



Alcohol, Cognitive Function and Homelessness: A Nutritional perspective



Professor Adrian Bonner

University of
Kent

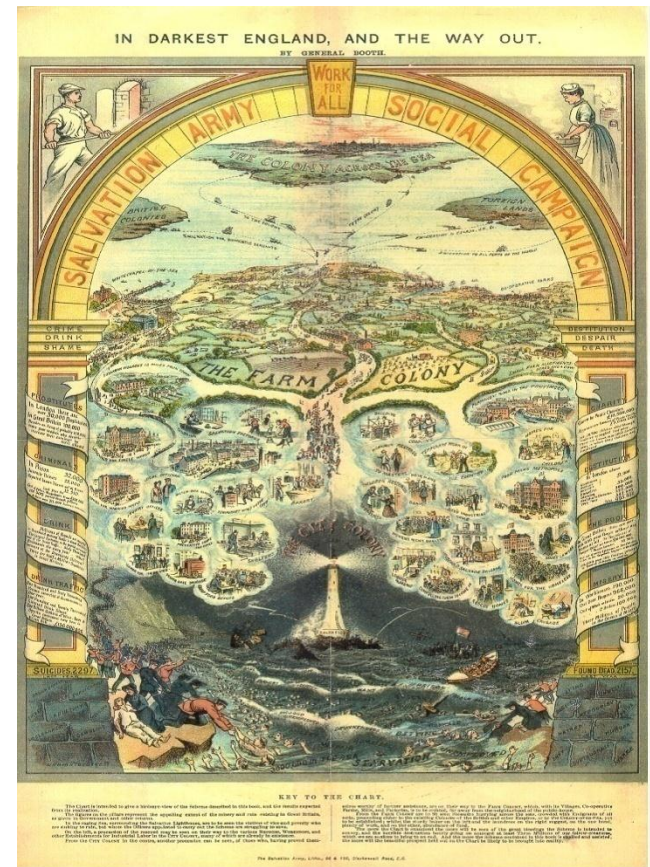
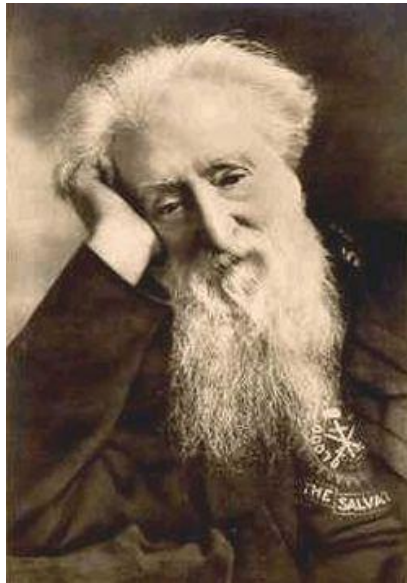


In Darkest England and the Way Out, 1890



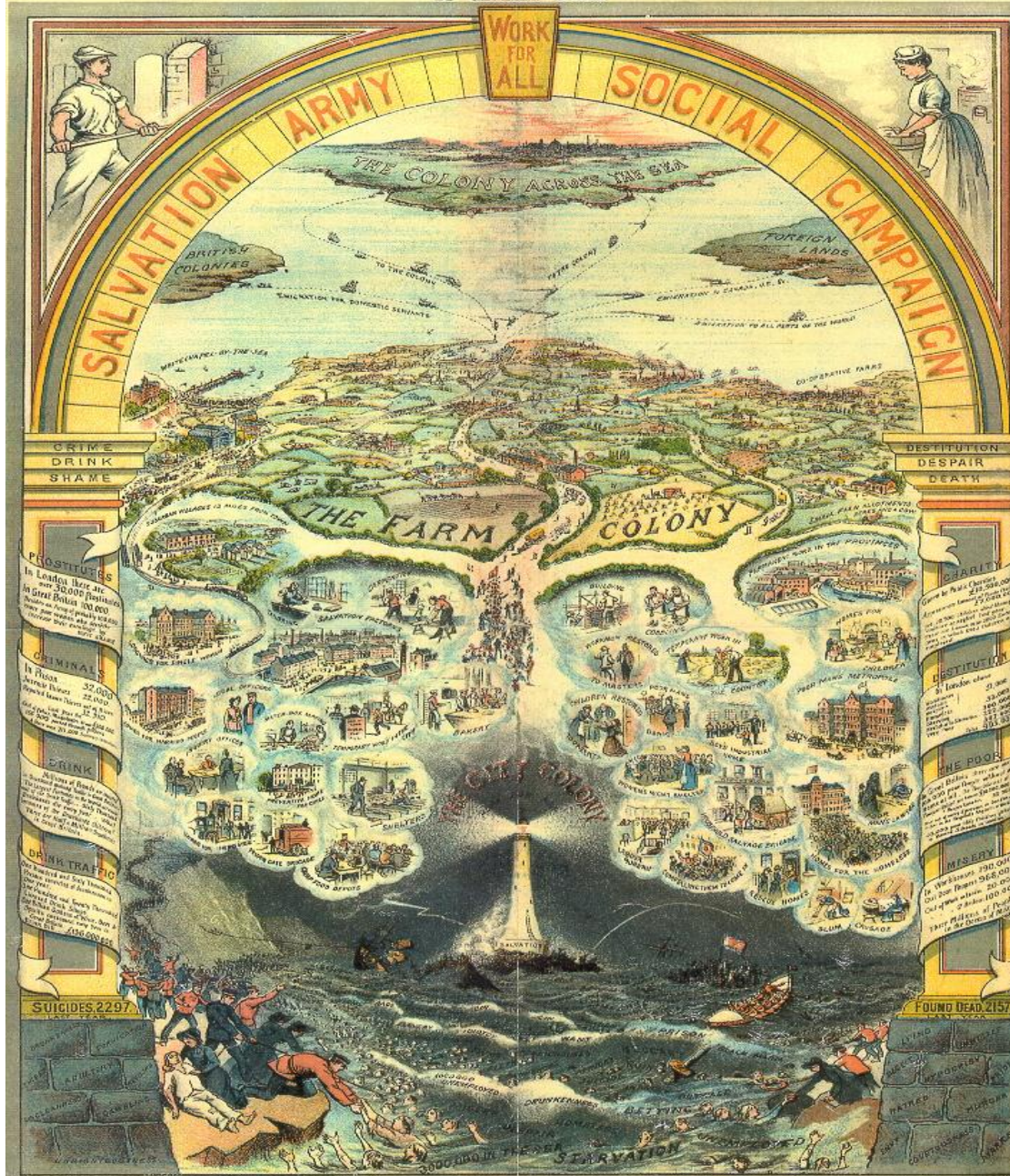
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William Booth,
1829-1912



IN DARKEST ENGLAND, AND THE WAY OUT.

BY GENERAL BOOTH.



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SAL

IGN

**CRIME
DRINK
SHAME**

**DESTITUTION
DESPAIR
DEATH**

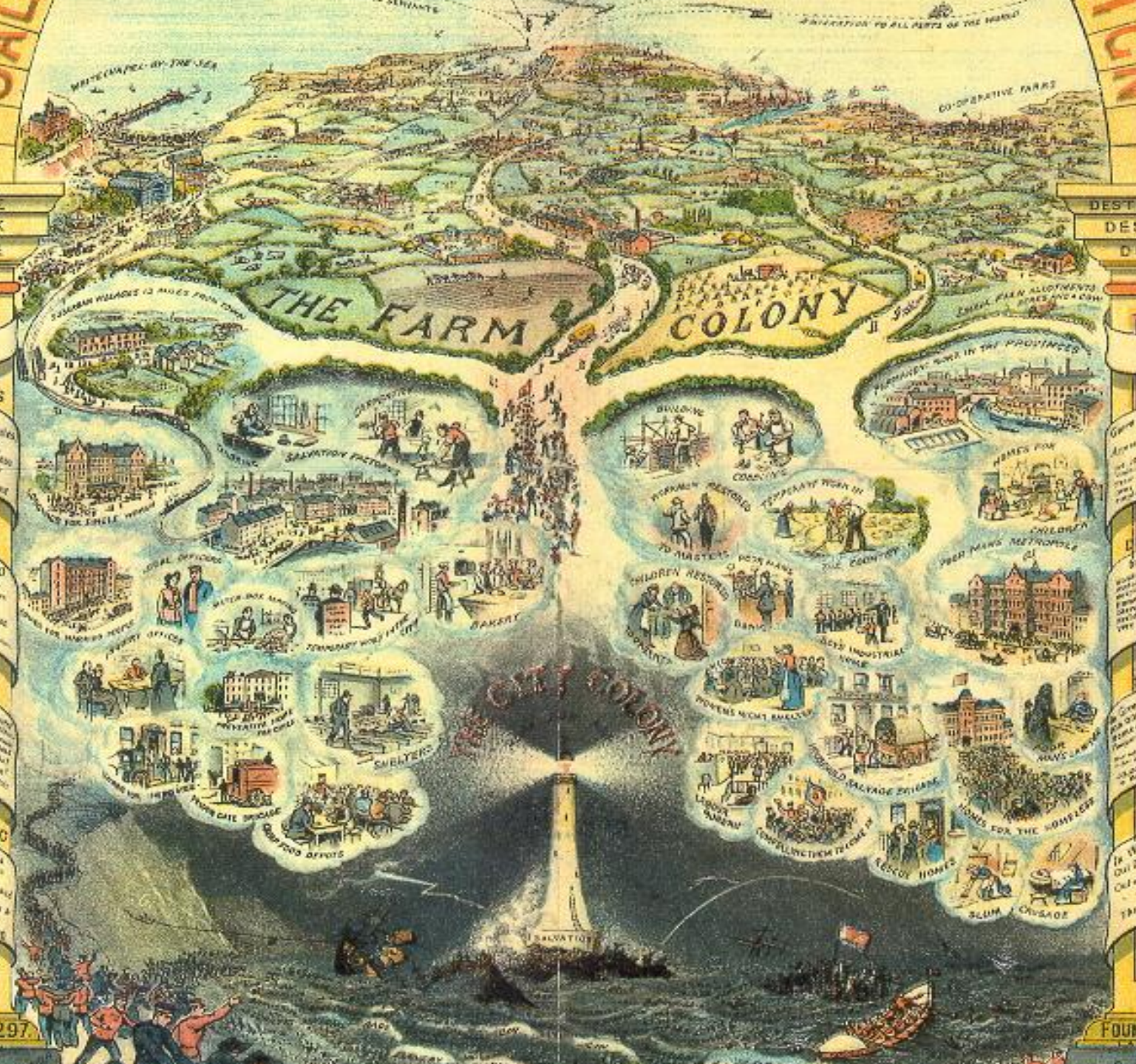
PROSTITUTES
In London there are
over 30,000 prostitutes
In Great Britain 100,000
Suffer from venereal disease
which is spread by their
immoral conduct

CRIMINALS
In Prison 52,000
Armed Forces 22,000
Suffer from venereal disease
which is spread by their
immoral conduct

DRINK
Millions of people are
drunk every day
The largest number in the
army are drunkards
The largest number in the
army are drunkards

DRINK TRAFFIC
Over 100,000 people are
drunk every day
The largest number in the
army are drunkards
The largest number in the
army are drunkards

SUICIDES 2,297
LAST YEAR



CHARITY
Current for Public Charity
£12,500,000
Approved for Public Charity
£7,000,000
Approved for Public Charity
£7,000,000

DESTITUTION
In London alone
31,000
In the rest of the country
33,000
In the rest of the world
33,000
In the rest of the world
33,000

THE POOR
In London alone
31,000
In the rest of the country
33,000
In the rest of the world
33,000
In the rest of the world
33,000

MISERY
In London alone
31,000
In the rest of the country
33,000
In the rest of the world
33,000
In the rest of the world
33,000

FOUND DEAD 2,157
LAST YEAR



“Beds” in early hostel, 1888



“Breakfasts”
Hanbury Street, 1880





Booth House, Whitechapel London

The Salvation Army is an international Christian church working in 115 countries worldwide. As a registered charity, The Salvation Army demonstrates its Christian principles through social welfare provision. The Salvation Army in the UK has 754 local church and community centres and 113 social service centres. Social centres include 57 residential homeless centres, 17 older people's care centres and six substance misuse centres, as well as programmes to support the Armed Forces and emergency services, a clothing recycling programme, charity shops, prison visiting services and a family tracing service handling 4,000 cases annually.

The Salvation Army is a Christian Church and a Registered Charity
The Salvation Army
UK Territory with the Republic of Ireland
101 Newington Causeway
London SE1 6BN

0207 367 4500

thq@salvationarmy.org.uk
www.salvationarmy.org.uk

Central Trust: Registered Charity No 214779, and in Scotland SC009359;
Social Trust: Registered Charity No 215174, and in Scotland SC037091;
Republic of Ireland: Registered Charity No CHY6399

The Seeds of Exclusion

THE SEEDS OF EXCLUSION





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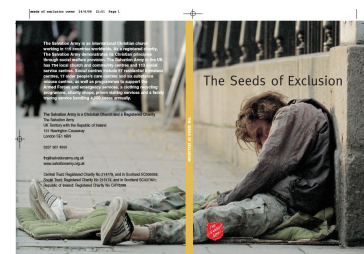
A STUDY OF MENTAL HEALTH, SUBSTANCE PROBLEMS, SOCIAL AND OTHER PROBLEMS IN HOMELESS PEOPLE

Dr Adrian Bonner
Dr Marianne van den Bree
Professor Pamela Taylor
Claire Luscombe



University of
Kent

CARDIFF
UNIVERSITY
PRIFYSGOL
CAERDYDD







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The Seeds of Exclusion

The Seeds of Exclusion is an international Christian anti-racism and anti-discrimination campaign. It is a project of the Seeds of Exclusion Trust, a registered charity in the UK. The campaign aims to raise awareness of the impact of racism and discrimination on society and to promote a more inclusive and equitable world. It does this through a variety of media, including film, television, radio, and print. The campaign also includes a range of educational resources and activities for schools and churches. The Seeds of Exclusion Trust is a registered charity in the UK, with its headquarters in London. It is a member of the Christian Anti-Racism Network and the Christian Anti-Discrimination Network. The Seeds of Exclusion Trust is a registered charity in the UK, with its headquarters in London. It is a member of the Christian Anti-Racism Network and the Christian Anti-Discrimination Network.

The Seeds of Exclusion is a Christian Church and a Registered Charity. The Seeds of Exclusion is a registered charity in the UK, with its headquarters in London. It is a member of the Christian Anti-Racism Network and the Christian Anti-Discrimination Network.

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Seeds of Exclusion Trust, registered charity No. 1121779, and a National Christian Anti-Racism and Anti-Discrimination Centre, registered charity No. 1121779, and a National Christian Anti-Racism and Anti-Discrimination Centre, registered charity No. 1121779.



Initial screen

- education
- social relations and support
- employment history

Diagnostic interview

- Addiction Severity Index
- AUDIT
- Dast -20
- GHQ-12
- Psychosis Screening Questionnaire
- Impact of Events Scale-revised (for PTSD)
- Personality Diagnostic Questionnaire-4
- Mini Mental State Examination

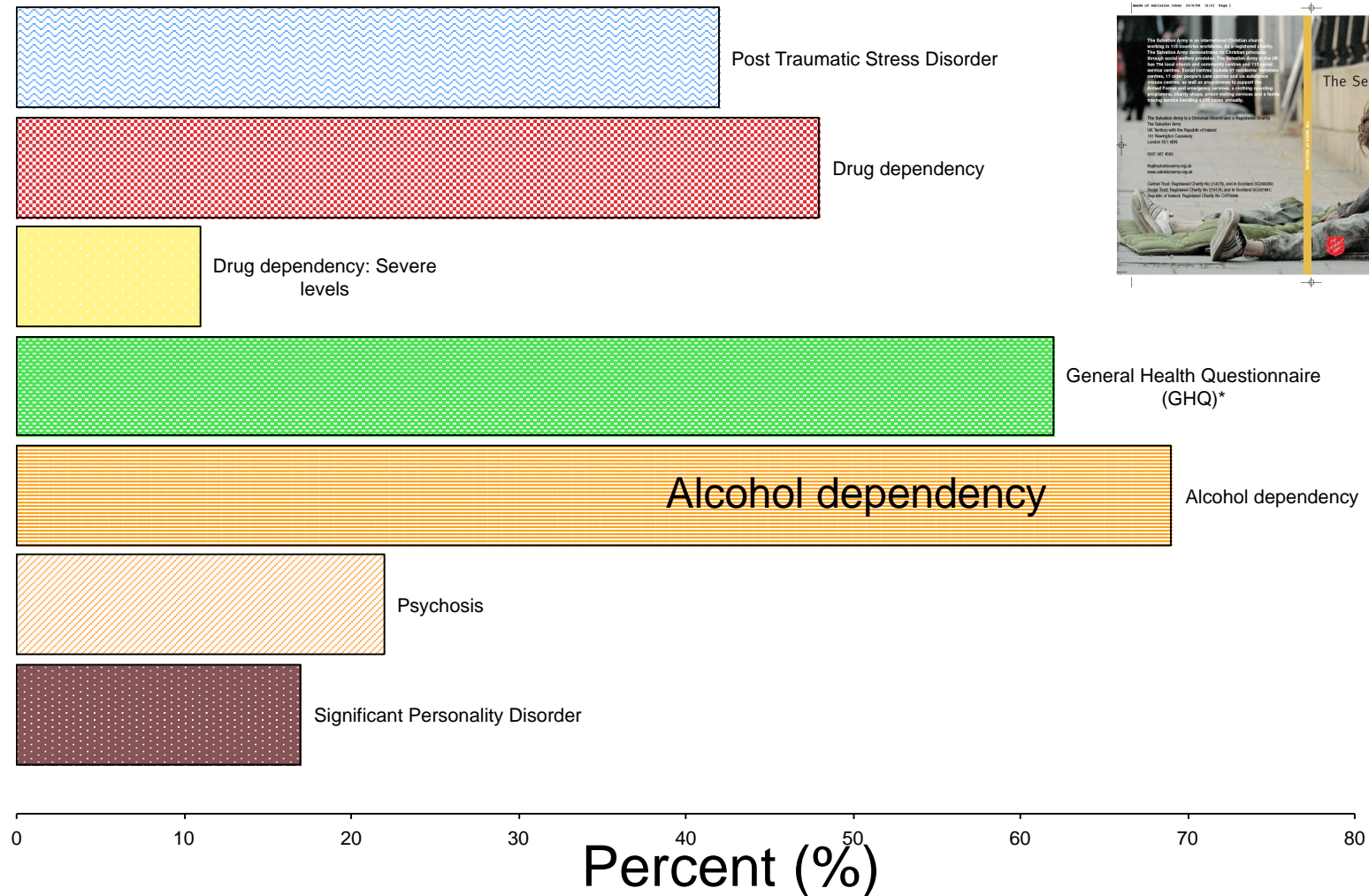
Screening, self-reporting and in-depth/diagnostic interviews of:

- 967 homeless people
- January 2006 - April 2009
- 7 UK geographical locations
- supervision by a consultant forensic psychiatrist

Percentage of interviewees who screened positive for specific mental health conditions



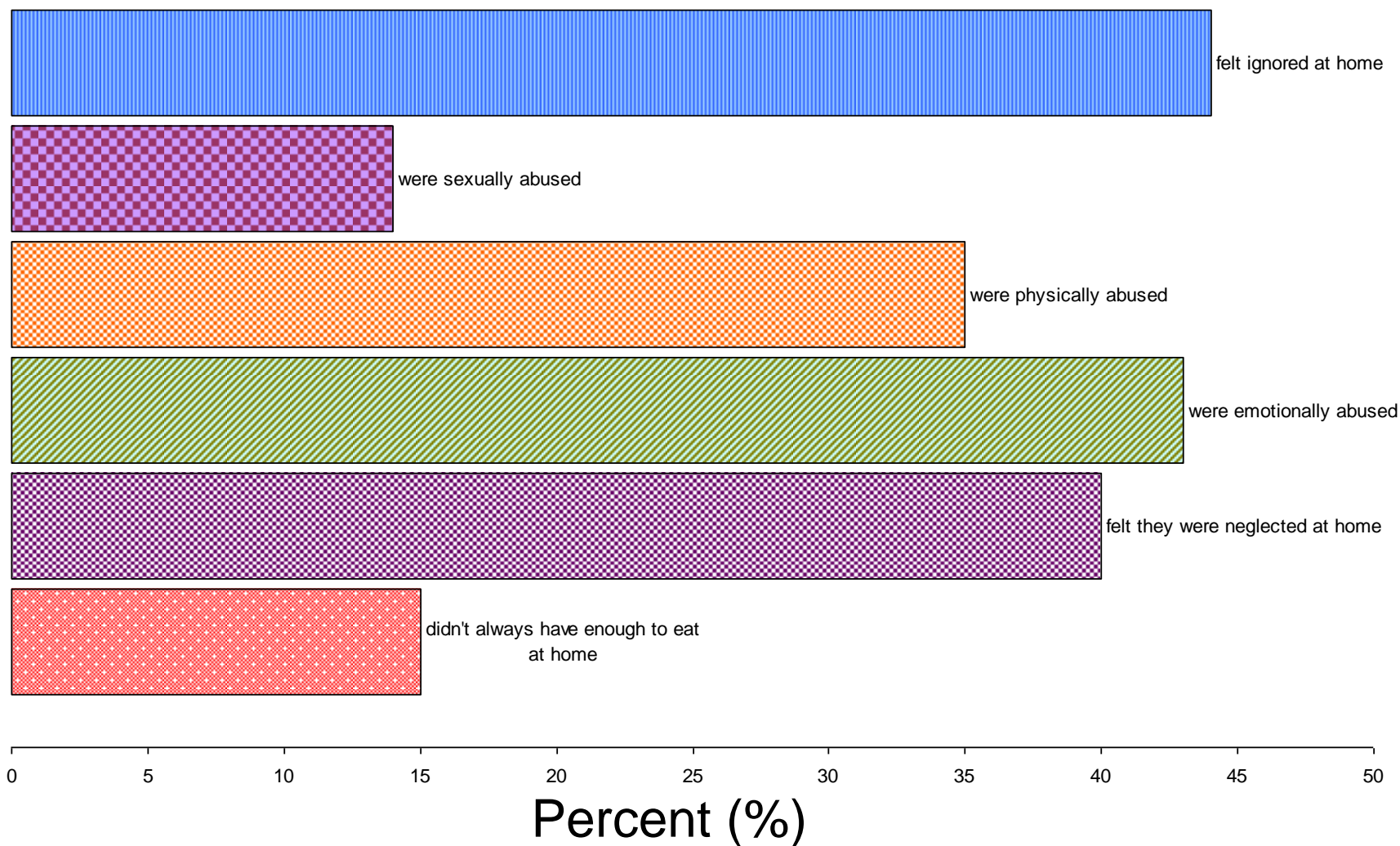
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Percentage of interviewees who had negative childhood experiences



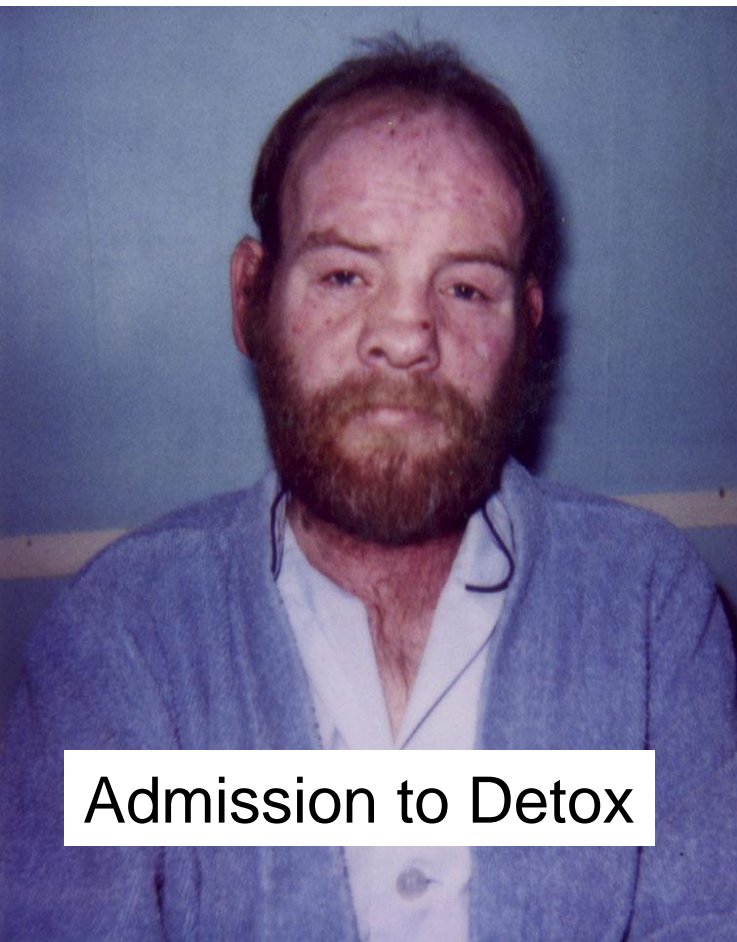
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Salvation Army Alcohol Treatment



Admission to Detox



Two weeks into detox





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Biomedical Service

Analysis of alcohol and drugs

3,000 samples per year

from SA centres around the UK





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Research into Nutrition and Social exclusion

- Nutrition deficits are associated with poor health
 - Vulnerability to mental health problems
 - Reduced cognitive function
- Deficits linked to
 - Alcohol and drug use
 - Poor quality parenting
 - Chaotic lifestyle



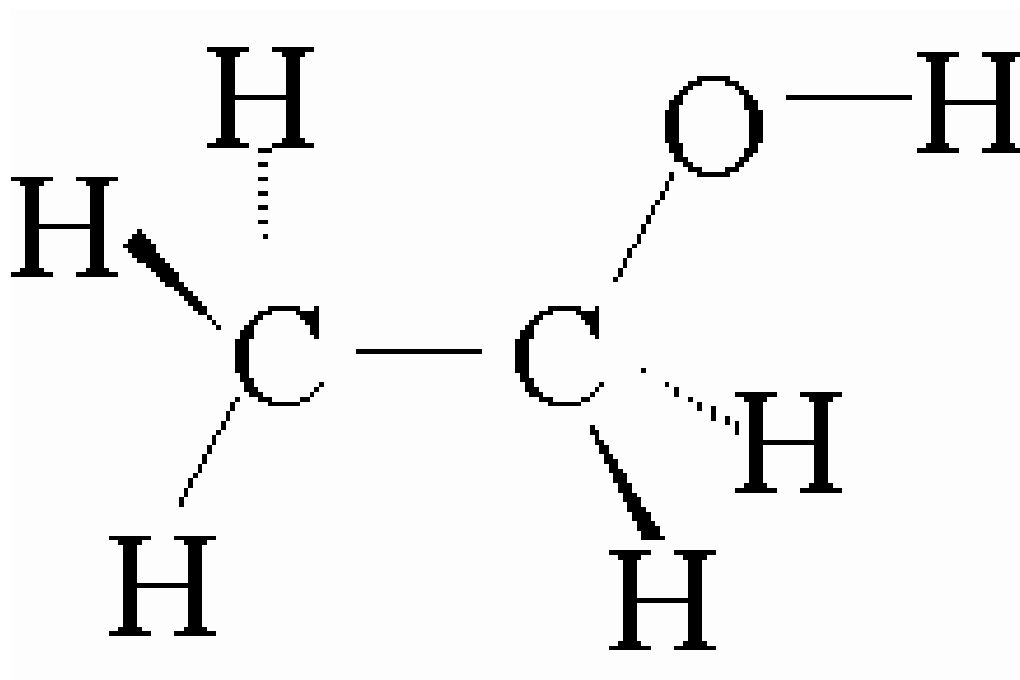


Alcohol and Nutrition





Ethyl Alcohol



Alcoholics are often malnourished



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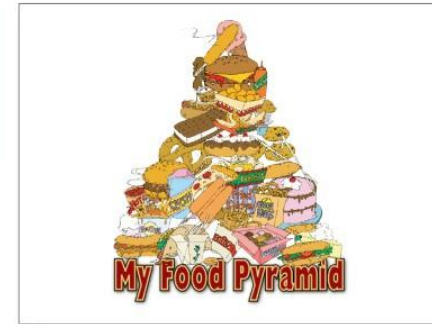
Alcohol

- it is a toxin *per se* and also produces acetaldehyde (highly toxic)
- All bodily organs affected
- Reduces the absorption, transport and metabolism of essential micronutrients (vitamins and minerals, essential fatty acids and amino acids)
- Reduced micronutrients influence optimal body functioning
- Particularly vulnerable is brain (adolescent brain)



Poor nutrition

- Diet based on convenience food when out and about/school
- Parents and peers influence
- Not consuming enough F+V
- Not enough fish
- Diet based on simple sugars, salty snacks, red and processed meat
- Lack of supply of essential micronutrients
- All organs affected but particularly the brain (adolescent brain)





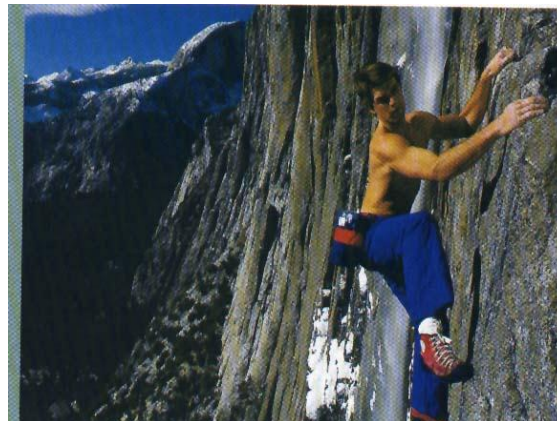
Nutrition and the development of Behaviour





Nutrition, Alcohol and other Drug Problems

- Exposure to substances across the life span
 - Effects of prenatal exposure
 - During adolescence
 - In young adults
 - Late life drinking

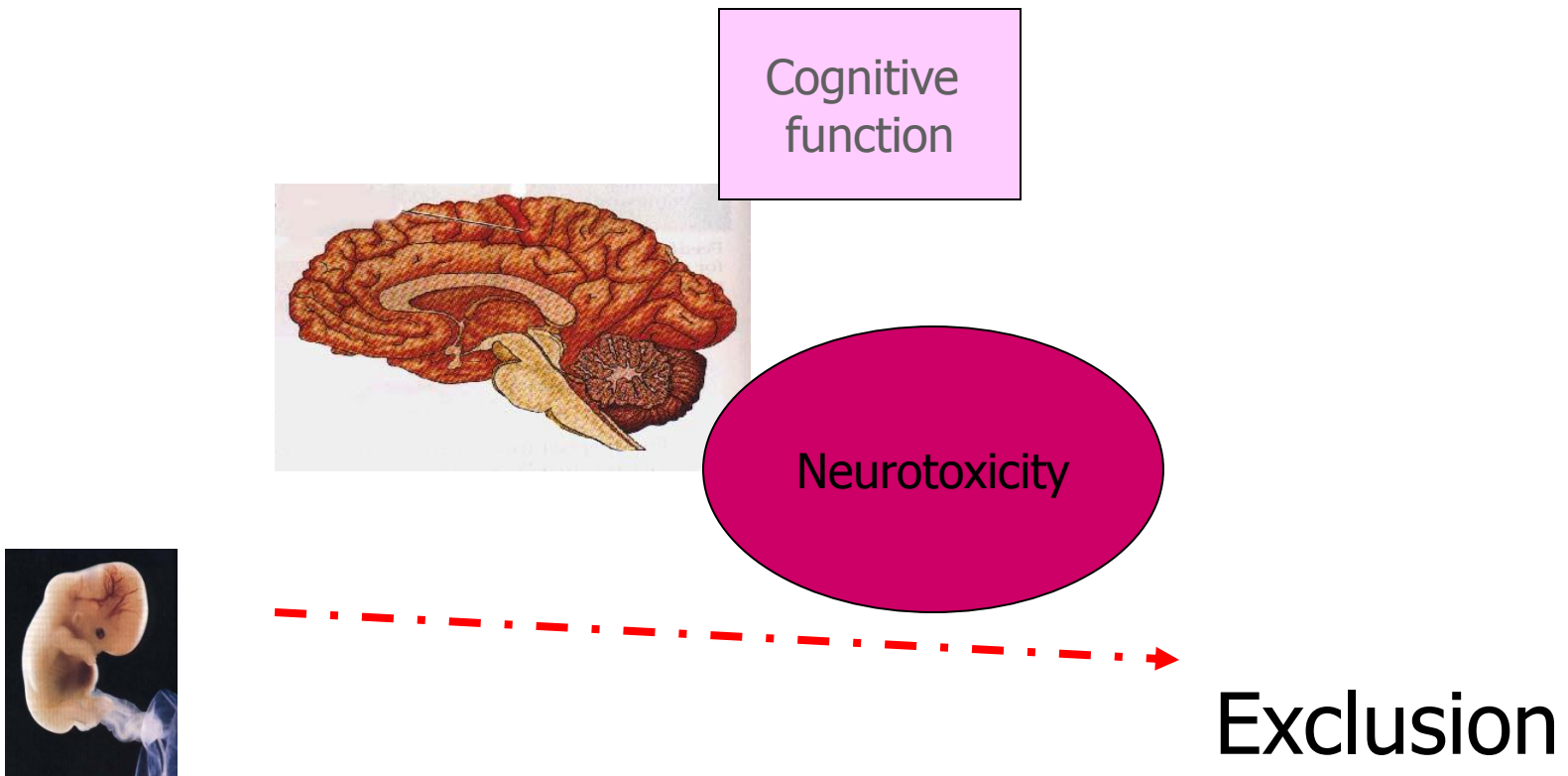


Social Context



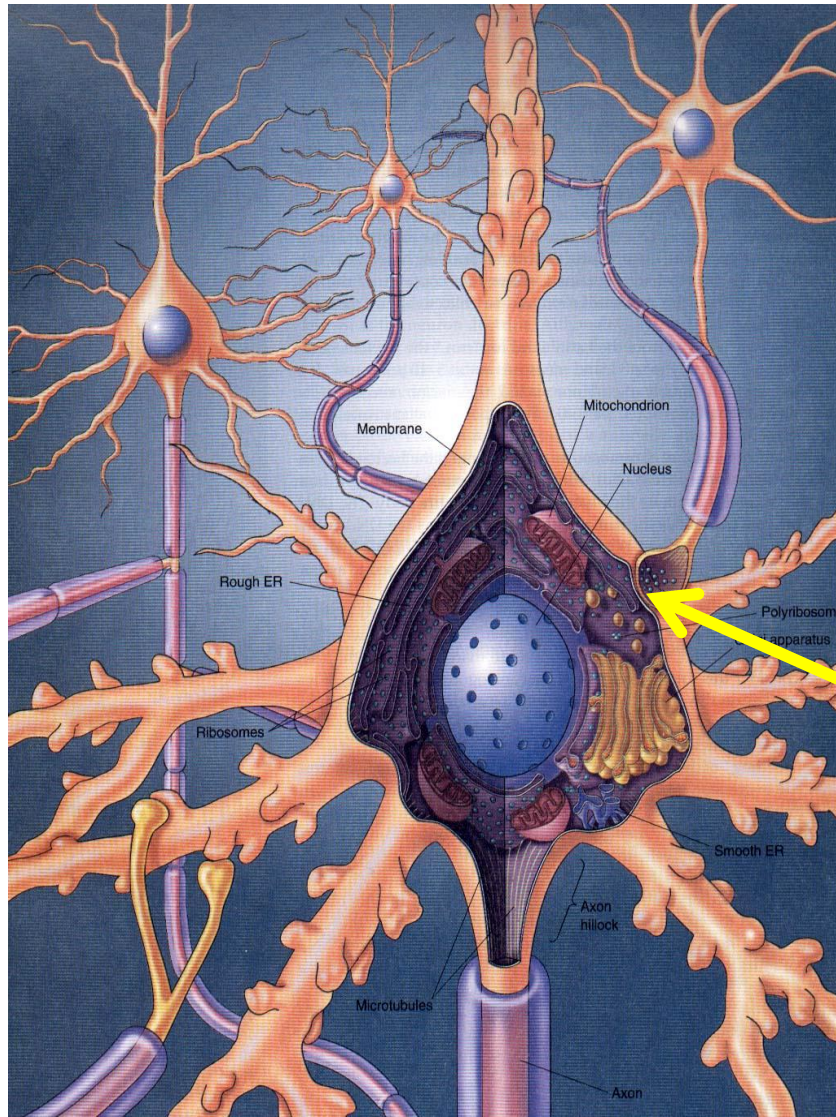
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Inclusion





Neurotransmitters are involved as chemical messages between neurons



serotonin

[can be manipulated by diet]

Serotonin

- deficits result in:



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- * **Alcohol craving and withdrawal** (Badawy, 2001)
- * **Insomnia** (Mouret et al, 1968)
- * **Hyperemotionality** (Rosecrans, 1970)
- * **Hyperirritability** (Koe & Weissman, 1966)
- * **Neophobia and anxiety** (Evans et al, 1980)
- * **Increased susceptibility to convulsive seizures**
(De la Torre et al, 1970)
- * **Increased sensitivity to pain** (Tenen, 1969)
- * **Increased avoidance learning** (Valzelli et al, 1976)
- * **Increased irritative aggression** (Gessa, 1979)
- * **Hyperdipsia** (Coscina et al, 1972)
- * **Increased alcohol preference** (Ho, 1974)
- * **Behavioural disinhibition** (Stein et al, 1973)
- * **Pathological and suicidal aggression**
(Brown et al, 1982)



Neurotransmitter Precursors:



Tryptophan

Serotonin (5-HT)

DIET

NEUROTRANSMITTER:
chemical messenger in the brain

Dietary amino acid

Neurotransmitter

*Breakdown product
excreted in urine*



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TRYPTOPHAN



Blood-brain barrier

Serotonin



MAO

5-Hydroxyindole
Acetic Acid



Brain serotonin

- Transport through blood-brain barrier
 - depends on competition between Tryptophan and other Amino Acids



Large Neutral Amino Acids

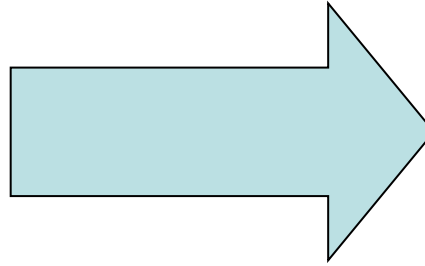
- Lysine
 - Phenylalanine
 - Tyrosine
 - Isoleucine
 - Valine
 - Leucine
 - Tryptophan
- Try/ LNAA ratio
 - determines flux of tryptophan into the brain
 - Tryptophan is the precursor of SEROTONIN



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High Carbohydrate

High Carbohydrate

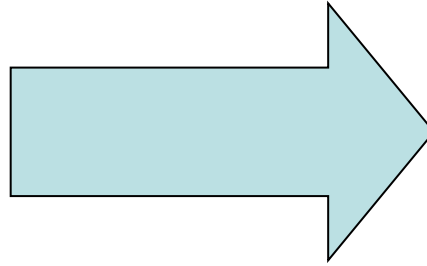


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High Carbohydrate

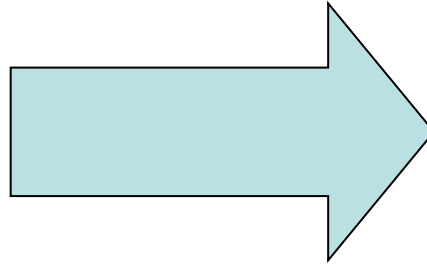


Insulin Surge

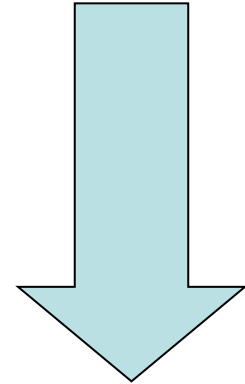


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High Carbohydrate

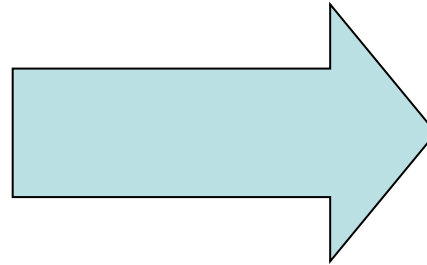


Insulin Surge

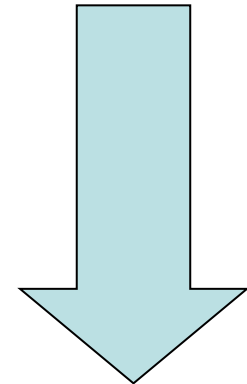




High Carbohydrate



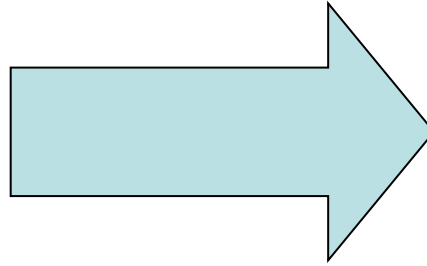
Insulin Surge



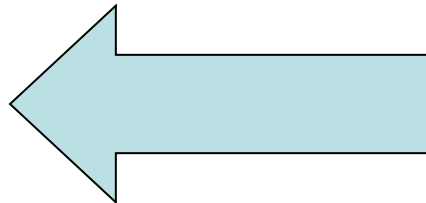
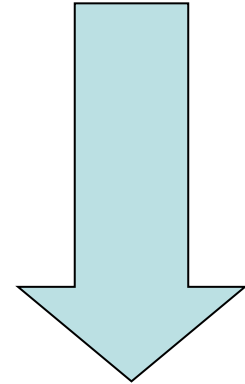
***LNAA Incorporated
into Muscle Protein***



High Carbohydrate



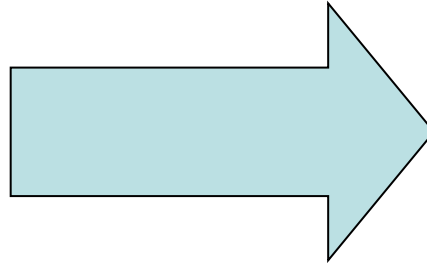
Insulin Surge



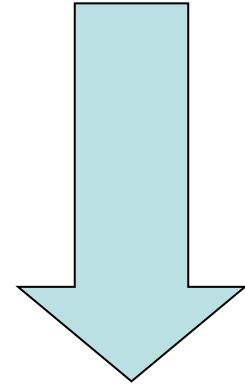
***LNAA Incorporated
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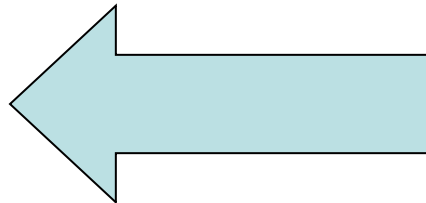
High Carbohydrate



Insulin Surge



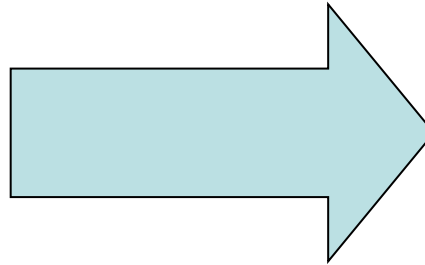
***Elevation of
Tryptophan/LNAA
Ratio***



***LNAA Incorporated
into Muscle Protein***

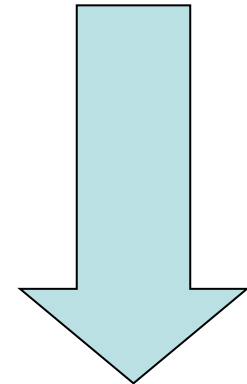


High Carbohydrate

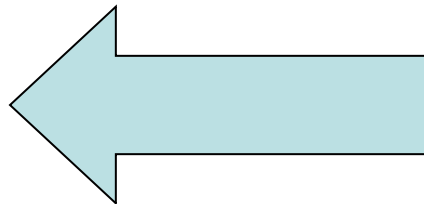


Insulin Surge

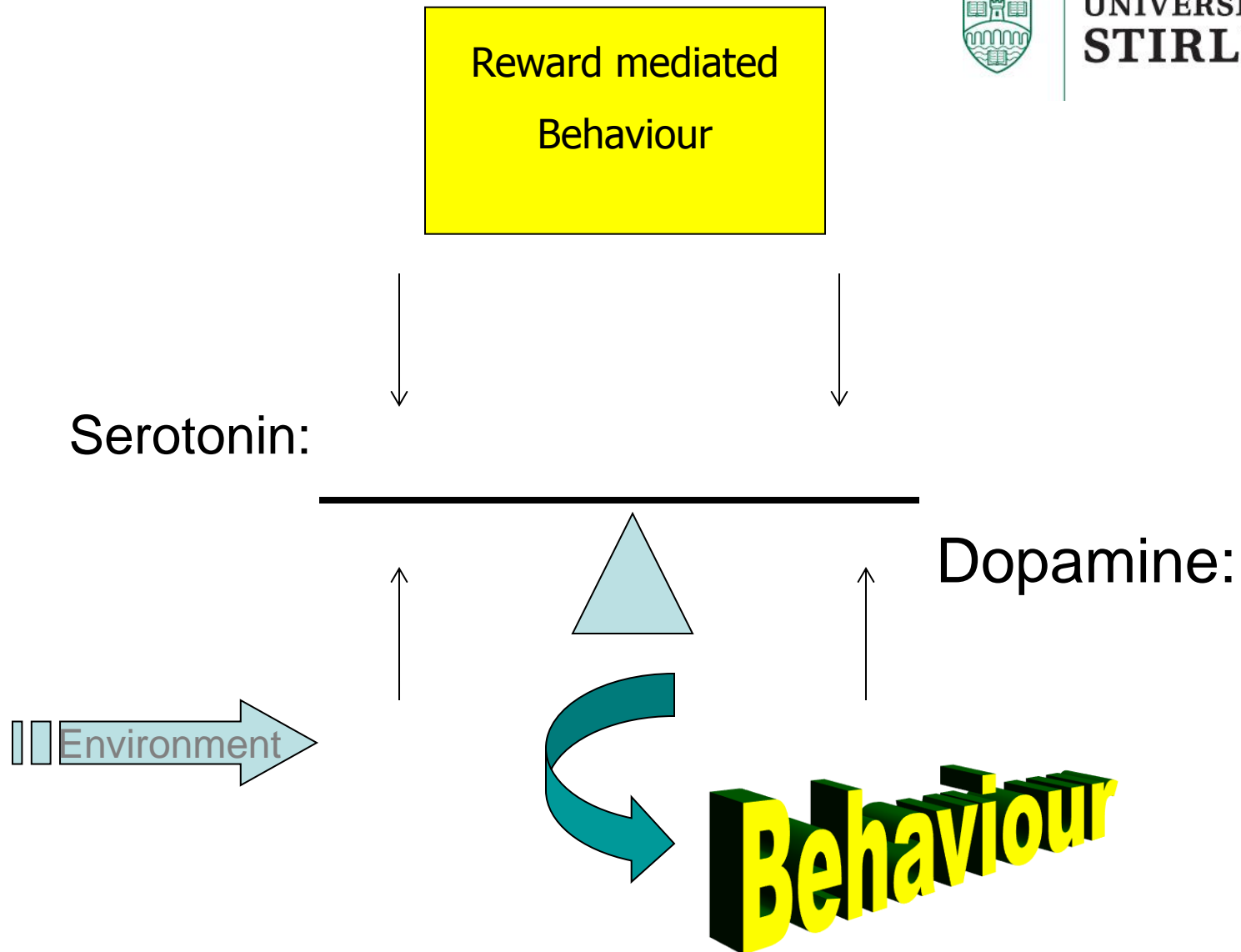
***Therapeutic ?
Potential***

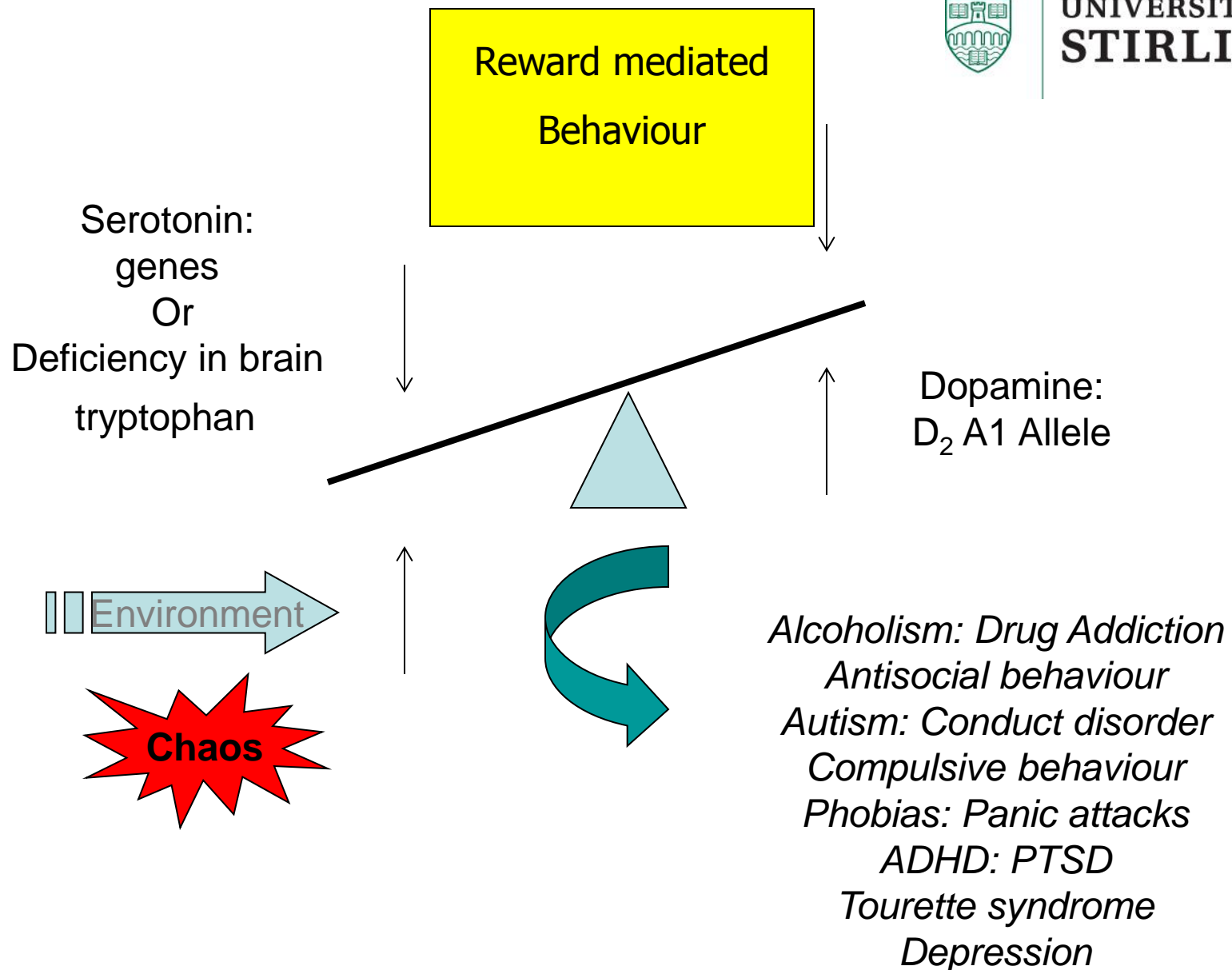


***Elevation of
Tryptophan/LNAA
Ratio***



***LNAA Incorporated
into Muscle Protein***



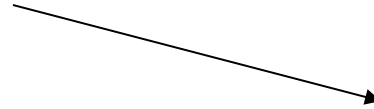




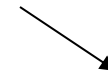
TRYPTOPHAN



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Serotonin



5-Hydroxyindole
Acetic Acid



TRYPTOPHAN

Try. dioxygenase

Serotonin

Kynurenine

5-Hydroxyindole
Acetic Acid

Kyn. aminotransferase

Kyn. hydroxylase

Kynurenic acid

Hydroxykynurenine

Hydroxyanthranillic acid

Quinolinic acid

Nicotinic acid



TRYPTOPHAN

Try. dioxygenase

Serotonin

Kynurenine

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Acetic Acid

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TRYPTOPHAN

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Hydroxykynurenine

Hydroxyanthranillic acid

Quinolinic acid

Nicotinic acid

Neurotoxicity



TRYPTOPHAN

Try. dioxygenase

Serotonin

Kynurenine

5-Hydroxyindole
Acetic Acid

Kyn. aminotransferase

Kyn. hydroxylase

Kynurenic acid

Hydroxykynurenine

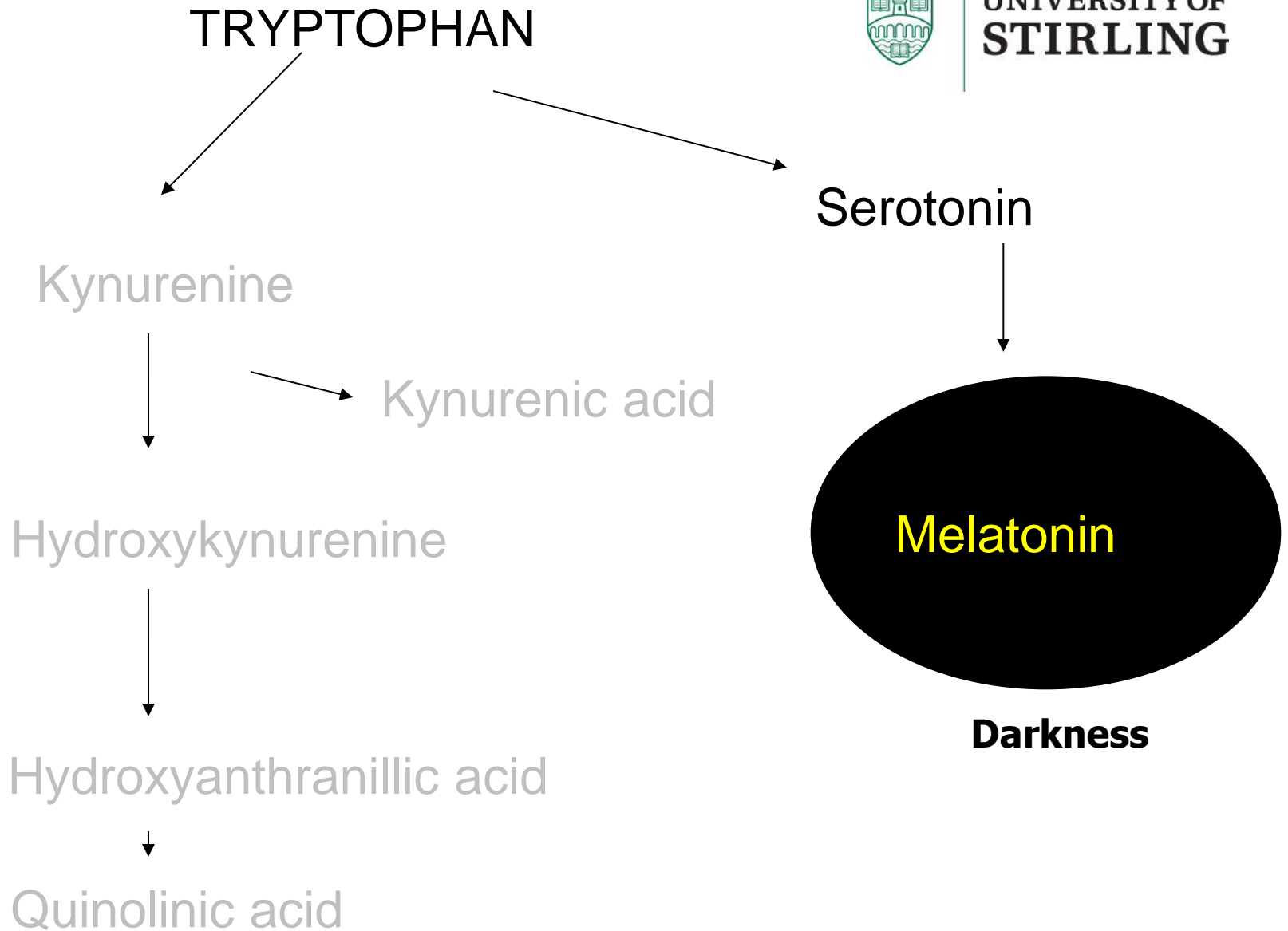
Neuroprotection

Hydroxyanthranillic acid

Neurotoxicity

Quinolinic acid

Nicotinic acid



SECRETION OF
MELATONIN

PINEAL BODY

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HYPOTHALAMUS

PITUITARY GLAND

OPTIC NERVE

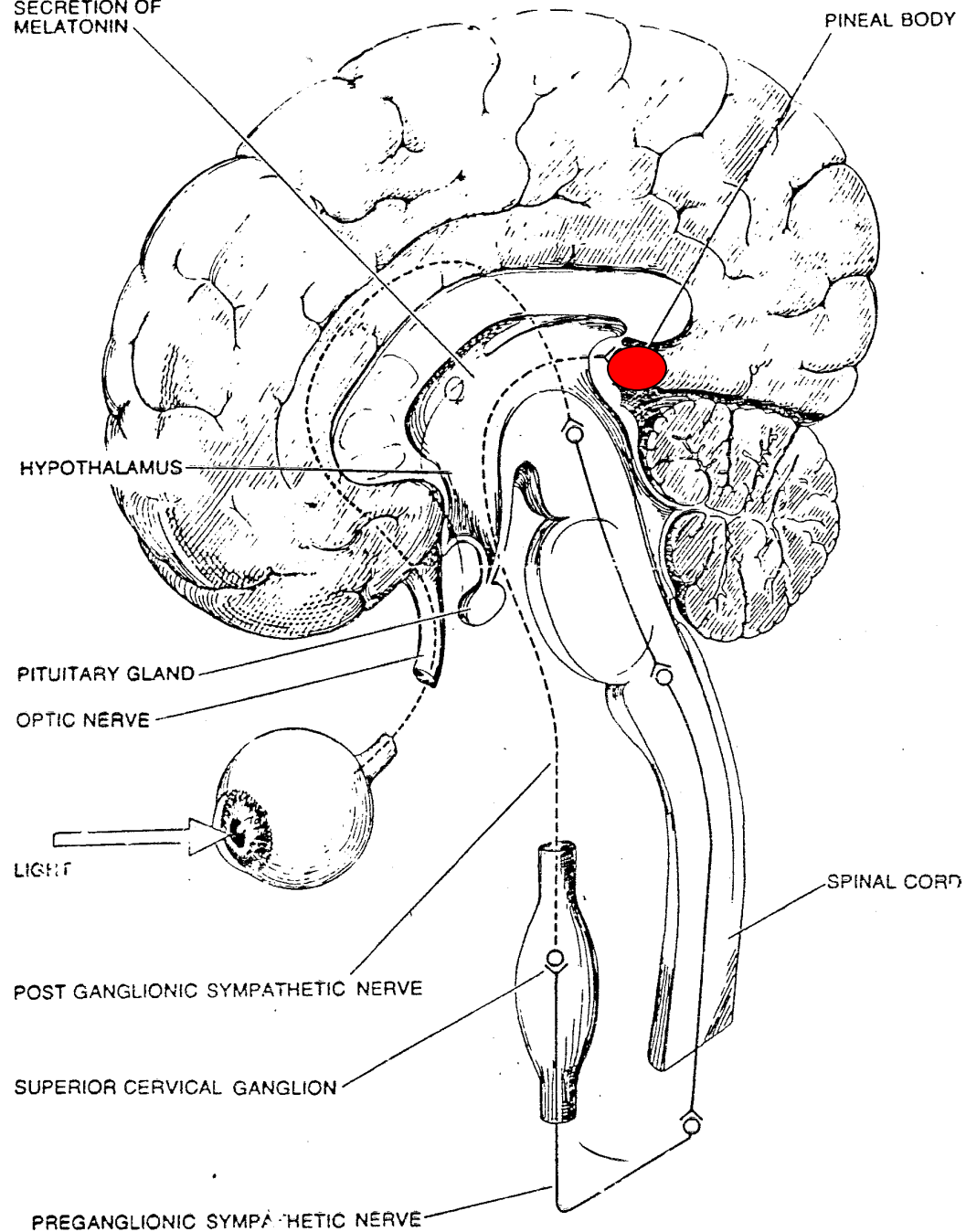
LIGHT

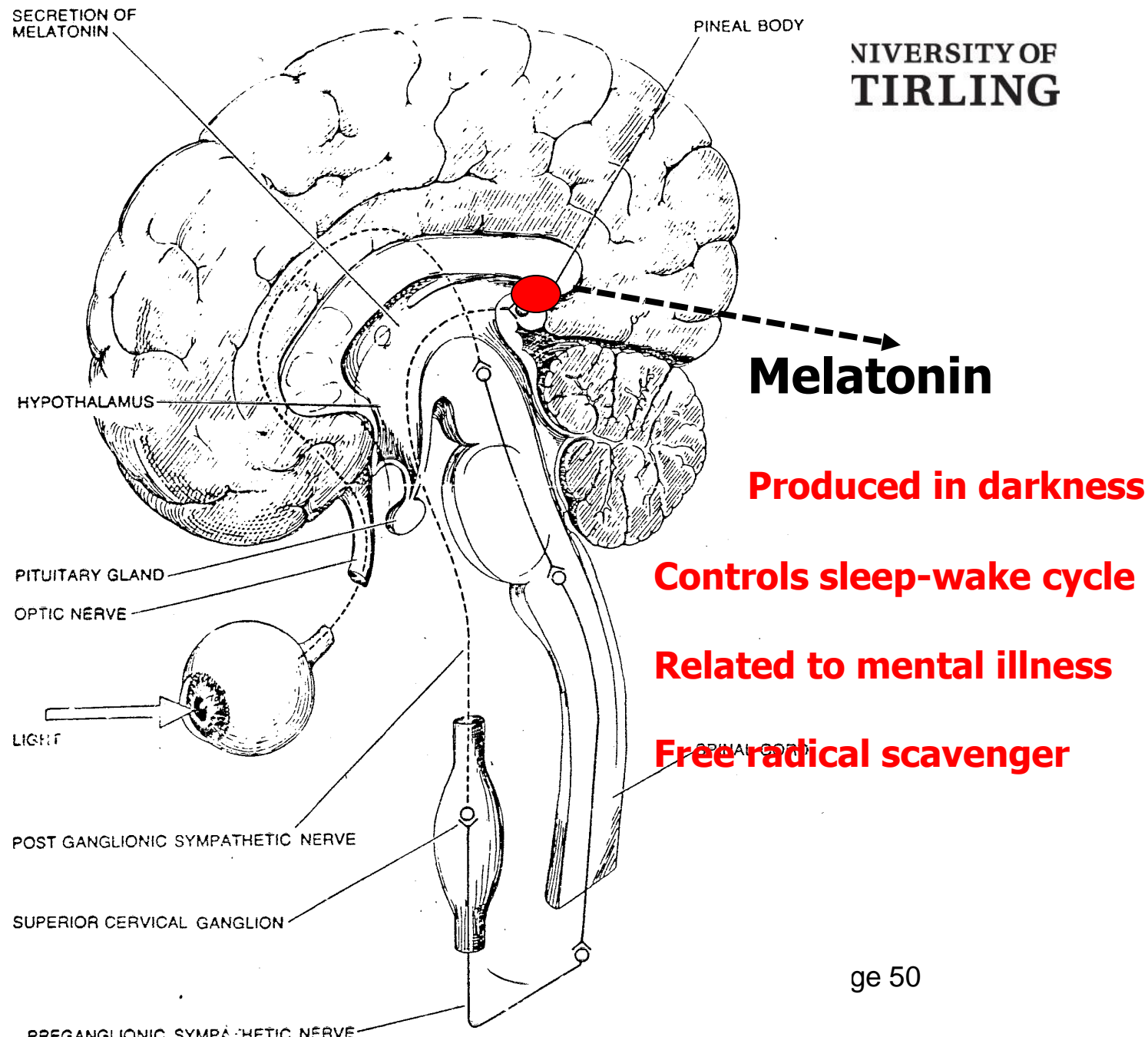
POST GANGLIONIC SYMPATHETIC NERVE

SUPERIOR CERVICAL GANGLION

PREGANGLIONIC SYMPATHETIC NERVE

SPINAL CORD





Acute and chronic consequences of alcohol misuse



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- Sleep disturbance
 - Association between Alcohol abuse and sleep problems is well established (Shawn et al 2004)

Acute and chronic consequences of alcohol misuse



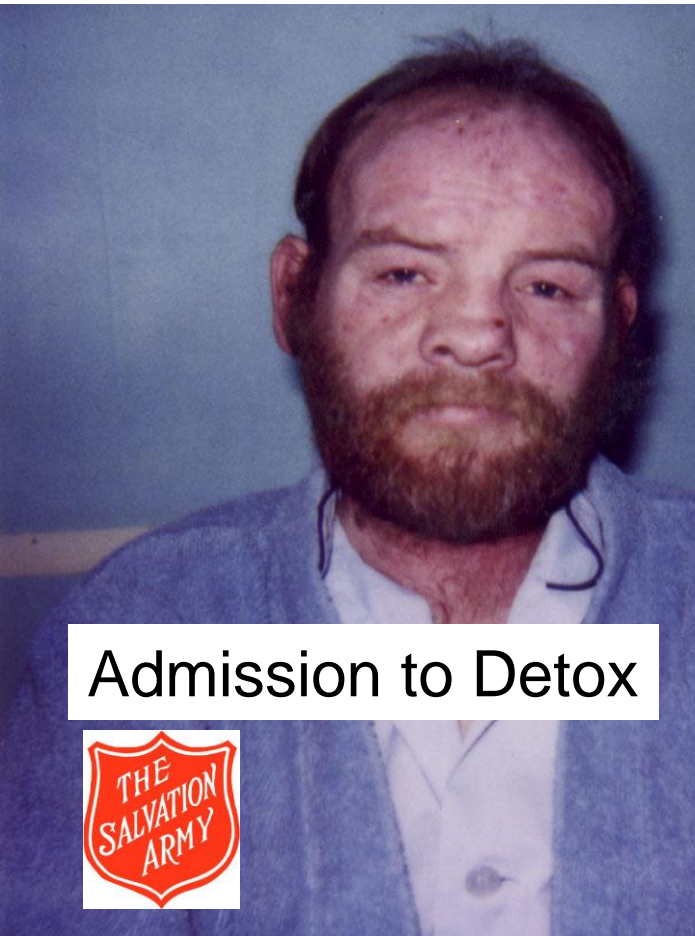
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- Sleep disturbance
 - Association between Alcohol abuse and sleep problems is well established (Shawn et al 2004)

Research on clients using Salvation Army Substance Misuse Treatment Centre



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Phase II



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Study design

- A prospective double blind randomised controlled trial
- 1 week duration (i.e 2nd week of standard detoxification programme)
- Clients randomised to one of the following supplements:
 - Energy-based flavoured supplement with tryptophan, vitamins, minerals and trace elements
 - Energy-based flavoured supplement with tryptophan
 - Control supplement containing energy, flavouring and artificial sweetener.
- The powdered supplements will be coded to blind the investigators and clients.



Entry criteria

Inclusion criteria

- Alcoholic males undergoing the detoxification programme
- Age > 18 years (ideally similar to mean age of 47 years in earlier studies)
- ‘uncomplicated’ detoxification. If a client meets the inclusion criteria, he will be switched to a standard dose of Oxazazepm after 3 days of starting detoxification.
- Informed consent for the study



Entry criteria

Exclusion criteria

- Chronic liver disease e.g cirrhosis/ acute hepatitis/abnormal liver function (subject to review by study Doctor)
- Antidepressant medication
- Use of cocaine
- Excessive intake /reliance on carbohydrate foods for diet ie. standard meals not taken.
- Clients with another diagnosis/condition that would affect the outcome of the study e.g taking psychotropic medication / with learning disabilities, at the discretion of the physician.



Enter programme

start supplement

final day



Day 1

6&7

13



Enter programme

start supplement

final day



Day 1

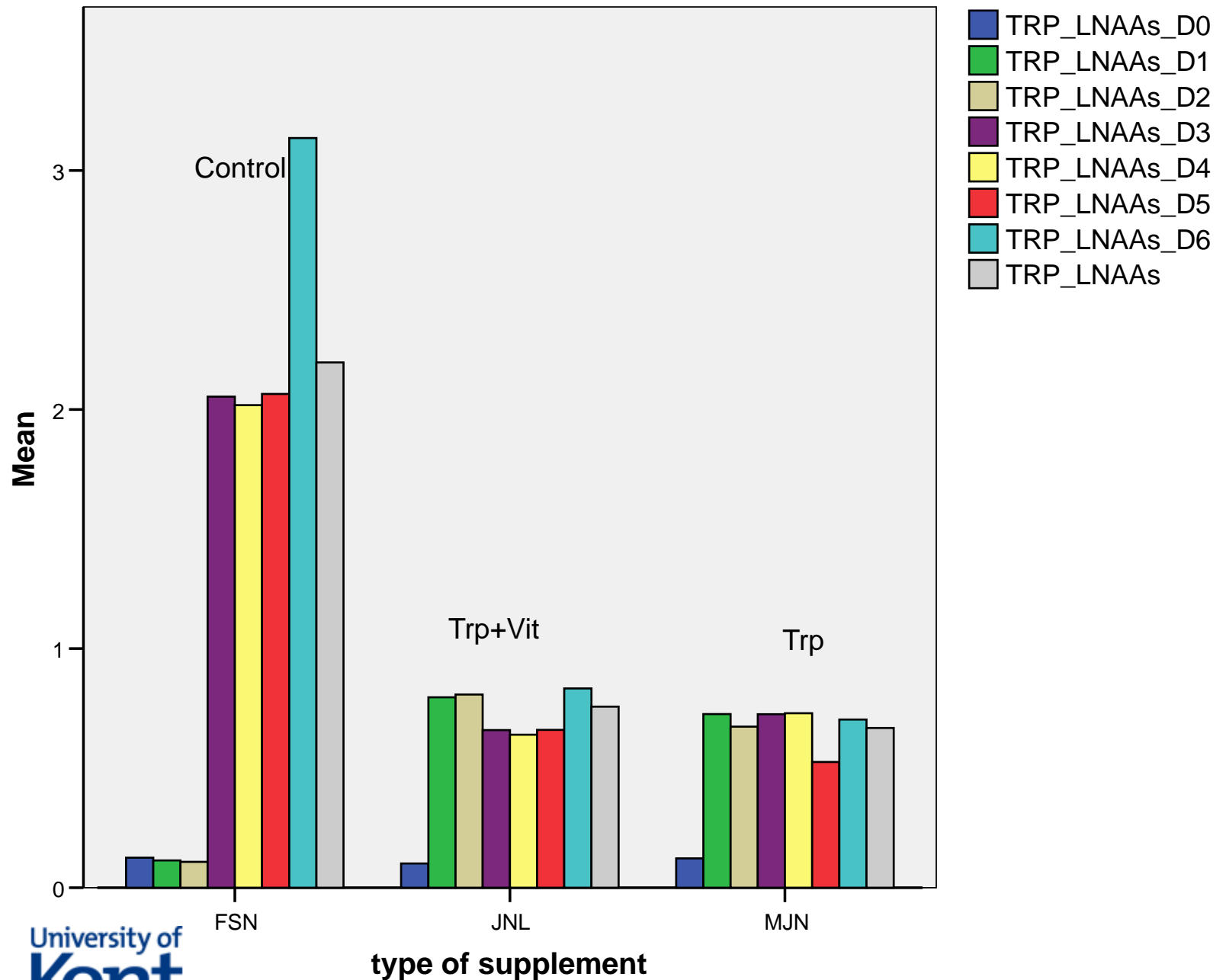
6&7

10

13



Liver Function Tests





TRYPTOPHAN

Try. dioxygenase

Serotonin

Kynurenine

5-Hydroxyindole
Acetic Acid



Kyn. aminotransferase

Kynurenic acid

Hydroxykynurenine

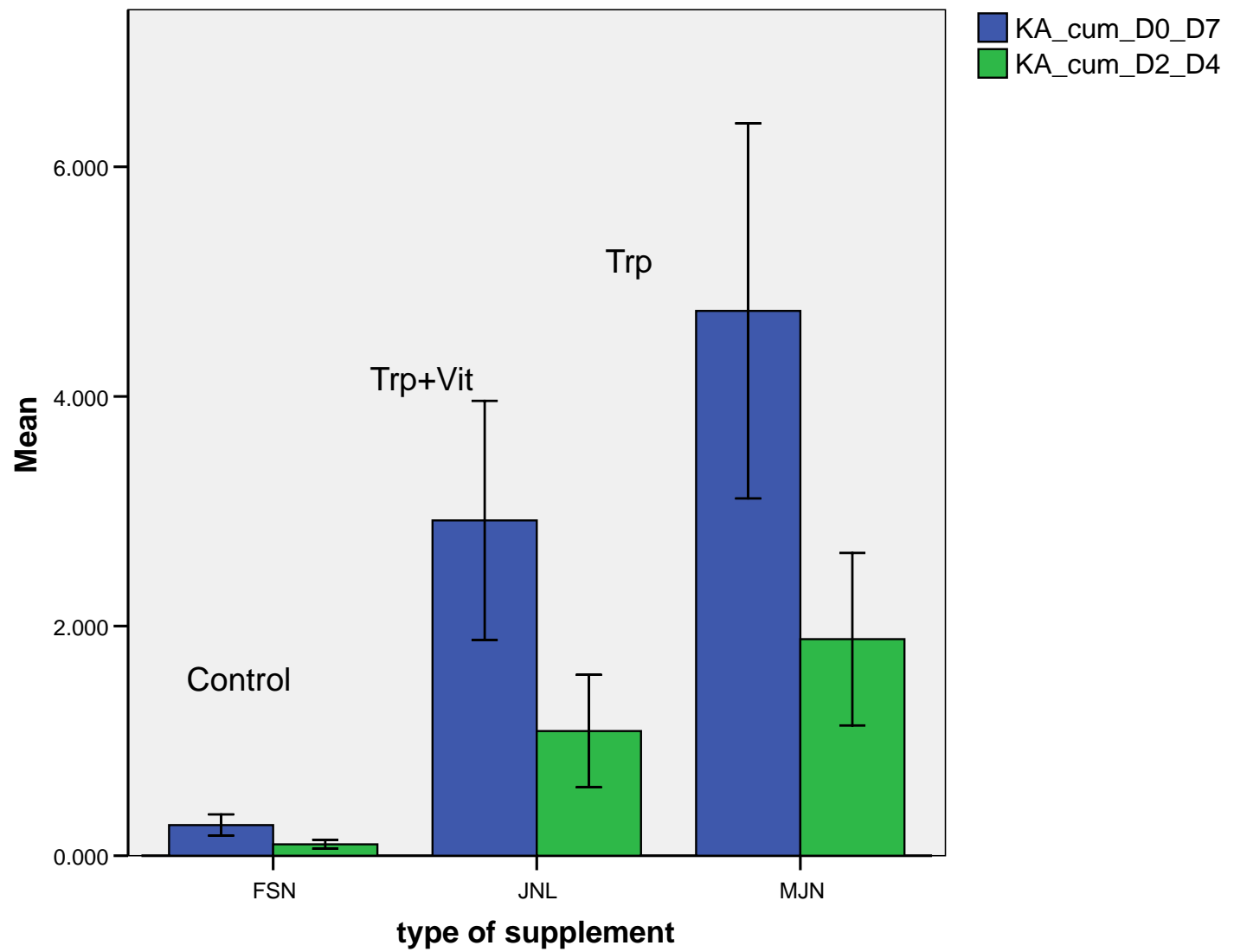
Neuroprotection

Hydroxyanthranillic acid

Neurotoxicity

Quinolinic acid

Nicotinic acid



Error bars: +/- 1 SE



Neuropsychology Tests

- BMAPS
 - Bexley Maudesley Automated Psychological Screen

B.M.A.P.S

1. PATIENTS

2. VISUOSPATIAL - Little Men

3. SYMBOL DIGIT

4. VISUOSPATIAL ANALYSIS

5. VERBAL MEMORY

6. SPATIAL MEMORY

7. CATEGORY SORTING

8. EXIT PROGRAM



SELECT AN OPTION USING THE MOUSE OR KEYBOARD



SYMBOL DIGIT TEST

=====

In this test you will be shown a row of 9 different symbols, each having a number displayed beneath it as shown below. One of the symbols will be shown beneath together with a box into which you can type your response.



You will be asked to type the number matching this symbol as quickly as you can.

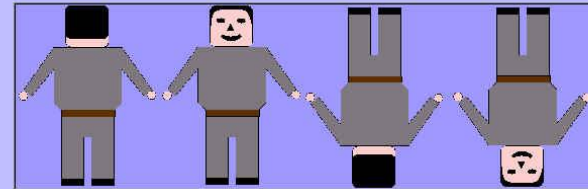
You will be given ten Practice Goes before starting the Main Test.

Press a Key or Click a Mouse Button to Start.

LITTLE MAN TEST

=====

In this test you will be shown a little man on the screen with an object in his hand. You must decide in which of HIS hands he is holding the object. The little man can appear in each of the 4 orientations shown here.



You must then press the LEFT ARROW Key if it is in THE MAN'S LEFT HAND and the RIGHT ARROW Key if it is in his RIGHT HAND.

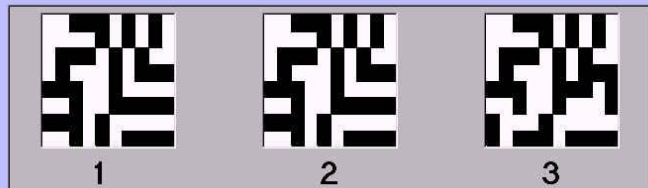
If you understand please press a Key or Mouse Button to start a practice.

VISUAL PERCEPTUAL ANALYSIS TEST

=====

This is a test of how accurately and quickly you can pick out differences in designs like the ones below.

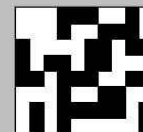
Look carefully at these three designs.



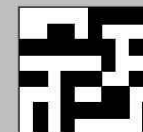
You will notice that two of the designs are identical and the third design differs slightly.

Press a Key or Click a Mouse Button to Start.

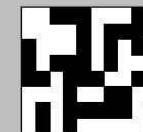
SPATIAL MEMORY



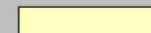
1



2



3



Type the Number of the Pattern you Memorised

1-way ANOVA

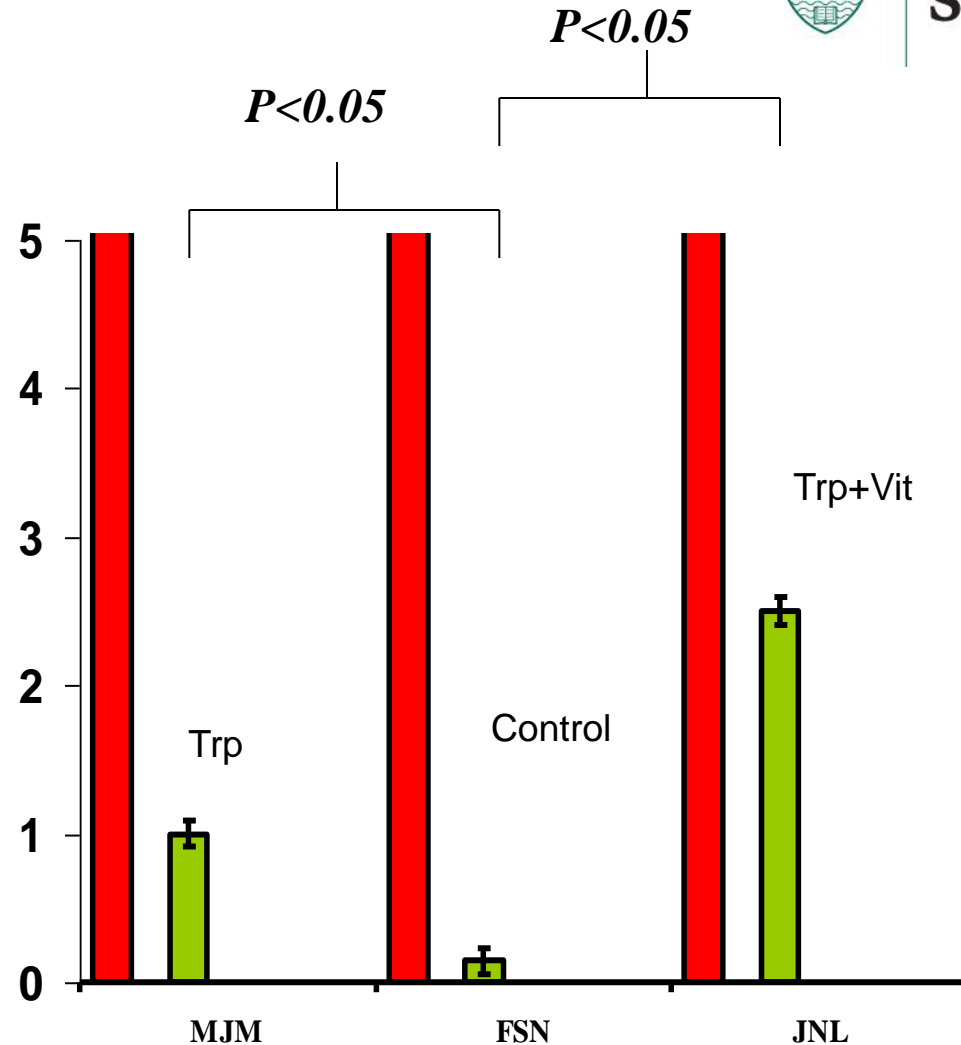
Figure 1B Little Man Test



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TEST Response

Correct 
Wrong 





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School of
Applied Social Science

Current research:

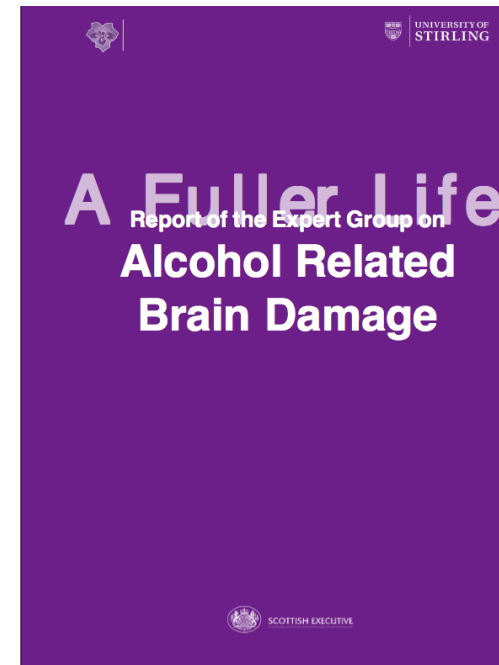
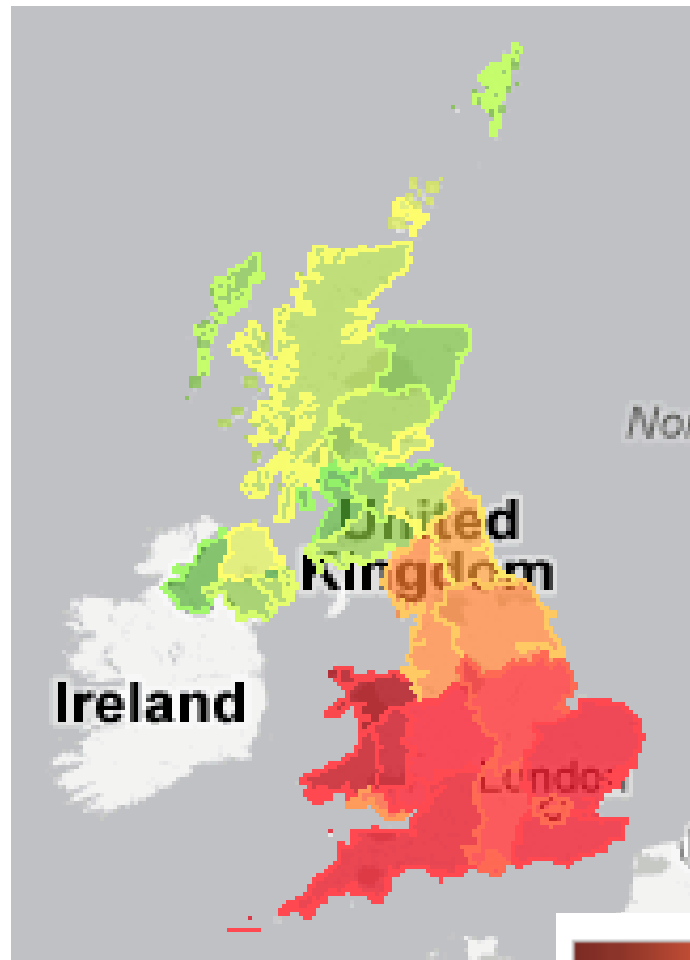
Understanding the experiences and support needs of people with cognitive impairment and alcohol problems in users of Salvation Army services in Scotland



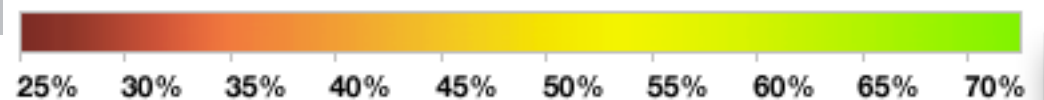


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Wellbeing: ARBD



Rates of dementia
diagnosis



Collaborative research:

Main Aims



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- Ascertain levels and severity of cognitive impairment among services users accessing Salvation Army programmes
- Examine current use and experiences of services by people with cognitive impairment and alcohol problems and assess how well current services meet their specific needs
- Develop pathways to improve access and use of services.





Alcohol and Nutrition: Conclusion..

- Nutrition plays an important role in maintaining physical and psychological health
- People suffering from an addiction are more likely to experience malnutrition
- Alcohol users benefit from a nutrient-rich food (wholegrain), lots of water, F+V, a good amount of good quality proteins and the right kind of fats
- Drug users benefit from the all the above + slow-release energy (complex, unrefined CHO's)



Tryptophan studies: conclusion

- Tryptophan metabolism is implicated in the predisposition to becoming alcohol dependent
- Alcohol has a major effect on Tryptophan metabolism
- Changes in Tryptophan metabolism during detoxification probably contribute to Alcohol Withdrawal Syndrome
- Nutritional manipulation during detox should be considered in order to offset the neurotoxic effects of increased Kynurenine production



Alcohol and Nutrition: Recommendations

A principle aim of evidence-based strategies should be to:

Facilitate a **Psychologically Informed** recovery environment

Supported by

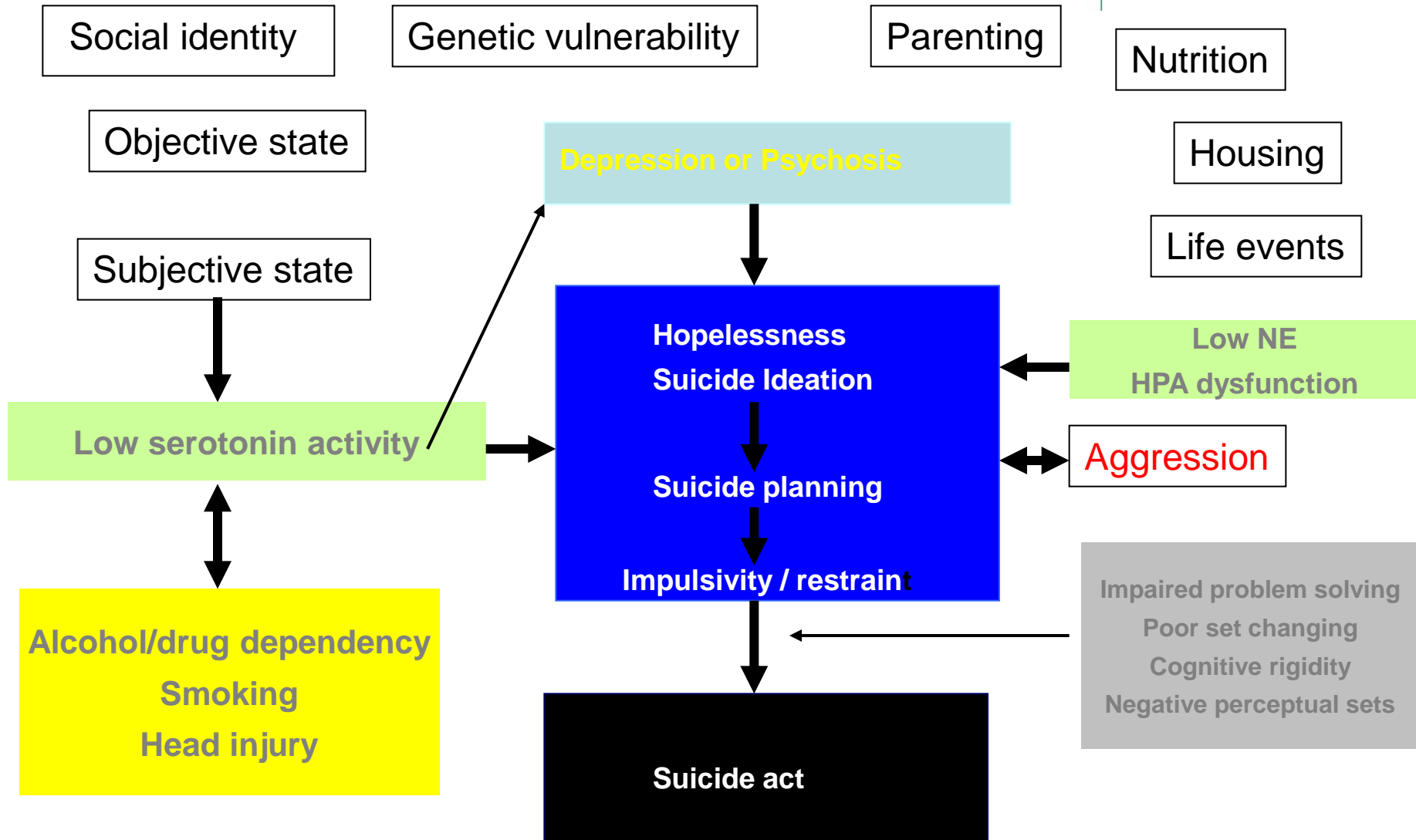
- Lifestyle and life cycle approaches with reference to:
 - exercise
 - sleep-wake activities
 - Nutrition
 - Promote neuroadaptation and minimise neurodegeneration.

-

Bio-psycho aspects of *Social Exclusion*



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