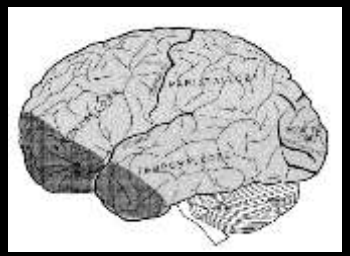
Hayley Bennett
Barrister
New Chambers
Sydney

The role of neurobiology in achieving a "Comfortable Satisfaction"



Background

Term "Comfortable Satisfaction"

Briginshaw v Briginshaw (1938)

[HIGH COURT OF AUSTRALIA.]

BRIGINSHAW . . . . . APPELLANT;
PETITIONER,

AND

BRIGINSHAW AND ANOTHER . . . RESPONDENTS.
RESPONDENT AND CO-RESPONDENT,

ON APPEAL FROM THE SUPREME COURT OF VICTORIA

H. C. OF A. 1938.

MELBOURNE, *May* 18, 19; *June* 30.

Latham C.J., Rich, Starke, Dixon and McTiernan JJ

Divorce—Evidence—Adultery—Standard of proof—Marriage Act 1928 (*Vict.*) (*No.* 3726), *secs.* 80, 86.

The *Marriage Act* 1928 (Vict.) provides, by sec. 80: "Upon any petition for dissolution of marriage, it shall be the duty of the court to satisfy itself, so far as it reasonably can, as to the facts alleged," and, by sec. 86: "Subject to the provisions of this Act the court, if it is satisfied that the case of the petitioner is established, shall pronounce a decree nisi for dissolution of marriage."

Held that, on a petition for divorce on the ground of adultery, the standard of proof required by the Act was not that of proof beyond reasonable doubt which obtains in respect of issues to be proved by the prosecution in criminal proceedings.

Decision of the Supreme Court of Victoria (*Martin* J.) affirmed.

"Comfortable Satisfaction"

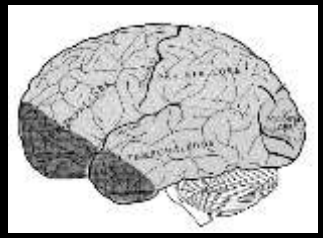
- **The (civil) standard of proof, and how to achieve the requisite "satisfaction", per Rich J**

- The nature of the allegation requires as a matter of **common sense** and **worldly wisdom** the careful weighing of testimony, the close examination of facts - proved as a basis of inference - and a **comfortable satisfaction** that the tribunal has reached a **correct** and **just** conclusion

Meaning?

- **What does "comfortable satisfaction" mean?**
- **Macquarie Dictionary:**
  - **Comfortable**: producing or attended with comfort or ease of mind or body
  - **Comfort**: a cause or matter of relief or satisfaction
  - a state of ease, **with freedom from pain and anxiety, and satisfaction of bodily wants**

Mind and body



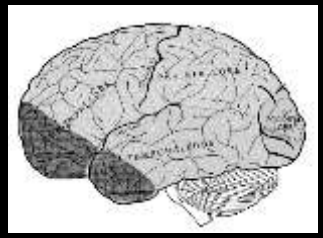
- Having regard to this definition - given the somatic (bodily) associations of the word "comfort" …
- it would seem that in *Briginshaw*, it has been suggested that **what the decision maker <u>feels</u>** (mentally and somatically), contributes to, and **may be decisive of**, the decision making outcome

Justice Dixon

- **Consistent with what was said by Justice Dixon:**

- The truth is that, when the law requires the proof of any act, the tribunal must **feel an actual persuasion** of its occurrence or existence before it can be found.

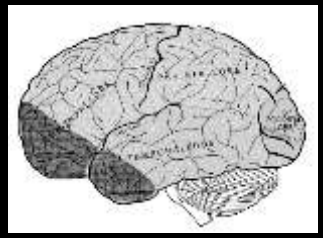
Neurobiology



- Past few decades have seen an avalanche of research in relation to the **neurobiology of decision making**

- **Now known**: that **particular** neural substrates underpin the decision making networks of brain – these are, in turn, **associated with** various bodily states and somatic "feelings"
  - For example, whether the decision maker **"feels"** they have made the **"right" decision**

Briginshaw



- With this neuroscience context as **background**
- *Briginshaw* emerges as being **neurobiologically intriguing,** given the judicial references to "comfort" and what a legal decision maker "feels"

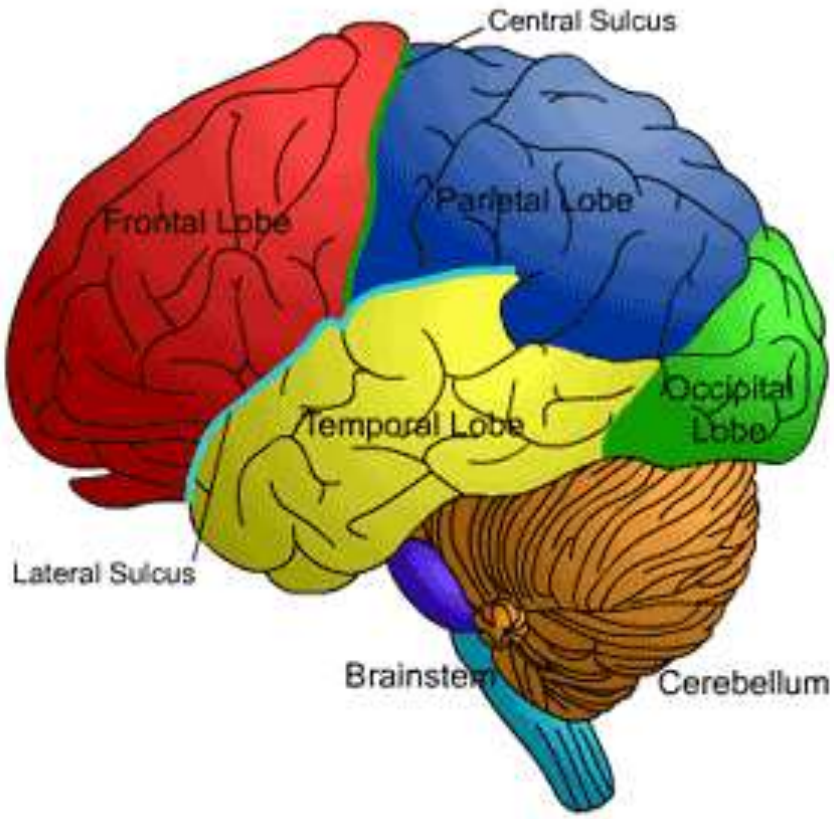
- Given this, any **understanding of the processes** of legal decision making, and in particular, achieving a **"comfortable satisfaction",** will be assisted by understanding more about the underlying neurobiological processes

Aims of presentation

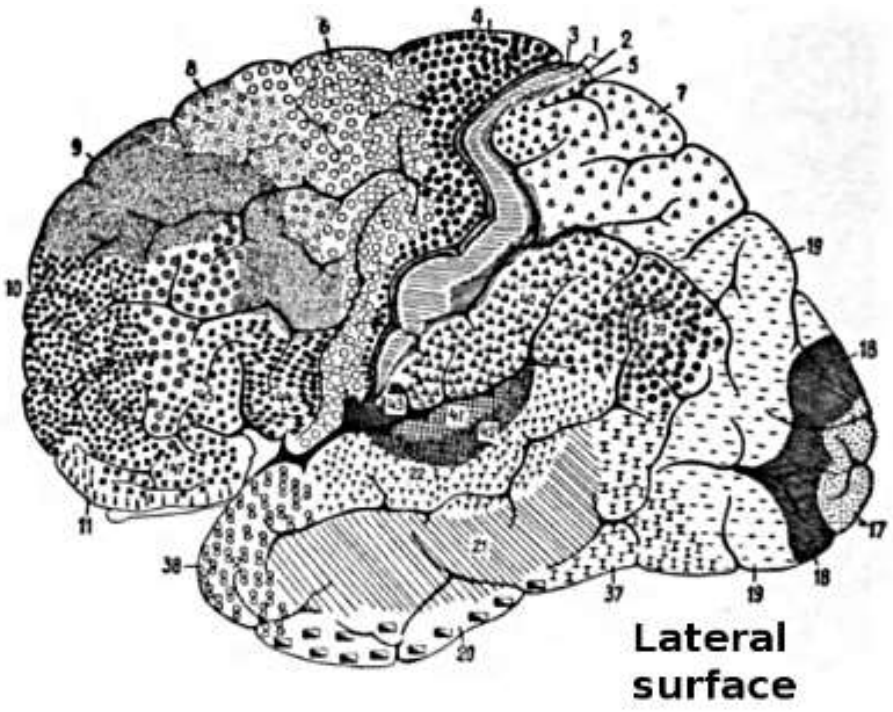
- 1) Assist with understanding of the role of **neurobiology** in decision making
- 2) To understand how **bodily reactions** and **emotions** are a central and **essential part** of some forms decision making
- 3) More specifically, to understand the role of neurobiology in achieving a "Comfortable Satisfaction"

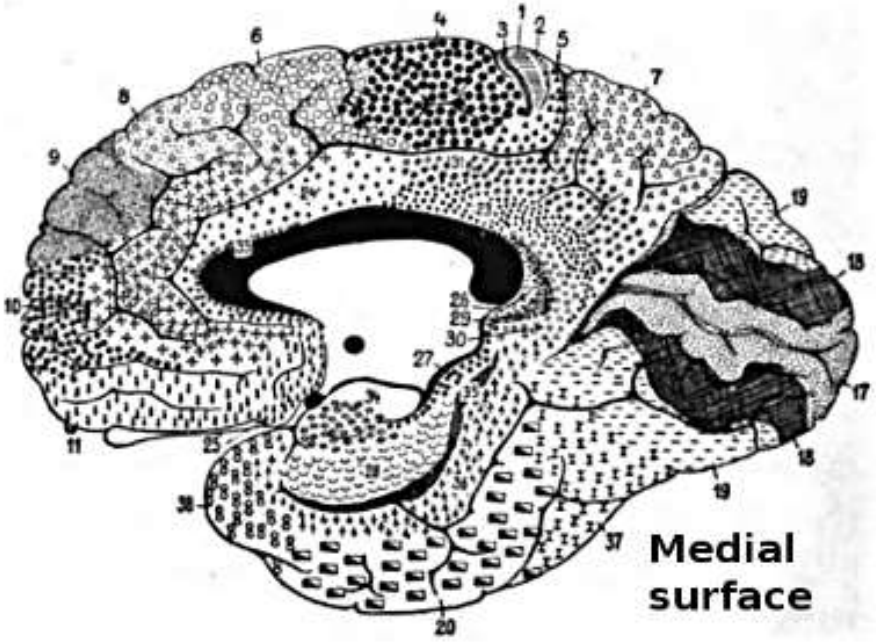
Neurobiology of decision making

Brain anatomy

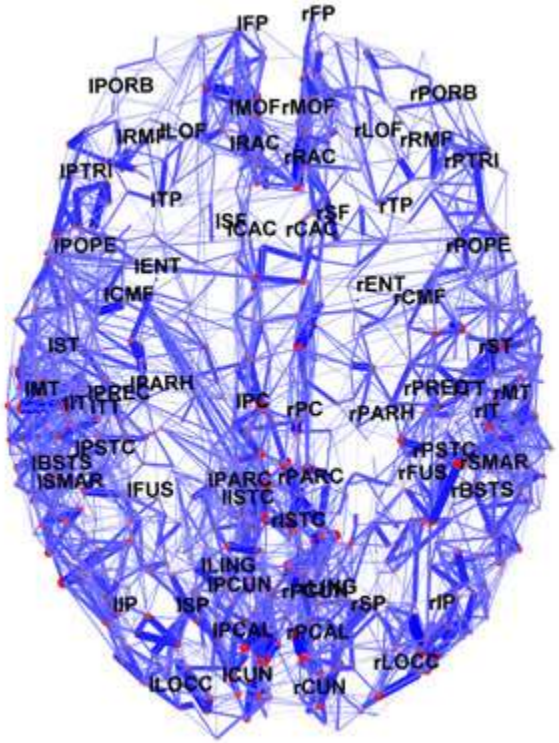


Brain anatomy: complex

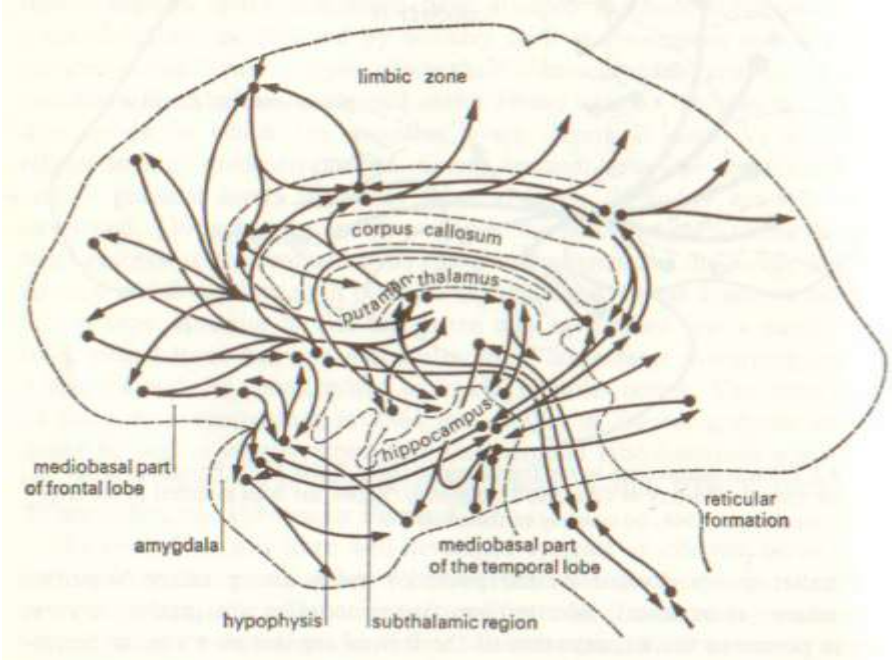




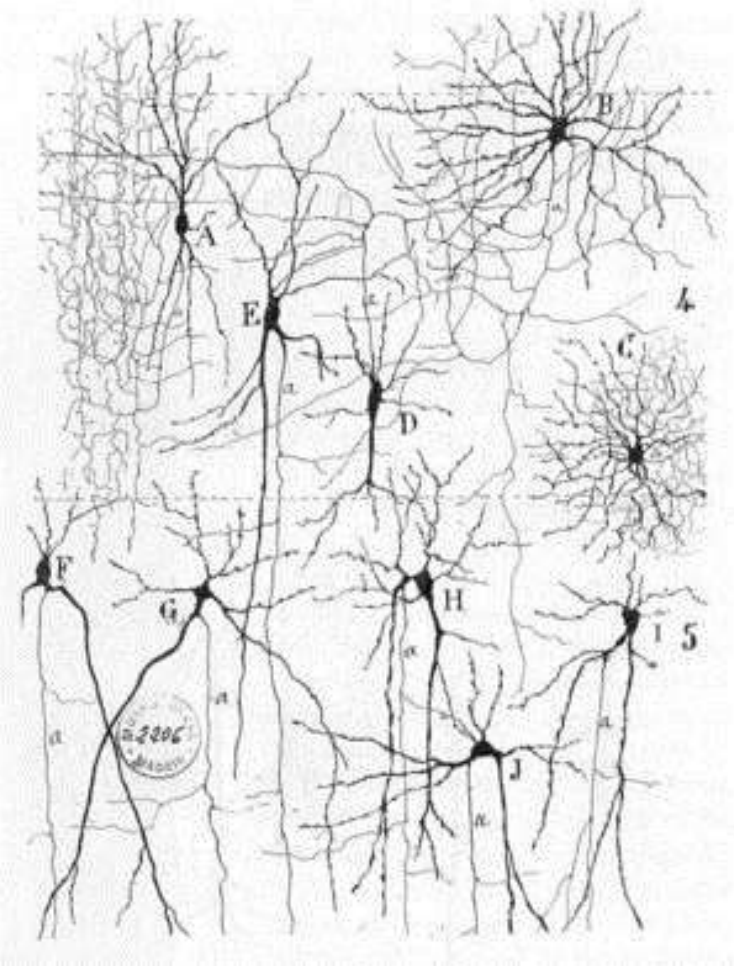
Functional anatomy: complex



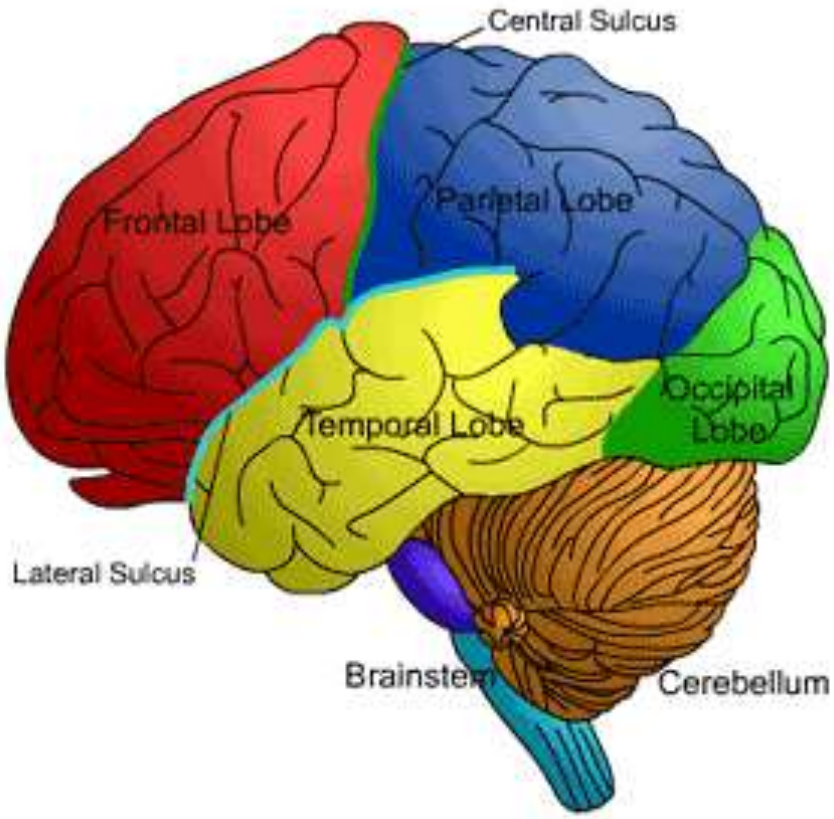
Functional anatomy: complex



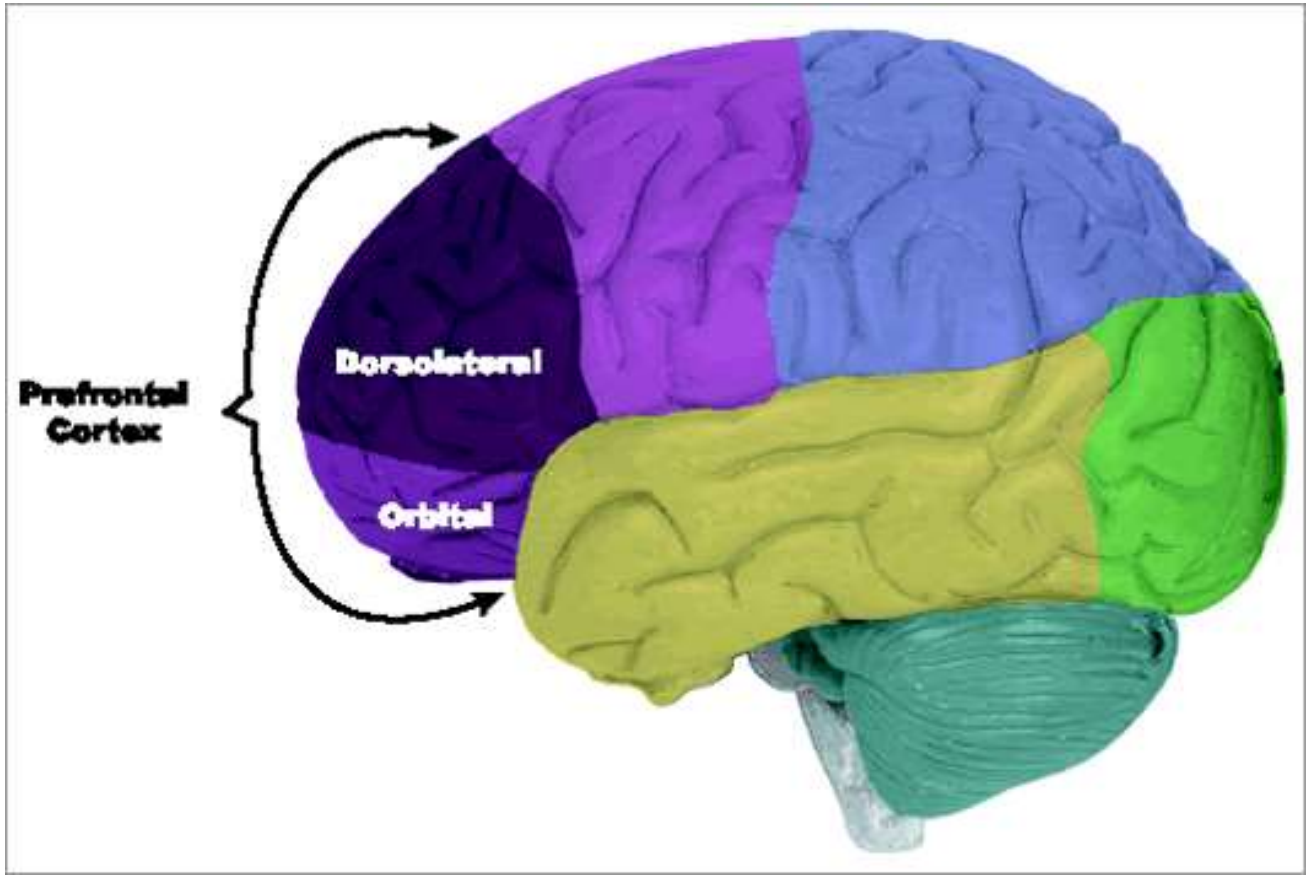
Neuronal functional: complex



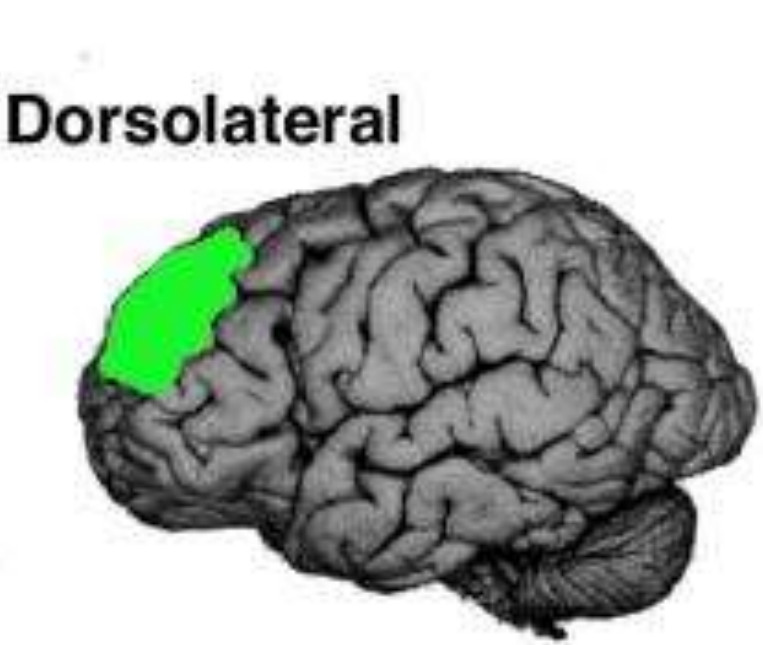
Brain anatomy

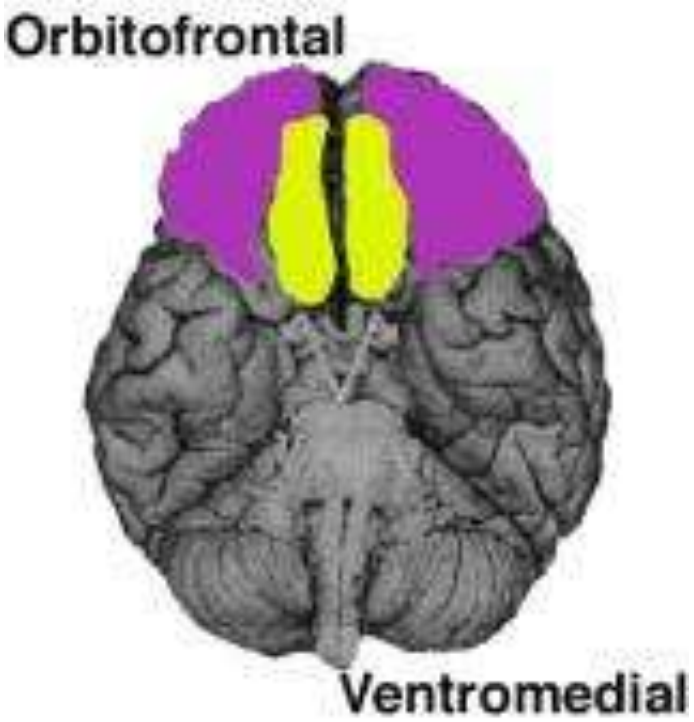


Prefrontal region



Dorsolateral & ventromedial

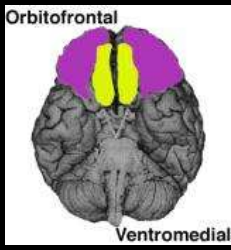




Frontal lobe & decision making

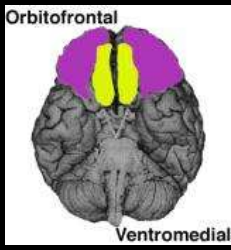
- Knowledge of the **association** of frontal lobe functioning and "executive" function has been available since the mid 1800's
- At that time, **damage** to a person's frontal lobe was found to result in impairments in "executive" function, that is, in judgment, reasoning, problem solving, abstraction, decision making, and for the regulation of emotion and behaviour
- In recent decades, there has been an **exponential increase** in research demonstrating that within the frontal lobe, **ventromedial** and **dorsolateral** regions have particular importance in learning and decision making processes

Ventromedial cortex



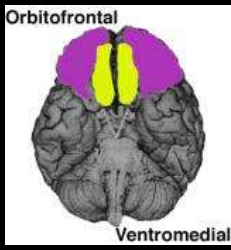
- Found that VM cortex is the:
  - Source of seemingly **unconscious**, "automatic", and "intuitive" decision-making
  - Source of "hunches"
  - Source of "gut feelings"
  - Source of "alarm bells"
  - Source of the awareness of whether a particular decision "feels right"
  - Source of somatic (bodily) responses and brain-body associations

Ventromedial cortex …



- Source of access to **past experience** of decision maker quickly and automatically
- Studies have found that participation of the **ventromedial cortex** in decision making **assists** when there is:
  - Incomplete and uncertain factual basis

Ventromedial cortex …



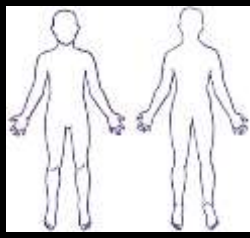
- Associated with the processing of **emotional information**
  - In particular, is **essential** when processing information of a **personal, social, or moral nature**

Emotion and ventromedial

- Ventromedial cortex is involved in the **coordinating and assimilating** of information with **emotional content** into the **chain of reasoning**

- It also has a **rich network** of connections to the other parts of the brain, as well as to the **farther reaches of the body**

Emotion and the body

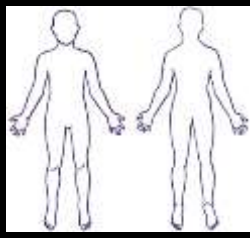


- As a consequence, these connections mean that the experience of "**emotion**" is associated with **changes** to the visceral and musculo-skeletal states of the body

- These changes can be measured experimentally by changes in **heart rate** (pulse), **blood pressure**, **respiration**, **skin conductance** (sweating), etc

  - Examples: anger, disgust, fear

Emotion and the body …



- These somatic changes may be experienced (or not)
- In this, when the emotions and their physiological changes are of a **sufficient magnitude**, the emotions may be "felt" (ie, consciously perceived)
- When **not** of a **sufficient magnitude**, ventromedial function and its associated physiological changes to the body, may **not be consciously** recognised, but **will still occur** and may still participate in cognition (at a non-conscious level)

Definitions

- **"Emotion"**
  - A collection of changes occurring in both brain and body, usually prompted by a particular mental context
- **"Feeling"**
  - The perception of those changes

Iowa Gambling Task:

Experimental task illustrating role of ventromedial cortex in decision making

Iowa Gambling Task

- **Bechara A, Damasio H, Tranel D, and Damasio A**
- *Results first published in* ***Cerebral Cortex*****, 1997** – but have since been replicated

- **Accepted wisdom**: Deciding advantageously in a complex situation is thought to require overt reasoning on declarative knowledge, namely, on facts pertaining to premises, options for action, and outcomes of actions that embody the pertinent previous experience

- **Study hypothesis**: Overt reasoning is **preceded** by a **nonconscious biasing** step that uses neural systems other than those that support declarative knowledge

Iowa Gambling Task

- **4 decks of cards**: A, B, C, and D
- Each card in each deck either wins you a sum of money or costs you some
- **Task:**
- Play so that player loses the least amount of money and wins the most
- Turn over one card at a time, from any deck

Iowa Gambling Task

- **Experimental condition:**

- **Cards stacked:**
- A and B decks are disadvantageous:
  - Rewards high, but losses higher

- C and D are advantageous:
  - Rewards not so high, but losses less

Iowa Gambling Task

- **Experimental conditions:**
- Subjects monitored for skin conductance response (SCR): sweaty palms
- Subjects asked at various intervals: "*Tell me all you know about what is going on in this game*"

Iowa Gambling Task

- **Results**: Normal subjects began to choose advantageously before they realised what strategy worked best, whereas ventromedial patients continued to choose disadvantageously even after they knew the correct strategy

- **Moreover**: normal subjects began to generate "anticipatory" SCRs whenever they **pondered** a choice that turned out to be risky, before they knew explicitly that it was a risky choice

Iowa Gambling Task

- **Experimental observations:**
- All subjects commenced by sampling cards from all decks

- Usually by **card 10:**
- Normal subjects began to generate anticipatory SCRs to decks A and B
  - All indicated they had no idea of what was going on: **"Pre-hunch" period**

Iowa Gambling Task

- By about **card 50**:

- All normals began to express a "hunch" that decks A and B were riskier, and generated anticipatory SCRs whenever they pondered a choice from decks A or B
  - **"Hunch" period**

Iowa Gambling Task

- By **card 80:**
- Many normal subjects expressed knowledge about why, in the long run, decks A and B were bad, and C and D were good:
  - **"Conceptual" period** (70%)

Iowa Gambling Task

- **Patients:**

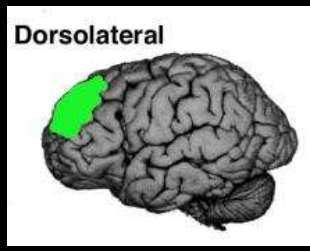
- Subjects with **ventromedial lesions** did not develop the anticipatory SCRs, although some eventually articulated the observation that the choices they were making were risky

Iowa Gambling Task

- **Experimenters concluded:**

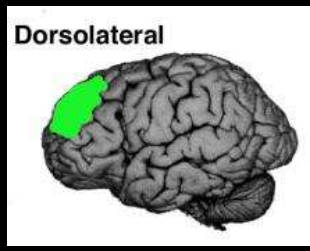
- *"In normal individuals, nonconscious biases guide behaviour before conscious knowledge does. Without the help of such biases, overt knowledge may be insufficient to ensure advantageous behaviour"*

Dorsolateral Cortex



- Primary neural substrate for **attention** and "**working memory**"
- Working memory is the **"short term" memory** system that allows **attention** to be paid to a **number of pieces** of information **at once**, for a limited amount of time
- Whilst in working memory, this information may then be **evaluated**, **compared and contrasted**, and **manipulated**
- May hold and integrate information from **multiple sources**, as well as incorporating and orchestrating this **new knowledge** with **previously learned and stored** information

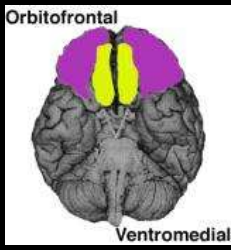
Dorsolateral …



- Dorsolateral function is typically a **conscious** process, and can **actively draw on** information from a wide variety of sources

- Dorsolateral function more **classically related** to traditional concepts of **deliberation and judgment**

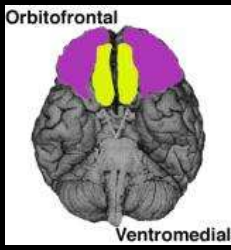
Stages of decision making



- **Earliest processing mediated by ventromedial cortex**

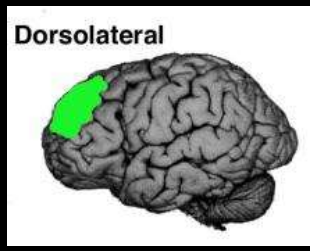
- May be **conscious or non-conscious**
- Processes with operate **rapidly** and apparently **automatically**
- Is able to, consciously or non-consciously, access **relevant and related past experience**
- Is able to process and access **emotional** information as it relates to **personal, social, and moral** issues – which tends to have **high emotional salience**

Stages of decision making



- **On its own**, ventromedial is:
- Able to arrive at a **preliminary "decision"** which may be felt as a "hunch" or "gut feeling"
- Preferences **towards or against** particular options will be linked to particular **bodily reactions**, via the somatic and emotional connections from the ventromedial cortex **to the body**
- In doing this, information is sorted and prioritised for later processing by the dorsolateral cortex

Stages of decision making



- **Later processing by the dorsolateral cortex**
- Information **becomes available** for **conscious** dorsolateral deliberation
- Information from a **variety of sources** may be accessed:
  - Conscious access to **past experience**
  - **New information** recently acquired
  - Conscious awareness of **emotion**

Without ventromedial

- Decision making in relation to **personal, social, and moral issues**:
  - "acquired sociopathy"
  - lack **empathy** and **compassion**
  - "dispassionate", "uninvolved", detached", "cold-blooded"
  - but **general intelligence** and knowledge of social and moral rules intact

Without ventromedial

- Decisions **slow and effortful**
- Need to **actively** interrogate memory systems for relevant experience
- Decisions **technical and mechanical**
- Decisions **unemotional**
- No ***feelings*** of being **"right" or "wrong"**
- As no **preliminary** "bias", all alternative choices may appear of **equal weight** thus unable to make a decision

Without dorsolateral

- "Biased" decisions **based only** on previous experience
- **Not able to integrate** new information into factors to be considered

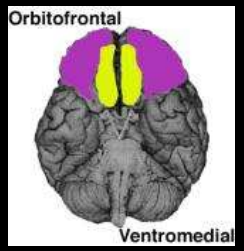
- Not able to **hold complex information** in mind, nor information from a number of sources, at once, to compare and consider

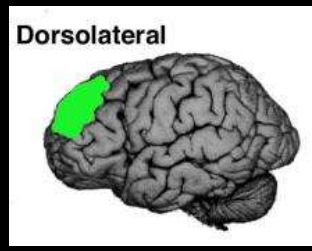
- Wholly emotional decisions **unchecked** for inappropriate bias and relevance

Without dorsolateral

- No "**testing**" against **reason and logic**
- There will be an inability for this "testing" to **over-ride** a pre-set (based on ventromedial selection) **emotionally and somatically** favoured decision

Both VM and DL

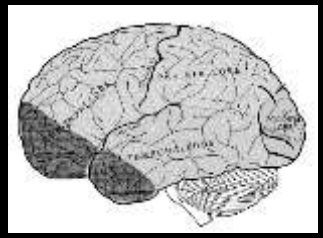




- The **ideal** decision making context is with participation of **both** the ventromedial and dorsolateral cortexes
- In situations where personal, social, or moral issues are **paramount**, then ventromedial participation **is required**
- In other situations however, a decision made on a **technical basis** with only dorsolateral processing will be **sufficient**

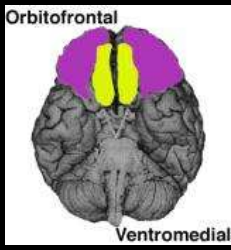
Implications for achieving a comfortable satisfaction

Decision making process



- Stages of decision making
  - 1) Ventromedial
  - 2) Dorsolateral
  - The decision itself:
    comfortable satisfaction, or not

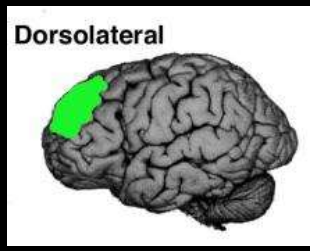
Stage 1: Ventromedial



- **Rapid**, automatic, "intuitive", **unconscious**
- Relies on previous learning: **past experience**
- **Emotional** responses
- Related **bodily** sensations
- Legitimate preliminary "bias"
- Potential source of inappropriate bias

- Gut feelings, **hunches**, alarm bells
  - *Internal voice: "I've got a bad feeling about this"*

Stage 2: Dorsolateral



- Slow, **deliberative**, conscious
- Able to take in **new information** from a variety of sources
- Scrutinise and "**test**" the results of ventromedial processes
- Able to assess for **emotion and inappropriate bias**, unsubstantiated suspicion, guesswork, hunches
- Able to **over-ride** a decision from the ventromedial

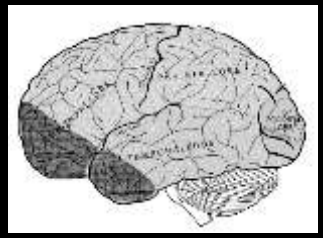
The decision

- **In moving from ventromedial (unconscious) processing, to, dorsolateral (conscious) processing:**

- Need to raise awareness of bodily sensations, disturbances, emotions, and hunches
- The "right" decision carries with it a mental and somatic feeling of comfort and ease
- When decision maker retains a "bad feeling" or lack of "comfort" in relation an issue, they can not be said to have achieved a comfortable satisfaction

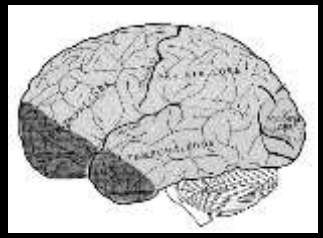
Conclusion

To conclude



- **Each decision maker** required to make findings in the context of being comfortably satisfied, will have **their own views** on what it takes to achieve this level of satisfaction
- Neurobiological research over the past few decades **can assist legal decision makers** in this understanding
- In particular, that **in addition** to the **mental processes**, both conscious and unconscious, that **participate** in the decision making process, that **bodily sensations and feelings** are also integral to the process

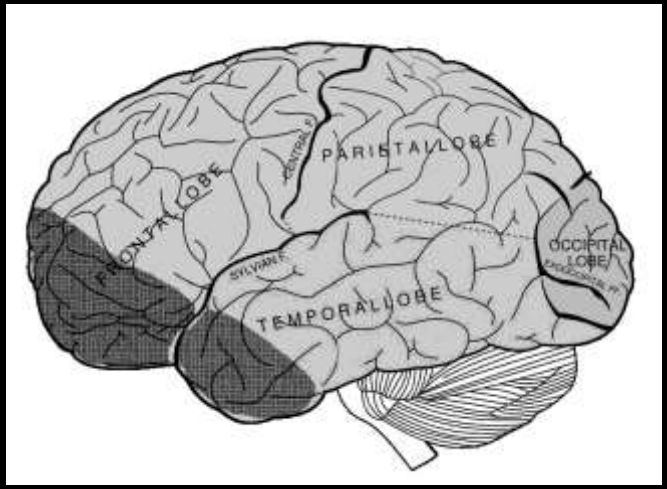
To conclude …



- Thus, it is important for all legal decision makers to recognise, that **emotional and physical responses** to situations and issues are not only **highly** valuable sources of information, they are at times, **critical information**

- In this, a sick feeling in ones stomach is a friend and guide

- This approach will, in turn, lead to the greatest likelihood of legal decision makers producing the "right" decision ("**correct and just**"), and will also allow for a more precise articulation of the reasons for decision – according to law



The End