



## Facilitating a more climate resilient future for farm businesses.

John Noonan <sup>1,2</sup>

1) Ticketyboo Management and NEXT Decision Consulting  
[jn@aftc.org.au](mailto:jn@aftc.org.au)

2) Adjunct Senior Lecturer Agribusiness Management  
Curtin University, Perth, Western Australia  
[j.noonan@curtin.edu.au](mailto:j.noonan@curtin.edu.au)



Rural Financial Counselling Service  
*Regain Focus. Create Solutions. WA*



Supporting farm businesses and rural communities to be resilient to adverse conditions



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### Disclaimer and thanks



Rural Business Development Corporation



Department of Agriculture and Food



#### Input from:

Chris Evans  
Mick Quartermaine  
Christine Storer  
Janet Bommann  
Rebecca Heath  
Charlie Thorn  
Amir Abadi  
Simon Cook

Kay Bodman  
Peter Cooke

and Roy toooooooooo

Activities to change attitudes and beliefs - FBR

What happened...(Roy) and then five years later

So what does this all mean?

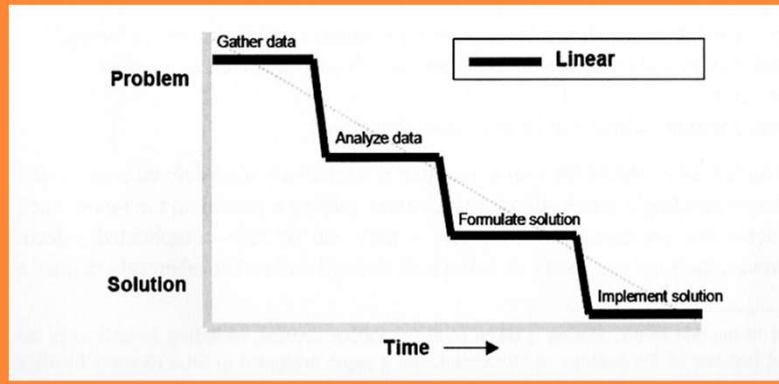
Learning and decision making under uncertainty

What can 'government' and 'industry' do in a policy context?

2

A traditional view of complex problem solving and innovation

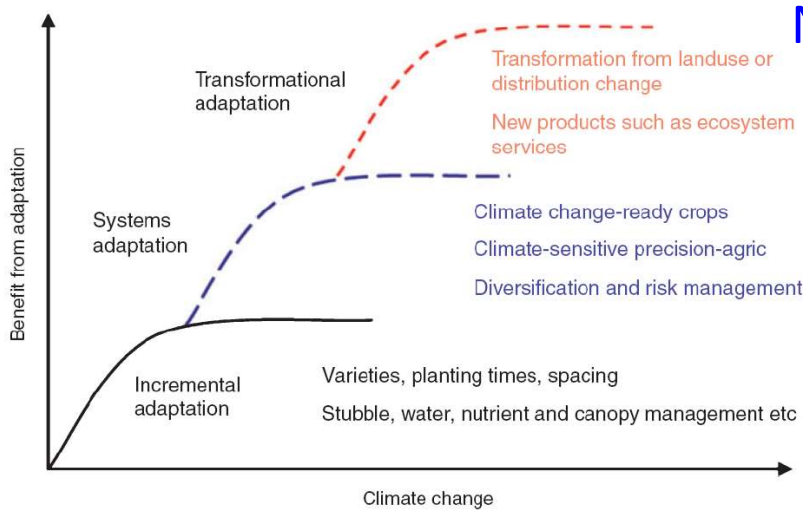
**Influence**  
**CHANGE**  
**Knowledge**  
**Attitudes**  
**Behaviours**  
**Practices**



**Outcomes → 'Impact'**

**TWEAKS    SHIFTS    NEW BALL GAME**

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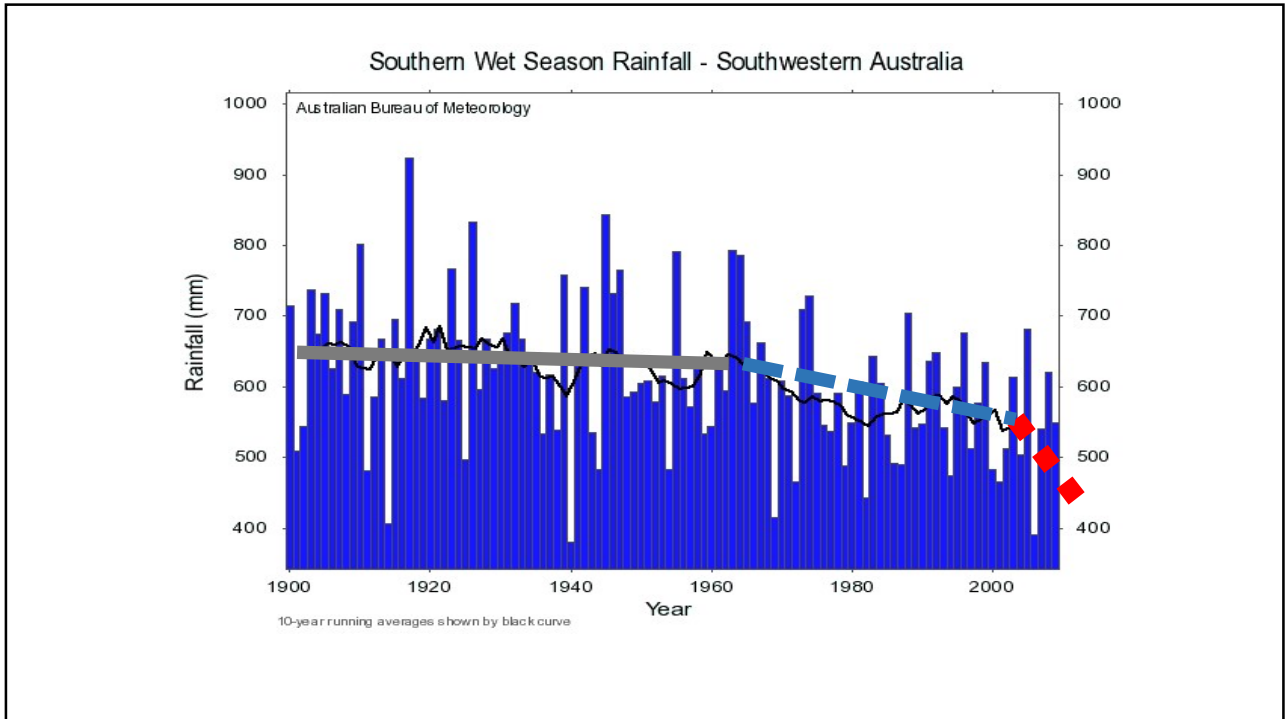
**NEW BALL GAME**

**SHIFTS**

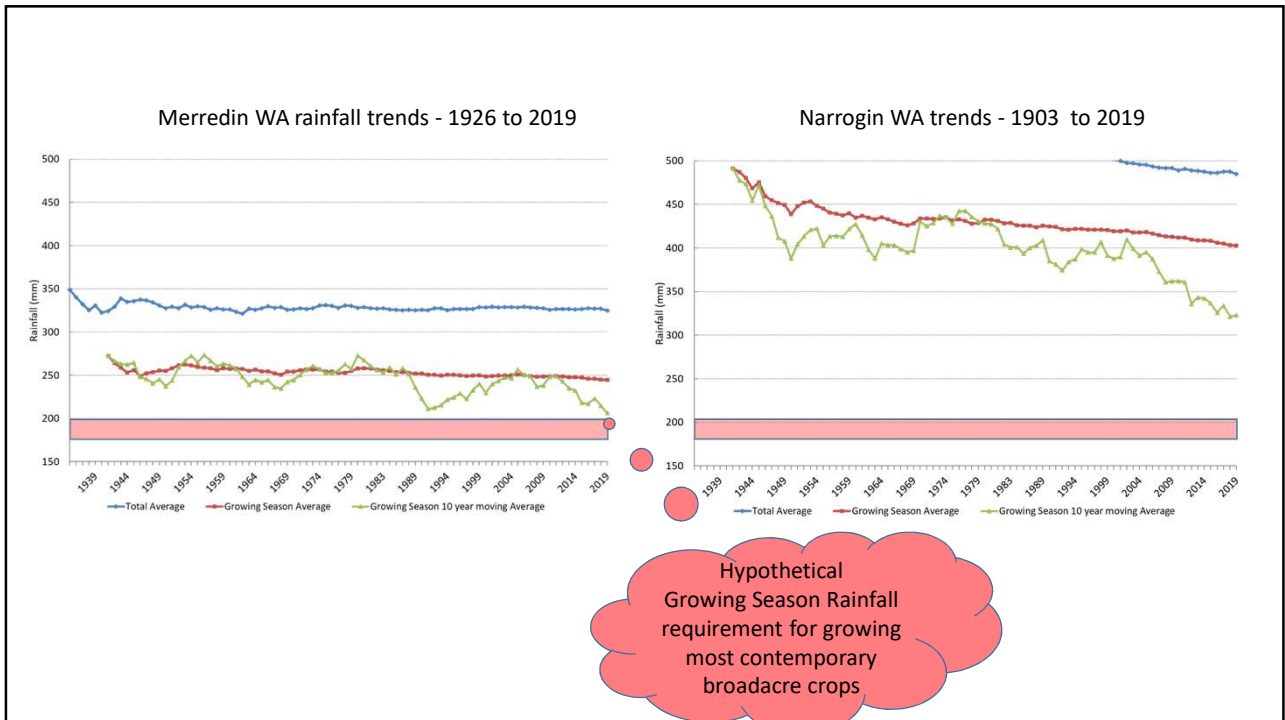
**TWEAKS**

Source: Crop & Pasture Science L. Rickards and S.M. Howden 2012

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(Image courtesy of the [Museum of Cannock Chase](#).)

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The folly of many past efforts to bring about farmer attitude and behaviour change with respect to climate

**information deficit model**

Reductionist Scientific Underpinning  
(positivism)

+ (Nelson, Howden & Stafford Smith 2008)

**A range of impediments**  
**Low impact**

overly simplistic and inaccurately characterizing the relationship between knowledge, attitudes, beliefs, and behaviours, particularly for politically polarized issues like climate change. Suldovsky (2017)

**“Information Deficit” is not the problem**

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*"The definition of insanity is doing the same thing over and over and expecting different results."*



Rita Mae Brown

(1983)

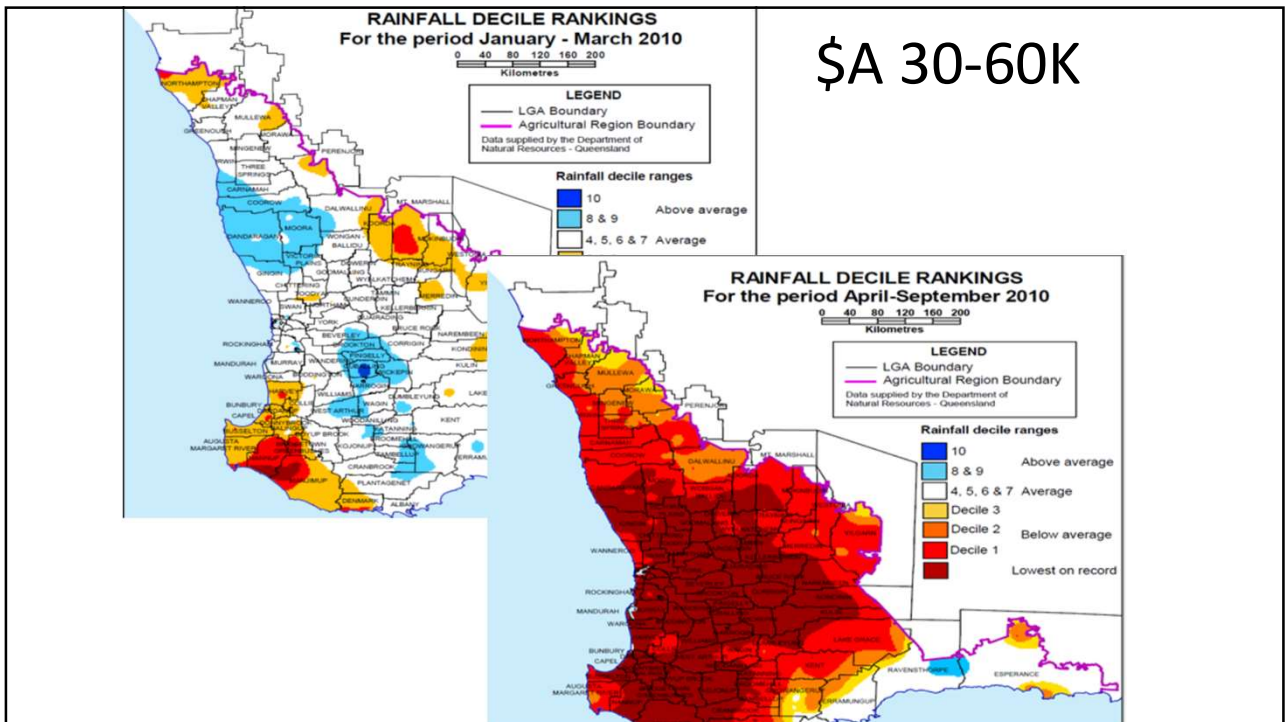
"Jane Fulton"

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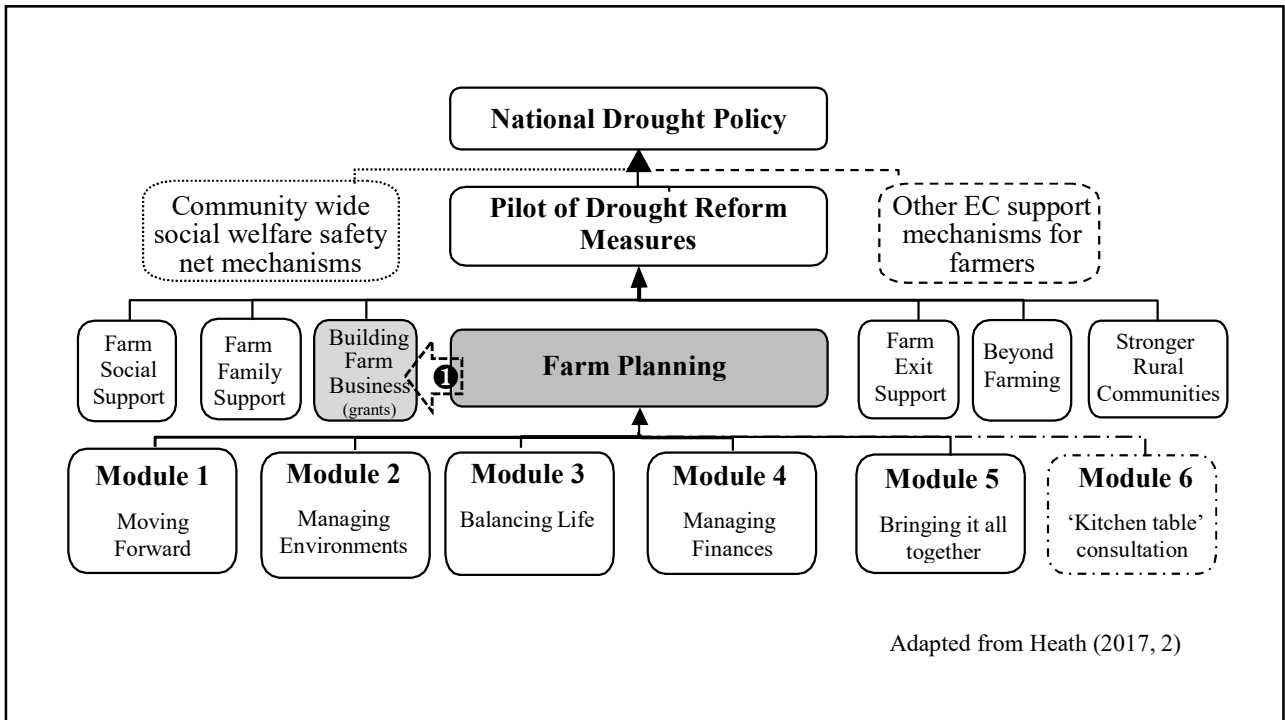
*The Farm Business  
Resilience Program  
for the  
Pilot of Drought Reform  
Measures in WA*

A collage of images related to the Farm Business Resilience Program. The collage includes a line graph showing trends, a group of people in a meeting, a woman smiling, and a woman in a meeting. The text is overlaid on the collage in yellow and white.

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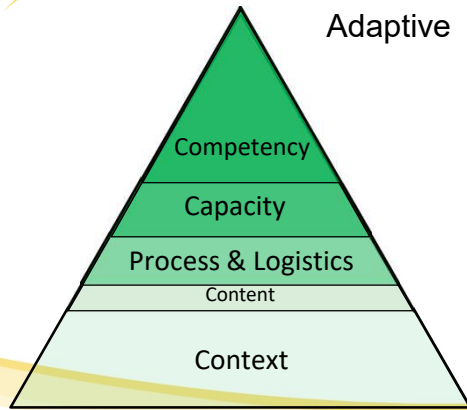


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## Crafting a new model



Adaptive

- Governance *see* Dooley (1997)
- Management Nelson *et al.* (2008)
- Research Kennedy *et al.* (2010)

- Salience
- Credibility
- Legitimacy

Cash *et al.* (2002)

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623  
98% Success  
...

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“the original strategic plan we put together a couple of years ago was [#\$&@!!]; now we have rewritten our plan all by ourselves!”.

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## Drought Pilot - Farm Planning

**Facilitated  
adaptive  
process to  
'self  
discover'  
solutions....**

**in a peer to  
peer  
setting**



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## Families working together



Thank you for the fantastic course you provided in xxxxx . I enjoyed it thoroughly, and have since lodged my strategic plan and application. 30 yo female farmer – Great Southern

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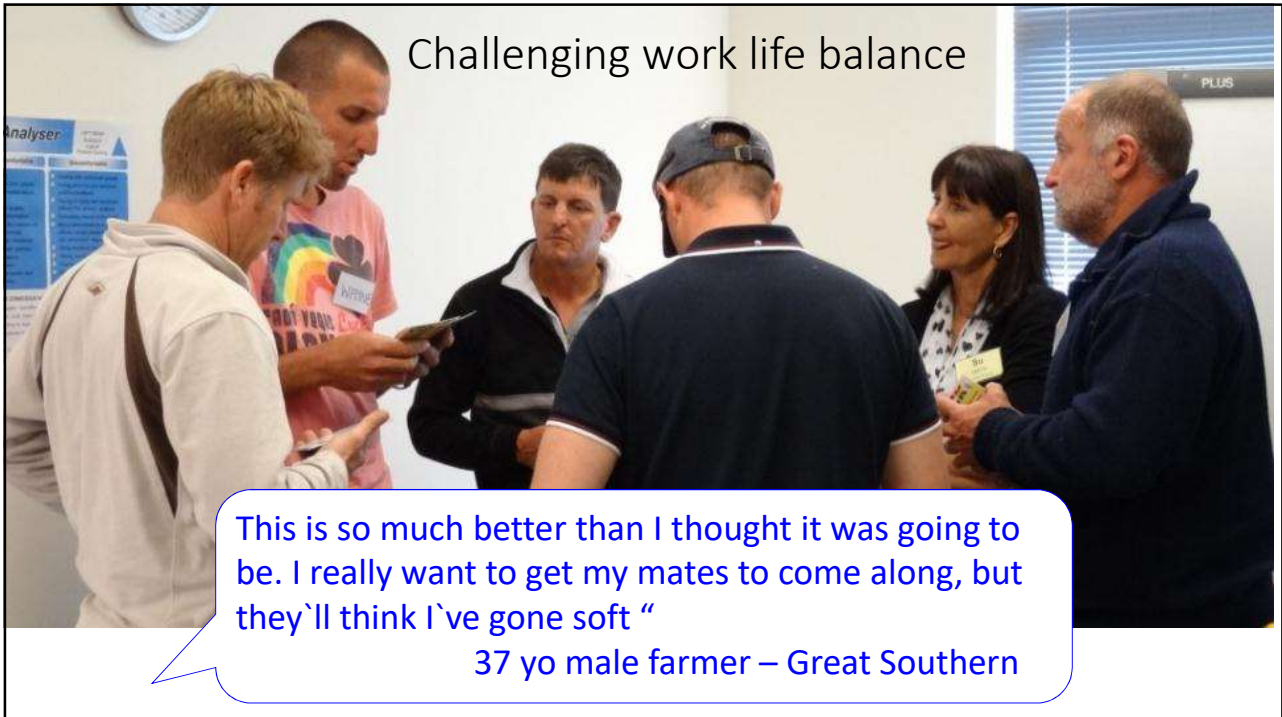
## Neighbours working together



You know xxxx, I have been coming to courses and field days for more than 40 years and they are mostly 'xxxx'! I thought this would be the same. But it is not!

70 yo male Farmer - Eastern Wheatbelt

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### *Shifts in attitude to climate change*

Moved from ambivalent to belief that it is impacting (40 – 50% to 80%)

*“Global climate change could be possible. Need 6 panadol.”*

*“There is a possibility slightly larger than I previously accepted that climate change may be real”*

***“Climate change sucks!”***

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## Impact of the facilitated peer to peer process...what did participants 'learn'?

But.... the process did not provide any new information, especially about climate change  
 All content had been previously provided to participants via a number of other mechanisms

Module	New information presented	Would do something different
1 - Moving Forward - Introduction to strategic planning	75%	74%
2 - Managing production environment inc climate	76%	72%
3 - Balancing Life	58%	58%
4 - Managing Finances	68%	73%
5 - Going Forward	57%	51%

Chris Evans (2012) found that less than a third of farmers found 'climate change information' 'easy to understand'.

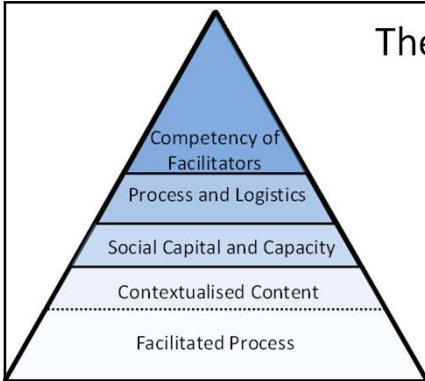
Supporting farm businesses and rural communities to be resilient to adverse conditions



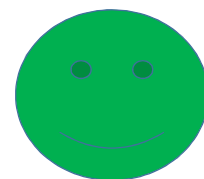
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## The 'new facilitated journey' extension model



+ Grants =



Attract

Engage

Stimulate

Motivate

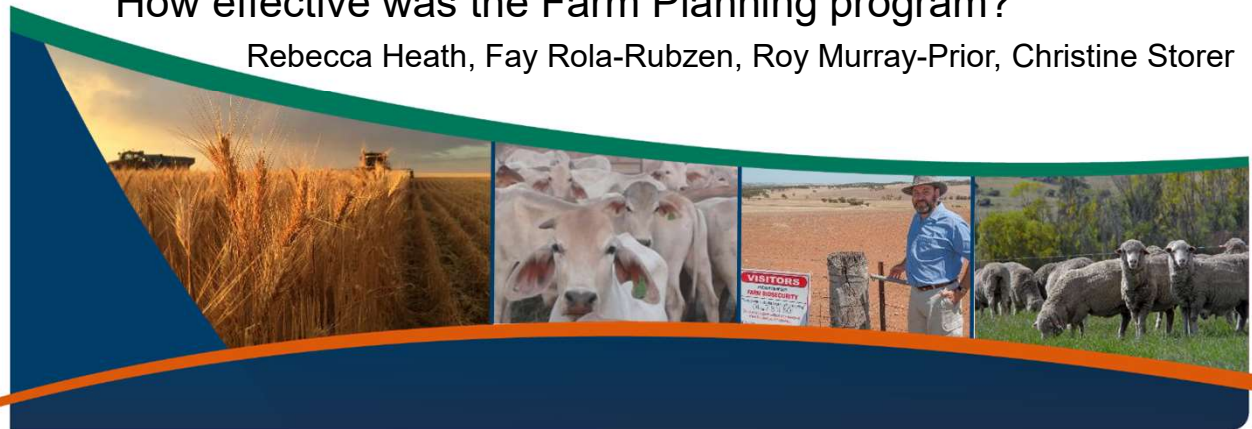
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# Building climate resilience

## How effective was the Farm Planning program?

Rebecca Heath, Fay Rola-Rubzen, Roy Murray-Prior, Christine Storer



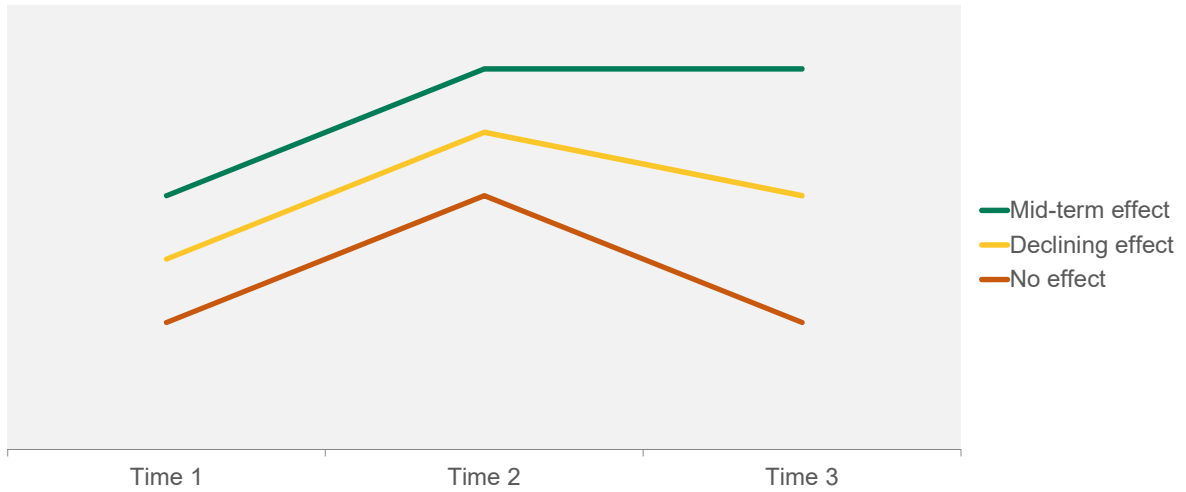
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## The research

- Questionnaires
- 12-18 months after completing the program
- Comparison to 'non-participants'
- Comparison to pre- and post-workshop responses
- Three components presented:
  - Attitudes and beliefs
  - Practices
  - Perceptions of resilience

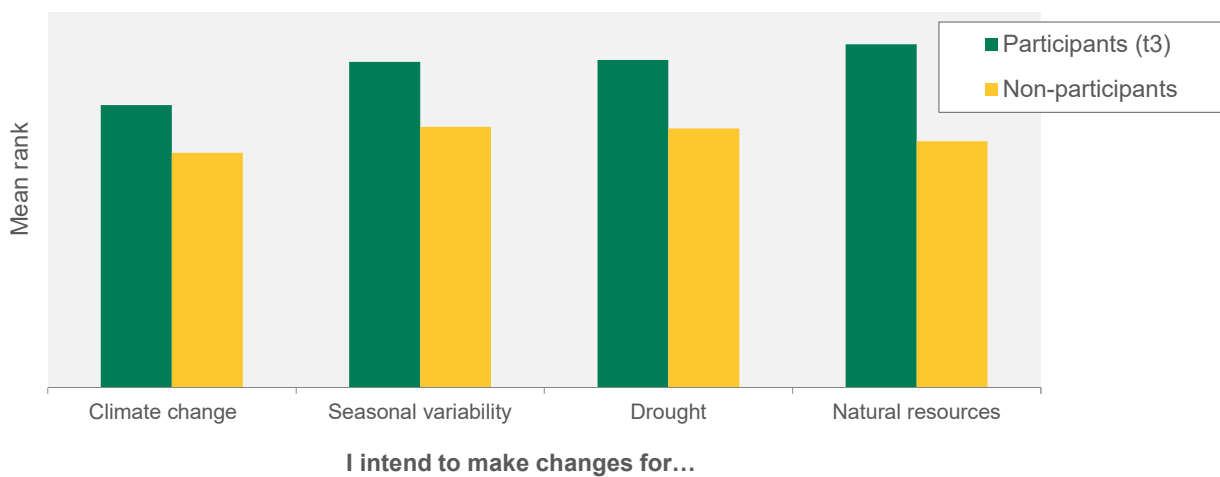
24

## Changes in attitudes over time: illustrative patterns



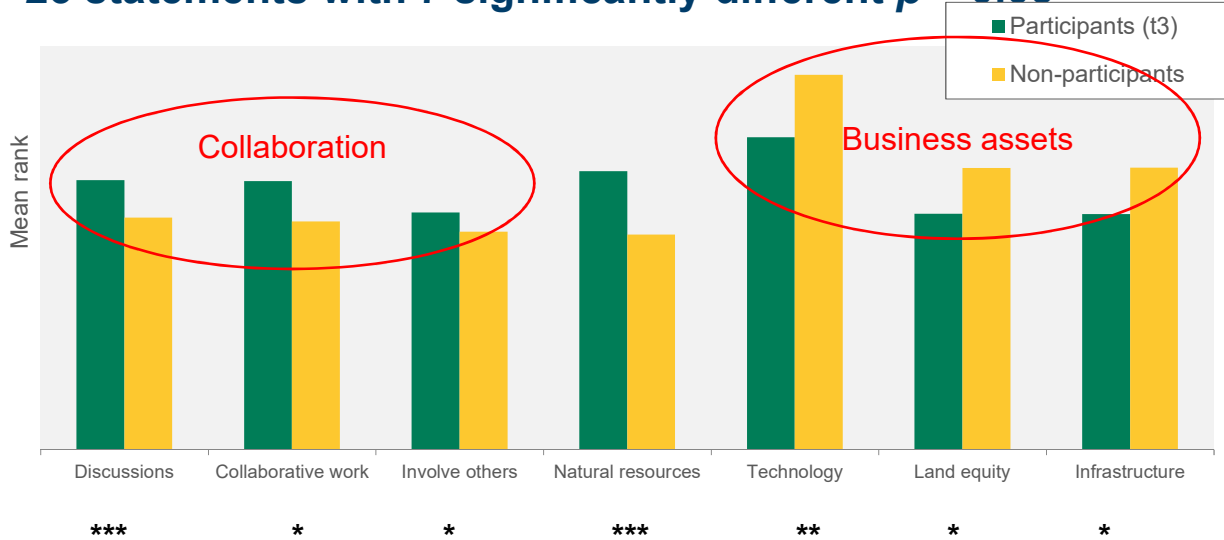
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## Practices



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## Perceptions of resilience: 23 statements with 7 significantly different $p < 0.05$



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## Conclusions

- Program had a short-term effect on attitudes / beliefs
- Little difference in participant and non-participant attitudes/ beliefs/ perceptions ... except:
  - Optimism for the future; risk management; collaboration; natural resource management; business assets
- Participants had greater intentions to make changes to their business than non-participants
- Resilience is an emergent property that is difficult to measure
- Other lesson:
  - Immediate post workshop changes may not persist
  - Need for follow-up evaluations.

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### Key Differences between Participants and Non-Participants

Significant Descriptive Questions	Mean Participants	Mean Non-Participants
Do you have a 5-10 year plan for production?	72%	
Do you have a 5-10 year plan for finances?	73%	
Do you have a 5-10 year plan for NRM?	69%	
Do you have a 5-10 year plan for work life balance?	61%	
You intend to make changes to protect or minimize the impact on the natural resources (scale 1 strongly disagree to 7 strongly agree)	5.6 / 7	

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	<b>Accurately perceived knowledge</b>	<b>Inaccurately perceived knowledge</b>
Facts that are <b>objectively known</b>	<b><i>Known knowns</i></b> (proper knowledge or informed wisdom)	<b><i>Unknown knowns</i></b> (uneducated ignorance, false notions, misconceptions or wrong-headedness)
Facts that are <b>objectively not known</b>	<b><i>Known unknowns</i></b> (wise ignorance, or the acceptance of not knowing)	<b><i>Unknown unknowns</i></b> (absolute blindness, superstition, myths or invented truths)

Gray 2009

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## Participants had

greater equity than commencing position and outperformed the equity improvements in the Bankwest Planfarm benchmark groups.

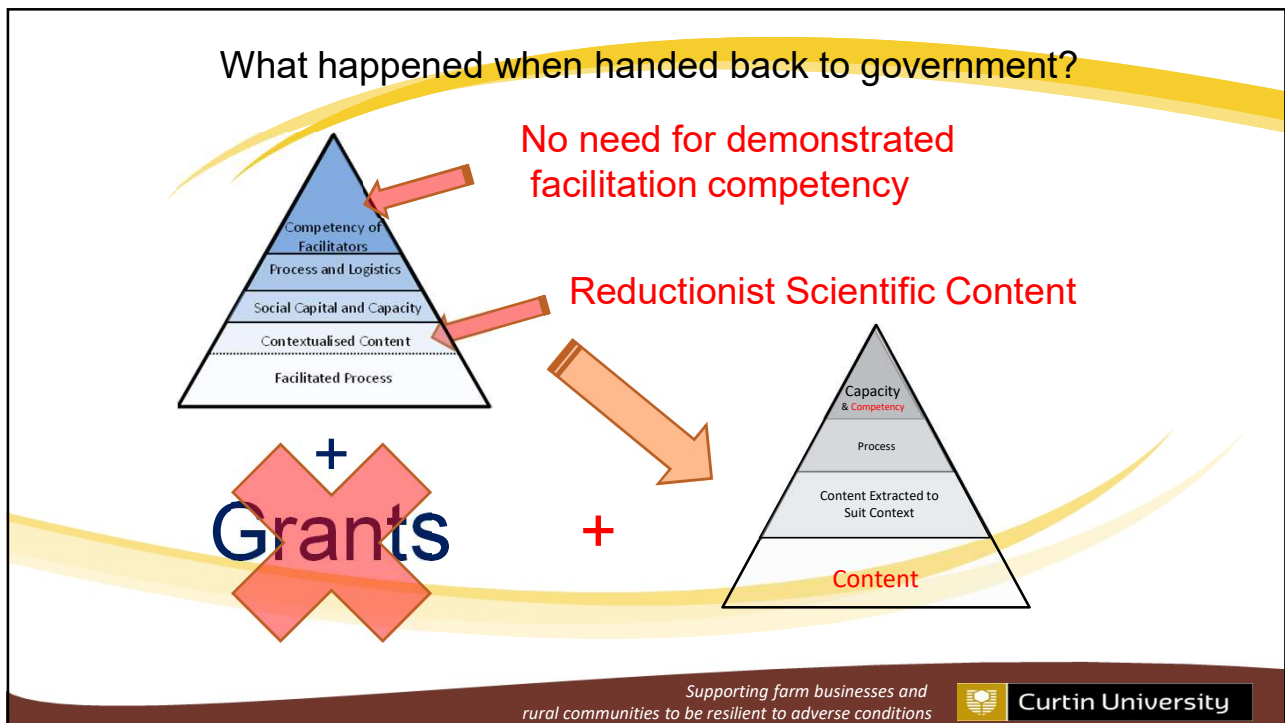
improved physical, financial, social and environmental outcomes

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Observations of many farm businesses are that they  
 are prospering, and doing better than other like  
 farm enterprises  
 manage and own their destiny  
 can manage through the increasing volatility of  
 weather events and life's challenges  
 are less reliant on Government assistance.

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## CENTRE FOR RURAL AND REMOTE MENTAL HEALTH RESEARCH

ORIGINAL RESEARCH

Farmers' stress and coping in a time of drought

KM Gunn<sup>1</sup>, LJ Kettler<sup>1</sup>, GLA Skaczkowski<sup>2</sup>, DA Turnbull<sup>1</sup>

<sup>1</sup>School of Psychology, The University of Adelaide, Adelaide, South Australia, Australia

<sup>2</sup>School of Psychological Sciences, The University of Melbourne, Melbourne, Victoria, Australia

Submitted: 27 January 2012; Revised: 29 June 2012; Published: 9 October 2012

RESEARCH VOGAMs 2019 | 159,36-4

Drought-related stress among farmers: findings from the Australian Rural Mental Health Study

Erma K Axelin, Tonello Handoy, Anthony S Kiern, Jane L Rich, Tony J Leese, Hedda H Aakland, Sara S Askarimansari, David A Perkins and Brian J Kelly  
Med J Aust 2018; 209 (4): 559-565. | doi: 10.5694/mja17.02200  
Published online: 30 July 2018

**Rural and Remote Health**

The International Electronic Journal of Rural and Remote Health Research, Education, Practice and Policy

ORIGINAL RESEARCH

Climate adversity and resilience: the voice of rural Australia

FY Ng<sup>1</sup>, LA Wilson<sup>2</sup>, C Veitch<sup>1</sup>

<sup>1</sup>Faculty of Health Science, University of Sydney, Lidscombe, New South Wales, Australia

<sup>2</sup>School of Science and Health, University of Western Sydney, Penrith, New South Wales, Australia

Submitted: 25 March 2014; Revised: 9 December 2014; Accepted: 9 December 2014; Published: 7 October 2015

**SUICIDE in RURAL & REMOTE AREAS of AUSTRALIA**

Paul I Kohers, Alison Milroy, Kathy McKay & Diego Di Leo

While the gap is widest between metropolitan and remote suicide rates and the rates highest among rural males, regional suicide rates are still higher and metropolitan rates and the rural female suicide rate is higher than the urban female suicide rate.

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# Farmers Where else?

“Suicide, drug abuse, post-traumatic stress disorder, panic, depression, divorce,”

Gen George Casey chief of staff of the US Army (2008).

Seligman (2018, 311)

“We’d like to run a pilot study with 100 drill sergeants and 5000 soldiers,”

General Rhonda Corman

“We are at war, I don’t want a pilot study. I want to teach and measure resilience and positive psychology in the whole army now.”

Gen George Casey chief of staff of the US Army.

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## Master Resilience Training in the U.S. Army

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Karen J. Reivich and Martin E. P. Seligman *University of Pennsylvania*  
Sharon McBride *Headquarters, Department of the Army*

Reivich, K. J., Seligman, M. E. P., & McBride, S. (2011). Master resilience training in the U.S. Army. *American Psychologist*, 66(1), 25-34.

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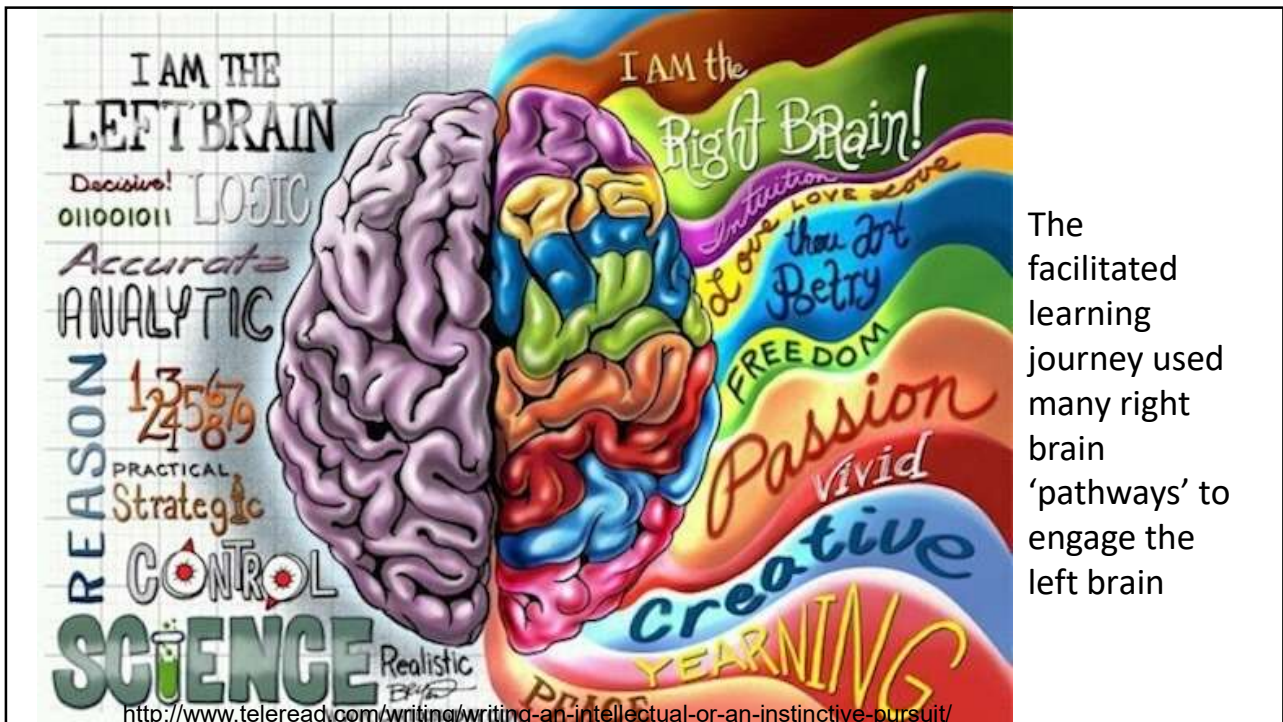
# What can we learn from Brain Science - Neurobiology Neuroscience

Supporting farm businesses and  
rural communities to be resilient to adverse conditions



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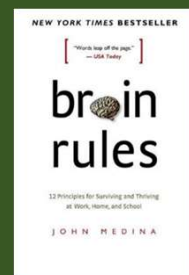


The facilitated learning journey used many right brain 'pathways' to engage the left brain

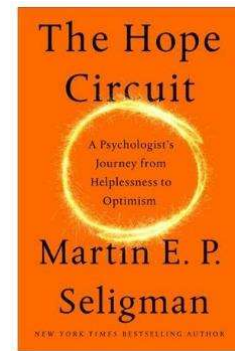
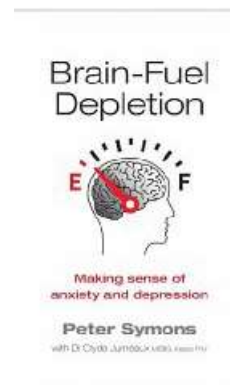
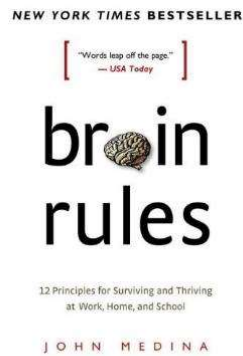
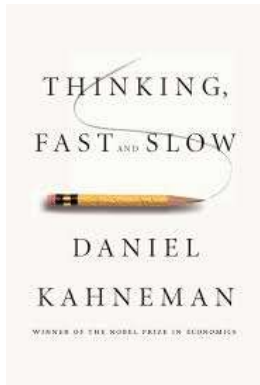
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### Key relevant 'Brain Rules' from John Medina

- ④ Stressed brains don't learn
- ⑤ Every brain is wired differently
- ⑥ We don't pay attention to boring things
- ⑦ Involve and repeat to remember and remember to repeat
- ⑧ Use as many senses as possible
- ⑨ Vision (pictures - good graphics) trumps all other senses
- ⑩ Listening to music to boost cognition.
- ⑪ Male and female brains are wired differently
- ⑫ We are powerful and natural explorers



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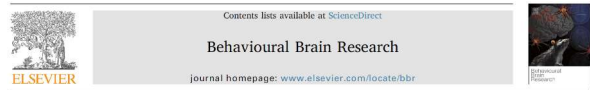


Learned Helplessness at Fifty: Insights From Neuroscience

Steven F. Maier  
University of Colorado at Boulder

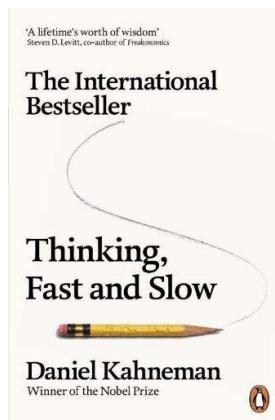
Martin E. P. Seligman  
University of Pennsylvania

Psychological Review  
2016, Vol. 123, No. 4, 349–367



Circadian misalignment has differential effects on affective behavior following exposure to controllable or uncontrollable stress  
Rachel A. Daut<sup>1</sup>, Matthew J. Hartsock, Angela C. Tomczak, Linda R. Watkins, Robert L. Spencer, Steven F. Maier, Laura K. Fonken  
Department of Psychology and Neuroscience, Center for Neuroscience, Munsteringer Building, UCR 345, University of Colorado Boulder, Boulder, CO, 80506, USA

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“There is a tendency for people to “throw good money after bad”; continuing to invest in activities with poor prospects that have already consumed resources that ‘rationally’ should not occur.”

“...‘unwarranted optimism’ and the ‘planning fallacy’ whereby there is a tendency to overestimate benefits and underestimate costs, impelling people to take on risky project.”

p 428

Rational ?? Bayesian ???

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# Serotonin

'a' key brain fuel

Fig 3.3 Depletion – Repletion

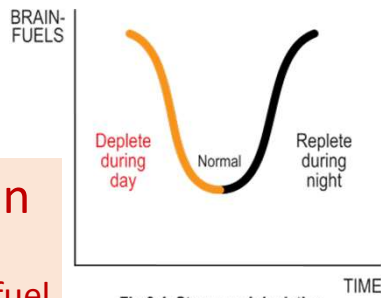
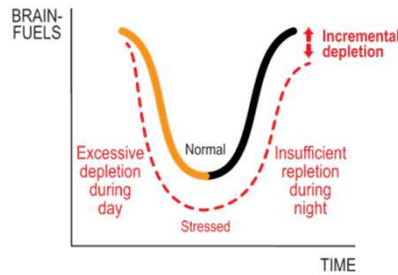


Fig 3.4 Stress and depletion



## Brain-Fuel Depletion



Making sense of anxiety and depression

Peter Symons

with Dr Clyde JUMBOUX MBS, Assoc Prof

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## Master Resilience Training in the U.S. Army

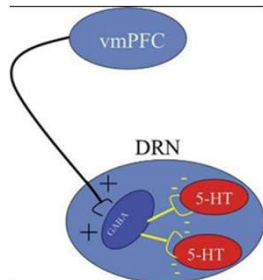
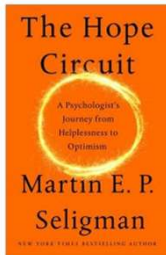
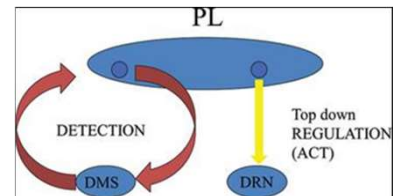
Karen J. Reivich and Martin E. P. Seligman *University of Pennsylvania*  
Sharon McBride *Headquarters, Department of the Army*

## Learned Helplessness at Fifty: Insights From Neuroscience

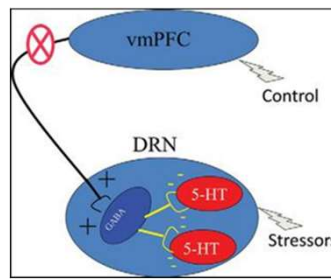
Steven F. Maier  
University of Colorado at Boulder

Psychological Review  
2016, Vol. 123, No. 4, 349–367

Martin E. P. Seligman  
University of Pennsylvania



Helpless default position  
Serotonin increases



Control and Flight or Fright  
Serotonin is blocked at the PFC

the prefrontal cortex (PFC) mediation (top down regulation) of the impact of behavioral control. Separate systems are involved in the detection of control, and then acting on this detection. The detection circuit involves bidirectional flow between the dorsomedial striatum (DMS) and the prefrontal cortex

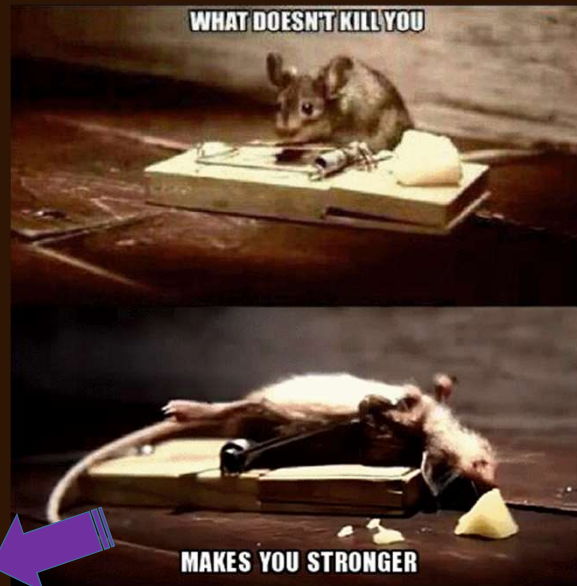
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What does this mean? **John's 'interpretation'**

**Passivity and Panic**  
 Dorsal Raphe Nucleus ->  
 Ventromedial Prefrontal Cortex

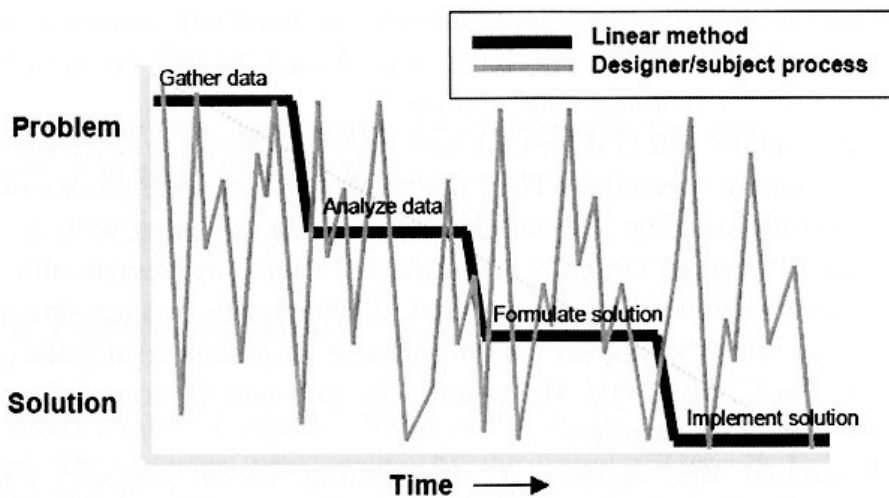
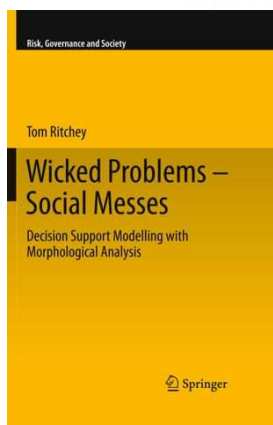
**Flight or Fight**  
 Dorsal Raphe Nucleus |->|  
 Ventromedial Prefrontal Cortex

**Learning via**  
**Medial Prefrontal Cortex**  
 Creation of Plasticity Proteins



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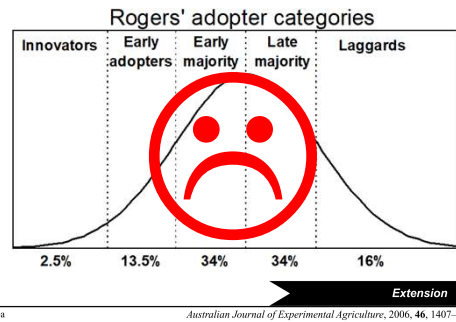
Reality is that creating solutions is 'more' complex and 'zig zag'



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# So what

Have the extension models in use over the past thirty years served farmers well in getting them to plan ?



CSIRO PUBLISHING

www.publish.csiro.au/journals/ajea

Extension

Australian Journal of Experimental Agriculture, 2006, 46, 1407-1424

Understanding and promoting adoption of conservation practices by rural landholders

D. J. Pannell<sup>A,EG</sup>, G. R. Marshall<sup>B</sup>, N. Barr<sup>C,F</sup>, A. Curtis<sup>D</sup>, F. Vanclay<sup>E</sup> and R. Wilkinson<sup>C,F</sup>

Our view is that 'we' have got 'extension' wrong

Perhaps why there has been slower adoption and diffusion levels for some things

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> 80% of Australian farmers are of a 'risk averse' personality type

Strachan, R. (2011). Myers Briggs Type Indicator Preferences by Industry and Implications for Extension [Shaping Change: Natural Resource Management, Agriculture and the Role of Extension](#). J. Jennings, R. Packham and D. Woodside. Wodonga, Victoria, Australasia Pacific Extension Network.

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**Farm decision making**  
The interaction of personality, farm business and risk to make more informed decisions

**Grain & Graze**  
Grains Research & Development Corporation

**The head**  
This is the **logical**, rational processing of information, the calculations and some realities we can face such as a financial position, age or health.

**The gut – is intuition,** shaped through experiences and knowledge. It allows us to make quicker decisions because it bypasses rational processes by linking past experiences and knowledge (both good and bad) with the present. Intuitive decisions are about 'feel'.

**The heart**  
which captures the **emotional** aspects of a decision. They are value-based and include a farmer's goals, beliefs and preferences. Put simply, they are a guidance system for decision making.

Image courtesy of Alice Long, AgCommunicators

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**the majority of human error comes from erroneous heuristic-based thinking**

Kahneman, D. and A. Tversky (1972). "Subjective probability: A judgment of representativeness." *Cognitive Psychology* 3(3): 430-454

Kahneman, D. (2011). *Thinking, Fast and Slow*. London, Penguin.

most people are not fully 'rational' in their thinking and decision making most of the time, using a collection of processes entitled 'System 1' (lazy) thinking, rather than 'System 2' (intensive) thinking

**anchoring** (relying too heavily on the first piece of information offered or commercial incentives)

**availability** (attention grabbing – wow 'xyz' yielded well)

**recency** (last year was a good year – so this year will be ....)

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A longitudinal examination of business performance indicators for drought-affected farms

R.A. Lawes<sup>a,\*</sup>, R.S. Kingwell<sup>b</sup>

<sup>a</sup>CSIRO Ecosystem Sciences and Sustainable Agriculture Flagship, Centre for Environment and Life Sciences, Wembley, WA 6913, Australia  
<sup>b</sup>Department of Agriculture and Food, WA, South Perth, WA 6151, Australia

Agricultural Systems 106 (2012) 94–101

Leading farmers in South East Australia have closed the exploitable wheat yield gap: Prospects for further improvement

Harm van Rees<sup>a,b,\*</sup>, Tim McClelland<sup>b</sup>, Zvi Hochman<sup>c</sup>, Peter Carbone<sup>d</sup>, Neil Huth<sup>d</sup>, Dean Holzworth<sup>d</sup>

<sup>a</sup>Cropfacts Pty Ltd, 69 Rooney Rd, RSD Mandurang South, Victoria 3551, Australia  
<sup>b</sup>BCG, PO Box 85, Birchip, Victoria 3483, Australia  
<sup>c</sup>CSIRO Ecosystem Sciences/Sustainable Agriculture Flagship, EcoSciences Precinct, 41 Roggo Road, Dutton Park, Queensland 4250, Australia  
<sup>d</sup>CSIRO Ecosystem Sciences/Sustainable Agriculture Flagship, Toowoomba, Queensland 4350, Australia  
<sup>e</sup>CSIRO Plant Industry/Sustainable Agriculture Flagship, PO Box 1600, Canberra, ACT 2601, Australia

Field Crops Research 164 (2014) 1–11

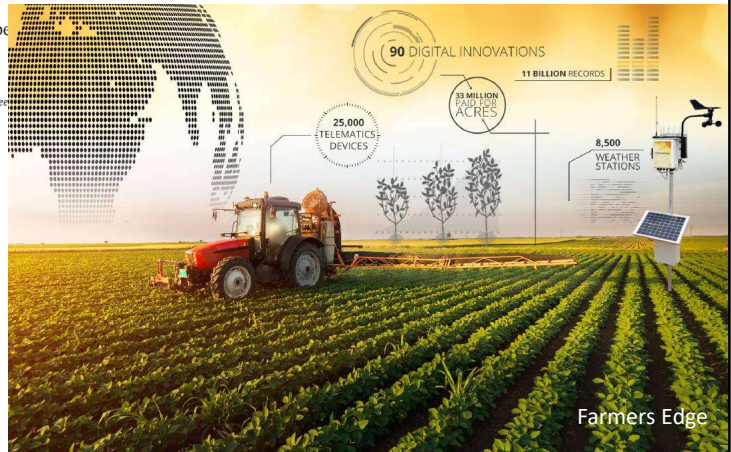


Broadacre farmers adapting to a changing climate

Final Report

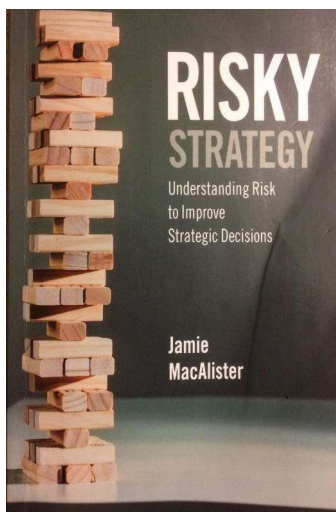
Ross Kingwell, Lucy Amderton, Nazrul Islam, Vilaphonh Xayavong, Angela Wardell-Johnson, David Feldman and Jane Speijers

“Characteristics”

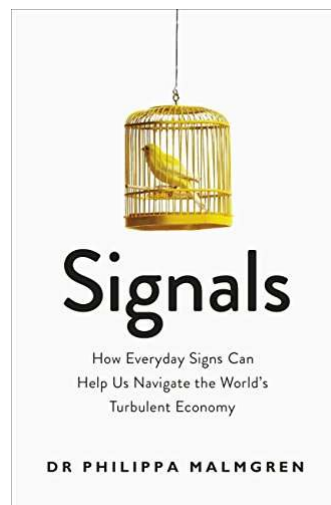


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MCGREGOR, M., WILLOCK, J., DENT, B., DEARY, I., SUTHERLAND, A., GIBSON, G., MORGAN, O. & GRIEVE, B. 1996. Links between psychological factors and farmer decision making. *Farm Management*, 9, 228-239.



‘Character’



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Farmers' poor sense of future is of considerable concern because of its possible links to hopelessness and suicide.

While it is tempting to rush to causal inferences and, hence, policy interventions, we argue that farmers' mental health status, and its relationship to climate change-related factors, cannot be assumed but must be empirically studied.

**Climate Change and Farmers' Mental Health: Risks and Responses**  
Helen L. Berry, Anthony Hogan, Jennifer Owen, Debra Rickwood and Lyn Fragar  
*Asia Pac J Public Health* 2011 23: 119S  
DOI: 10.1177/1010539510392556

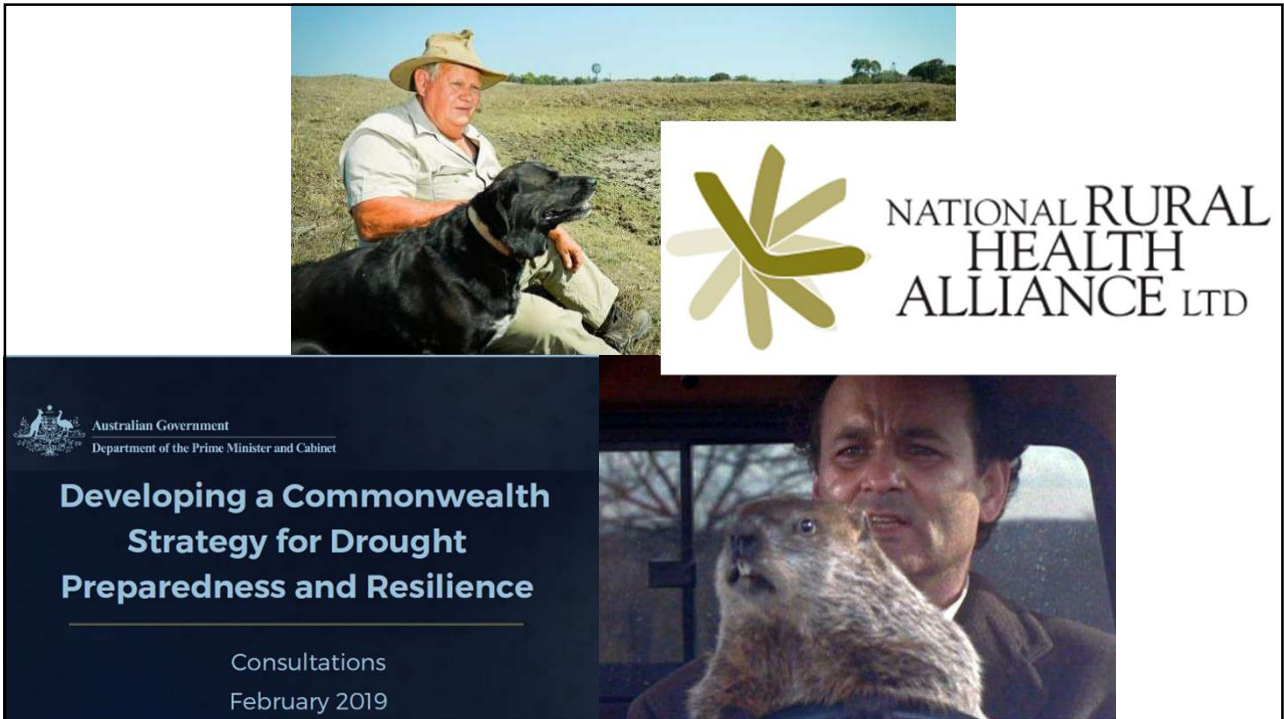
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PHOTO: The trees next to the road urge people to ask: "r u ok?" (ABC Radio Brisbane: 1

The Blue Tree Project began in Western Australia and encourages people who need a "blue lease on life" and paint it in memory of a friend who lost

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We need to continue to explore new ways of transferring and sharing knowledge amongst and with farmers through peer to peer learning in a contemporary setting  
 The FBR model is more effective in influencing attitudes and behaviours towards a range of factors, the use of Strategic Planning and Life Long Learning

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