BE WHAT YOU WANT TO BE

# A consuming passion

## Linking gambling to the use of alcohol, caffeine, and energy-rich foods

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EXPERIMENTAL GAMING LABORATORY

# Evidence for a common underlying trait

- Generalized consumption: simple behaviors that result in immediate, sensation-oriented rewards
  - alcohol, caffeine, smoking, illicit drugs, energy-rich foods (including salt)
  - gambling
- Theoretical perspective
  - Behavioural approach system:
    - sensitivity and and responsiveness to rewards
  - Impulsivity and lack of impulse control
  - Personality, addiction, and neurophysiology

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# Evidence for a common underlying trait

- Empirical evidence for co-morbidity / co-variation is growing
  - eg gambling + alcohol + nicotine
- But is gambling fundamentally different?
  - eg no physical ingestion of substance
- The consumption hypothesis: should we recognize gambling as an appetitive behaviour?
- Does it share same motivational system?

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# Testing the consumption hypothesis

- Substance consumption behaviors show significant co-variability
- Therefore, other consumption behaviours should predict:
  - whether one gambles or not
  - how much one gambles (if a gambler)
  - even after controlling for other covariates (demographic, social)

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# The survey

- Tele-survey conducted by the CQU PRL
- 1,194 completed surveys
- Incorporated multiple self-report measures of health, lifestyle, and well-being
- A relatively high-risk population issues around health and/or well-being
  - Shift-workers preferred
  - Central Queensland (mining intensive)
  - mixed SES

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# Consumption, social, and demographic variables

| | |
|---|---|
| **CSPG** | Consumption screen for problem gambling (frequency and intensity) |
| **AUDIT-C** | Alcohol Use Disorders Identification Test - Consumption (frequency & quantity) |
| **BMI** | Body Mass Index (self-reported height and weight used to calculate) |
| **CAFFEINE** | Custom scale – tea, coffee, and energy drinks |
| **SALT** | Two simple questions regarding adding to prepared food at home |
| **CIGARETTES** | Based on number of cigarettes smoked per day |
| **ILLICIT DRUGS** | One item screen converted to yes / no binary variable |
| **BRCS** | Brief Resilient Coping Scale – coping with stress in an adaptive manner |
| **PSS** | Perceived Stress Scale – self-perceptions of stress |
| **AGE** | Recorded numerically |
| **MARRIED** | (or de facto) versus single, divorced, etc. |
| **OCC. SECTOR** | Converted to binary variable: Primary / secondary versus tertiary sector |
| **EDUCATION** | 11 point scale from none to post-graduate qualifications |
| **GENDER** | |

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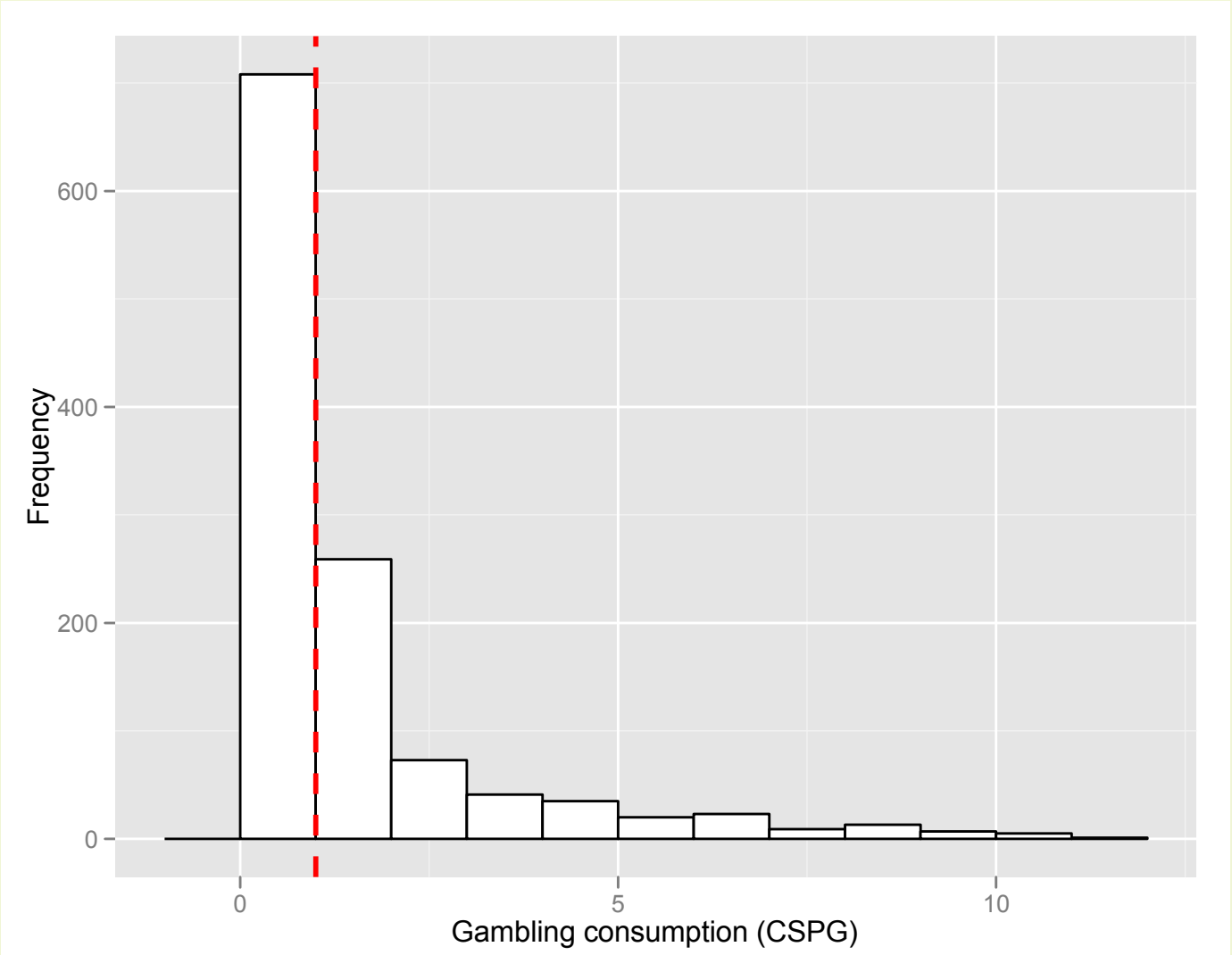
# Distribution of CSPG scores in the general population



# Bivariate analysis

- Comparison of gamblers versus non-gamblers

| | Gambles | | | | | |
|---|---|---|---|---|---|---|
| | No | | Yes | | | |
| | M | *SD* | M | *SD* | *t*[a] | df |
| **AUDIT-C** | 1.02 | *1.06* | 1.51 | *1.02* | +7.53*** | 898 |
| **Caffeine** | 12.35 | *5.39* | 13.43 | *5.23* | +3.2** | 885 |
| **BMI** | 27.77 | *5.88* | 28.31 | *5.38* | +1.5 | 848 |
| **Cigarettes** | .67 | *1.98* | .94 | *1.63* | +2.24* | 783 |
| **Hi-en. food** | 25.32 | *7.22* | 27.00 | *6.92* | +3.77*** | 877 |
| **Salt** | 4.41 | *1.99* | 4.80 | *1.97* | +3.22** | 898 |
| **Illicit drugs** | N | | | | Chi-square | |
| No | 599 | | 393 | | 4.22*[b] | |
| Yes | 25 | | 29 | | | |

*p<0.05
**p<0.01
***p<0.001

[a]One-tailed Student's independent groups t-test
[b]Pearson's chi-squared test with simulated p-value (based on 2000 replicates)

# Bivariate analysis

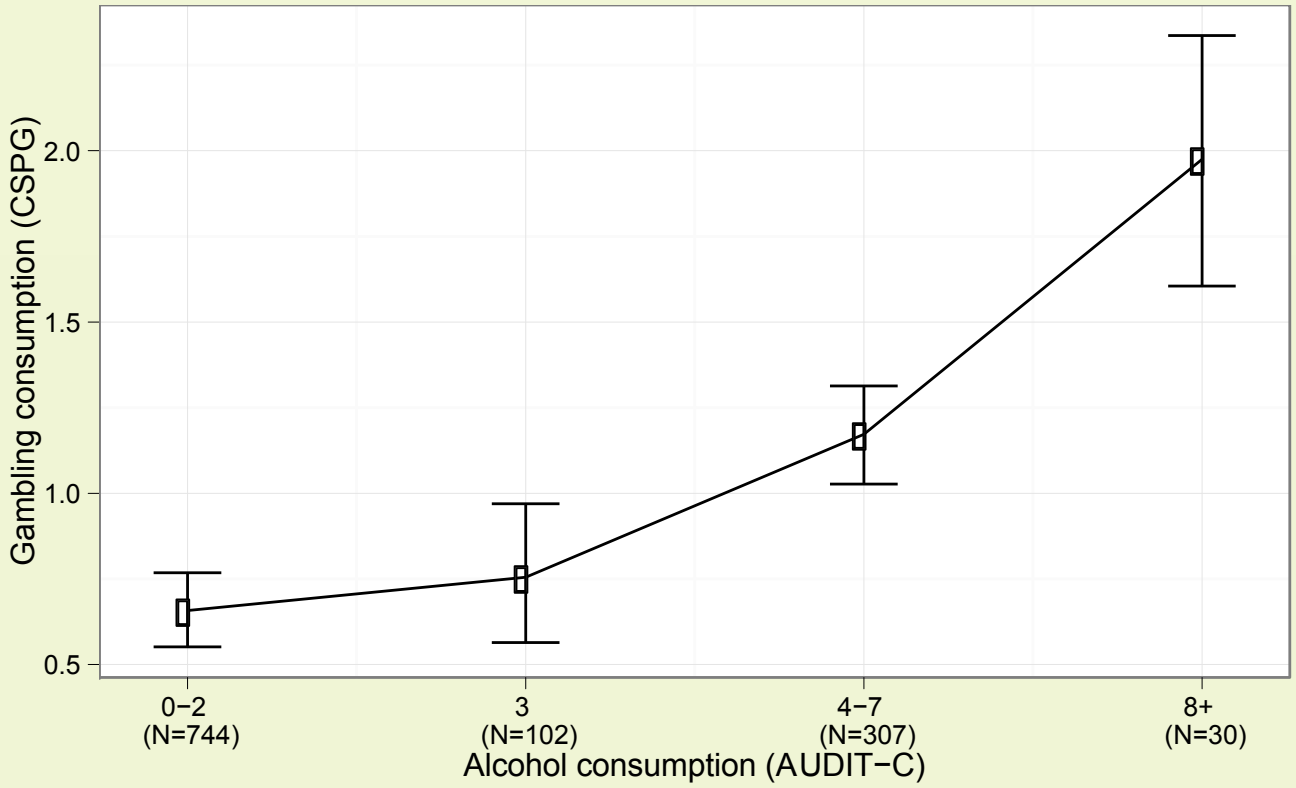
- As gambling consumption increases, does other forms of consumption increase?

| | CSPG |
|---|---|
| **AUDIT-C** | +.17*** |
| **Caffeine** | +.12** |
| **BMI** | +.10* |
| **Cigarettes** | +.14** |
| **Hi-en. food** | +.01 |
| **Salt** | +.05 |
| **Illicit drugs** | +.03[a] |

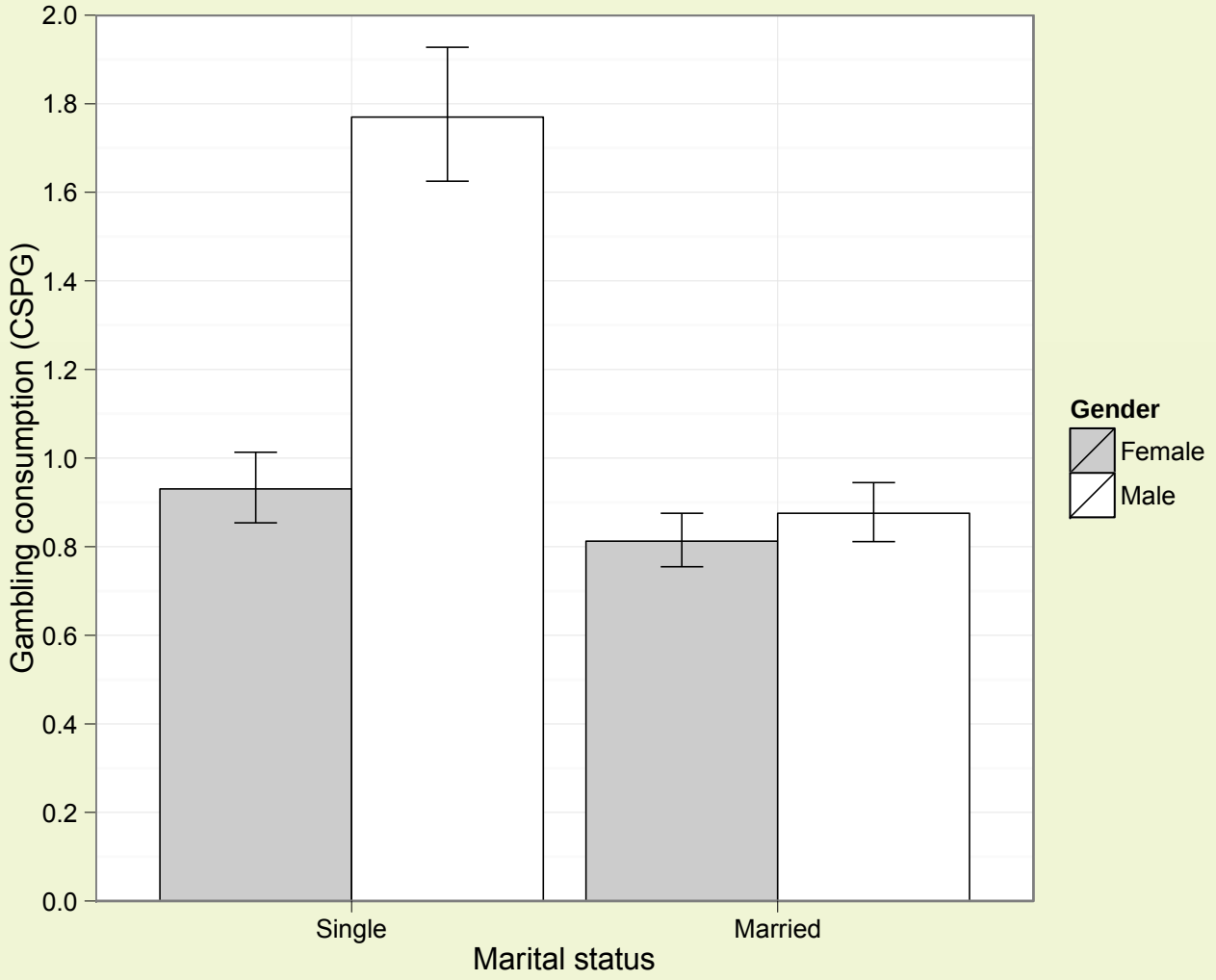
*p<0.05
**p<0.01
***p<0.001

[a]The non-significant relationship between CSPG values and binary variable 'drug use' was confirmed using a independent 2-group Mann-Whitney U test.

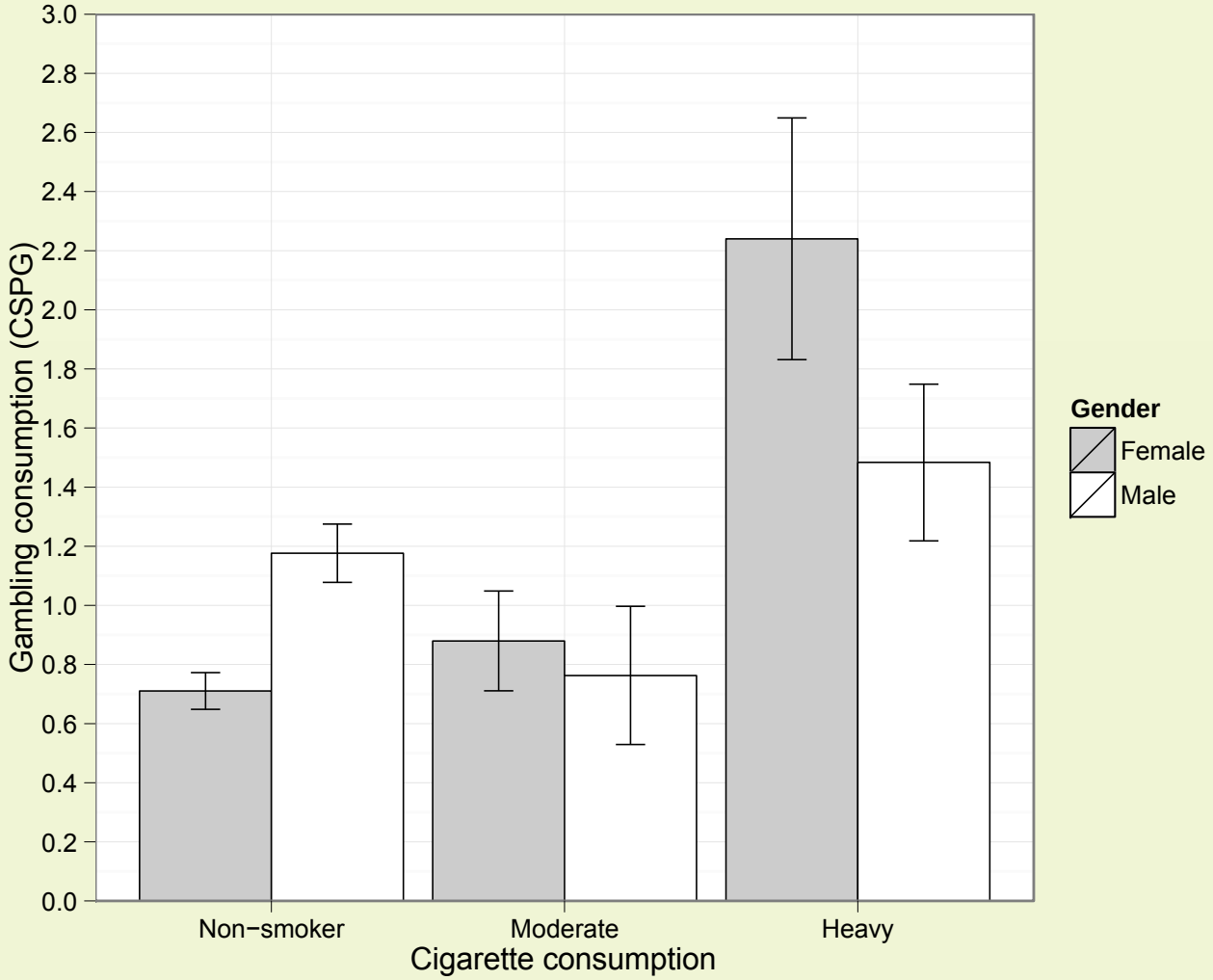
# Relationship of alcohol consumption to gambling consumption



# Effect of gender and marital status



# Smoking, gambling and gender



# Multivariate analysis

- Stepwise inclusion of all variables
- Consumption variables proved useful after including other effects

Zero hurdle model coefficients (binomial with logit link)

| | Estimate | SE | z |
|---|---|---|---|
| **Intercept** | -1.541 | .597 | - 2.578** |
| **AUDIT-C** | .452 | .067 | +6.743*** |
| **Married** | -.185 | .191 | - .970 |
| **Gender** | .452 | .247 | +1.824[a] |
| **Education** | -.321 | .137 | - 2.336* |
| **Hi-en. food** | .023 | .009 | +2.396* |
| **Caffeine** | .027 | .012 | +2.174* |
| **BRCS** | -.048 | .021 | - 2.221* |
| **Occ. Sector** | -.249 | .179 | - 1.393 |
| **PSS.sig** | .028 | .017 | +1.633 |
| **Married:Gender** | -.740 | .288 | - 2.568* |

[a]p<0.1
*p<0.05
**p<0.01
***p<0.001

# Multivariate analysis

- Highly conservative model
- Alcohol not significant after including gender
- Smoking and caffeine significant

Coefficients for estimation of non-zero CSPG values (truncated negative-binomial with log-link)

| | Estimate | SE | z |
|---|---|---|---|
| **Intercept** | -2.637 | .815 | - 3.234** |
| **Age** | 0.018 | .007 | + .016* |
| **Salt** | .008 | .045 | + .176 |
| **Smoke** | .217 | .061 | +3.524*** |
| **Gender** | .817 | .213 | +4.085*** |
| **AUDIT-C** | .084 | .089 | + .940 |
| **Caffeine** | .040 | .017 | +2.276* |
| **Smoking:Gender** | -.234 | .085 | - 2.753** |
| **Log(theta)** | -1.54 | .716 | - 2.154* |

# Conclusions

- Cautious support
  - In agreement with previous findings in terms of known predictors (alcohol, cigarettes, drugs – less so)
  - Contribute unique portions of explained variance
  - Mostly out-competed social or demographic explanatory variables
  - Junk-food, caffeine and salt added to the list of known co-occurring use-behaviours
- Interpretation
  - Causality issues eg gamblers spend more time in clubs being exposed to alcohol, cigarettes
  - A general trait towards ‘healthy lifestyle choices’ - or a true shared motivation mechanism?
  - Regardless, highly suggestive support for the ‘consumption hypothesis’ is shown