

The Psychology of Paranoid Delusions



Richard Bentall

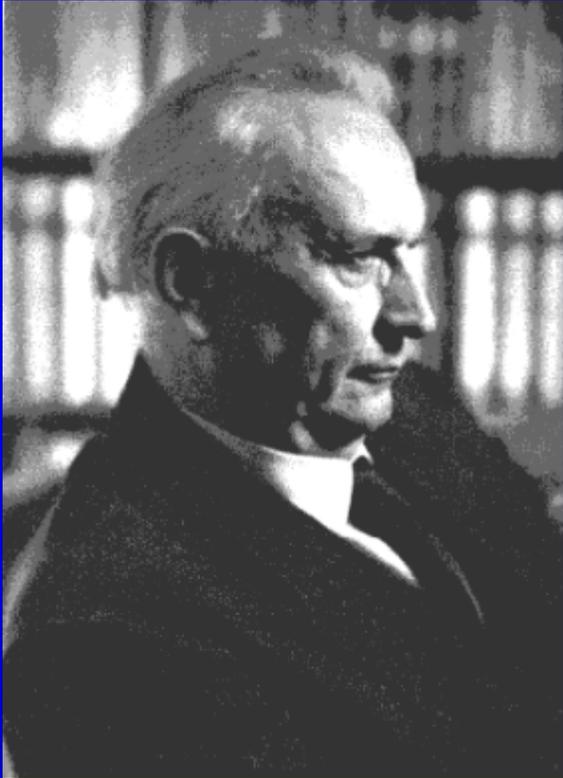
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1: Defining delusions and the phenomenology of paranoia

Delusions are.....

Bizarre or unusual beliefs. However, defining what makes a particular belief delusional has taxed the minds of the greatest psychopathologists.....

Understandability



Karl Jaspers (1883-1960) argued that the abnormal beliefs of psychiatric patients are bizarre, resistant to counter-argument and held with extraordinary conviction. However, true delusions are also ununderstandable:

They cannot be understood in terms of

The patient's personality

The patient's experiences

And can therefore only be explained in terms of aberrant biology.

Berrios (1991): delusions are “empty speech acts, whose informational content refers to neither world or self”.

A modern definition

DSM-IV (APA, 1994) defines a delusion as:

“A false personal belief based on incorrect inference about external reality that is firmly sustained despite what almost everyone else believes and despite what constitutes incontrovertible and obvious proof or evidence to the contrary. The belief is not one ordinarily accepted by other members of the person’s culture or subculture.”

Persecutory (paranoid) delusions

In the SoCRATES first episode sample (Moutoussis et al. 2007)

PANSS* > 2	N/255	%
Delusions (P1)	250	98
Suspicion (P6)	235	91.8
Delusions & Suspicion	230	90.2
Hallucinations (P3)	177	69.1
Thought disorder (P2)	144	56.5
Grandiosity (P5)	98	38.6
Agitation (P4)	179	70.2
Hostility (P7)	97	37.9

Positive and Negative Syndromes Scale (Kay et al., 1987), a widely used measure of psychotic symptoms,

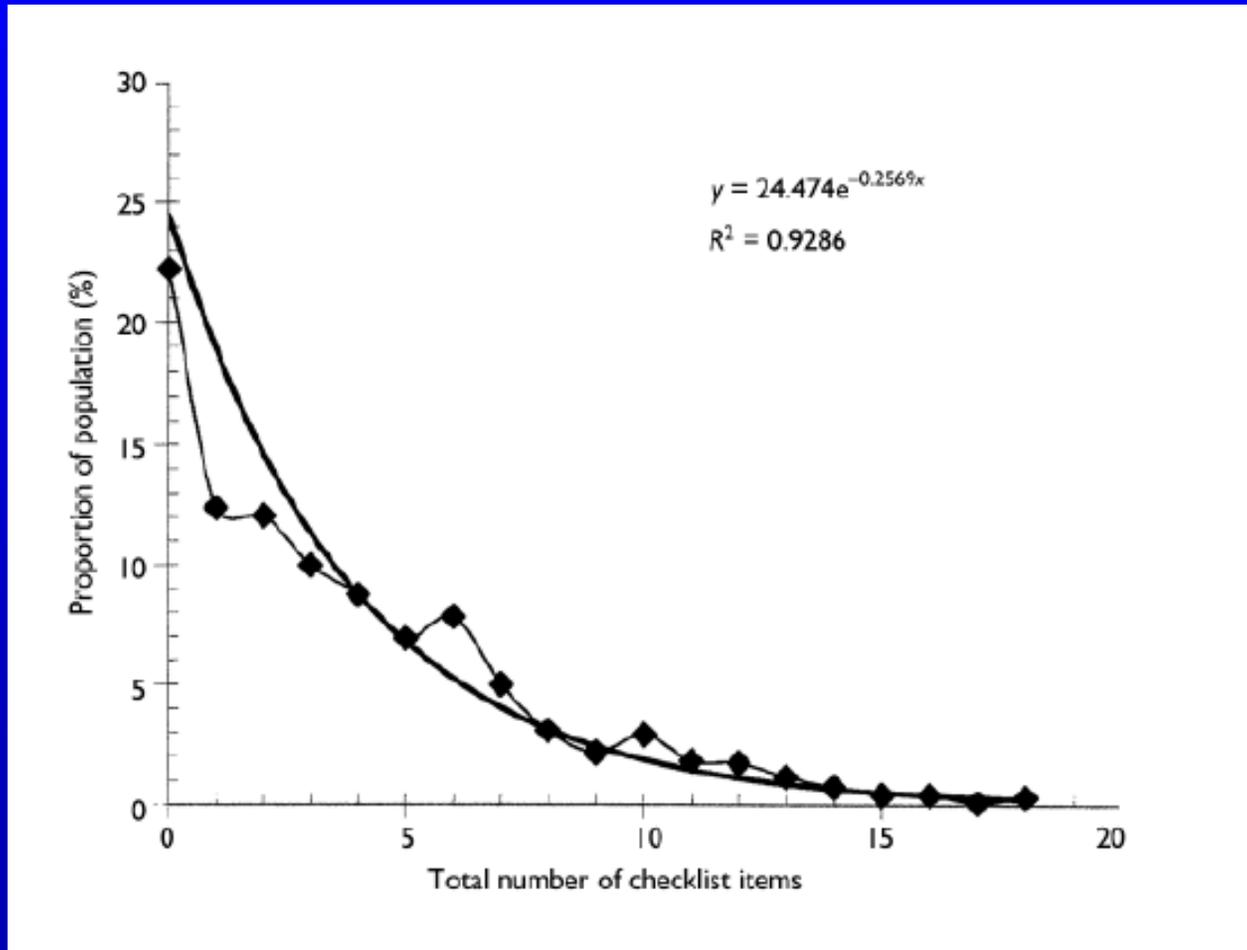
A paranoid continuum?

Many psychologists have argued that psychotic experiences exist on a continuum with normal functioning (e.g. Claridge, 1990) and have developed psychometric instruments to assess this continuum (e.g. Bentall, Claridge & Slade, 1988),

- **Epidemiological studies show that large numbers of people report delusional beliefs (12.0%, van Os et al., 2000, Holland) or paranoia (12.6% paranoia, Poulton et al., 2000, New Zealand)**
- **Freeman et al. (2005) administered a paranoia questionnaire to over 1000 people in a UK internet survey. They found evidence for a continuum, although extreme beliefs about threats of harm were only endorsed by a minority.**

A paranoid continuum?

Proportion of population scoring on the Paranoia Checklist (from Freeman et al. 2005).



A paranoid continuum?

Hierarchy of paranoia (from Freeman et al. 2005).



Two types of paranoia?

- Trower and Chadwick (1995) argue that there are two types of paranoia:

‘Poor me’ paranoia (persecution underserved, self-esteem preserved)

‘Bad me’ paranoia (persecution deserved, self-esteem low)

- However, there has been almost no research to examine the distinction.

The PADS (Melo et al., 2009)

Developed a Persecution and Deservedness scale (10, 12 and 20 item versions) designed for both patient and clinical participants.
Administered to 312 undergraduates and 45 acutely psychotic patients.

1. There are times when I worry that others might be plotting against me.

(ANS: 0 = certainly false; 4 = certainly true)

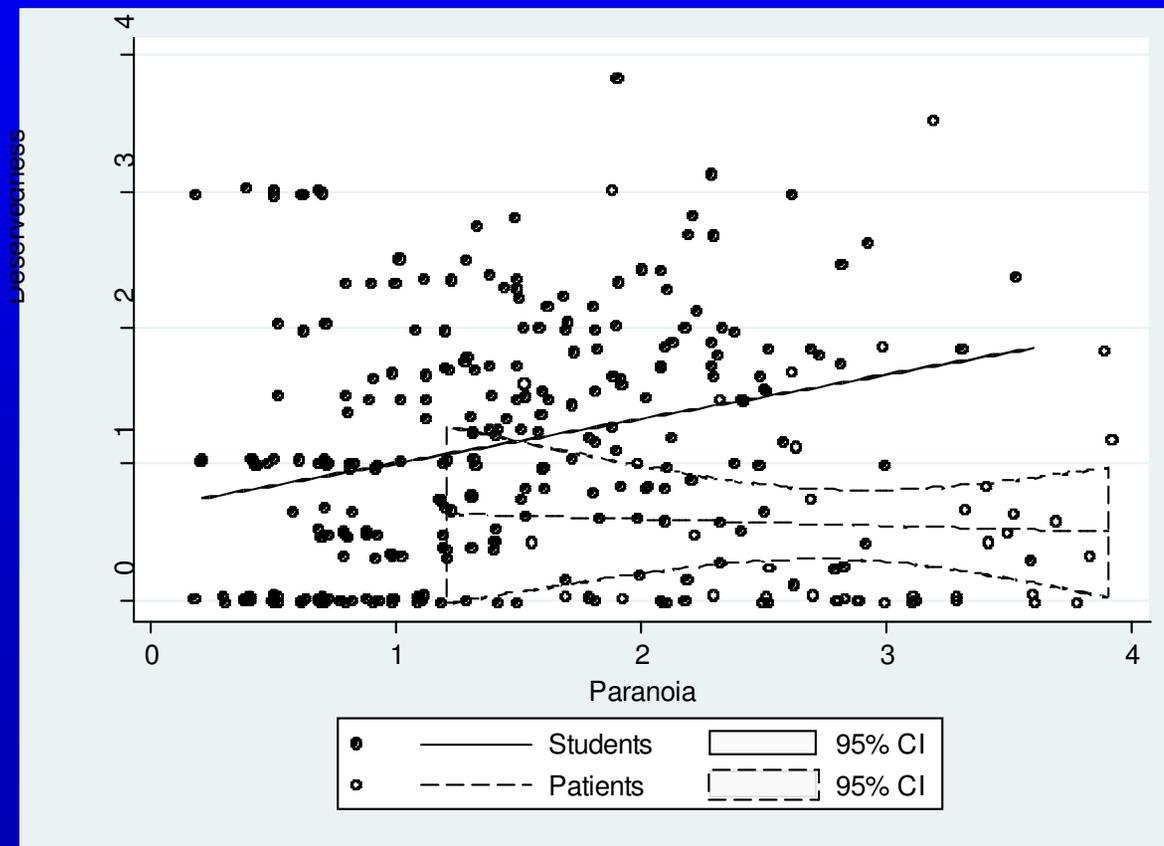
If you've answered 2 or above to the last question, please answer to the following question:

1.1 Do you feel like you deserve others to plot against you?

(ANS: 0 = not at all; 4 = very much)

The PADS (Melo et al., 2009)

Adequate reliability was found for both dimensions. In non-patients, a clear relationship was observed between paranoia and deservedness, but this relationship was absent in patients. In the patient sample, deservedness scores appeared to be suppressed.



Collip, Oorschot, Thewissen, Van Os, Bentall & Myin-Germeys (2010)

Used a diary method (Experience Sampling) to examine variation of momentary paranoia and perceived social threat (“In this company I feel threatened”, “In this company I feel accepted” [reversed]) with social context:

whether alone, in unfamiliar company, in familiar company
subjective stress since last sleep



At low and moderate levels of trait paranoia (Fenigstein scale), paranoid thinking and perceived social threat were predicted by both context and subjective stress.

At high levels of trait paranoia, paranoid thinking and perceived social threat were NOT predicted by either context and subjective stress.

Fluctuations in deservedness (Melo et al., 2006)

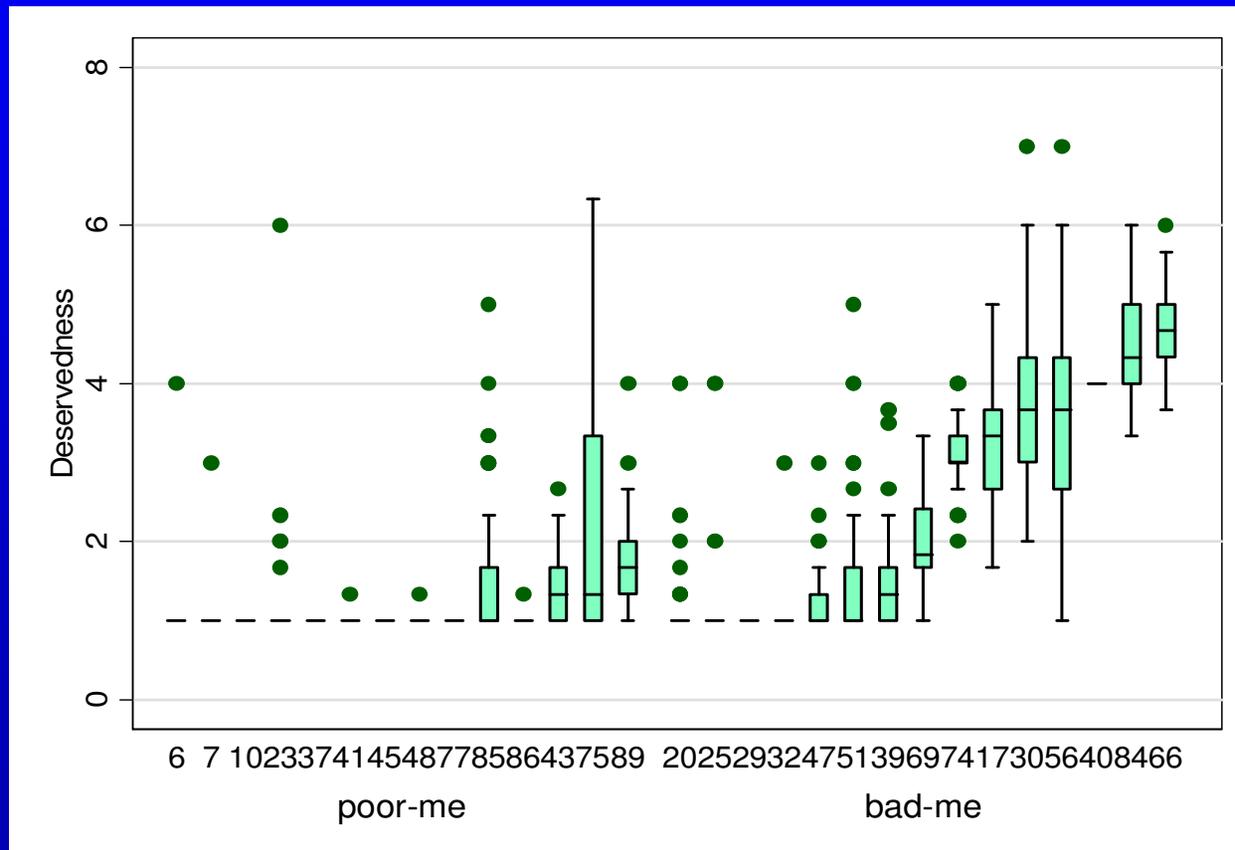
43 paranoid patients compared with 22 healthy controls.

Initial intention was to repeat assessments of paranoid patients after 1 month – proved difficult.

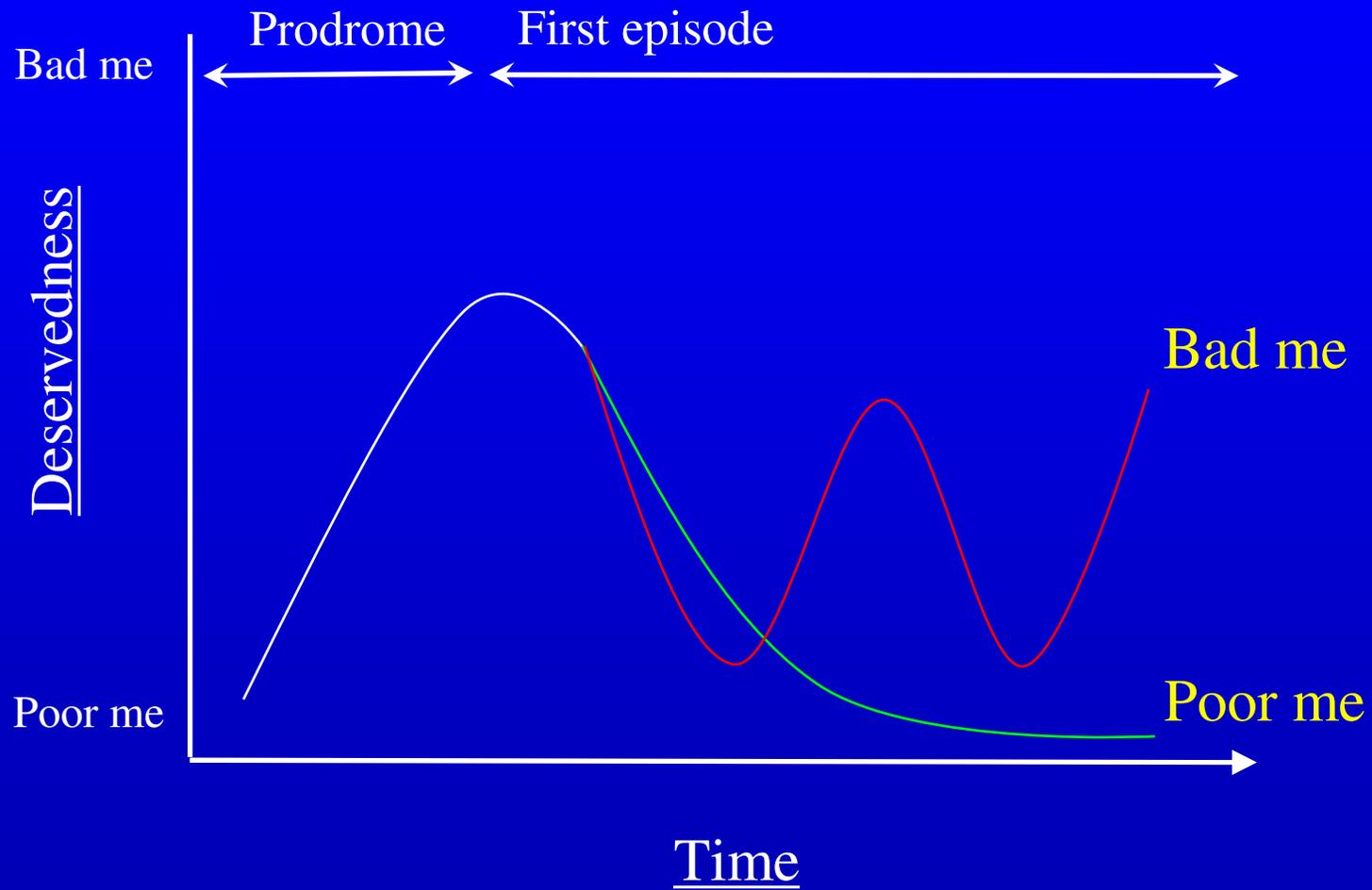
All patients completed a deservedness analogue scale on each assessment “0 = I don’t deserve to be persecuted”; “12 = I deserve to be persecuted”.

Fluctuations in deservedness (Udachina et al. in press)

ESM study with 14 PM and 15 BM patients. Deservedness measured at each beep.



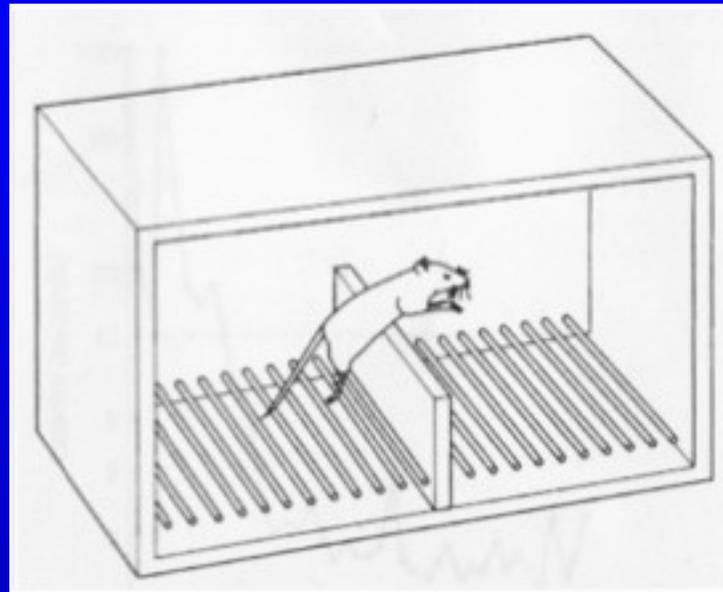
Time course of deservedness?



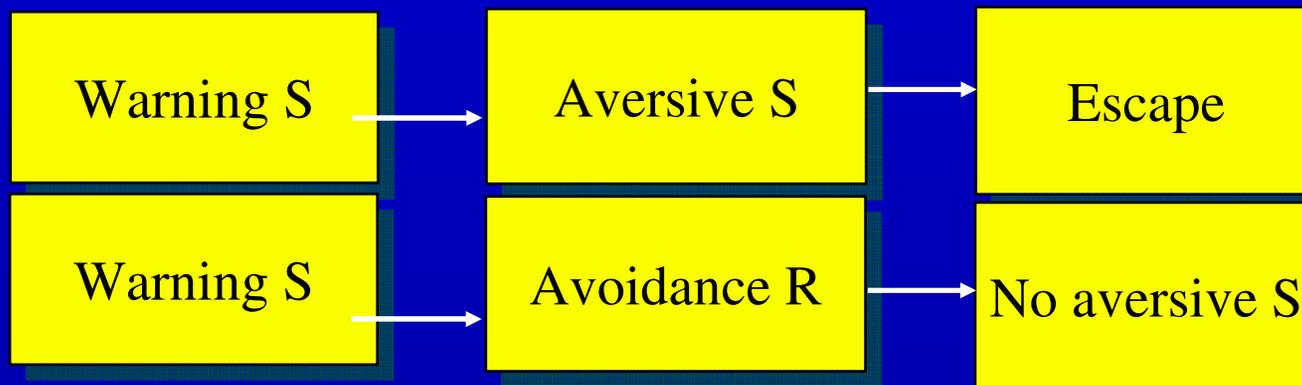
2: Evolutionary and developmental origins of paranoia

All organisms need a system for anticipating and avoiding threat

In the conditioned avoidance paradigm, the animal is placed in a shuttle box, in which it can receive a warning signal and an electric shock.



Note that learning continues (decreased response latencies) long after 100% avoidance is achieved.



Does repeated exposure to threat lead to psychosis?: A meta-analysis

Initial database search found 27,572 hits- after excluding studies based on inspection of the papers' titles and abstracts, the 763 remaining papers were examined for inclusion.

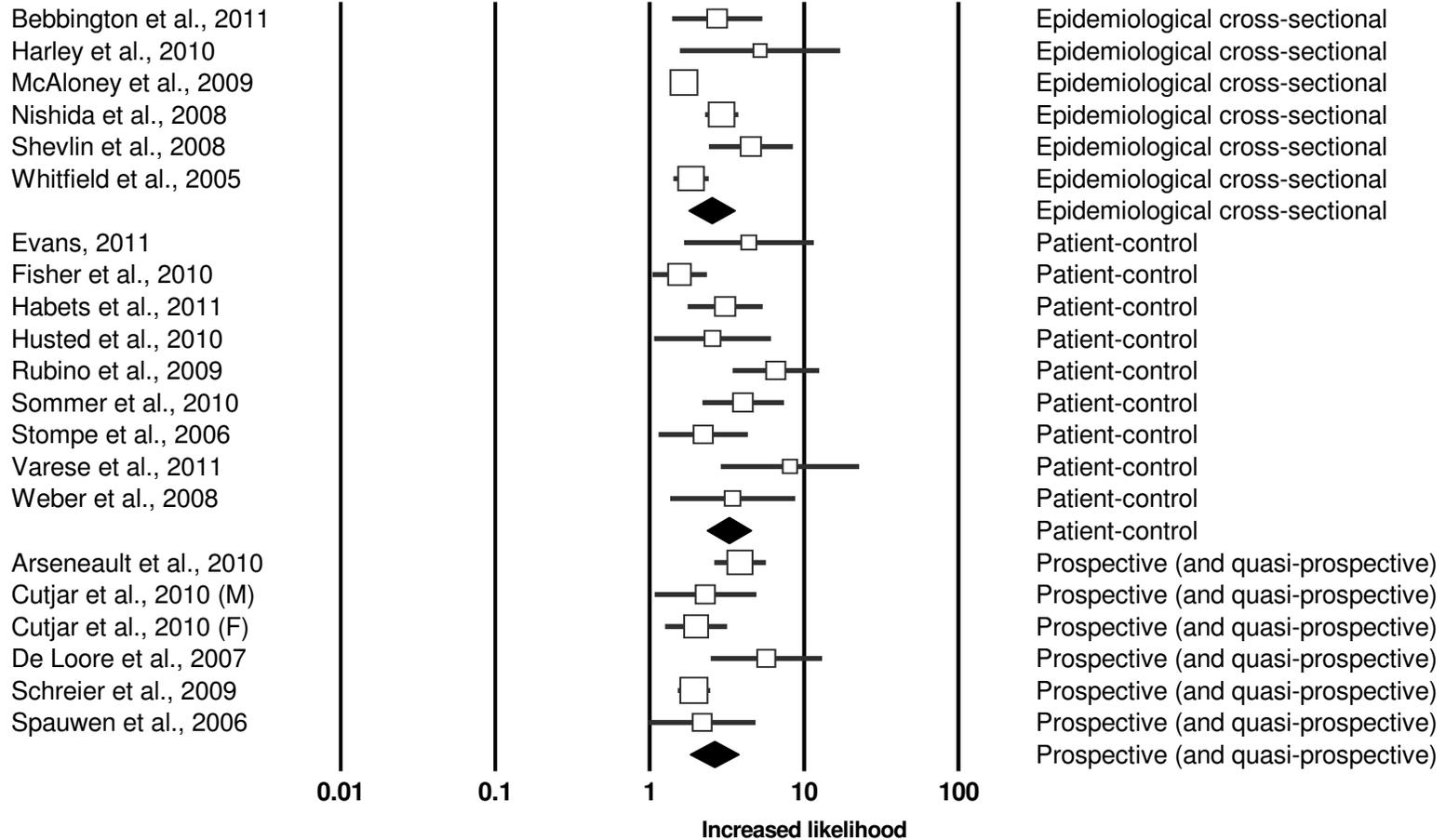
The analysis refers to studies focusing on EARLY adversity (exposure to trauma, bullying, parental death etc before the age of 18) and psychosis (both diagnostic and dimensional outcomes) with the following designs:

- epidemiological cross-sectional studies
- prospective studies (and quasi prospective studies)
- patient control studies

Association between trauma and psychosis

Study name

Odds ratio and 95% CI



Does repeated exposure to threat lead to psychosis?: A meta-analysis

The findings suggest a significant association between trauma and psychosis across all different reserach designs (patient-control studies:

- patient-control studies: OR = 3.3
- epidemiological cross-sectional: OR = 2.5
- prospective: OR = 2.6

Is there a specific association between victimization and paranoia?

Mirowski and Ross (1981) reported data on paranoid beliefs from a community survey of residents of El Paso and Juarez. Paranoia was associated with an external locus of control and experiences of victimization and powerlessness.

Janssen et al. (2003), in an epidemiological study of 7000+ Dutch citizens, found that experiences of discrimination predicted the later development of paranoid symptoms.

The high risk of psychosis in immigrant groups (Harrison et al., 1988), especially those living in relative isolation from other immigrants (Boydell et al. 2001) might be explained in this way.

Attachment: A developmental vulnerability?

Dozier et al. (1991, 1995) found that schizophrenia patients, especially with paranoia, most likely to have dismissing-avoidant attachment style.

Community surveys of 8000 adults (Mickleson et al., 1997) and 1500 adolescents (Cooper et al., 1998) also show psychosis, especially paranoia, associated with insecure attachment.

Early separation from parents (Morgan et al. 2006) and being unwanted at birth (Myhrman et al. 1996) increase the risk of psychosis in later life.

Pickering, Simpson & Bentall (2008)

503 students completed online questionnaires:

- The PADS (Melo et al. in press)
- The Launay–Slade (1981) Hallucination Scale
- Bartholomew and Horowitz's (1991) Relationship Questionnaire
- Levenson's multidimensional locus of control scale
(Externality, Chance, Powerful Others)
- Positive and negative self-esteem (Nugent & Thomas, 1993)
- Anticipation of threatening events (Bentall et al. in press)

Insecure attachment predicted paranoia when hallucinations were controlled for:

$R^2 = .53$, for model including attachment anxiety, negative self-esteem, anticipation of future threat, the recall of threat and powerful others

Insecure attachment did not predict hallucinations when paranoia was controlled for.

Specificity of adversities for paranoia

Data from the 2007 Adult Psychiatric Morbidity Survey (N = 7000+), which has measures of psychotic symptoms, and different kinds of childhood adversity.

Table 1: Odds ratios and their associated 95%CI for the effects of childhood sexual abuse, victimization and separation variables on auditory verbal hallucinations (AVHs) and paranoid delusions.

	Demographics adjusted ^a		Comorbidity adjusted		Adjusted for trauma types ^e	
	AVHs ^b	Paranoia	AVHs ^b	Paranoia ^c	AVHs ^d	Paranoia ^e
Rape	10.6 [4.9, 23.1]	3.2 [1.2, 8.5]	9.0 [3.4, 24.2]	1.9 [0.5, 7.2]	4.2 [1.1, 15.4]	0.9 [0.3, 2.8]
Sexual touch	4.7 [2.5, 8.7]	3.0 [1.5, 5.7]	4.3 [2.1, 9.0]	2.4 [1.1, 5.3]	1.5 [0.4, 5.3]	1.1 [0.4, 2.9]
Sexual talk	4.1 [2.2, 7.8]	3.1 [1.7, 5.5]	3.7 [1.8, 7.9]	2.6 [1.4, 5.1]	1.8 [0.6, 5.2]	1.8 [0.8, 4.5]
Physical abuse	3.9 [1.6, 9.3]	5.9 [3.3, 10.7]	2.9 [1.1, 7.7]	5.4 [3.0, 9.9]	1.7 [0.5, 6.4]	4.3 [2.2, 8.5]
Bullying	1.9 [0.9, 3.9]	1.6 [0.9, 2.8]	1.9 [0.8, 4.2]	1.5 [0.8, 2.8]	1.2 [0.5, 2.7]	1.2 [0.7, 2.1]
Institutionalized	3.9 [1.5, 10.0]	6.0 [3.0, 11.7]	2.7 [0.9, 8.3]	5.4 [2.7, 11.1]	1.45 [0.3, 6.6]	3.6 [1.7, 7.6]
LA care	3.1 [1.0, 9.2]	3.2 [1.3, 8.1]	2.5 [0.7, 9.2]	3.0 [1.1, 8.1]	0.9 [0.1, 6.3]	1.4 [0.5, 3.7]

Note. ^a Demographic confounds included age, gender, IQ, social class, education and ethnicity; ^b AVHs analyses were adjusted for concurrent paranoia (in addition to demographic confounds); ^c Paranoia analyses were adjusted for concurrent AVHs (in addition to demographic confounds); ^d AVHs analyses adjusted for other early adversity predictors (in addition to demographic factors and paranoia); ^e Paranoia analyses adjusted for other early adversity predictors (in addition to demographic factors and AVHs).

3: Psychological mechanisms

Psychological processes that have been implicated in paranoia

Jumping to conclusions (e.g. Garety et al. 2001):

Patients with delusions tend to ‘jump to conclusions’ (make a decision about uncertain events) on the basis of little information

- Typically measured by ‘the beads task’
- Well replicated finding
- Seems to be associated with delusions rather than specifically paranoia

Jumping to conclusions bias

Huq, Garety & Hemsley (1988)



Participants shown 2 jars with beads of two colours, in ratios of 80:20 and 20:80. A sequence of beads is shown, apparently from one of the jars. Participants had to guess which jar.

Participants with delusions tended to ‘jump to conclusions’, guessing after fewer draws. Although well-replicated (Young & Bentall, 1997)

Psychological processes that have been implicated in paranoia

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Patients with delusions tend to ‘jump to conclusions’ (make a decision about uncertain events) on the basis of little information

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Theory of mind (e.g. Corcoran & Frith, 1996):

It has been argued that paranoid patients have difficulty in understanding other people’s thoughts and feelings (they have a poor ‘theory of mind’)

- Assessed by false belief stories, hinting tasks or even appreciation of jokes
- Psychotic patients perform poorly on ToM tasks, but specificity to paranoia is not proven

Attributions (e.g. Kaney & Bentall, 1989):

Attributional (Explanatory) Style

People make explanations ('attributions') for noteworthy events many times in a single day. 'Attributional style' refers to individual differences in the way that we construct explanations. Eg. from the Attributional Style Questionnaire (ASQ):

You fail an exam. Write down one possible cause _____

Internal _____

Totally due to me

Unstable _____

I can change it

Global _____

It will affect all areas of my life

External

Due to others or
circumstances

Stable

I can't change it

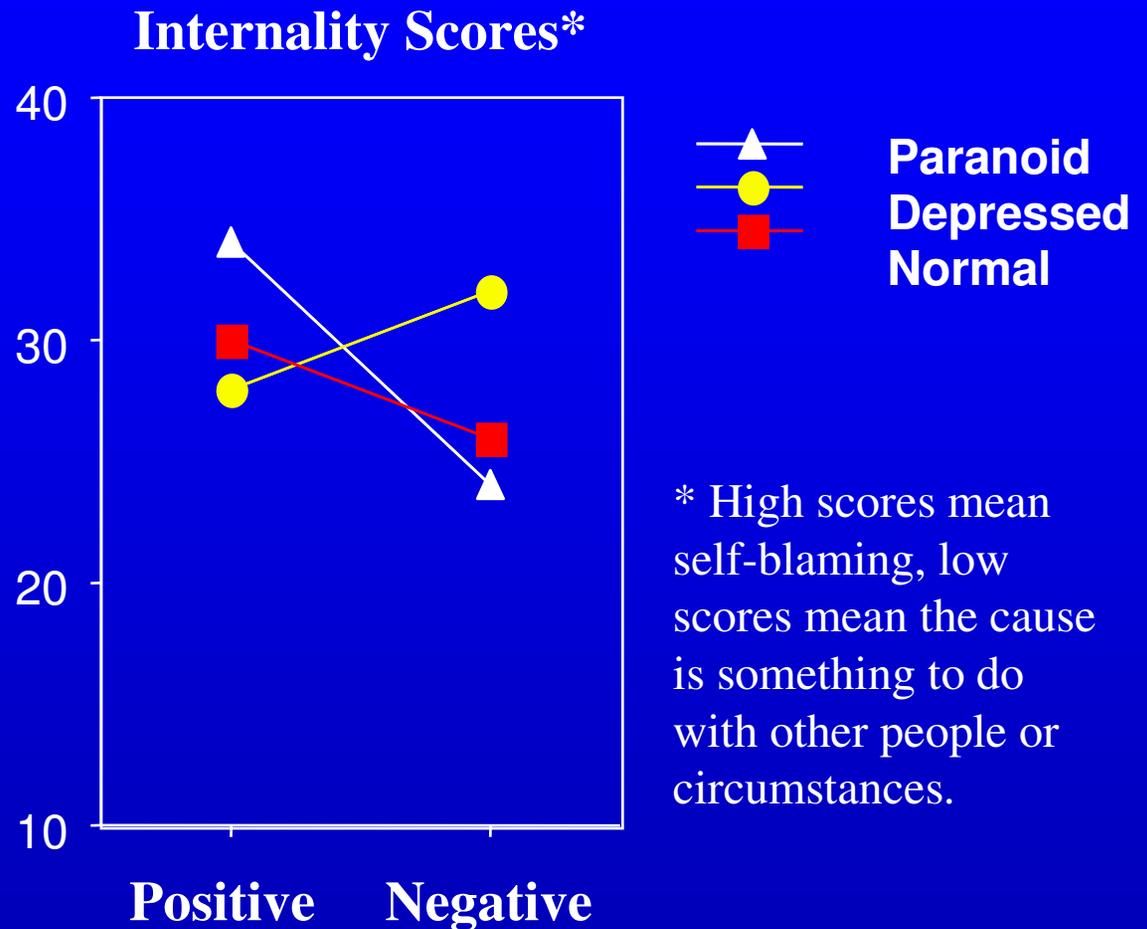
Specific

It will only affect
examinations

Attributional (Explanatory) Style

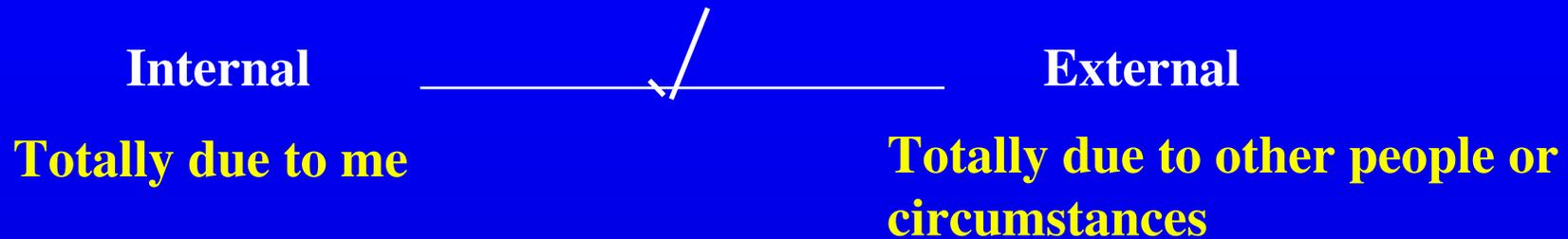
Fundamental observation:
Paranoid patients make abnormal attributions

Eg. Kaney & Bentall (1989) using the ASQ, found that paranoid patients made excessively stable and global attributions for negative events. More importantly, they showed an extreme self-serving bias.



3 loci of causal attribution?

Research suggests that the bipolar internality scale of Peterson et al's (1982) ASQ:

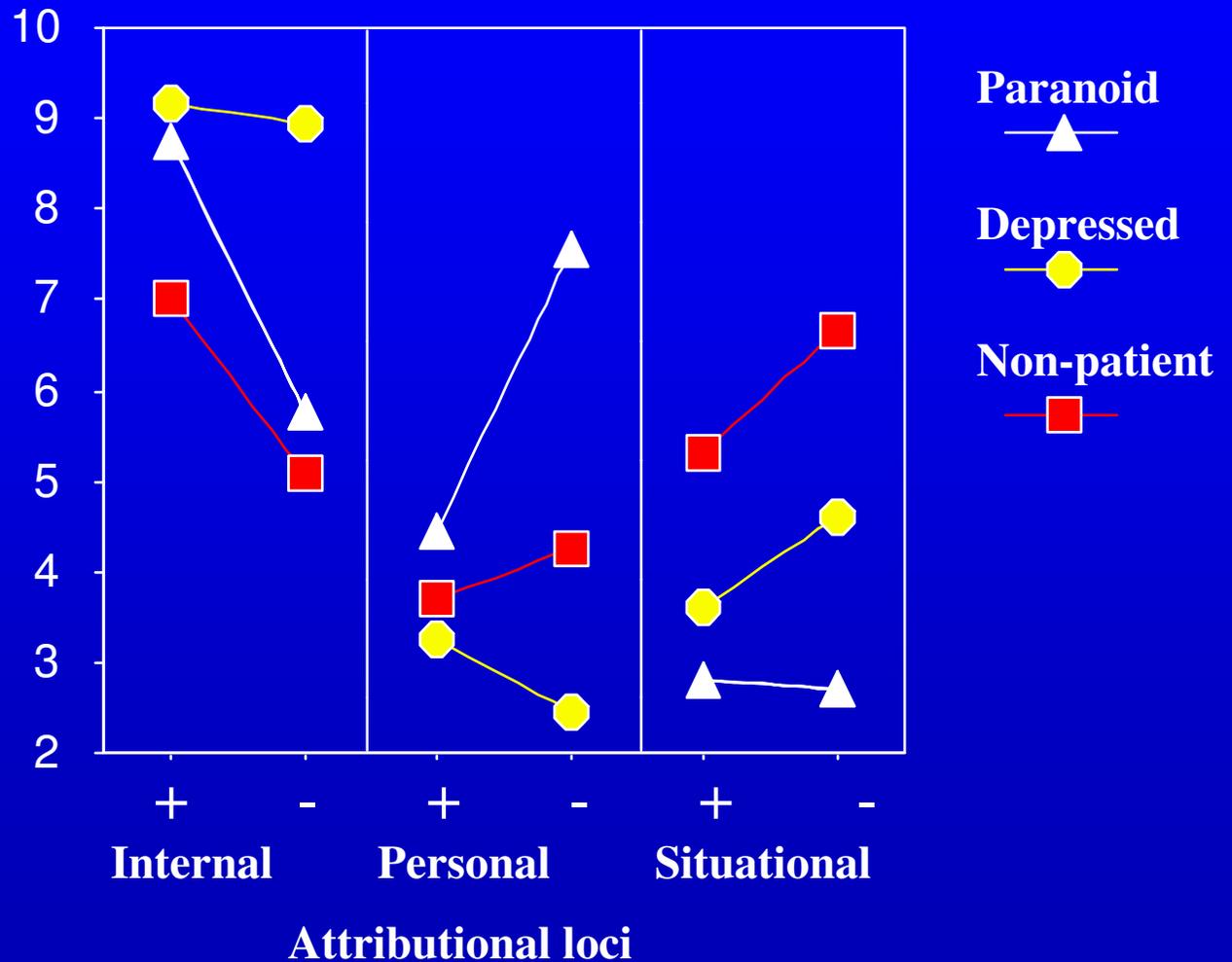


is in need of revision. Kinderman & Bentall (1996) have suggested a three-way categorization of the internality dimension :

Internal	Totally due to me
External Personal	Totally due to another person or other people
External Situational	Totally due to the situation (circumstances or chance)

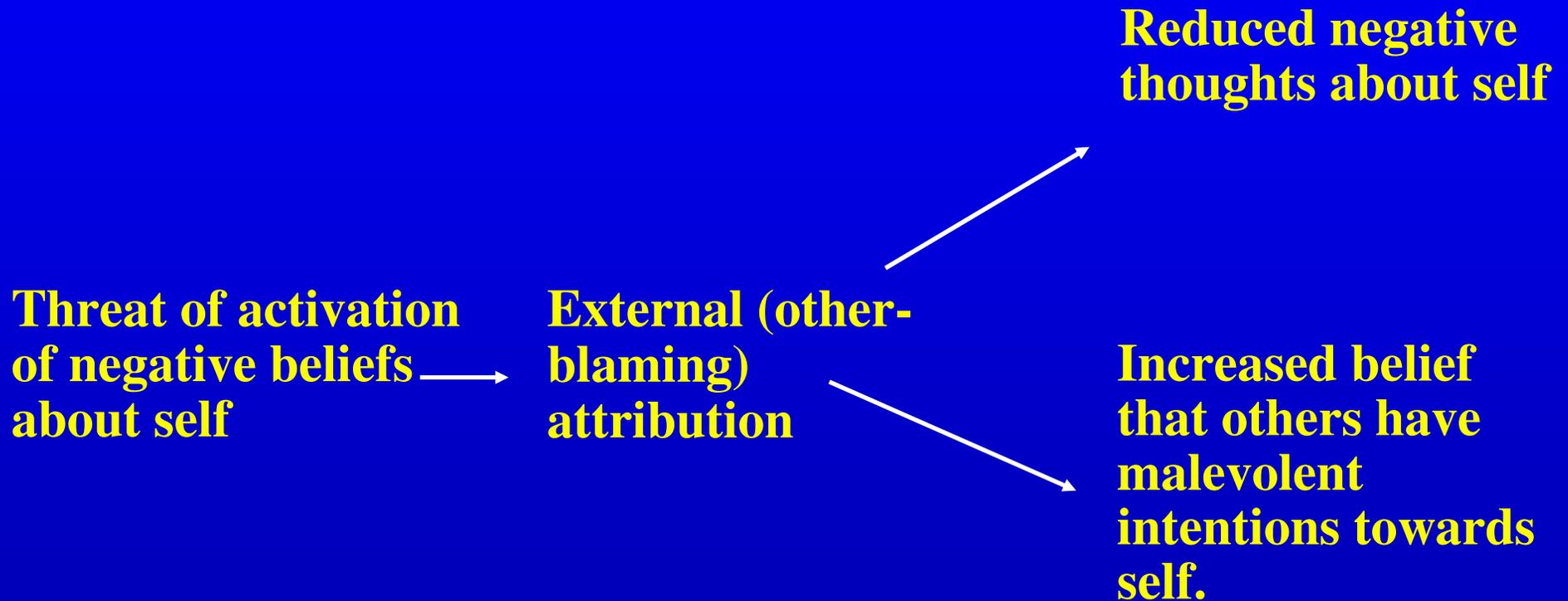
3 loci of causal attribution?

Kinderman & Bentall (1997) examined the tendency to make fewer internal attributions for negative events, and the tendency to make personal as opposed to situational external attributions in paranoid, depressed and non-patient participants.



The original attributional model

Bentall, Kinderman & Kaney (1994) proposed that an externalizing attributional style minimizes accessibility of negative self-schemas at the expense of generating paranoid beliefs.

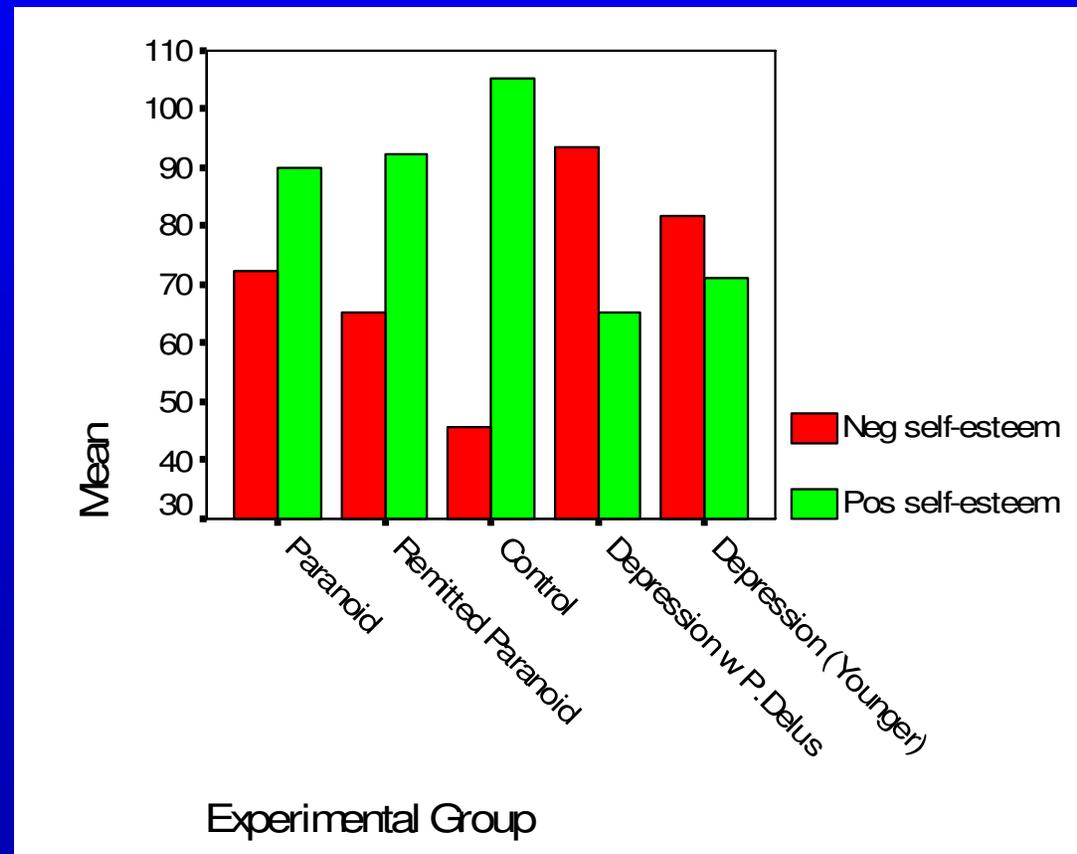


Problem #1: The relationship between self-esteem and paranoia (Bentall et al., 2008)

Wellcome Paranoia Study: Schizophrenic paranoid (N=38), remitted schizophrenic paranoid (N=27), depressed paranoid (N=18), depressed non-psychotic (N=27) and control participants (N=33) (Bentall et al., in press.)

Correlations between negative self-esteem & paranoia (Fenigstein Scale)

	<u>Spearman r</u>
SZ-P	.32
SZ-R	.41*
DEP-P	.42
DEP-NP	.53*
Control	.39*



Thewissen, Bental, Lecomte, van Os & Myin-Germeys (2008)

- Patients with positive psychotic symptoms (n=79), individuals with an at-risk mental state for paranoid psychosis (n=38), and control subjects (n=38) assessed using experience sampling method (ESM).
- 6 day diary, 10 bleeps/day:
 - 4 items measuring momentary self-esteem
 - Other items measuring context, significant experiences and attributions



Thewissen, Bentall, Lecomte, van Os & Myin-Germeys (2008)

Paranoia was associated with average low self-esteem, an effect that survived correction for depression but not SE instability. More importantly paranoia also independently related to SE stability:

SE instability	Confounders	n	β (SE)	p
Momentary level ¹	-	155	.11 (.03)	p<.001
	sex, depression	155	.10 (.03)	p<.01
	sex, depression, SE level	155	.09 (.03)	p<.01
Day level ¹	-	155	.21 (.06)	p<.01
	sex, depression	155	.20 (.07)	p<.01
	sex, depression, SE level	155	.17 (.07)	p=.01
Subject level ²	-	155	.13 (.03)	p<.001
	sex, depression	155	.13 (.04)	p<.001
	sex, depression, SE level	155	.11 (.03)	p<.01

1 Multilevel linear random regression model, β can be interpreted identically to the regression outcome in a unilevel linear regression model.

2 Unilevel linear regression model * p<0.05; ** p<.01; *** p<.001

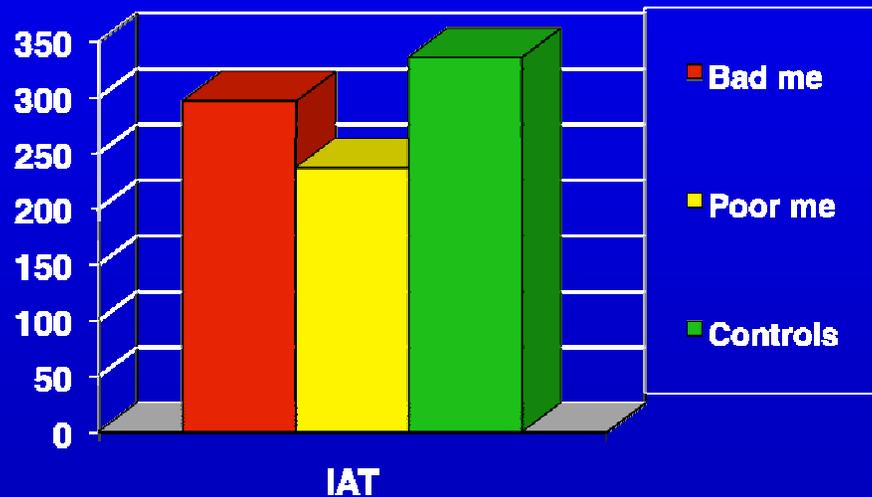
Fluctuations and PM vs BM (Udachina et al. in prep)

ESM study with 14 PM and 15 BM patients. 15 remitted patients and 23 controls also assessed. Self-esteem and deservedness measured at each beep.

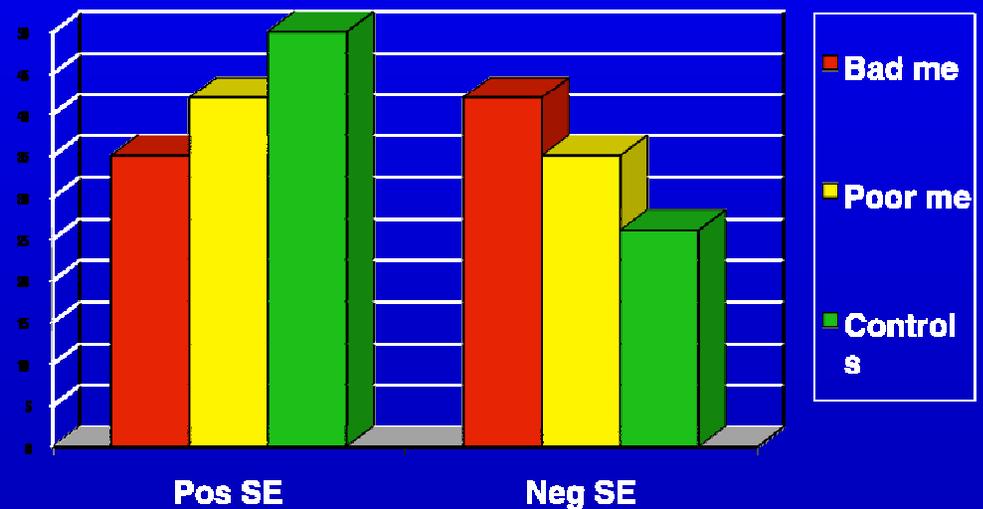
- Deservedness was predicted by concurrent self-esteem.
- Onset of paranoia was predicted by drop in self-esteem from the previous beep.
- In BM patients, increases in paranoia were followed by *decreases* in self-esteem at the next beep.
- In PM patients, remitted patients and controls, increases in paranoia were followed by *increases* in self-esteem at the next beep.

Grey, Evans, Valiente & Bentall (in prep)

Two studies have reported that paranoid patients sometimes show low implicit self-esteem but relatively preserved explicit self-esteem (Moritz & Woodward, 2005; McKay et al. 2005). We measured implicit (Implicit Attitudes Test) vs explicit SE (Nugent & Thomas's scale) in poor-me patients, bad-me patients and controls.



PM = BM < C



All groups sig different

Problem #2: Is the association between attributions and paranoia replicable?

Associations between attributions and clinical paranoia have a ‘now-you-see-it, now-you-don’t’ aspect:

Replications:

- *Candido & Romney (1990) (Canada)*
- *Fear et al. (1996) (Wales)*
- *Lassar & Debbelt (1998) (Germany)*
- *Lee & Wong (1998) (South Korea)*

Partial replications:

- *Kristev et al. (1999) (Australia; partial replication)*
- *Martin & Penn (2002)*
- *McKay et al. (2005)*

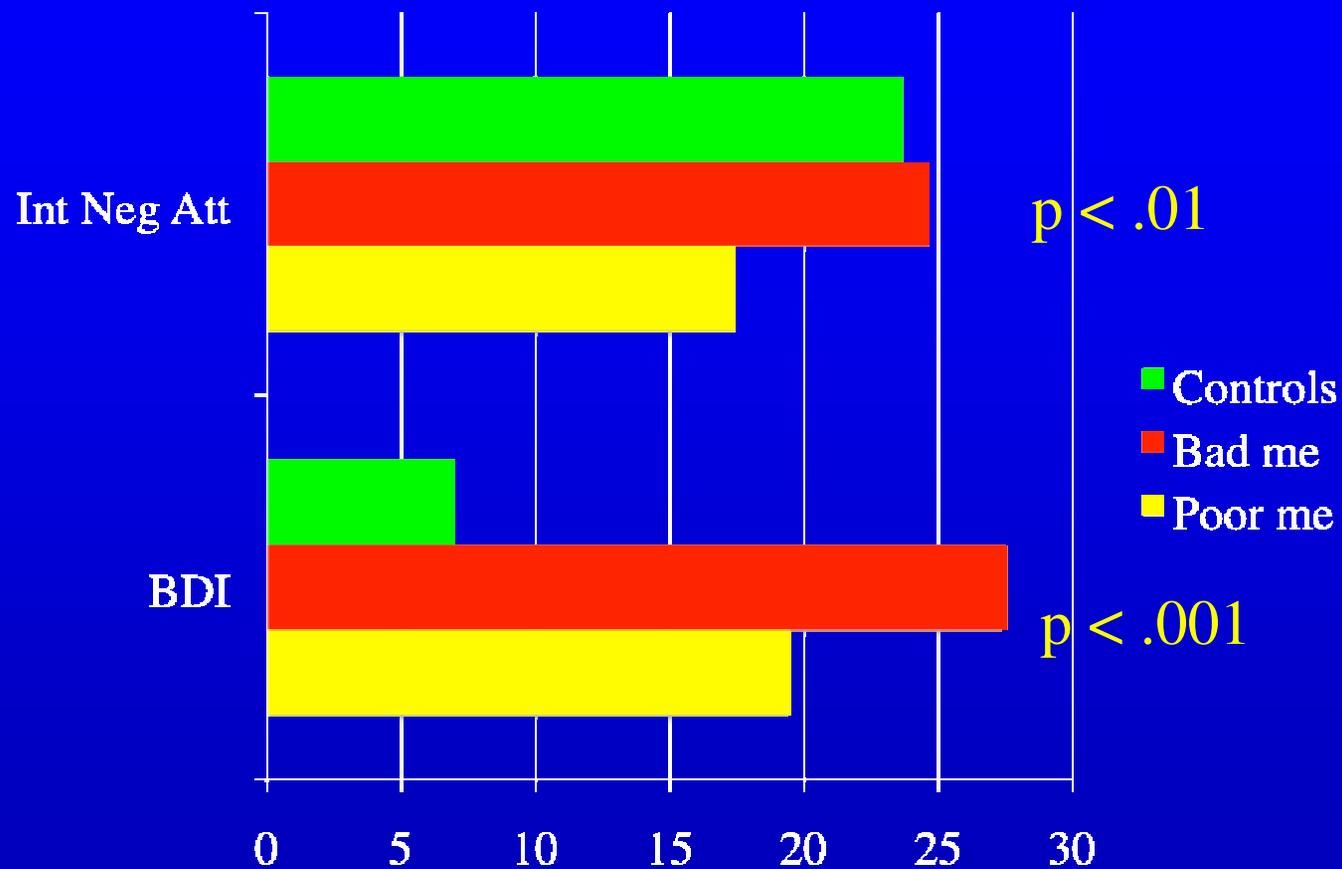
Complete failures to replicate:

- *Humphries and Barrowclough (2006)*

Attributional abnormalities present in acute paranoid but not ‘normal’ paranoids

- *Janssen et al (2006)*
- *McKay et al. (2005)*
- *Martin & Penn (2001 – non-patients) vs Martin & Penn (2002 – patients)*

Attributions and deservedness (Melo et al., 2006)



* Low attribution scores indicate external attributions for negative events

Take home message from Part 3

- **Negative self-esteem seems to be a very important factor in paranoia.**
- **Self-esteem is also highly unstable in paranoia (possibly relating the dynamic transitions between poor-me and bad-me beliefs)**
- **Excessively external attributions for negative events are only found in acutely ill poor-me patients when they are ‘poor me’**
- **Poor me paranoia is also associated with discrepancies between implicit and explicit self-esteem.**

4: Are all of the theories correct?

Must everyone get prizes?

In our recent Wellcome Trust funded study we combined data from the following groups (Bentall et al. 2009):

- Schizophrenia patients with paranoid delusions
- Schizophrenia patients with paranoid delusions in remission
- Depressed patients with paranoid delusions
- Depressed patients without paranoid delusions
- Patient with late onset (aged => 65) schizophrenia-like psychosis with paranoid delusions
- Elderly (aged => 65) depressed patients without paranoid delusions
- Healthy controls

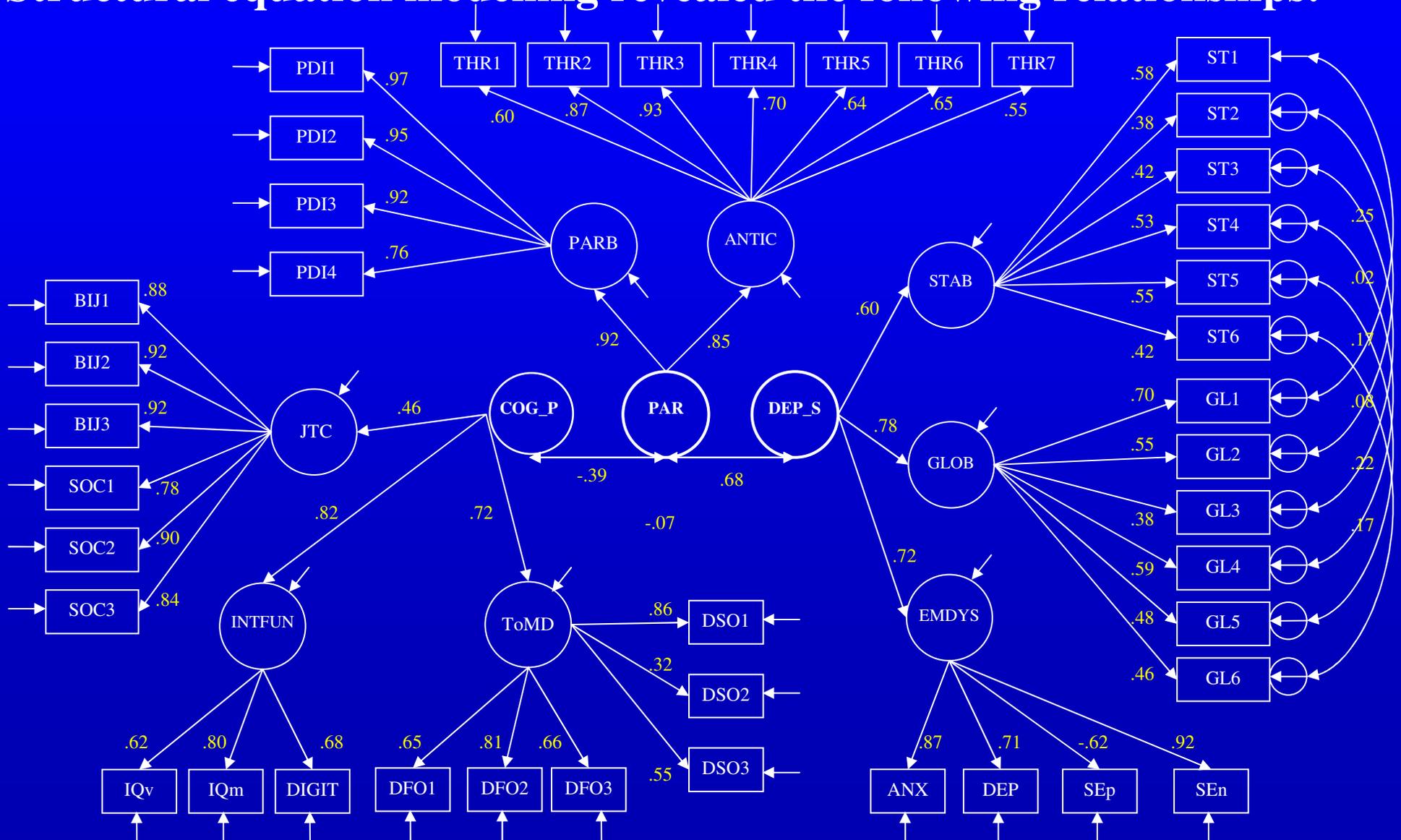
Must everyone get prizes?

And modelled the relationships between measures of:

- Paranoid beliefs
- Threat anticipation
- Attributional style (excluding internality)
- Self-esteem (positive and negative)
- Depression and anxiety
- Theory of mind (2 measures)
- Jumping to conclusions (2 measures)
- Cognitive (executive) function (short WAIS and digit span backwards)

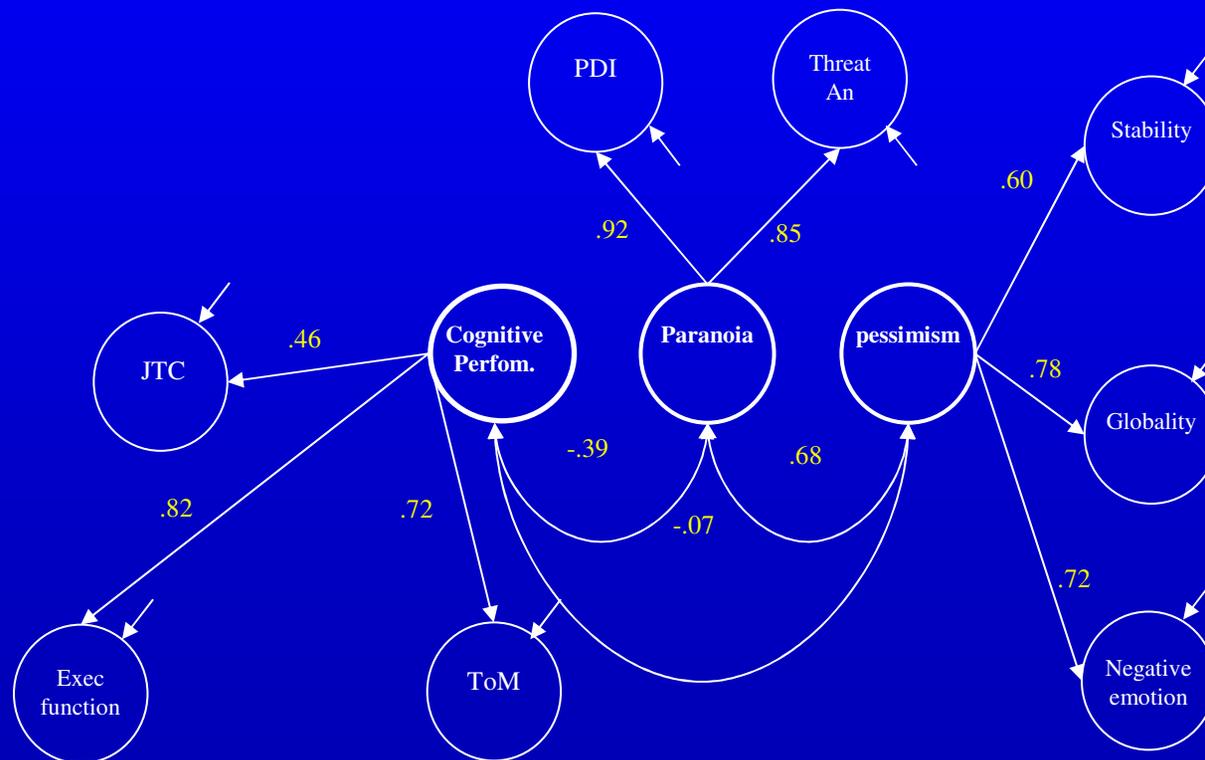
Could all of these theories be true?

Structural equation modelling revealed the following relationships:



Could all of these theories be true?

Structural equation modelling revealed the following relationships:



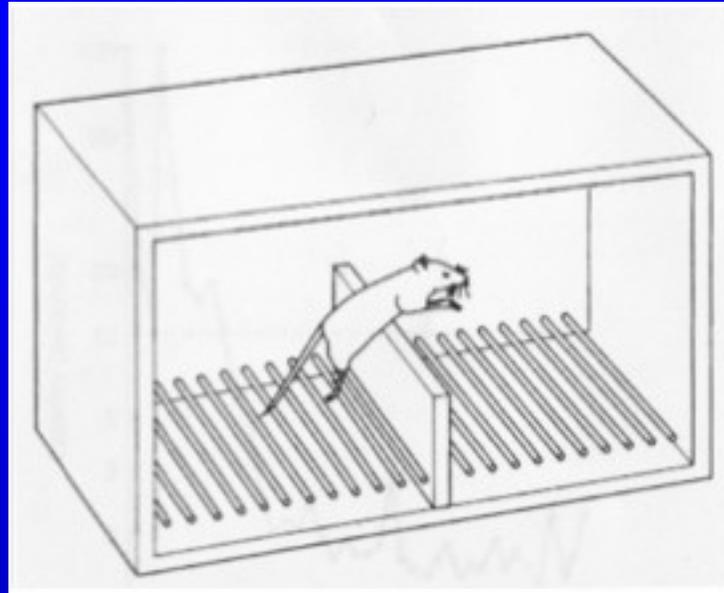
Take home message from Part 4

- **There is evidence to support the role of multiple psychological processes in paranoia**
- **These can be broadly grouped into two classes: emotional (self-esteem and attributions) and cognitive (executive function?)**
- **Emotional factors seem to be more important**
- **BUT the idea of a paranoid defence seems to still have some mileage with respect to poor-me delusions in acutely ill patients**

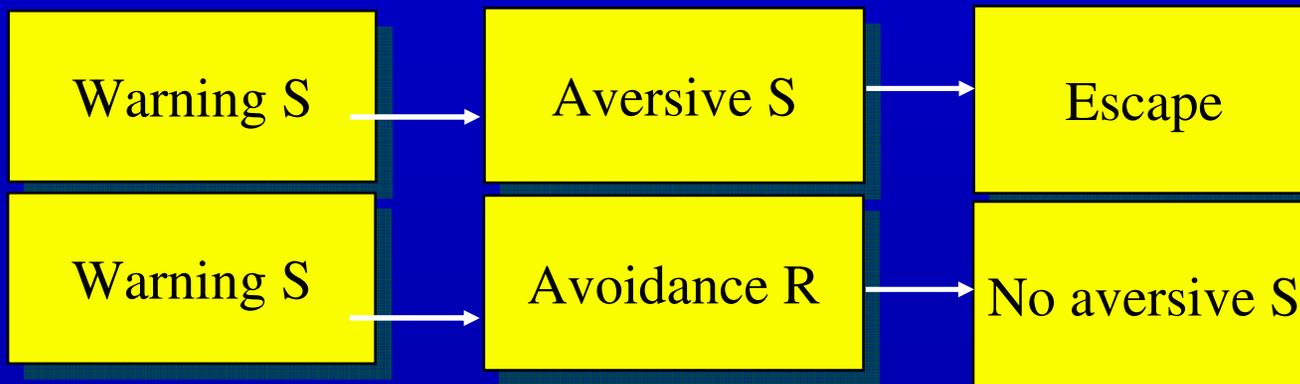
5: Some biological speculations

The conditioned avoidance paradigm

The animal is placed in a shuttle box, in which it can receive a warning signal and an electric shock.

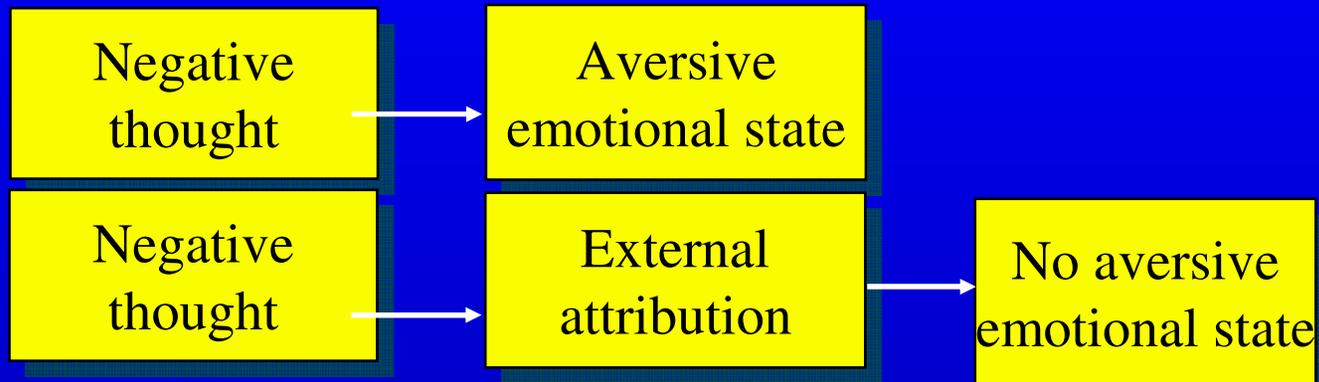


Note that learning continues (decreased response latencies) long after 100% avoidance is achieved.



How does CAR relate to paranoia?

Could attributional responses seen in poor-me paranoia be construed as covert avoidance responses?



The CAR and dopamine

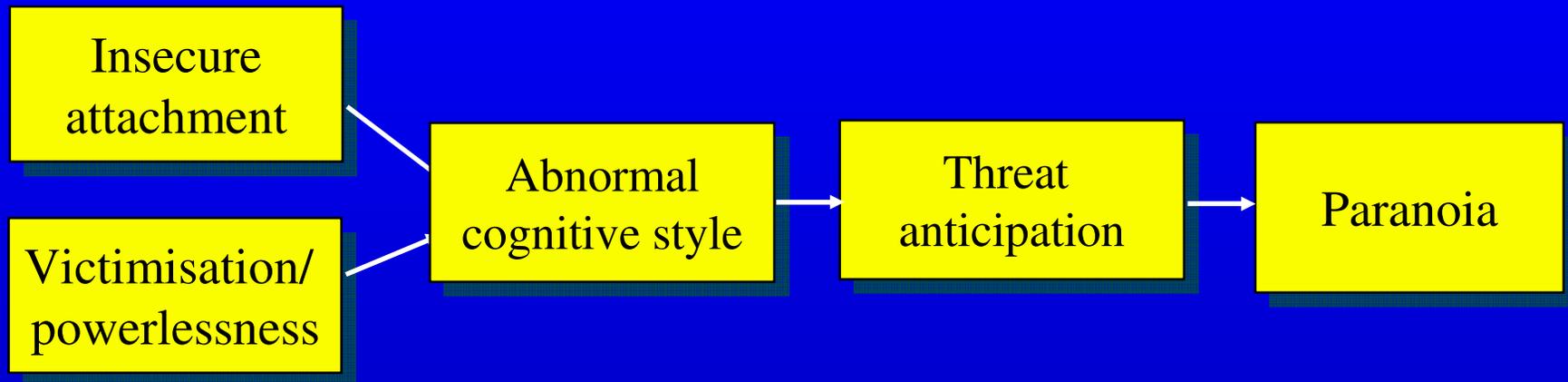
Drugs which block d-2 receptors in the striatum have a powerful therapeutic effect on patients who experience persecutory delusions.

Dopamine-blocking drugs abolish the conditioned avoidance response (CAR) in animals (Beninger et al., 1980; Smith et al. 2005), but not escape responding – suggests a role for dopamine in threat perception. Hence, the CAR has long been used as initial screen for antipsychotic drug action.

Animal studies show that repeated exposure to social defeat in animals leads to sensitization of the dopamine system (Selten, 2005).

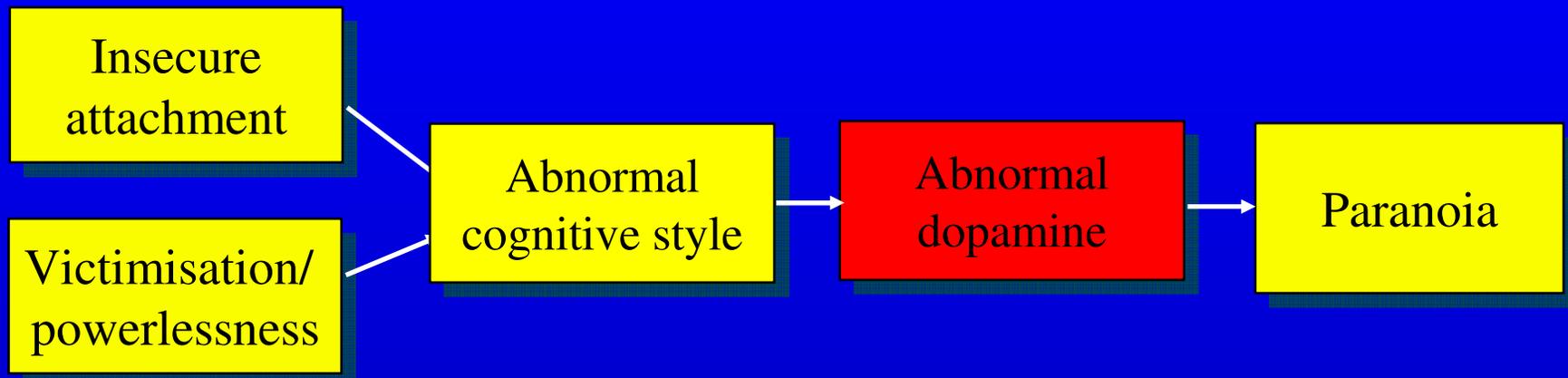
Paranoia as the end point of a developmental pathway

Psychological description:



Paranoia as the end point of a developmental pathway

Biological description:



Conclusions

- **There seems to be a discontinuity between moderate and severe paranoia**

	<u>Moderate Paranoid</u>	<u>Severe Paranoia</u>
Type of delusion	Bad-me	Poor-me, but switching to bad-me
Context dependency	Dependent	Independent
Self-esteem		
Implicit	Low	Low
Explicit	Low	Higher
Stability	Less unstable	Highly unstable
Attributions	Normal	External for negative events
Biological mediator	?	Hyper-dopaminergia?
Antipsychotic responsive	No	Yes

Conclusions

- Paranoia can be explained in terms of the interaction between a relatively small number of cognitive and emotional processes
- It is possible that the biological mediator of some of these processes is the striatal dopamine system
- Abnormal cognitive functioning, leading to paranoid ideas, may be the consequence of particular types of adverse life experiences (insecure attachment and victimization).
- *Genetic speculation (possibly naive):* The A1 allele of the DRD2 gene is associated with lower striatal D2 receptor density and poor avoidance learning (Klein et al. 2007) - it should therefore be protective against paranoia!

Clinical implications and further directions

- It seems likely (but not certain at this stage) that transition to psychosis from the prodromal state is associated with a switch from bad-me to poor-me. Consistent with this, we have found that low self-discrepancies (good self-esteem) is positively associated with psychosis in a prodromal sample (Morrison et al. 2006).
- We can hypothesize that the shift from bad-me to poor-me on transition to psychosis (if it occurs) is a result of attempts to avoid negative thoughts (consistent with the assumptions behind Bach & Hayes' (2002) Acceptance and Commitment Therapy version of CBT for psychosis)

Implications and further directions

- **This conjecture needs to be tested in future studies:**
 - **Longitudinal investigations of deservedness beliefs and avoidance behaviours in high risk samples**
 - **Experimental, genetic and neuroimaging studies of avoidance learning in clinical samples**
 - **Tests of new psychological interventions designed to prevent abnormal avoidance behaviour.**

That's all folks!