Female (%)	28.8	27%+	6.25%+	22%+	13.5%+
Illicit Substance Use Disclosures						
	Male (%)	15.8	16.5%+	18.4%+	16.5%+	8.2%+
	Female (%)	7.4	56.7%+	24.3%+	14.9%+	21.6%
Alcohol (total)						
	Male (units p.a)	44.8	20%+	13%-	0%	0%
	Female (units p.a.)	26.8	14%-	29.5%+	10%+	7.5%-

Impact

- Economic
 - Ceteris Paribus
 - Increased smoking disclosures: increased revenue by \$1.5mil p.a. Other potential impacts not modelled but likely to be huge.
- Customer
 - No complaints
 - Improved compliance with their obligations; predict fewer non-disclosure disputes
- Insurer
 - Low resource investment; Low risk; high return

The Future

- A new direction in improving insurance efficiency
- Potential applications
 - Iterative improvement in underwriting
 - Increasing retention rates
 - Many applications at claim
 - Increasing customer commitment to products