



Traumatic Brain Injury among NSW Prisoners

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Presentation

- Describe research from studies looking at traumatic brain injury among prisoners
 1. Prevalence study
 2. Community comparison
 3. Validation study
 4. Population-based data-linkage study
- Intervention study for men with histories of violence who are highly impulsive

Prisoner facts and figures

- Australian full-time prisoner population ~30,000
- ~50,000 flow through prisons each year
- Imprisonment rate Australia - 196/100,000
- Indigenous imprisonment rate - 2,182/100,000

- 94% men, 6% women
- Median age 33 years
- Median sentence 36 months*

- \$100,000 per year in NSW (\$274 per day)
- \$14 billion to run the justice system

* Excludes lifers and indeterminate sentences

Prisoner health research eras in Australia

- **Pre 1980s** – little interest in prisoner health and well-being

- **Mid-1980s → 1990s** – HIV epidemic



- **2000 → present** – mental health



- **2000 → present** – hepatitis C



- **2007 → present** – neuropsychiatric considerations (e.g. traumatic brain injury; impulsivity)

- **“Neurocriminology”** an emerging sub-discipline of criminology which applies brain imaging techniques and principles from neuroscience to understand, predict, and prevent crime.

Antecedents to TBI work

- Prison nurses drawing attention to the high numbers of prison inmates with head injuries
- Hunter Area Neuropsychiatry Service (Peter Schofield) receiving a remarkable number of head injury patients for assessment with a forensic history
- Collaboration established between Hunter Mental Health & Justice Health
- Study conceived to determine the prevalence of Traumatic Brain Injury (TBI) in the NSW criminal justice system
- Determine the neuropsychiatric correlates of reported TBI
- Assess the validity of self-reported TBI

Traumatic Brain Injury (TBI)

- **Traumatic brain injury (TBI)**

Trauma to the brain caused by an external force impinging upon the head and brain (e.g. deceleration injury as in car accident, blow to the head etc.)

- TBI can significantly affect many physical, cognitive and psychological skills
- **Increase**: depression, anxiety, impulsivity, irritability, disinhibition & lability of mood, drug use
- **Decrease**: Problem solving, memory, concentration, attention, speed of processing, communication, organisation & planning skills

Rates of reported TBI in prison populations are high

Community

- United States - NIMH Epidemiological Catchment Area Study 8.5% in adults (Silver et al. 2001)
- Canberra Longitudinal Study ~6% (Butterworth 2004)

Prisoners

- USA studies 87% (Slaughter et al. 2003)
- New Zealand 86% (Barnfield and Leathem 1998)
- Meta-analysis 60% (Shiroma et al. 2010)

‘.....a head injury leads victims to participate in more than half of the crimes that come to the attention of the police and that result in incarceration’

(Sarapata, 1998)*

Hunter Forensic Head Injury Project (HFHIP)

Participant characteristics

- 205 reception prisoners
- Men
- Age: mean 30 years (range 18-56 years)
- No. of times arrested: mean 17 (range 1-200)
- 43% were most recently arrested for violent offence
- No. of previous incarcerations: mean 3.9 (range 0-20)

- TBI questions incorporated into health reception assessment
- Permission sought to access their hospital records for the validation study

Hunter Forensic Head Injury Project¹

- **82%** history of TBI of any severity (dazed/confused, LOC)
- **64%** history of TBI with loss of consciousness (LOC)
- Median number of TBIs (any severity) was **3 (range 0-250)**
- **25%** had 10 or more TBI of any severity
- Most of those with >10 TBIs were involved in contact sports (e.g. boxing, rugby)
- Assault the most common cause of TBI (37%)

¹Schofield P, Butler T, et al. Traumatic brain injury among Australian prisoners: rates, recurrence and sequelae. *Brain Injury* 2006; 20:499-506.

TBI side effects

52% experienced some side-effect from the TBI, many persistent:

1. Neurological (45% unresolved):

- Short attention span - 18%

2. Psychological (32% unresolved)

- Personality change - 22%
- Anxiety/depression - 22%
- Uncontrollable anger - 20%

3. Social (17% unresolved)

- Relationship breakdown - 15%
- Job loss - 6%

Relationship between TBI and ‘personality’

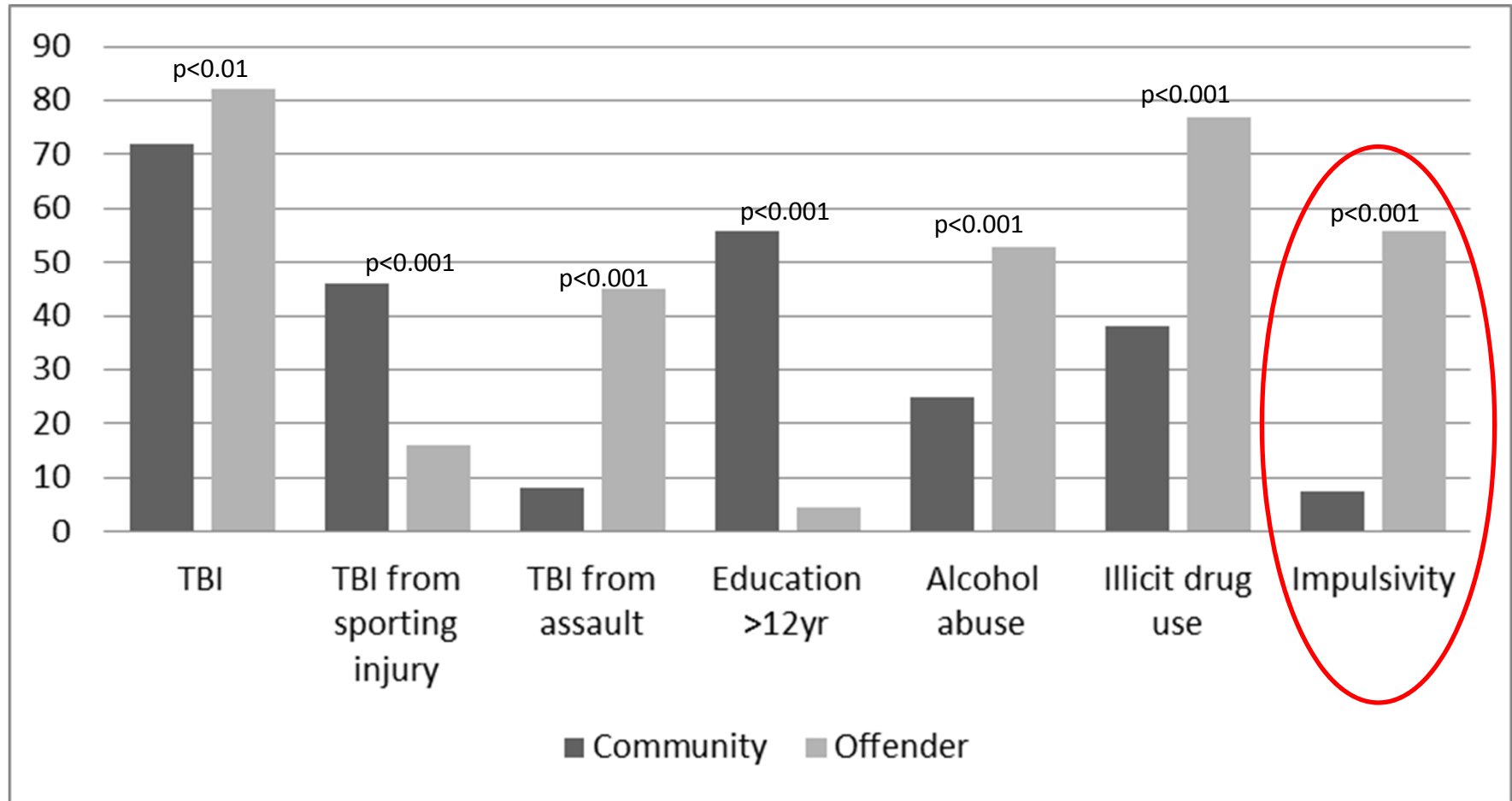
- Significant associations between HI with LOC and endorsing the following:
 - find it hard to stay out of trouble
 - lose temper and get into fights
 - very moody
 - will lie or con if it serves a purpose

Community comparison study*

- Sex, age and SES matched community controls in Hunter
- TBI of any severity more common among prisoners than community comparison group (**82% vs. 72%**)
- Main differences between prisoners and community were:
 - TBI with LOC (**65% vs. 35%**)
 - Multiple TBIs among prisoners (42% vs. 15% reported 4+ TBIs)
 - Prisoners more likely to report *persisting* side-effects of TBI:
 - Neurological (39% vs. 2%)
 - Psychological (25% vs. 1%)
 - Social (15% vs. 1%)
- Prisoners more likely to endorse items on:
 - Impulsivity screener (56% vs. 8%)
 - Dissocial screener (50% vs. 4%)

* Perkes I, et al. Traumatic brain injury rates and sequelae: A comparison of prisoners with a matched community sample in Australia. *Brain Injury*. 2011; 25: 131-41.

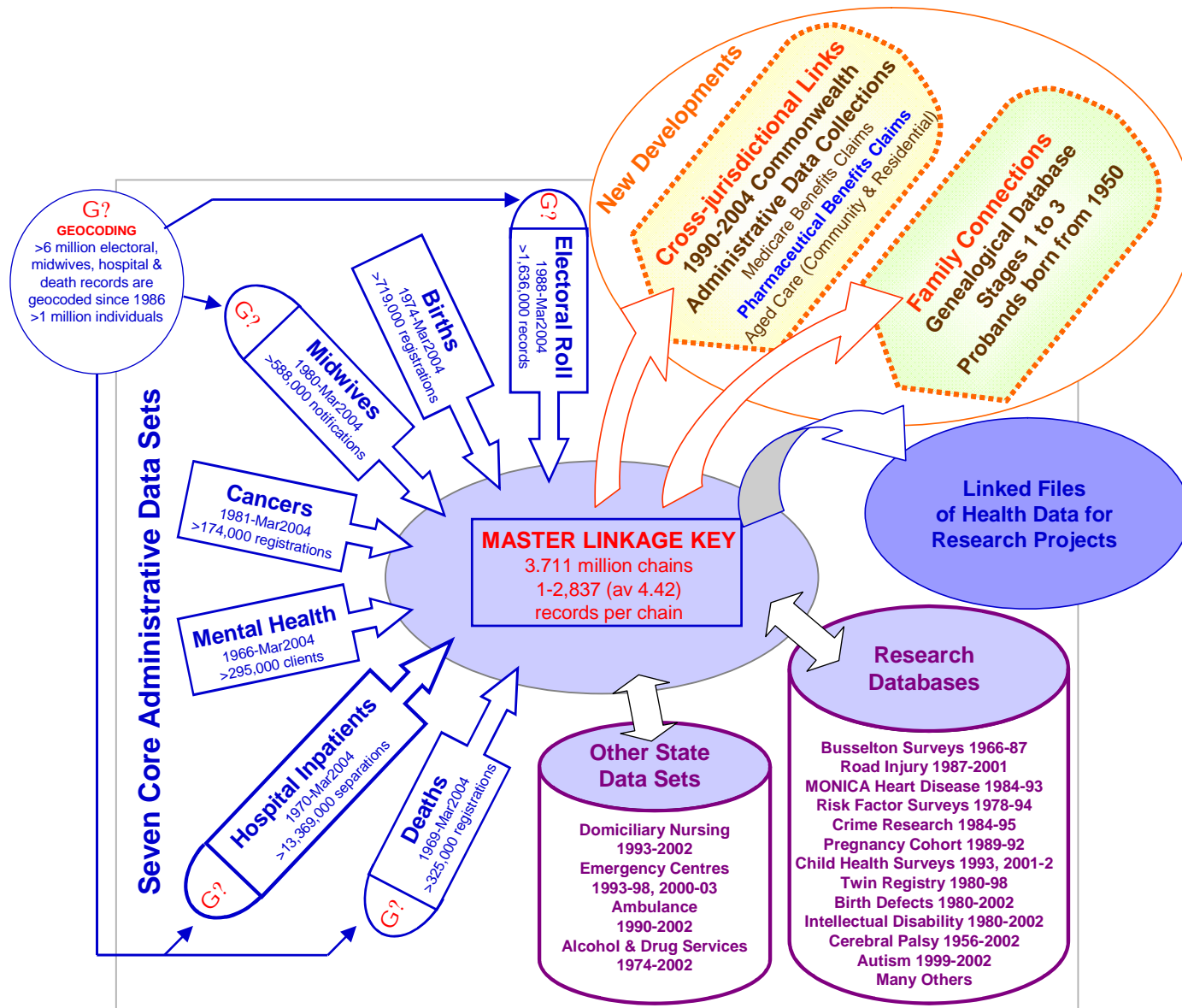
Associations with group membership



Does traumatic brain injury lead to offending?

- Cross-sectional studies limited
- Birth cohort 1980-85 Western Australia
- Western Australia Data-linkage System (WADLS)
- All cases of TBI registered in hospital records in WA
- Two control groups:
 - General population (3 per TBI case, age, sex matched)
 - Same sex siblings within 5 years of age
- Outcome: recorded conviction(s)

Western Australian Data Linkage System



- Established 1995
- 1 of 6 worldwide
- >30 health databases
- Probabilistic matching
- Best practice privacy

Does traumatic brain injury lead to offending?

TBI Group (n = 7,694)

Individuals with a hospital record of TBI (ICD codes) before any offending, born in WA 1980-1985

General community controls (n = 22,905)

Individuals without hospital record of TBI, born in WA, matched 3:1 for Age and sex with TBI group

Sibling controls (n = 2,397)

Same sex siblings of individuals in TBI group, without hospital record of TBI, born in WA, matched within 5 years of age

25-30 year follow-up through record linkage for outcomes/events



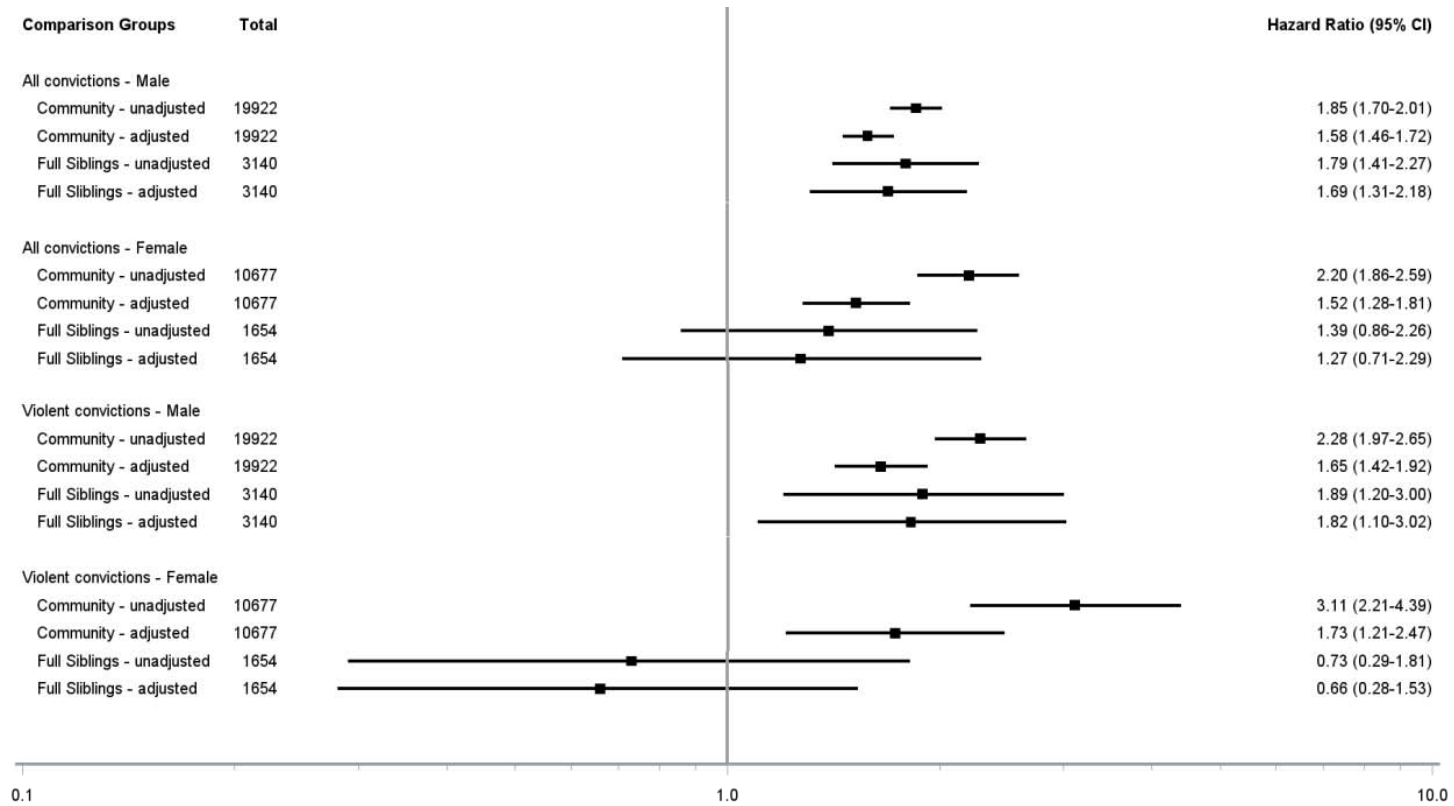
Principal Outcomes :

First criminal conviction
First violent conviction

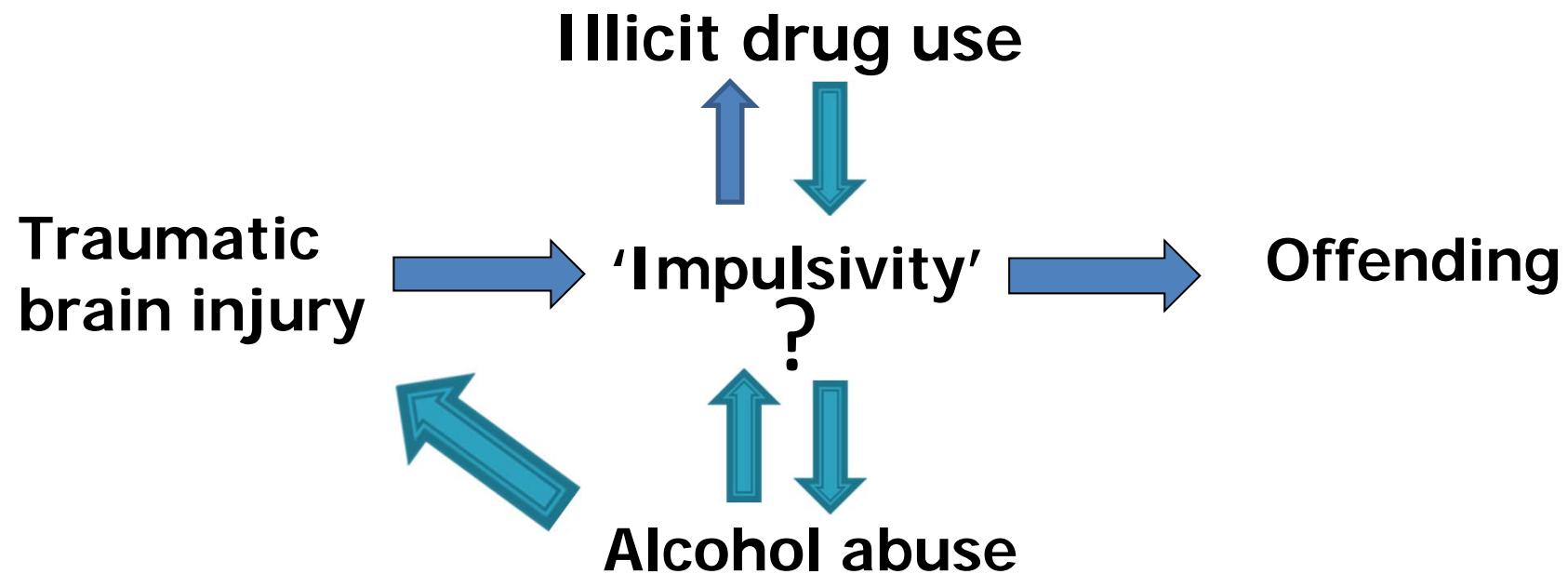
Other events:

Drug and alcohol treatment episodes
Mental health outcomes
Death

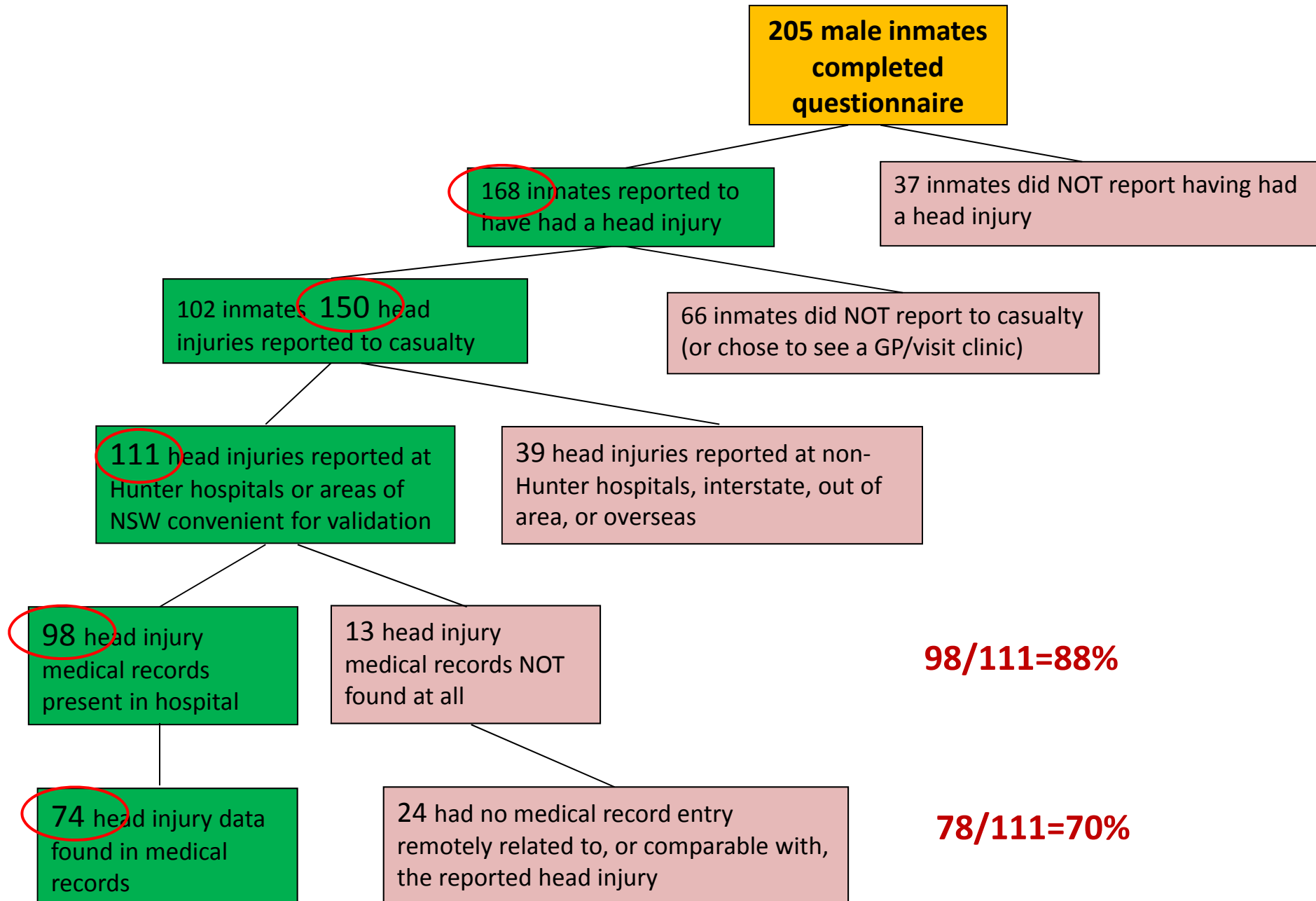
Association between TBI and offending



Possible mechanism (causality)



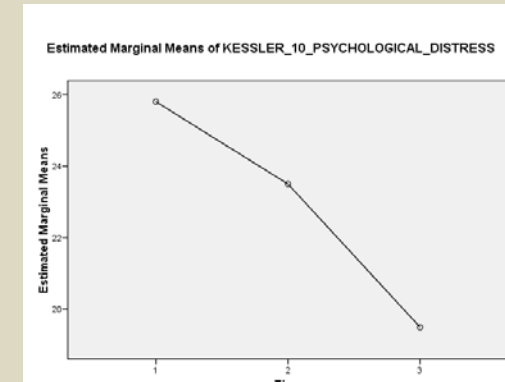
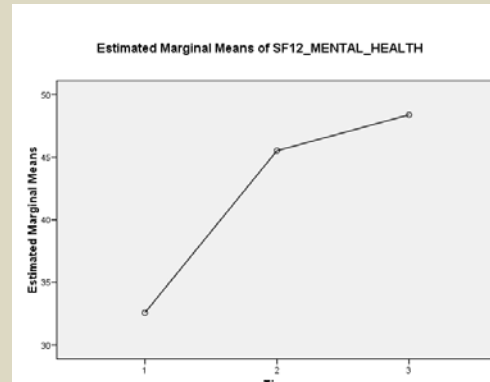
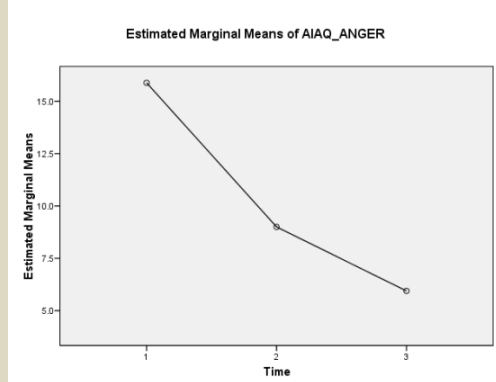
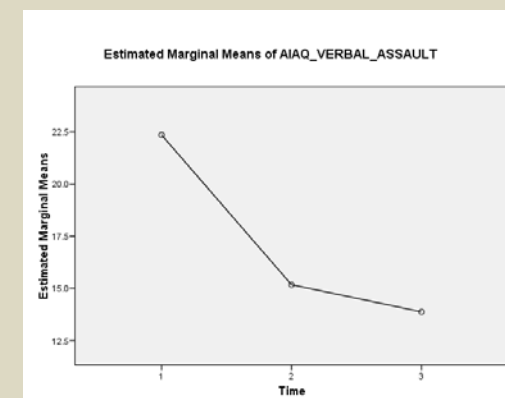
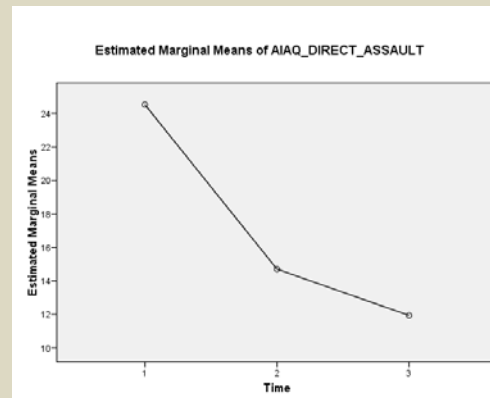
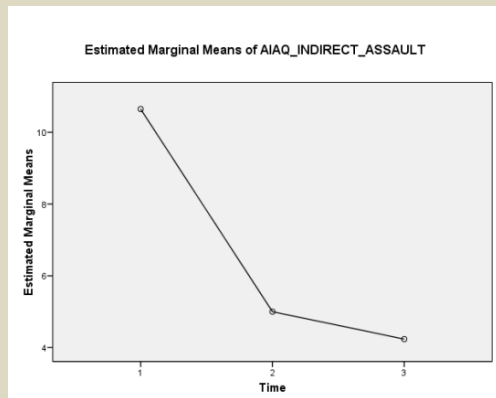
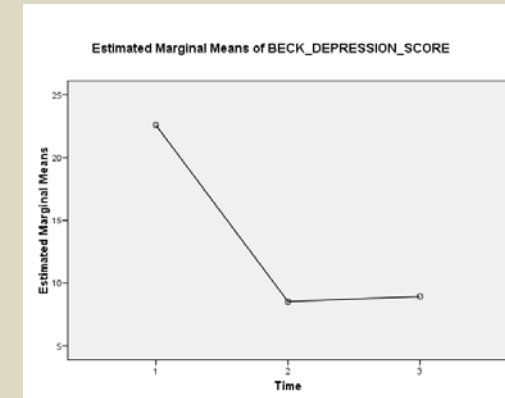
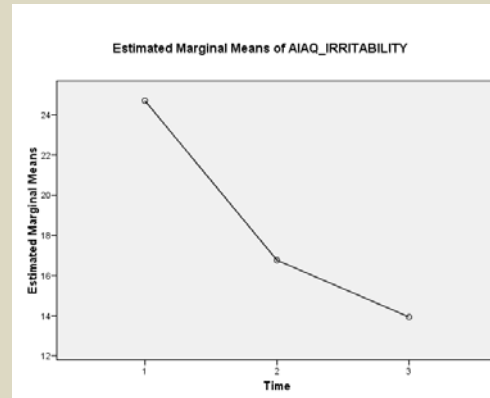
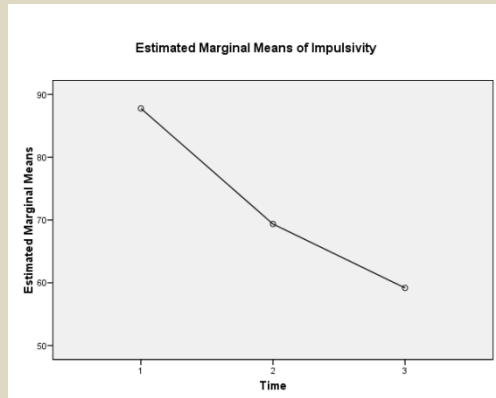
Validation study



Impulsivity and offending

- Support in the criminological literature for impulsivity and offending
- Support in the biological literature between reduced levels of brain serotonin and measures of impulsivity and aggression in animal and human studies
- Brain serotonin can be regulated using a class of antidepressant medication called selective serotonin reuptake inhibitors (SSRIs) (e.g. Zoloft, Prozac)
- Small number of studies in clinical populations using SSRIs with aggressive and violent patients
- No study in the criminal justice system of aggressive and violent offenders

Pilot study – SSRI administration to impulsive-violent offenders*



REducing Impulsivity iN Repeat-Violent offEnders using an SSRI (REInVEST) study

“This medication has changed my life. I wish I’d been on it years ago. I can now spend more quality time with my daughter and my relationship has improved. I’ve stopped smoking pot and have reduced my coffee intake from 15 cups per day to 1. I’ve experienced some side-effects but they are worth it for my current mental state.”
(Participant feedback)



“XXX reported yesterday and the medication has made the following improvements: 1. He wasn't pacing in the waiting room; 2. He wasn't shouting or speaking in a raised voice; 3. He was polite and said please and thank you; 4. We enquired about his balance with SDRO which should be \$0, however his timesheets hadn't been processed so it appeared he still owed \$420 AND HE DIDN'T LOSE CONTROL OR EVEN GET ANNOYED!!!”
(Community Corrections Officer)

Unease associated with the REInVEST study

- Level of discomfort within some groups – ‘moral panic’
- Ignoring psychological and social problems
- Focussing only on biological mechanism
- Looking for a silver bullet
- Emphasis on negatives associated with medication (most commonly prescribed psychotropic medication in Australia - 11 million scripts at last count)
- No adverse events due to study medication since commencement of study
- Coercion (25% refuse as don't want to take meds)

See discussions, stats, and author profiles for this publication at: <http://www.researchgate.net/publication/283949295>

Cosmetic Psychopharmacology for Prisoners: Reducing Crime and Recidivism Through Cognitive Intervention

ARTICLE *in* NEUROETHICS · NOVEMBER 2015

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O.J. Simpson Likely Suffers From Brain Disease CTE, Says Bennet Omalu

Simpson spent 11 seasons in the NFL.

🕒 01/29/2016 11:05 am ET



Juliet Spies-Gans
Editorial Fellow, HuffPost Sports



LEE CELANO VIA GETTY IMAGES

On Jan. 12, 1995, O.J. Simpson confers with his lawyer F. Lee Bailey during a pre-trial hearing.

In leading expert Dr. Bennet Omalu's mind, there is little doubt that disgraced football star O.J. Simpson is suffering from chronic traumatic encephalopathy (CTE), the degenerative brain disease [linked to repetitive head trauma](#), such as that incurred by football players over a career on the gridiron.



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The jousting accident that turned Henry VIII into a tyrant


Medical study uncovers turning point in king's life. Michael McCarthy reports

Saturday 18 April 2009 |  0 comments



 The jousting accident that turned Henry VIII into a tyrant



 13
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Henry VIII became the tyrannical monster remembered by history because of a personality change following a serious jousting accident, according to a new historical documentary.

After the accident – just before he became estranged from the second of his six wives, Anne Boleyn – the king, once sporty and generous, became cruel, vicious and paranoid, his subjects began talking about him in a new way, and the turnover of his wives speeded up.

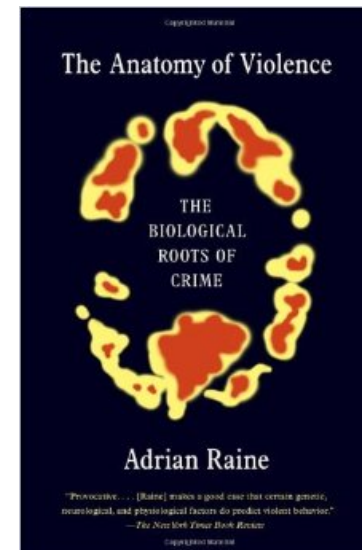
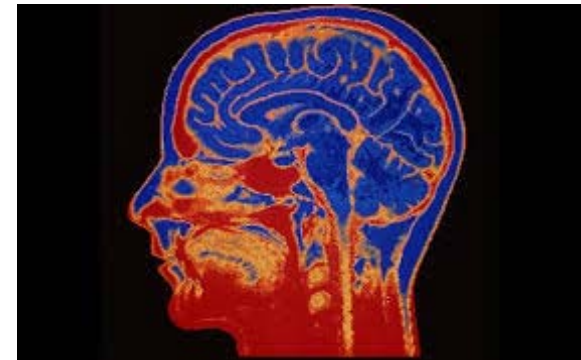
The accident occurred at a tournament at Greenwich Palace on 24 January 1536 when 44-year-old Henry, in full armour, was thrown from his horse, itself armoured, which then fell on top of him. He was unconscious for two hours and was thought at first to have been fatally injured.





VAUGHN'S PRACTICAL CHARACTER READER. 37

We wish to emphasize in the most absolute way the fact that so far as a human being is concerned all danger lies in these two faculties. They are easily located and should be understood by every man, woman and child. Be on guard against the danger in such men and women.



Conclusions

- High frequency of reported past TBI among prisoners
- Prisoners distinguished by key features (e.g. cause, frequency, persistent sequelae)
- Reliable self-report
- Exposure to TBI associated with offending behavior over time
- Need for screening and possible diversionary programs and/or effective interventions for offenders with significant TBI-related morbidity
- Neurocriminology emerging discipline
- Do neuropsychiatric/neuropsychological conditions warrant greater consideration in the legal system??

Acknowledgements

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