



Bolton, Salford and Trafford 
Mental Health NHS Trust




*Personality and Neuropsychological Correlates of
Violence in Schizophrenia*

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Mersey Care 
NHS Trust

*Factors associated with violence in
schizophrenia*



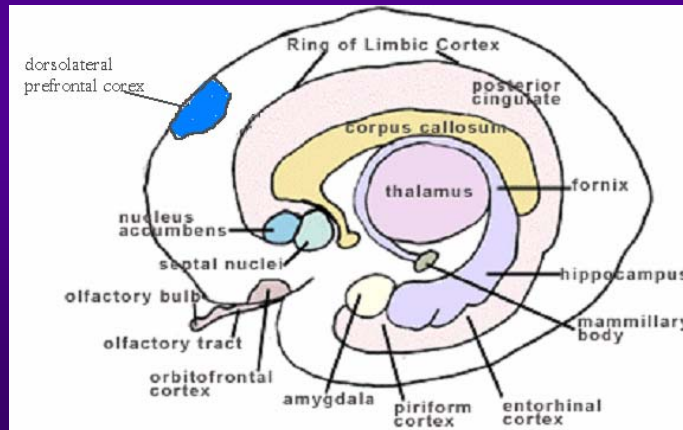
- Mixed evidence for positive symptoms such as hallucinations and delusions (Taylor, 1998; Haefner & Boker, 1982; Noble & Rodger, 1989; Lowenstein et al, 1990; Noble and Rodger, 1989; Krakowski and Czobor, 1997; Taylor, 1985; Zisook et al, 1995; Monahan et al, 2000; Cheung et al, 1997; Applebaum et al, 2000)
- Some evidence for negative symptoms (Bowie et al 2001; Cheung et al 1997).
- ASPD and psychopathy (Hodgins et al, 2003; Tengström, 2000)





Schizophrenia and violence: Neuropsychological function

Dorsolateral prefrontal cortex (DLPFC),
orbitofrontal/ventrolateral prefrontal (OFC/VPFC) and
amygdala



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Schizophrenia and violence: Neuropsychological function

- Correlational studies
 - Forster (1993) Stroop performance but not Wisconsin Card Sort Test (WCST) performance associated with violence
 - Lapierre et al (1995) poor WCST and Go/Nogo associated with violence

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Schizophrenia and violence: Neuropsychological function

- Group comparisons
 - Rasmussen et al (1995) violent patients worse on Go/Nogo
 - Lafayette et al (2003) no difference between violent and non-violent patients on Stroop or WCST
 - Barkataki (2005) violent patients worse on WCST, no difference on Tower of London
 - Silver (2005) violent pts better face affect recognition



Schizophrenia and violence: Neuropsychological function

- Problems
 - Small sample sizes
 - lack of, or highly inadequate control for comorbid personality disorders
 - focus on community violence
 - Few concurrently assess tasks that are differentially sensitive to DLPFC or OFC/MLPFC function
 - Retrospective analysis of aggression





Aims

- To examine the relationship between inpatient violence in a well characterised cohort of forensic patients with schizophrenia and:
 - Psychopathy,
 - Assessments of impulsive/aggressive and psychopathy related personality traits/interpersonal styles
 - Symptomatology
 - Performance on neurocognitive assessments that are differentially sensitive to DLPFC, VMPFC/OFC and amygdala function,



Hypotheses

- Compared to non-violent patients, those who exhibit inpatient violence will have
 - higher rates of co-morbid psychopathy, and higher scores on assessments of impulsive/aggressive, and psychopathy related personality traits
 - a range of executive (frontal function), and emotional information processing deficits (amygdala function)
 - have higher positive symptom scores
- Neurocognitive and personality factors will be better predictors of aggression during a 1 year follow up period than positive or negative symptom scores.



Methods: Participants

- 82 male patients with schizophrenia recruited from high and medium secure hospitals (Edenfield Centre, Manchester and Ashworth Hospital)
- Aged 18-60
- No history of significant head injury



Methods: Assessment of inpatient violence

- Official institutional records
 - Physical aggression since admission
 - verbal/physical aggression during one year follow-up
- Split into violent (V) and non-violent (NV) groups based on involvement in one or more physically aggressive incident since admission

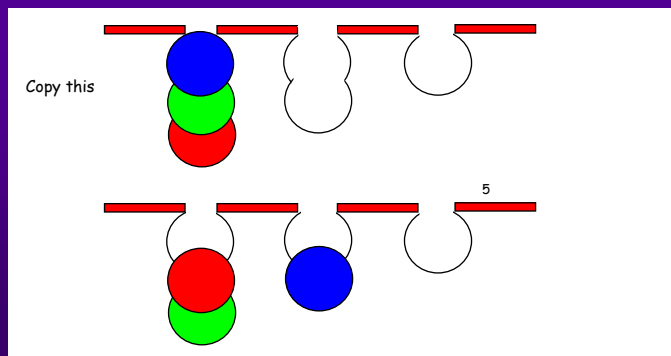




Methods: Neuropsychological assessment

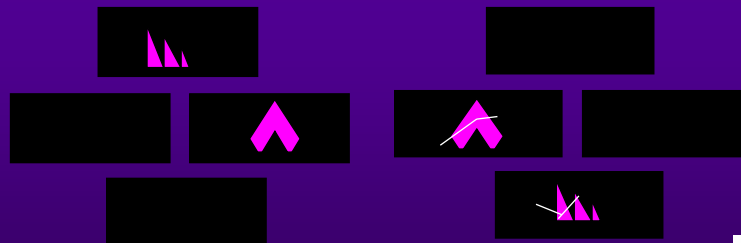
Task sensitive to Dorsolateral Prefrontal Cortex
function

- Stockings of Cambridge (SOC)



Methods: Neuropsychological assessment

Intra/Extra Dimensional Shift (IDED)- DLPFC





Methods: Neuropsychological assessment

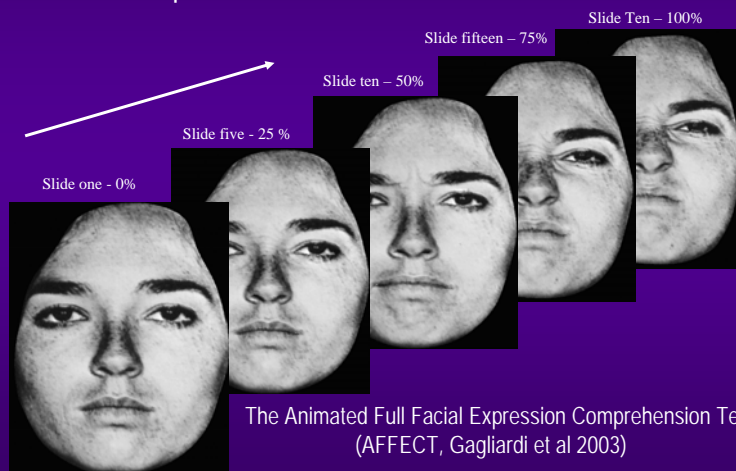
Tests sensitive to Orbitofrontal/ventrolateral prefrontal cortex dysfunction

- Go/NoGo and STOP tasks
- Press when you see a plane
- Do not press when you see a bomb
- Test of behavioural inhibition



Methods: Neuropsychological assessment

Neuropsychological Assessment: Animated Full Facial
Comprehension Test





Methods: Assessment of Personality and symptomatology

- Psychopathy Checklist - Screening Version (Hart et al, 1995)
- Antisocial personality questionnaire (APO, Blackburn & Fawcett, 1996)
- Chart of Interpersonal Reactions in Closed Living Environments (CIRCLE, Blackburn & Renwick 1996)
- Positive and Negative Syndrome Scale (PANSS Kay et al, 1987)



Results: Participant characteristics



	Non violent patients (NV) (n = 49)		Violent patients (V) (n = 33)		t-value (df 80)	Significance
	Mean	SD	Mean	SD		
Age	36.84	9.36	35.52	9.61	.62	NS
Yrs in education ^a	11.24	1.90	10.97	1.65	.68	NS
Length of current admission yrs (min 0.17, max 25.80) ^a	3.40	4.44	6.48	6.55	.58	NS
Illness duration in years since first psychiatric admission	11.24	9.12	12.58	9.20	-.60	NS
Age of first offence	18.69 ¹	6.43	17.47 ³	4.52	.68 (df 76)	NS
Number of previous offences ^b	8.76	12.13	13.19 ²	15.11	-1.89 (df 78)	NS
Medication mg per day converted into standard Chlorpromazine units ^b	461.84	362.75	572.99	454.53	-.91	NS

SD = Standard Deviation; NS = Not Significant; ¹n=48; ²n=31; ³n=30; ^a performed using log transformed data; ^b analysis performed using square root transformations.





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Results: Personality

- Significantly higher proportion of the V group met the criteria for psychopathy (39.4%) vs. (14.3%) ($X^2 = 12.17, p=0.001$). The V group have significantly higher psychopathy scores than the NV group
- V group have higher impulsive aggressive personality traits and a more dominant, hostile and coercive interpersonal style

	NV mean (SD)	V mean (SD)	T	Sig
APO Impulsivity	13.56 (7.24)	19.19 (7.20)	-3.31	P=.001
CIRCLE dominant	7.41 (6.41)	10.75 (7.28)	-2.419	P=.018
CIRCLE coercive	7.39 (8.65)	14.66 (10.09)	-3.604	P=.001
CIRCLE hostile	7.83 (6.15)	10.88 (6.47)	-2.191	P=.032

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Results: Symptomatology

- No differences between V and NV groups in PANSS positive, negative, depression, or cognitive scales
- V group have higher PANSS excitement scale scores than NV group

	NV n = 49		V n = 33		t-value	Sig
	Mean	SD	Mean	SD		
Positive scale ^a	9.22	5.40	10.52	4.88	-1.392	NS
Negative scale ^a	13.35	6.59	10.73	4.63	1.854	NS
Cognitive scale ^a	7.49	2.27	8.18	2.52	-1.311	NS
Excitement scale ^a	5.69	2.62	7.09	3.21	-2.329	.022
Depression scale ^a	8.33	2.87	8.00	3.00	.585	NS

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Results: Neuropsychology

- The V group had a significantly lower current IQ than the NV group.

	NV (n=49)		V (n=33)		t-value (df 80)	Sig
	Mean	SD	Mean	SD		
NART (NV n=41; V n=22)	105.61	10.53	98.91	14.55	2.101	.040
WASI IQ	94.67	16.33	83.85	16.68	2.917 (df 61)	.005

NV = Non-violent; V = Violent; Sig = Significance.; NART = National Adult Reading Test;
WASI = Wechsler Abbreviated Scale of Intelligence; IQ = Intelligence Quotient; SD = Standard Deviation

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Results: Neuropsychology

- No significant differences between the violent and non-violent groups on the test of planning, set shifting, behavioural inhibition, or face affect recognition
- No significant differences in neuropsychological function when the non-violent group was compared to
 - A group of patients who had committed 4 or more physically violent incidents since admission
 - A group of patients who were violent after their first year of admission
 - A group of patients who were violent during a one-year period

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Prediction of violence during follow-up

- PANSS positive symptom score only significant predictor of *number* of aggressive incidents during the follow-up (linear regression $F(4,57) = 4.88, p=0.002$ accounting for 20.3% of the variance)

	Unstandardised coefficients		Standardised coefficients		Sig
	B	Std error	Beta	T	
PANSS positive score	.12	.05	.35	2.33	P=.023
PANSS excitement score	.12	.11	.20	1.08	NS
CIRCLE dominant	.02	.04	.06	.37	NS
CIRCLE coercive	-.01	.04	-.03	-.17	NS

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Conclusions

- Compared to non-violent patients, violent inpatients with schizophrenia are more psychopathic, and have a more hostile and coercive interpersonal style
- Neuropsychological deficits show no direct relationship to inpatient violence in schizophrenia
 - deficits in OFC/VLPFC and amygdala function may have a secondary relationship via psychopathic personality traits


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Conclusions continued...

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- Positive symptom scores appears to be the best predictor of aggression over a short period of time.....
- BUT.... PANSS positive symptom scores show a significant correlation with psychopathy score ($r=.32$, $p=0.004$)
- Link between pre-morbid personality and current expression of symptoms???




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Clinical Implications

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- Remediation of cognitive deficits in patients with schizophrenia may not necessarily decrease risk for inpatient violence
- There should be a greater awareness of the impact that premorbid personality traits may have on the presentation of patients during psychotic illness
- Helps to inform risk assessments and treatment planning



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Related publications

- Fullam R. and Dolan M. (2006). The criminal and personality profile of patients with schizophrenia and comorbid psychopathic traits. *Personality and Individual Differences*, 40(8): 1591-1602. .
- Fullam R. and Dolan M. (2006) Emotional information processing in violent patients with schizophrenia: Association with psychopathy and symptomatology. *Psychiatry Research*, 141(1):29-37

