Selfishness

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Overview

1. Nature of Selfishness
2. The Selfishness Questionnaire
3. Neural Basis of Selfishness
4. Future Directions

Definition

"Exclusive focus on one's own well-being without concern for others"

Three Forms of Selfishness

1. Egocentric Selfishness
2. Adaptive Selfishness
3. Pathological Selfishness

Selfishness Questionnaire

2 = Agree; 1 = Neither Agree nor Disagree; 0 = Disagree

Overview

1. Nature of Selfishness
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1. Egocentric Selfishness

I don't give to charities

68% vs 11%

Even when I see people in need, I don't feel urge to help them

When it comes to helping myself or others, I help myself

53% no vs 12% yes

I admit I'm quite a selfish person

51% no vs 19% yes

I care a lot about getting what I want

I like buying things for myself even though I have enough

21% no vs 56% yes

I have enough in life to live on, but there are times I just want more

2. Adaptive Selfishness

If there was only one space left on a lifeboat that a child needed, I'd honestly have to take it for myself and my family.
32% no, 29% yes

If the choice was between killing someone or being killed, I'd kill

I would not try to save a drowning person if I could drown too
51% no vs 17% yes

You need to help your own family first before you help others.

Having a focus on oneself can be very adaptive in life

People need to be a little selfish for positive social change to occur
27% no vs 33% yes

Dealing with my own needs, I can make the world a better place
38% no vs 23% yes

3. Pathological Selfishness

Now and again I've manipulated friends to gain an advantage

It's not nice to exploit others, but sometimes you simply need to

54% no 16% yes

It's hard to get ahead in life unless you cut other people's corners here and there

I have to look after myself, even if it costs a loved one

51% no vs 15% yes

I've sometimes dumped friends I don't need

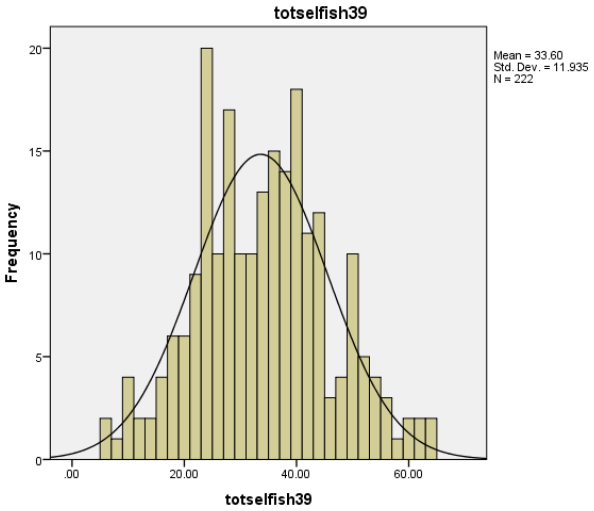
58% no vs 20% yes

Even if it would cause the other person to become depressed, I'd end the relationship if it's in my best interest

24% no vs 45% yes

I love rewards in life, even if there is a cost to others

Selfishness Scale



39 items
N = 230
Total score and three subscales

2 = Agree
1 = Neither Agree nor Disagree
0 = Disagree

Subscale	Mean	SD	Range
Egocentric	10.62	4.56	1 - 22
Adaptive	12.38	4.66	1 - 25
Pathological	10.62	4.89	0 - 24
Total	33.60	11.94	6 - 64

Adaptive higher than Egocentric and Pathological
($d = .38$, $p < .0001$)

Effect Sizes – Cohen's d

Aspirin and reduction in death from heart attack d = .04

Smoking and lung cancer d = .16

SAT scores and later college GPA d = .40

Attention scores and Attention Deficit Disoder d = .60

(Meyer, 2001)

Small effect size: d = .2

Medium effect size: d = .5

Large effect size: d = .8

Correlations (range 0 to 1): approximately half of d

Adaptive higher than Egocentric and Pathological
(d = .38, $p < .0001$)

Construct Validity – Warmth & Altruism

Altruism

I go out of my way to help others if I can
I generally try to be thoughtful and considerate

Warmth

I'm known as a warm and friendly person
I have strong emotional attachments to my friends

	Total Selfishness
	r
Altruism	-.45
Warmth	-.24

Construct Validity - Empathy

Cognitive Empathy

When two people argue I can see each other's point of view.

When someone is disappointed, I can tell by how they look.

Affective Empathy

If I saw my friend being made a fool of, I would feel uncomfortable.

Seeing people sad at a funeral would make me feel sad too.

	Total Selfishness
	r
Cognitive Empathy	-.19
Affective Empathy	-.28

Construct Validity - Psychopathy

Psychopathy

I don't care much if what I do hurts others.

I get in trouble for not considering the consequences of my actions.

	Total Selfishness
	r
Psychopathy	.38

Construct Validity – Proactive and Reactive Aggression

Proactive Aggression

Hurt others to get ahead.

Used physical force to get others to do what you want.

Reactive Aggession

Yelled at others when they have annoyed you.

Reacted angrily when provoked by others.

	Total Selfishness
	r
Proactive Aggression	.38
Reactive Aggression	.26

Construct Validity – Narcissism + Histrionic

Narcissistic

I expect other people to do favors for me even though I do not usually do favors for them.

People have often complained that I did not realize that they were upset.

Histrionic

I need to be the center of attention.

I have a flair for the dramatic.

	Total Selfishness
	r
Narcissistic	.44
Histrionic	.29

Construct Validity - Antisocial and Machiavellian

Antisocial

I don't care if others get hurt so long as I get what I want

I do a lot of things without considering the consequences

Machiavellian

I sometimes try to get others to "bend the rules" for me if I can't change them any other way.

In school or at work, I sometimes try to "stretch" the rules a little bit just to see how much I can get away with.

	Total Selfishness
	r
Antisocial	.29
Machiavellian	.60

Discriminant Validity: Depression + Anxiety

Depression

Sometimes I feel completely worthless

Sometimes things look pretty bleak and hopeless to me

Anxiety

I often feel tense and jittery

Frightening thoughts sometime come into my head

	Total Selfishness
	r
Depression	.10
Anxiety	.02

Discriminant Validity – Assertive + Schizotypy

Assertive

I have often been a leader of groups I have belonged to

Other people often look to me to make decisions

Schizotypal Personality (Odd Beliefs / Magical Thinking)

Do you believe in telepathy?

Can other people feel your feelings when they are not there?

	Total Selfishness
	r
Assertiveness	.00
Schizotypy	.10

Discriminant Validity – “Too Good”

I sometimes get upset.

Occasionally I talk about people behind their backs

There are some people that I don’t like

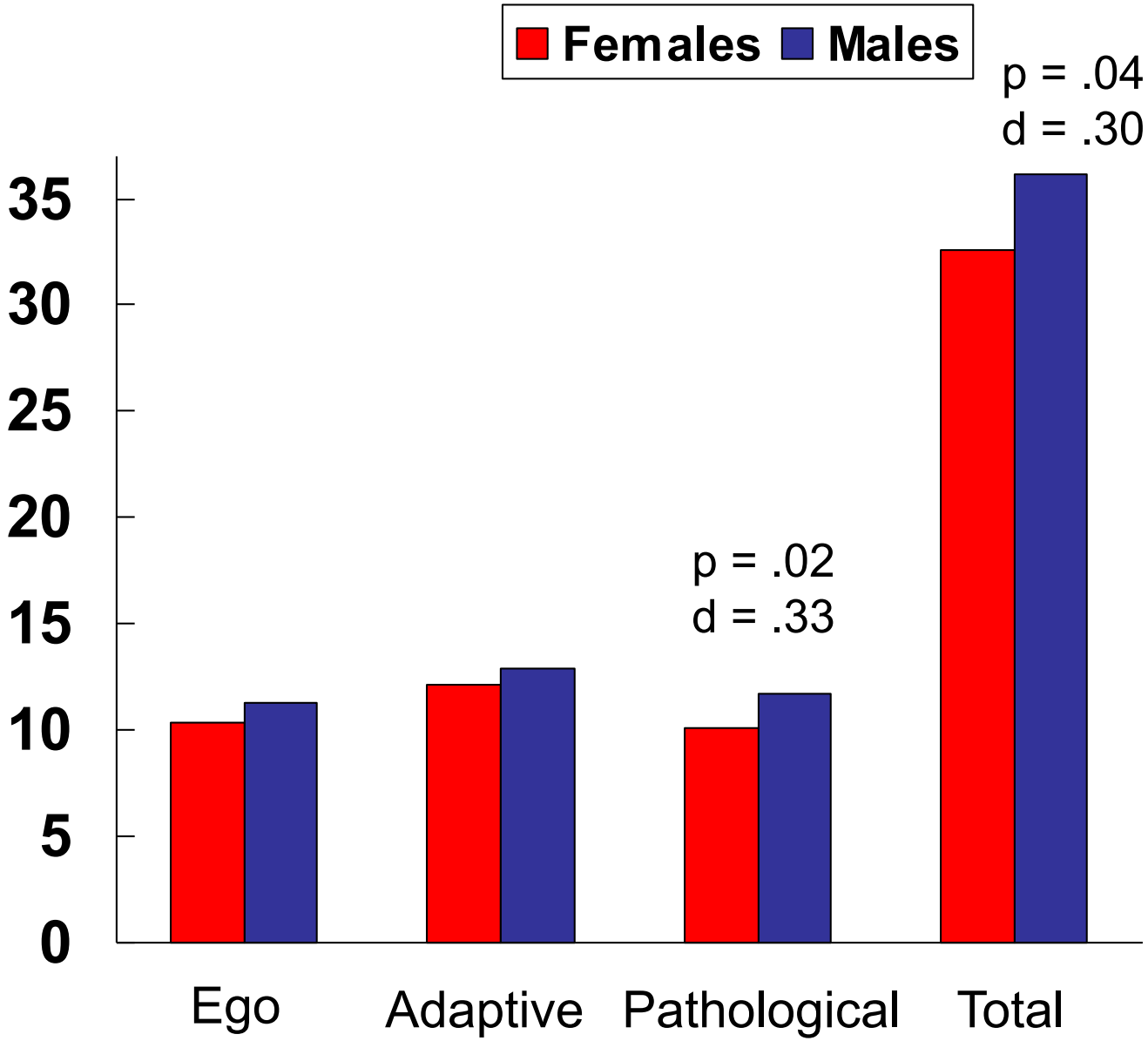
I have never told a lie

	Total Selfishness
	r
“Too Good”	.08

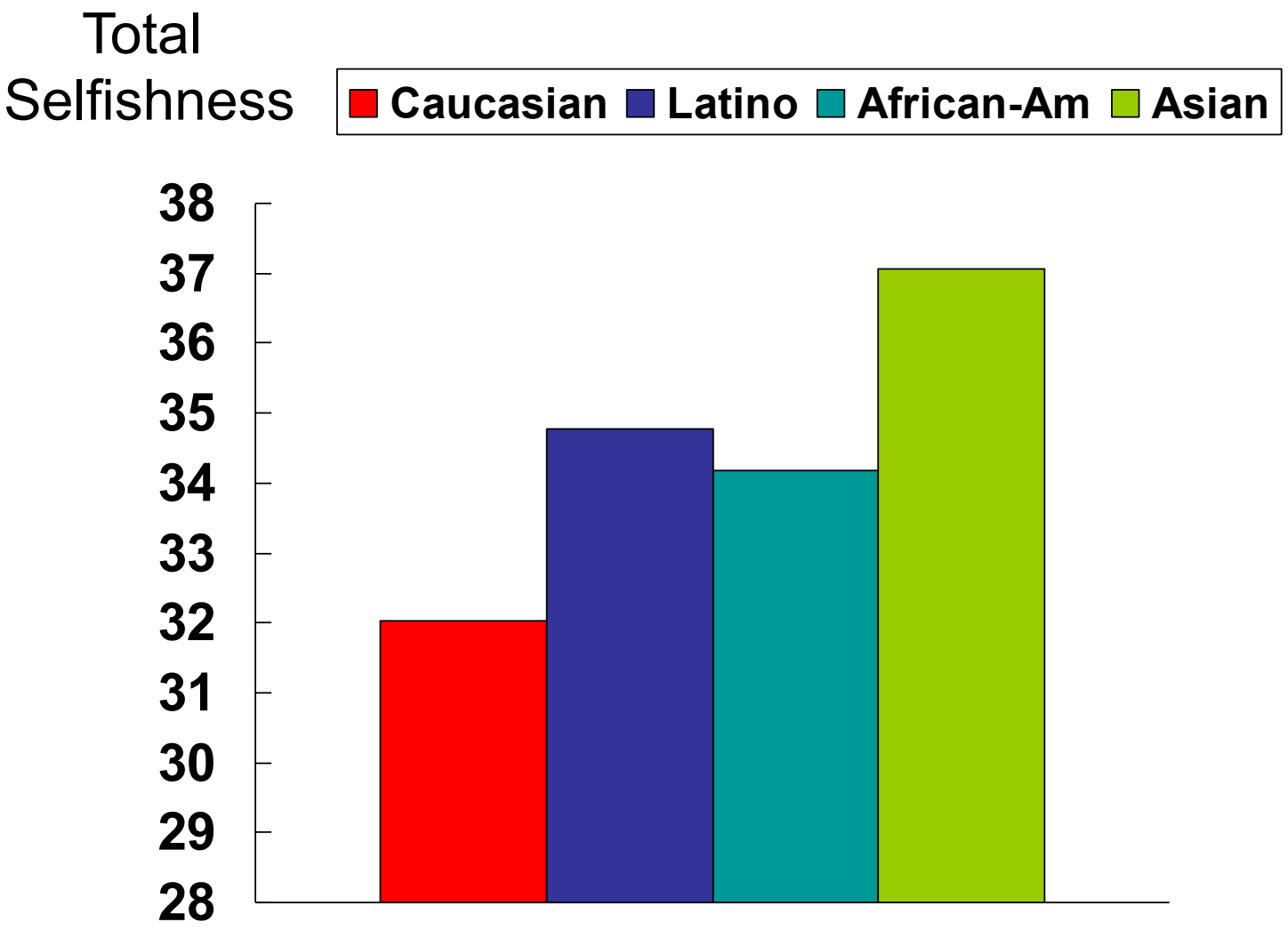
Three Factors of Selfishness (r)

	Ego	Pathol.	Adapt.
Altruism	-.45	-.40	-.27
Warmth	-.20	-.19	-.17
Cognitive Empathy	-.15	-.19	-.12
Affective Empathy	-.25	-.27	-.14
Psychopathy	.32	.47	.15
Proactive Aggression	.32	.44	.21
Reactive Aggression	.24	.28	.13
Narcissistic	.41	.38	.33
Histrionic	.31	.25	.21
Antisocial	.25	.36	.15
Machiavellian	.51	.58	.45

Sex Differences



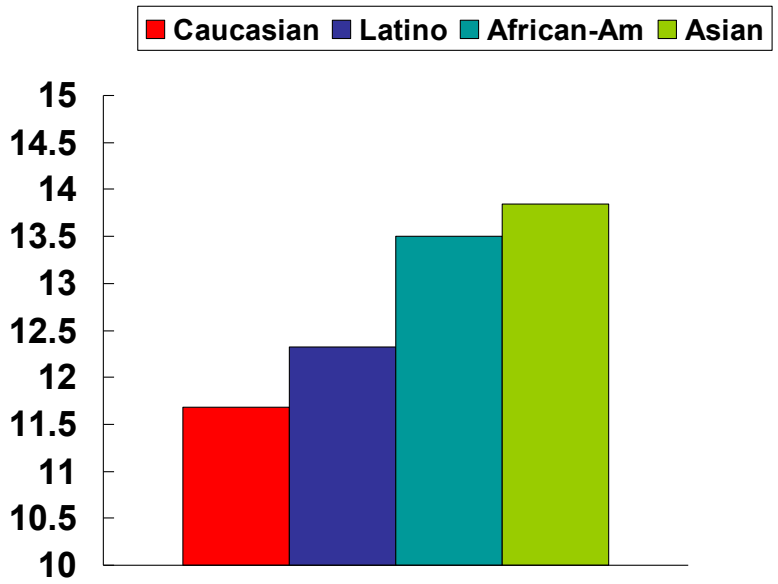
Ethnic Differences



Asians more selfish than Caucasians ($p < .008$, $d = .44$)

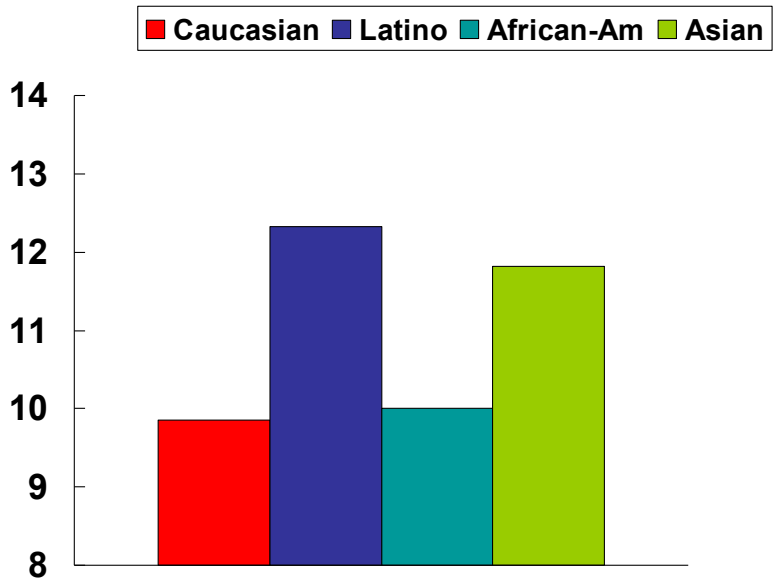
Ethnic Differences – Selfishness Subtypes

Adaptive Selfishness



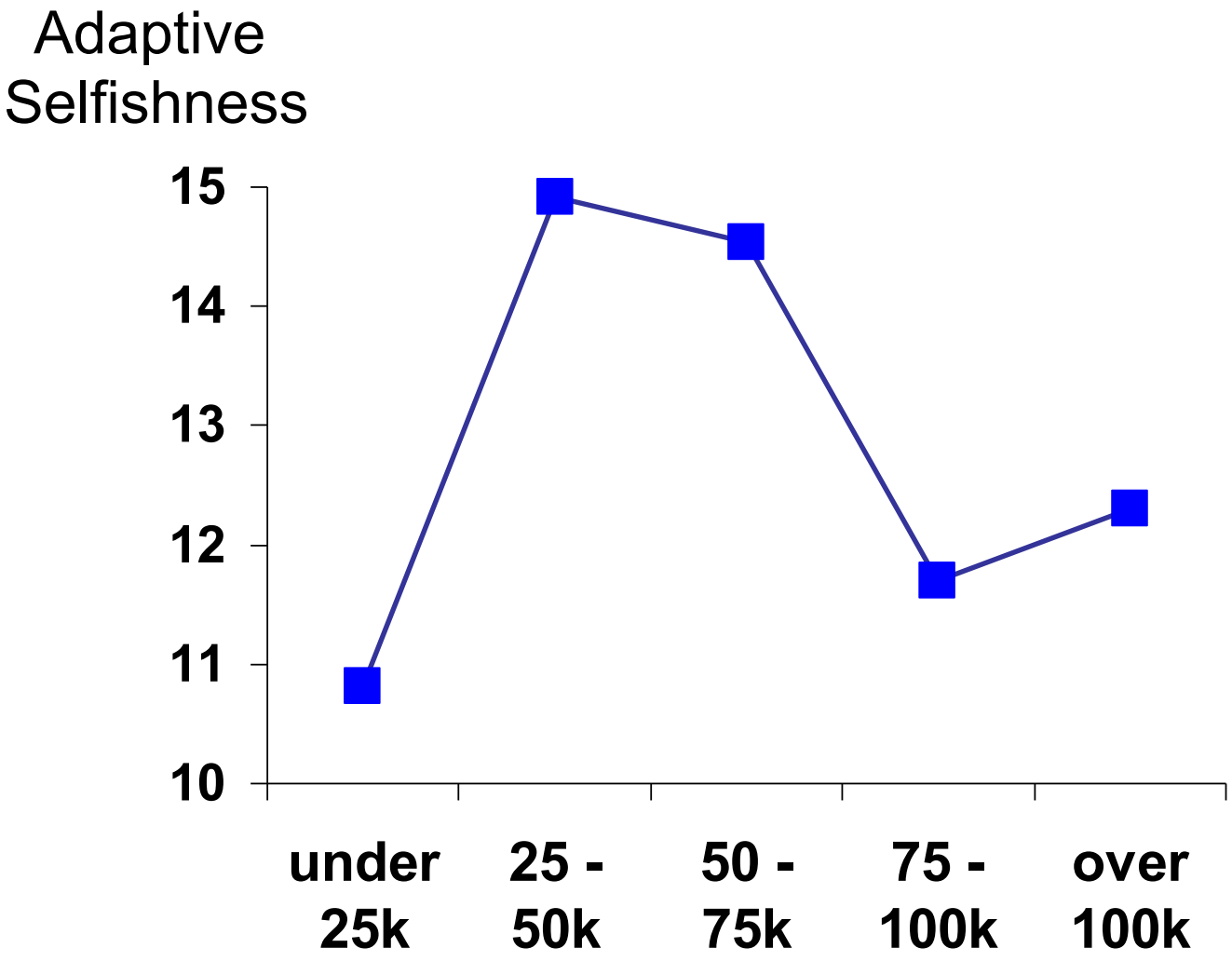
Asians (p = .003, d = .47) more Adaptively Selfish than Caucasians

Ego Selfishness



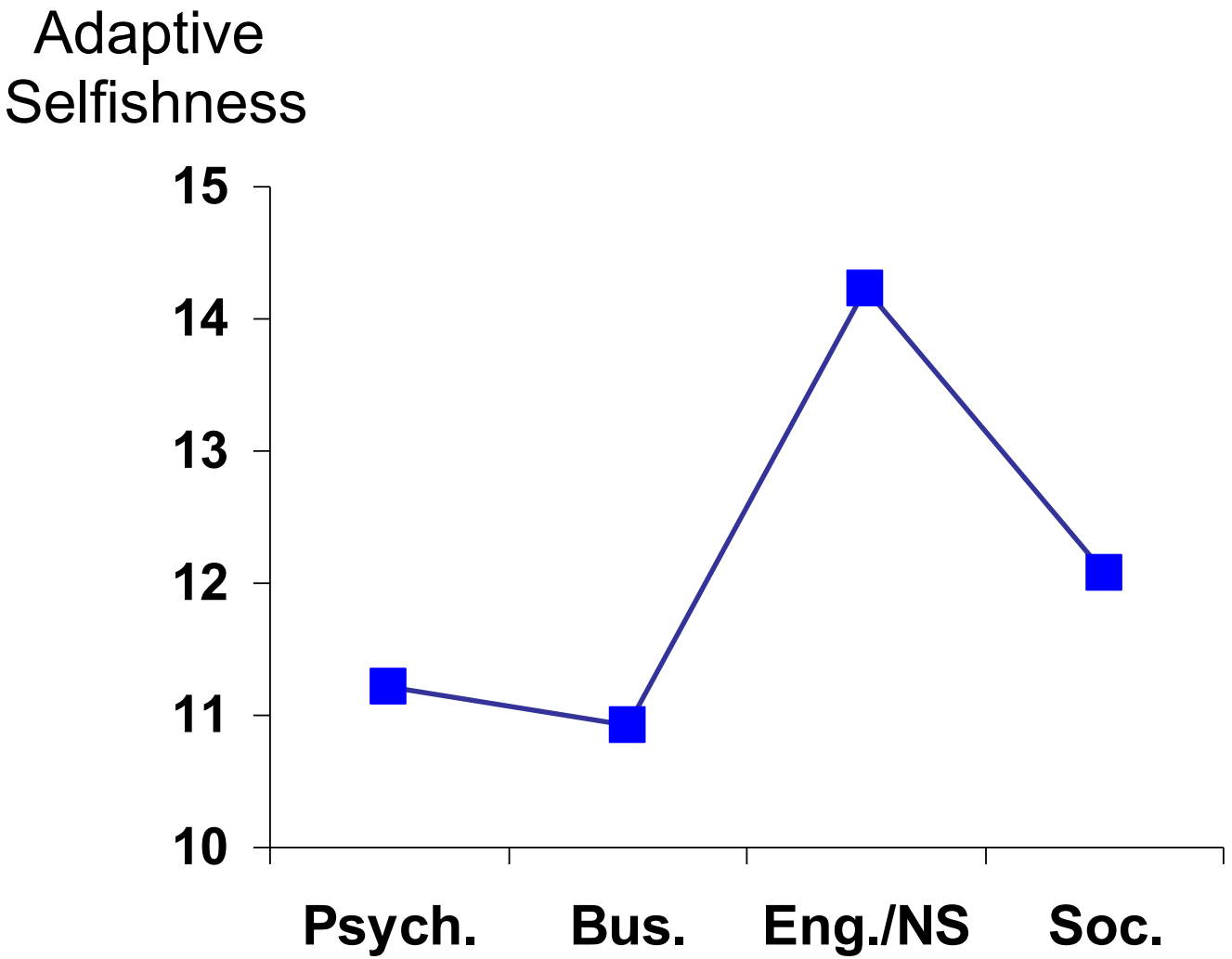
Latinos (p = .017) and Asians (p = .005) more Ego Selfish than Caucasians

Family Income and Adaptive Selfishness



25k – 75k more Adaptively Selfish than all others (d = .48 to .81)

Major and Adaptive Selfishness



Engineering / Natural Sciences Majors more Adaptively Selfish than all others (d = .43 to .66)

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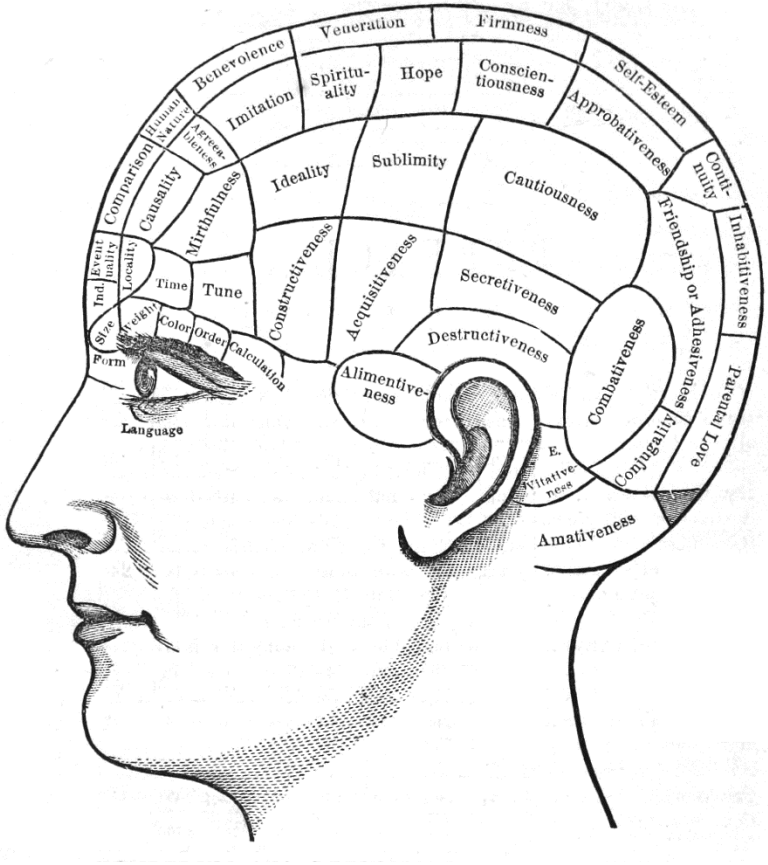
Where is selfishness in the brain?



9. ACQUISITIVENESS:

Economy: the disposition to save and accumulate property.

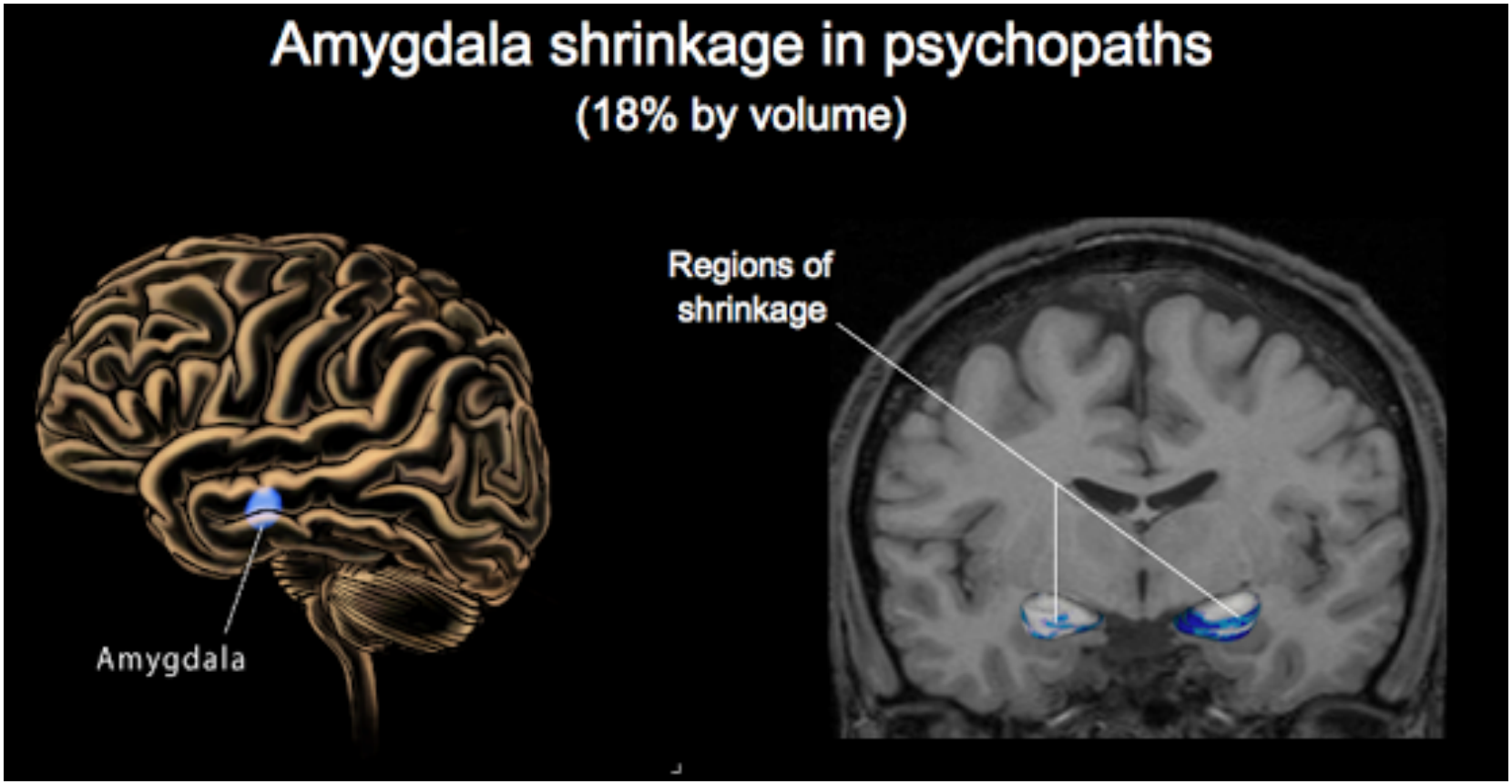
Excess: Miserly avarice: theft; extreme selfishness.

Deficiency: Prodigality; inability to appreciate the true value of property; lavish and wasteful

Amygdala and Psychopathy

Yang et al., (2009).
Archives of General Psychiatry

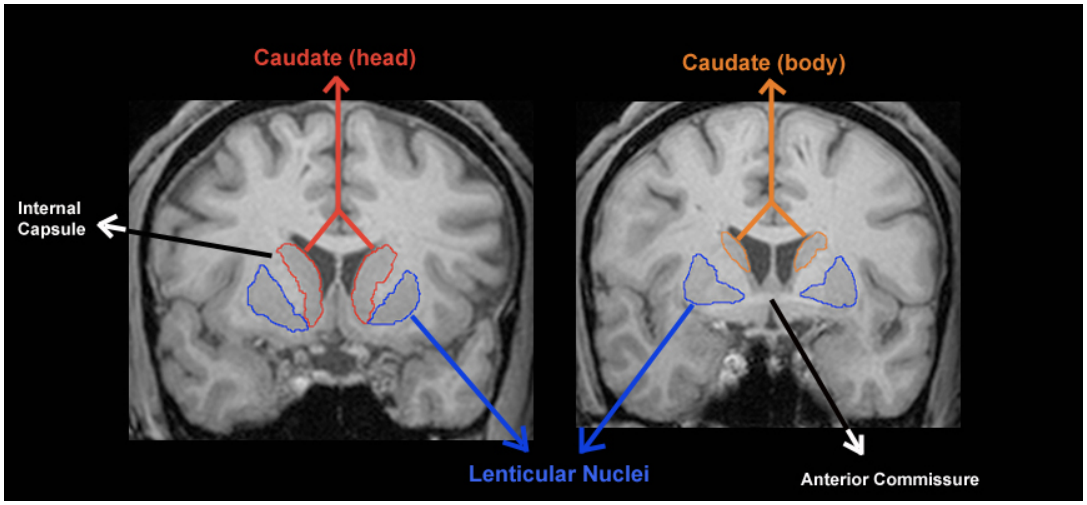
27 psychopaths vs. 32 non-psychopaths



Psychopathy and Rewards; Striatum

Striatum

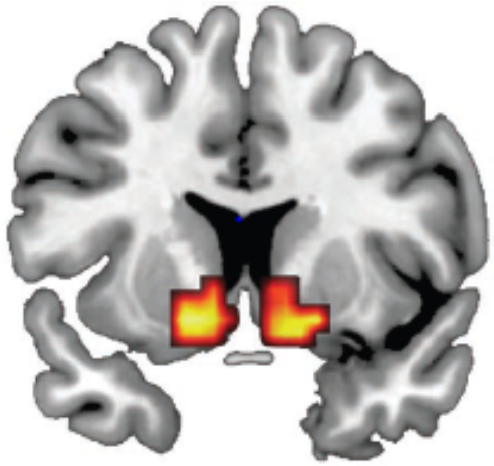
9.6% volume *increase*
in psychopaths



Glenn et al. (2010)
Biol. Psychiatry, *67*, 52-58

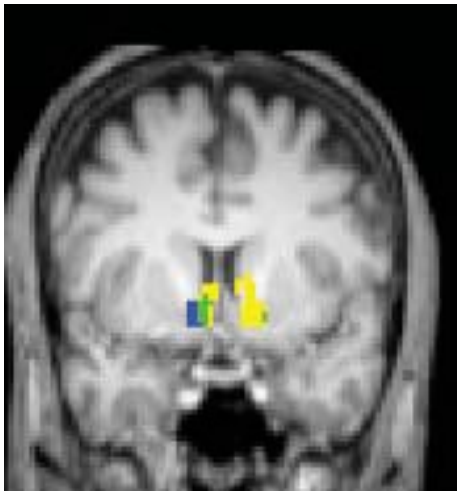
Ventral Striatum

Psychopathic traits:
Reward hypersensitivity



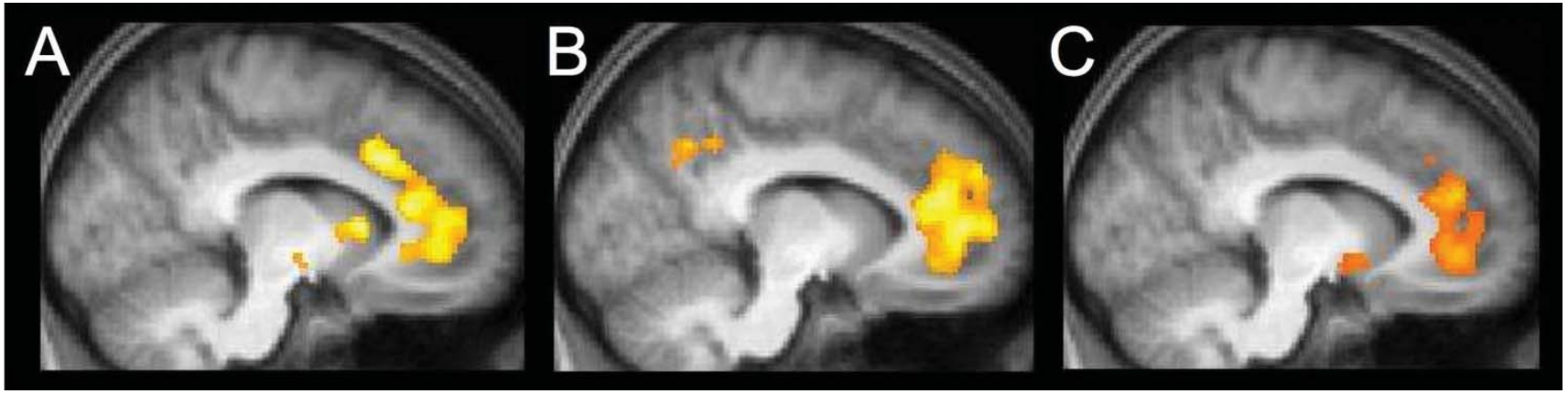
Buckholtz et al. (2010)
Nat. Neuro. 13, 419-421

Giving Activates Ventral Striatum



Harbaugh et al. (2007)

Reflecting on Self vs Others



Jenkins & Mitchell (2011)

self-referential: anterior dorsal MPFC
perspective-taking: posterior dorsal MPFC

Argembeau et al. (2007)

Future Directions

Immediate:

Behavioral Validation

- E.g., Dictator Game
- Behavioral reflection of selfishness through cooperation
- Different dimensions of SQ

Cross-cultural: Dharamsala, India

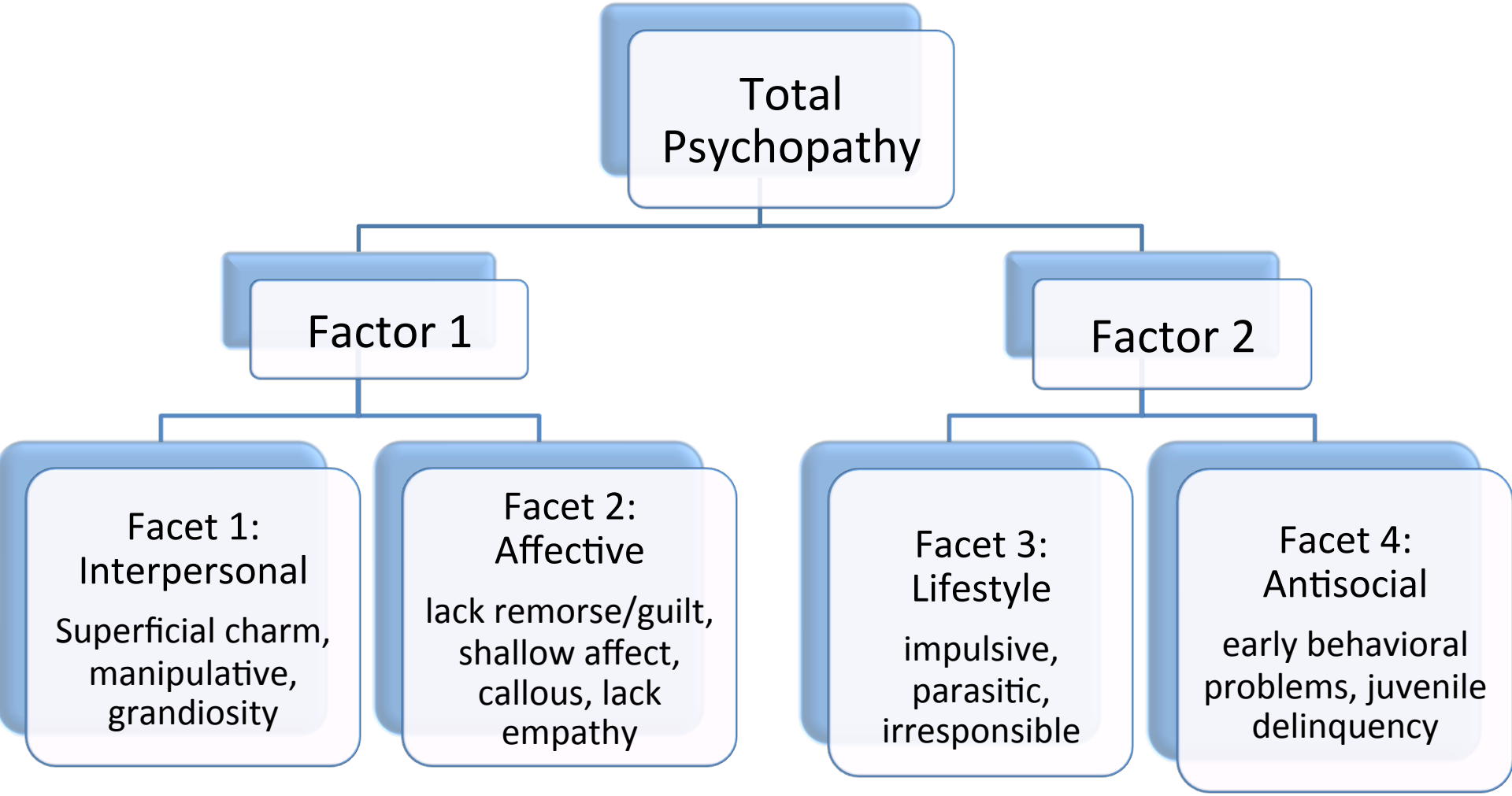
- Emory-Tibet Science Initiative
- Tibetan monks at monasteries
- Compassion-meditation lifestyle change selfishness?

Long-term:

Does mindfulness reduce excessive selfishness in US populations?

Psychopathy

Psychopathy: Constellation of Interpersonal, Affective, Lifestyle, and Antisocial characteristics (Hare, 1999)



Factors of Psychopathy

Hare Psychopathy Checklist – Revised (Hare, 2003)

1. Arrogant / deceitful

Glib
Grandiose
Pathological lying
Conning / manipulative

2. Deficient affect

Lacks remorse / guilt
Shallow affect
Callous / lacks empathy
Fails to accept responsibility

3. Impulsive – unstable

Need for stimulation
Parasitic lifestyle
Lacks realistic, long-term goals
Impulsivity
Irresponsibility

4. Antisocial

Poor behavioral controls
Early behavior problems
Juvenile delinquency
Revokes conditional release
Criminal versatility

Construct Validity

	Total Selfishness r
Altruism	-.45
Warmth	-.24
Cognitive Empathy	-.19
Affective Empathy	-.28
Psychopathy	.38
Proactive Aggression	.38
Reactive Aggression	.26
Narcissistic	.44
Histrionic	.29
Antisocial	.29
Machiavellian	.60

Discriminant Validity – Assertive + Schizotypy

Assertive
I have often been a leader of groups I have belonged to

Other people often look to me to make decisions

Assertiveness	.00
Schizotypy	.10
“Too Good”	.08

Assertiveness	.10
Schizotypy	.02

Narcissistic Personality Disorder: DSM 5 Definition

Pervasive grandiosity, need for admiration, lack of empathy

A. 5 or more of:

(1) grandiose sense of self-importance (exaggerates talents)

(2) fantasizes unlimited success/power/brilliance/beauty/love

(3) believes special/unique; only understood by high status

(4) requires excessive admiration

(5) sense of entitlement (favorable treatment)

(6) interpersonally exploitive (takes advantage or others)

(7) lacks empathy (won't recognize feelings / needs of others

(8) often envious of others / believes others envious of them

(9) arrogant / haughty behavior or attitudes

Borderline Personality Disorder: DSM 5 Definition

Pervasively instability of relationships, self-image, affect & marked impulsivity; begins early adulthood, multiple contexts

A. 5 or more of:

(1) frantic effort to avoid real / imagined abandonment

(2) unstable / intense interpersonal relationships

(3) identity disturbance (unstable self-image)

(4) impulsivity in 2 areas (spending/sex/drugs/binges/driving)

(5) recurrent suicidal behavior / gestures / threats / mutilation

(6) affective instability (dysphoria, irritability, anxiety)

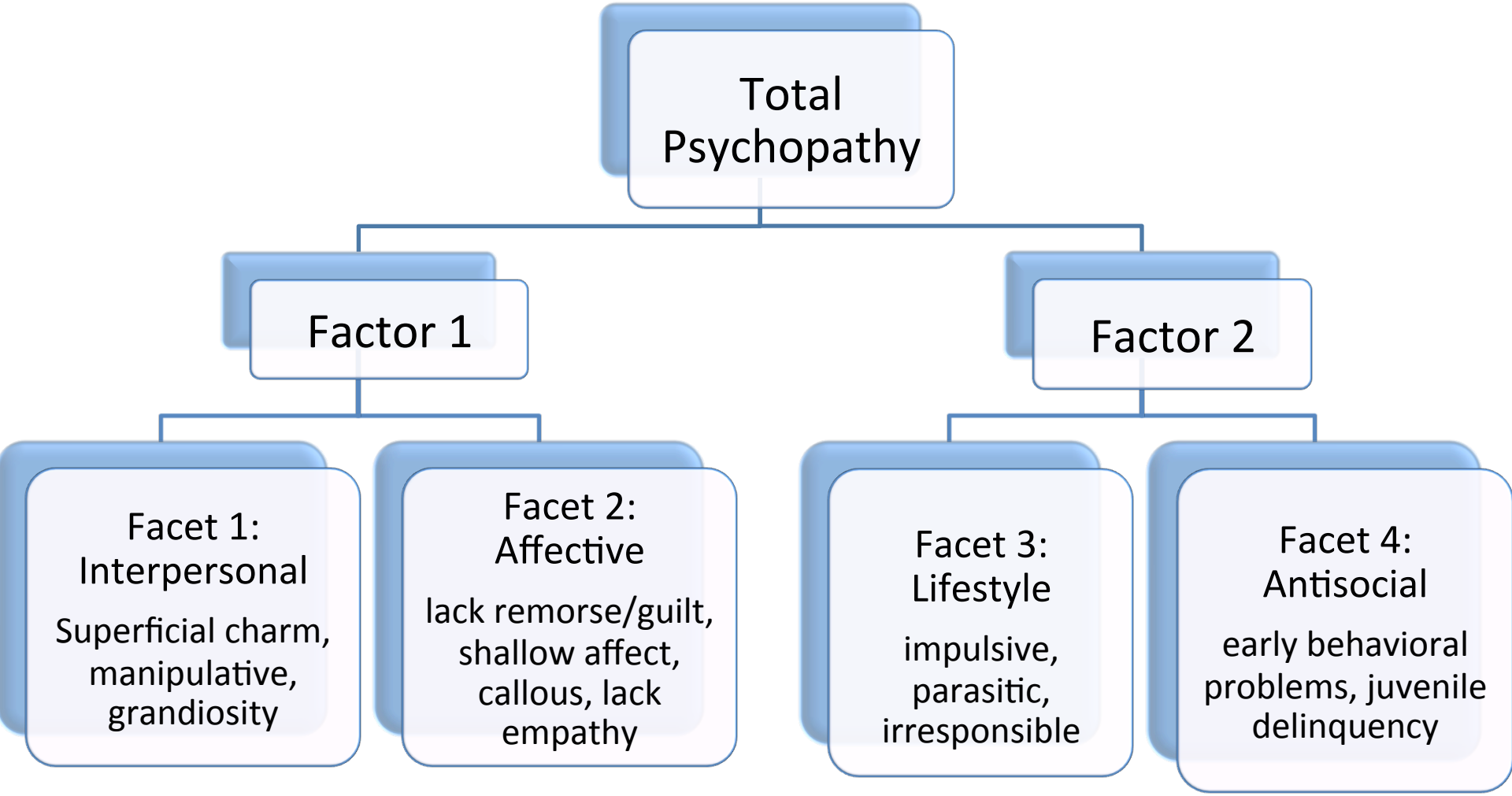
(7) chronic feelings of emptiness

(8) inappropriate, intense anger (temper/anger displays/fights)

(9) transient, stress-related paranoia or dissociation

Psychopathy

Psychopathy: clinical construct of a constellation of interpersonal, affective, lifestyle, and antisocial characteristics (Hare, 1999)



1. Pathological Selfishness

Sometimes need to take advantage of others before they do of you

Times when I put myself first, even if it's someone's loss

Have to look after myself even if cost to my loved one

Go out of my way to exploit situations for own advantage

Now and again I've manipulated friends to gain advantage

Hard to get ahead unless you cut other people's corners

Not nice to exploit others but sometimes you have to

. Giving my kids unfair advantage over others

I like voicing my opinions even if they offend

I like having "me" time even if others disappointed

End a relationship even if causes person to be depressed

I love rewards in life even if there is a cost to others

Sometimes dump friends I don't need anymore

2. Adaptive Selfishness

Choice between killing someone or being killed, I'd kill

Need to help own family first

People need to be selfish for positive change

Take one space for myself and family
in lifeboat even if child needed it

Not try to save drowning person if I could drown too

It's not good to be too modest

Not always honest because honesty can harm myself and others

Focus on my concerns first, better able to help others
Better to save for a rainy day

Sometimes lie to others for my own good, and theirs too

Having a focus on oneself can be adaptive

Deal with my own needs, can make the world better place

Don't give to charities because I need to help my family and myself more

Not always honest because honesty can harm myself and others

3. Egocentric Selfishness

Don't feel urge to help people I see in need

Care for myself much more than for others

When it comes to helping myself or others, I help myself

I care a lot about getting what I want

Really want things, even when I don't need them

I don't like paying for friends meals

Rarely give money to homeless

I admit I'm quite a selfish person

I don't give to charities

Have enough in life to live on but times I just want more

Discuss my own life rather than theirs

Like buying things even when I have enough

I don't think I give to others as much as I receive

PSYCHOPATHY

1. Clinical manifestation

2. Etiology:
   - Parental bonding
   - Mind-body connection
   - Temperament
   - Brain mechanisms

3. “Successful” vs. “Unsuccessful psychopaths”

Introduction to Psychopathy

- Cleckley
  "The Mask of Sanity"

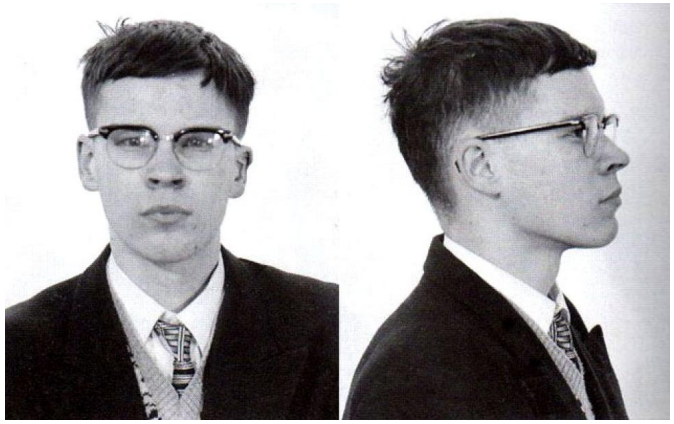
- Terminology
  - "moral insanity" Pritchard (1837)
  - "sociopathy" DSM (1952)
  - "psychopathy" ("Psychopathic inferiority, Koch 1888)

- Relationship to APD and "sociopathy"

- Base-rate in society

- Demographics
  - gender
  - ethnicity
  - age

David Krueger: Features of Psychopathy



(1) lack of remorse / guilt: lacks sense of shame
(2) callous / lacks empathy: disregard for others' suffering
(3) conning / manipulative: persuaded another to help kill
(4) deception: deceived lover to walk in grounds
(5) need for stimulation: curious about what it feels like to kill
(6) glib: quick and clever comeback to Q on prior killings
(7) revokes conditional release: killing on 1st day-pass
(8) grandiose: spurned lover, wants to be on top
(9) shallow affect / sexuality: no sense of deep love

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Parental Bonding and Psychopathy

Gao et al. (2010) *Psychological Medicine, 40*, 1007–1016.

Concurrent design

- 330 male and female community participants, aged 28
- Parental Bonding Instrument aged 28 (retrospective bonding)
- Hare's self-report psychopathy scale age 28

Longitudinal Design

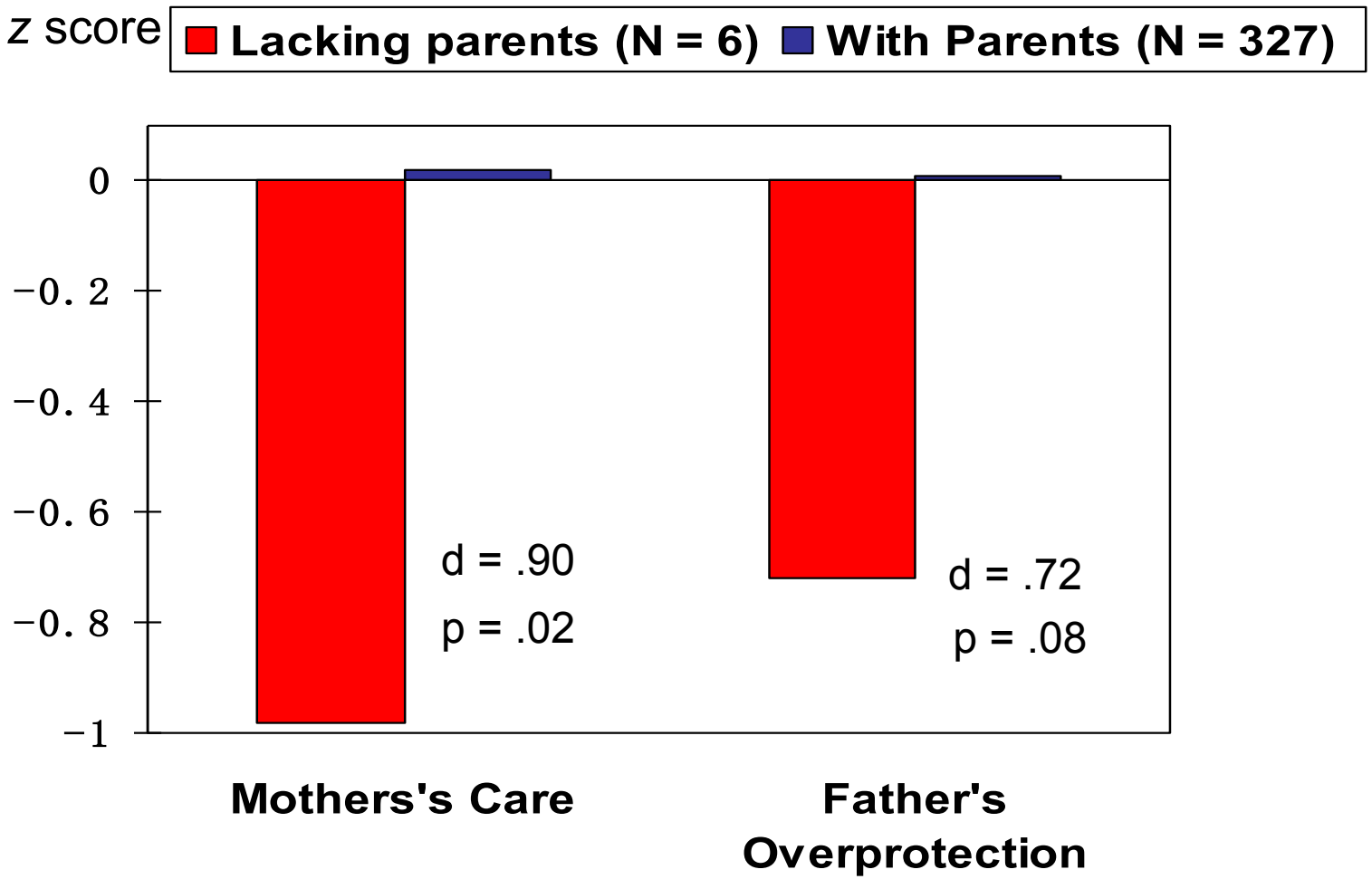
- 6 participants separated from both parents before age 3
- Parental Bonding Instrument aged 28 (retrospective bonding)
- Hare's self-report psychopathy scale age 28

Warmth scale "Was affectionate to me"

Overprotection scale "Was overprotective of me"

Loss of Parents at Age 3 and Parental Bonding

Gao et al., (2010)



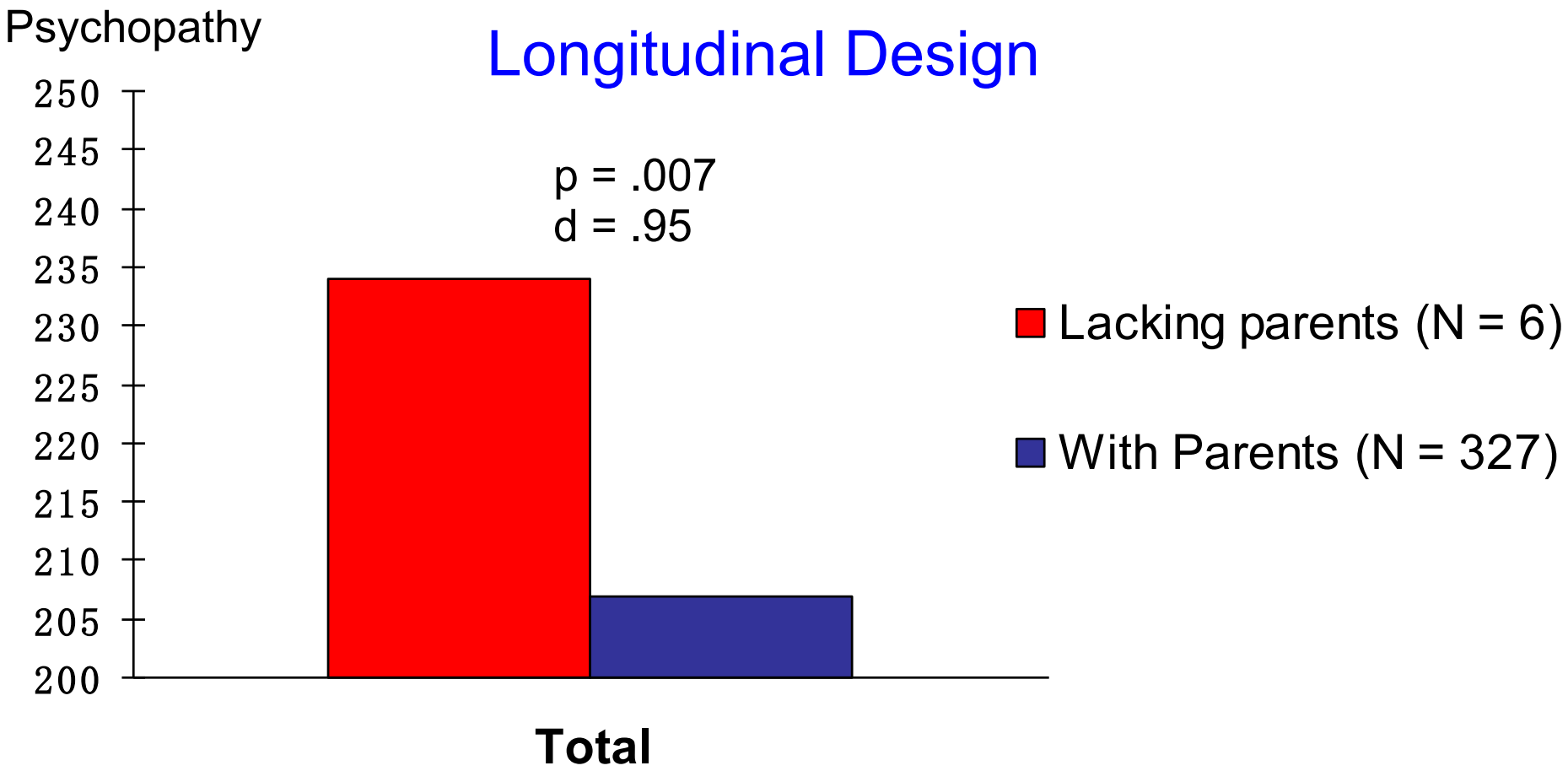
Parental Separation at 3 and Psychopathy at 28

Gao et al., (2010)

Concurrent Design

Maternal Care – Adult Psychopathy: r = -.38, p < .001

Longitudinal Design



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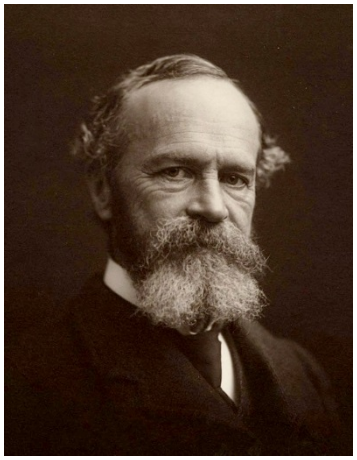
Mind-Body Connectedness



"We feel sorry because we cry, angry because we strike, afraid because we tremble".

(James, 1884)

- Emotional experiences arise directly from perception of bodily change

SOMATIC MARKER HYPOTHESIS AND PSYCHOPATHY (Bechara et al. 1997)

Patients with ventromedial lesions:

(a) don't give SCRs to socially disturbing pictures

(b) perform poorly on decision-making (gambling) task

(c) don't give anticipatory SCRs before making risky decision

(d) make bad life decisions

(e) exhibit psychopathic-like behavior

Unresolved Question: Do psychopaths have deficits in accurate perception of somatic (bodily) sensations?

Somatic Aphasia in Psychopaths

Gao et al. (2012) *Biological Psychology, 90, 28 – 233*

Social Stressor Task

Rest

Speech Preparation

Speech Presentation

Rest

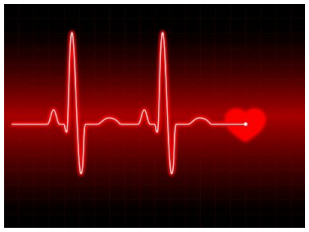
1 minute

2 minutes

2 minutes

1 minute

Psychophysiological Recording



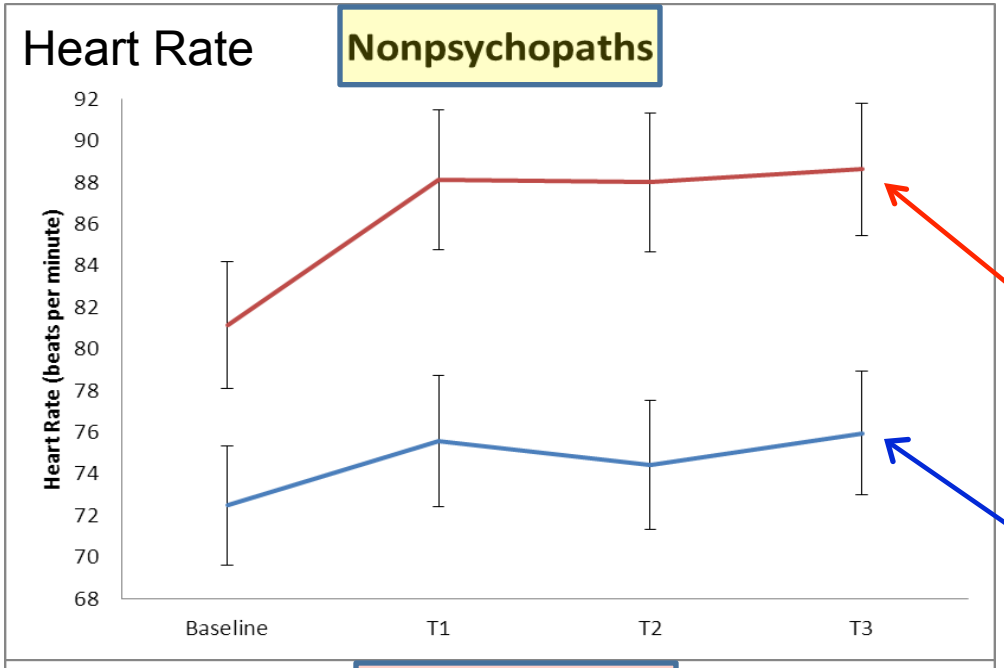
Bodily sensation measure

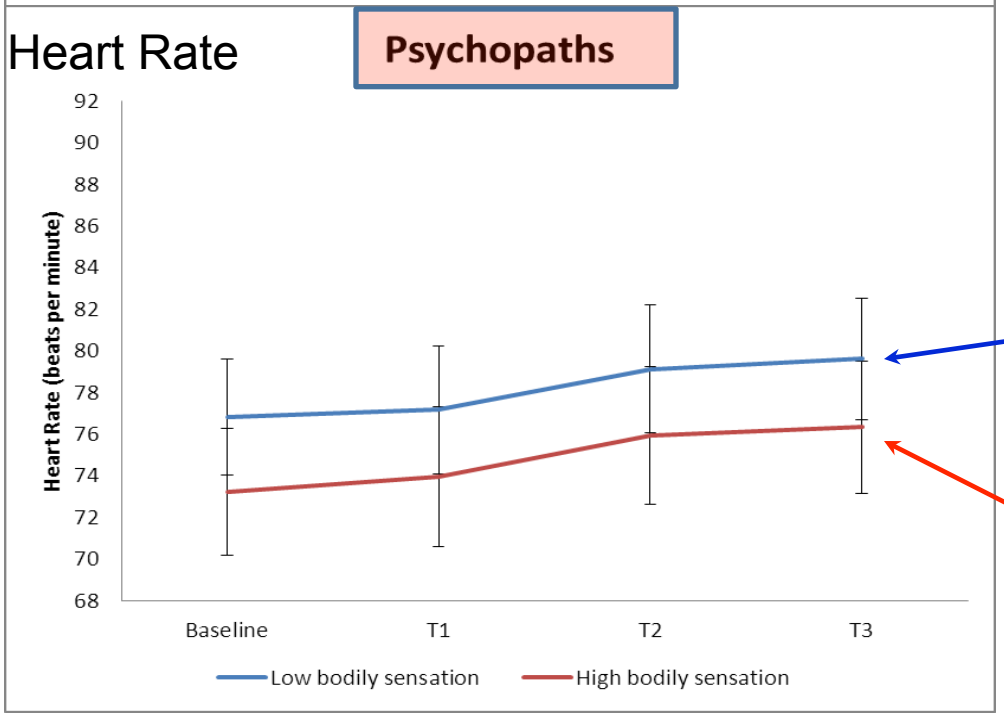
Bodily Sensation Measure

"How much did you experience the following body feelings when preparing and giving your speech?"

(1= not at all, 2 = a little, 3 = sometimes, 4 = often, 5 = very often)

- lump in throat
- breathing changes
- stomach sensations
- feel cold
- feel hot
- heart pounding
- tense muscles
- perspiration
- goose pimps
- facial blushing
- jelly legs
- hands tremble
- voice trembling
- eyes well with tears





Heart Rate

Psychopathy x Body Group interaction ($p < .05$)

High bodily sensation group

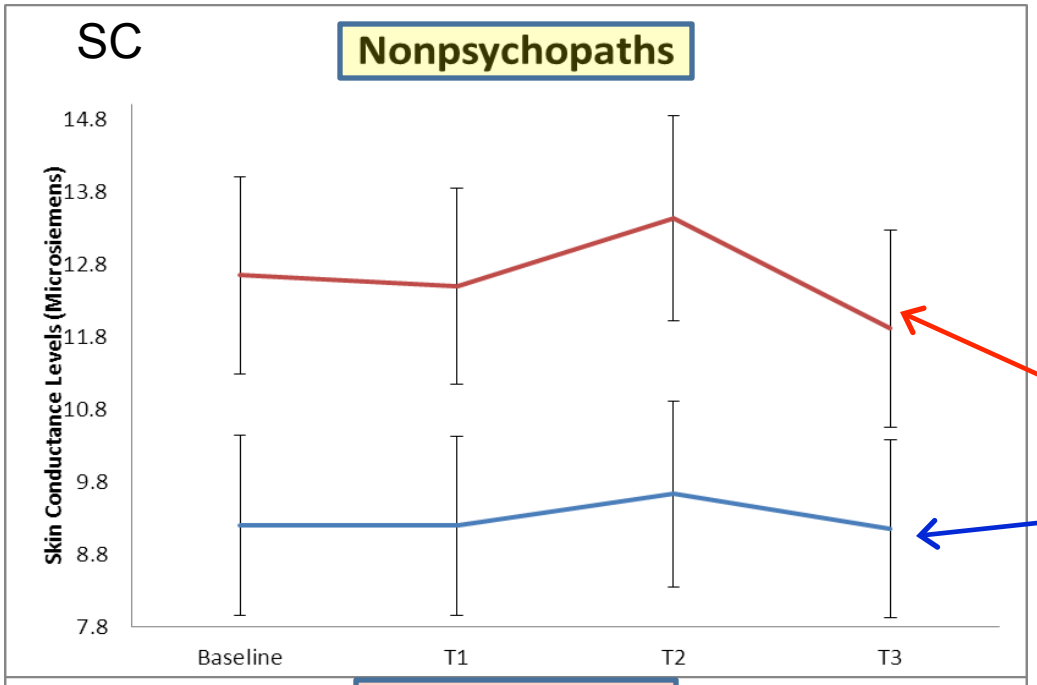
$p < .01$

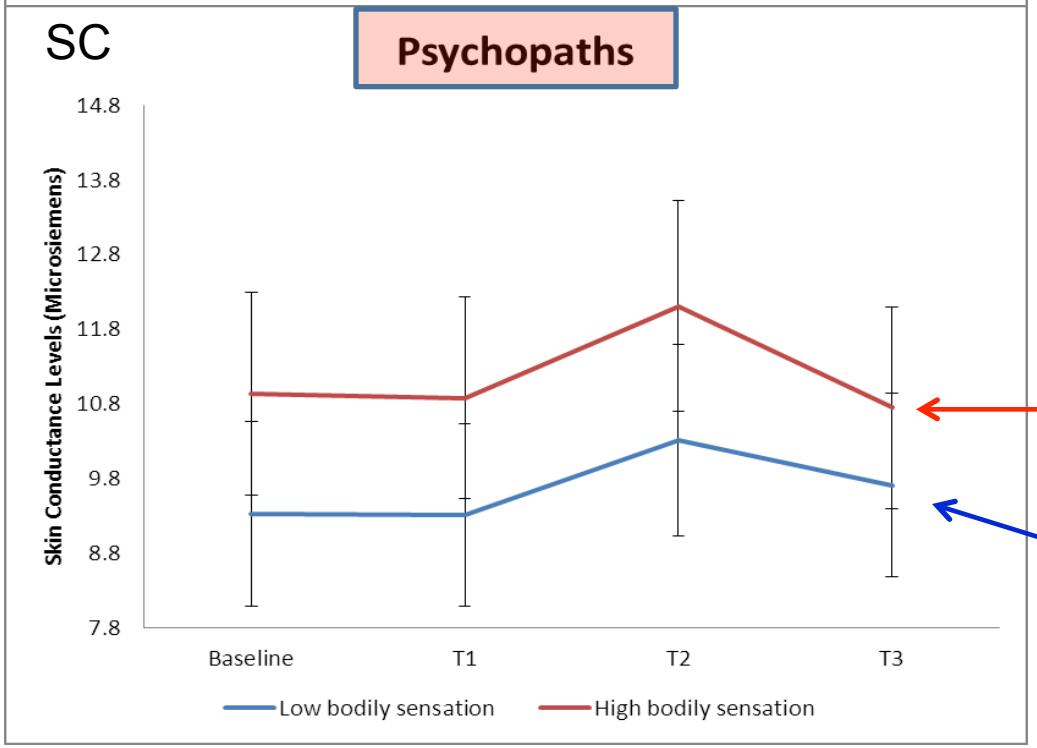
Low bodily sensation group

Low bodily sensation group

$p > .45$.

High bodily sensation group





Skin Conductance

$p < .01$

High bodily sensation group

Low bodily sensation group

n.s.d

High bodily sensation group

Low bodily sensation group

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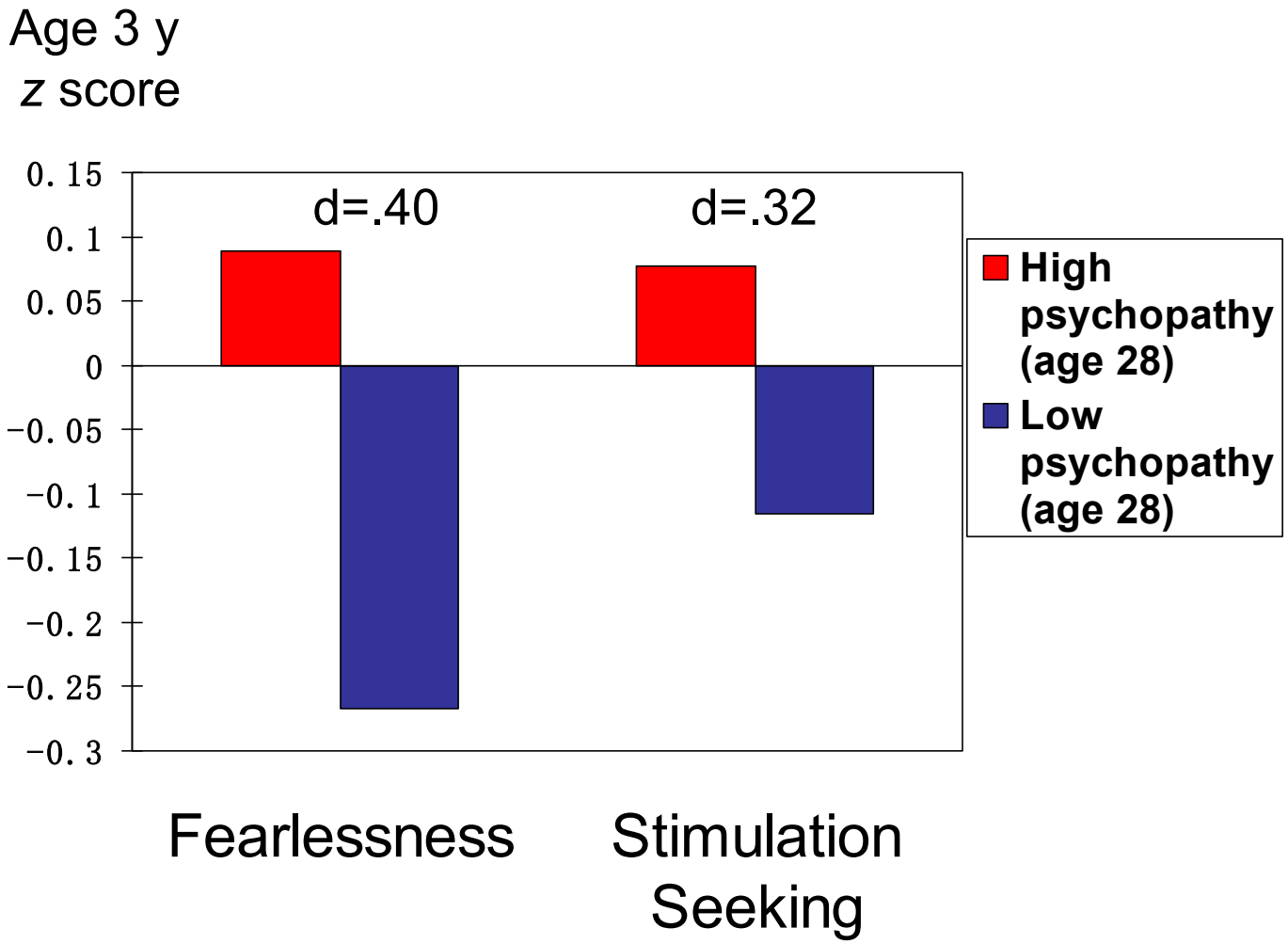
   - Temperament
   - Brain mechanisms

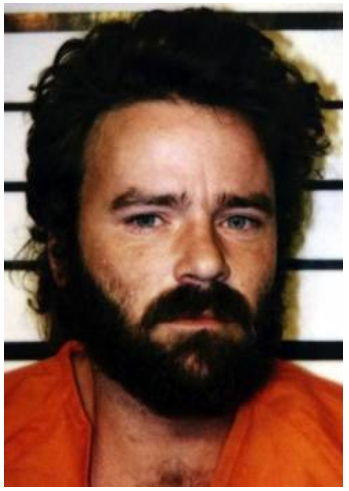
3. “Successful” vs. “Unsuccessful psychopaths”

Age 3 Temperament and age 28 Psychopathy

Glenn et al., (2007) *Journal of Abnormal Psychology*

N = 330





Tommy Lynn Sells

PSYCHOPATHY

1. Clinical manifestation

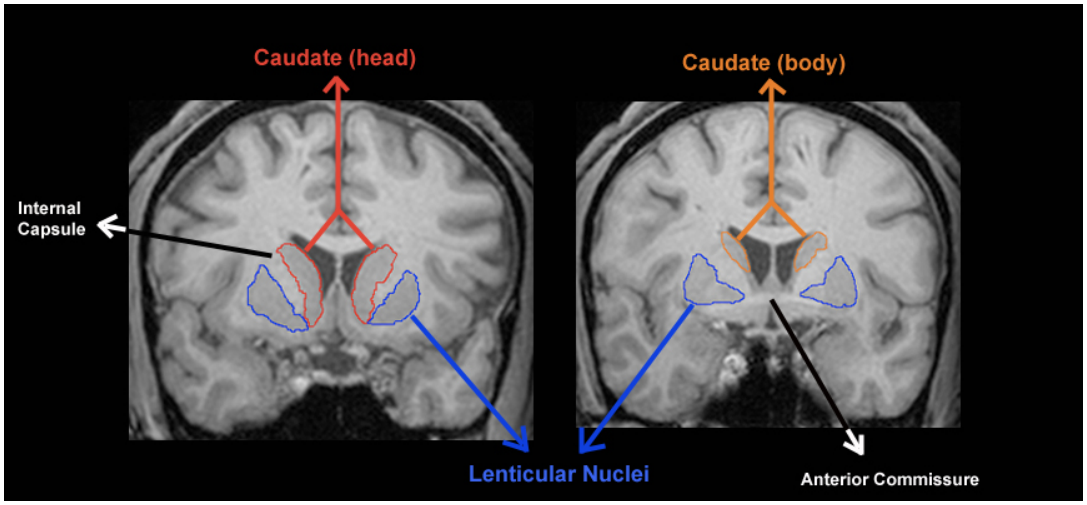
2. Etiology:
   - Parental bonding
   - Mind-body connection
   - Temperament
   - Brain mechanisms

3. “Successful” vs. “Unsuccessful psychopaths”

Psychopathy and Rewards; Striatum

Striatum

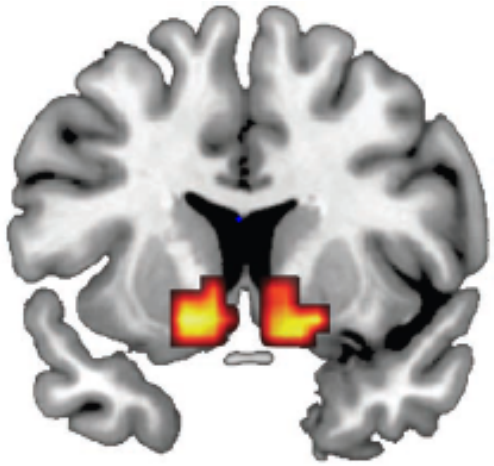
9.6% volume *increase*
in psychopaths



Glenn et al. (2010)
Biol. Psychiatry, *67*, 52-58

Ventral Striatum

Psychopathic traits:
Reward hypersensitivity

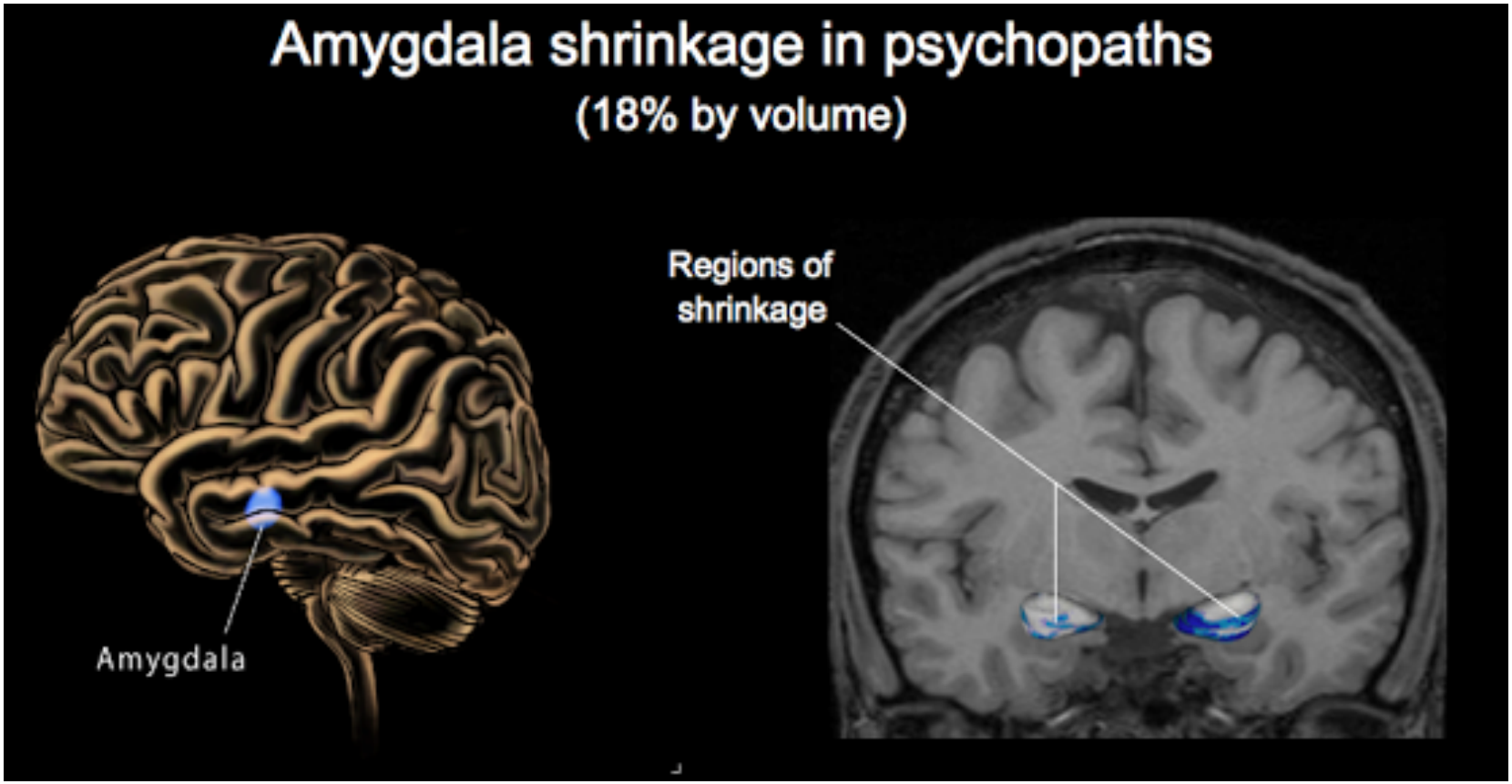


Buckholtz et al. (2010)
Nat. Neuro. 13, 419-421

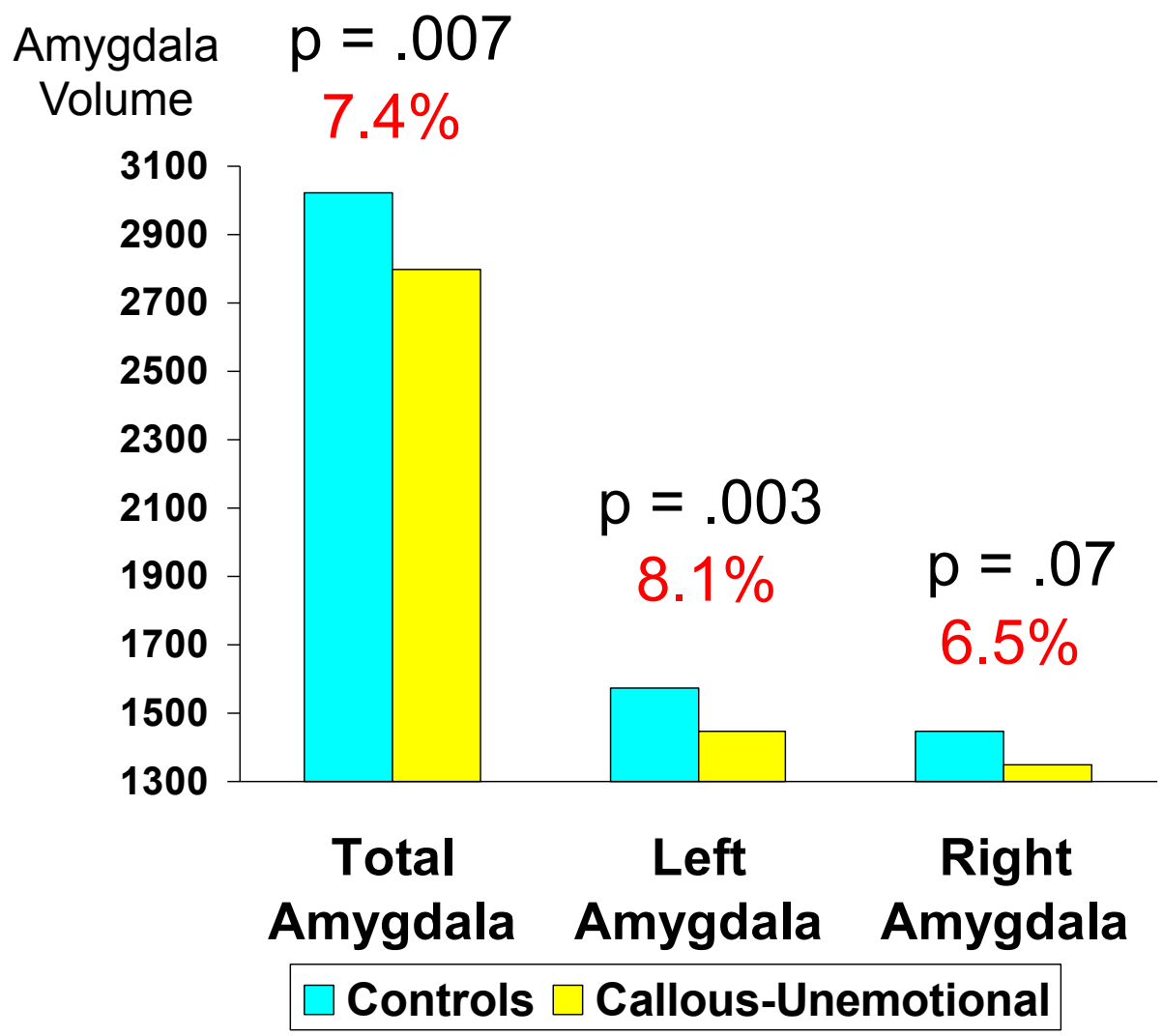
Amygdala and Psychopathy

Yang et al., (2009).
Archives of General Psychiatry

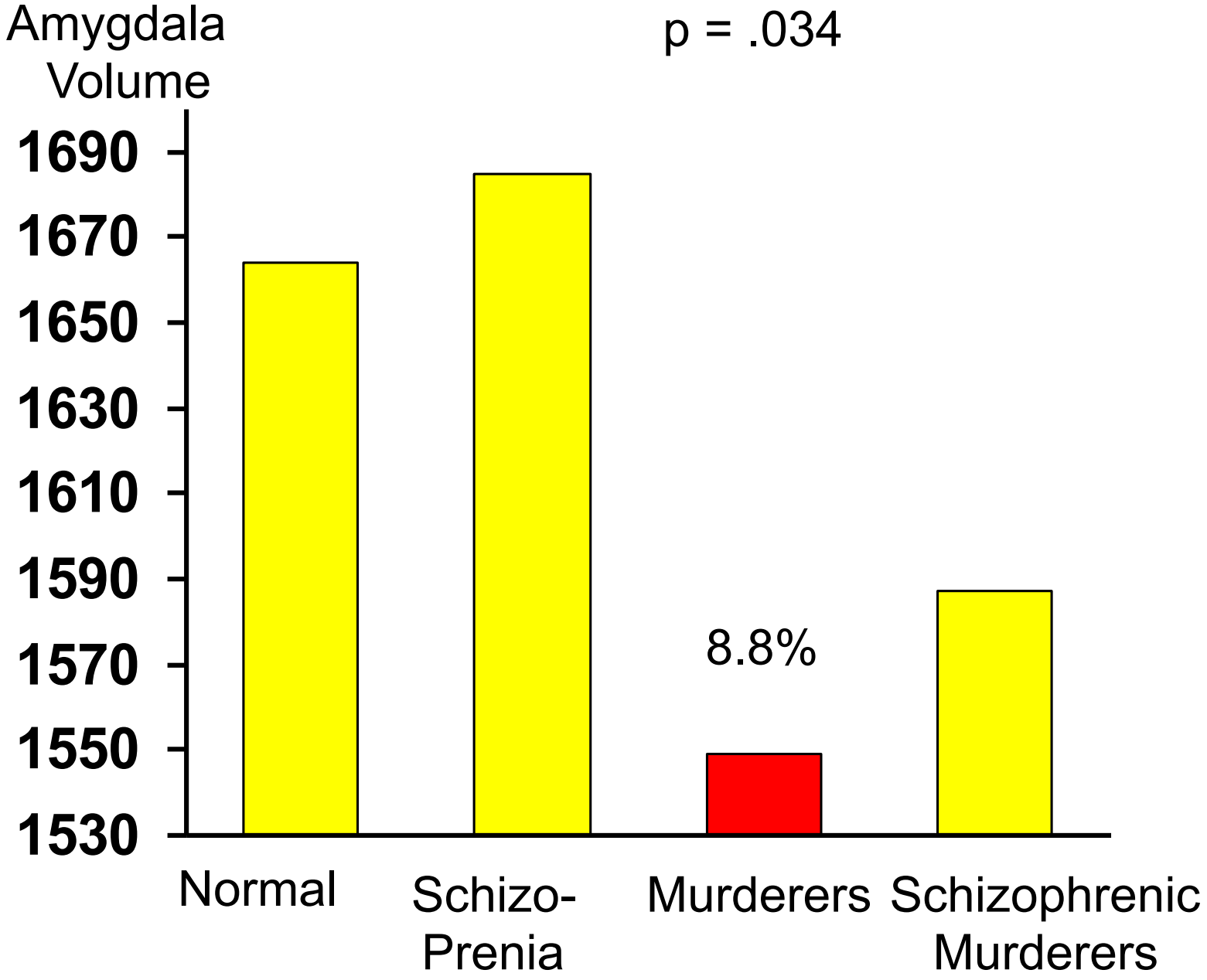
27 psychopaths vs. 32 non-psychopaths



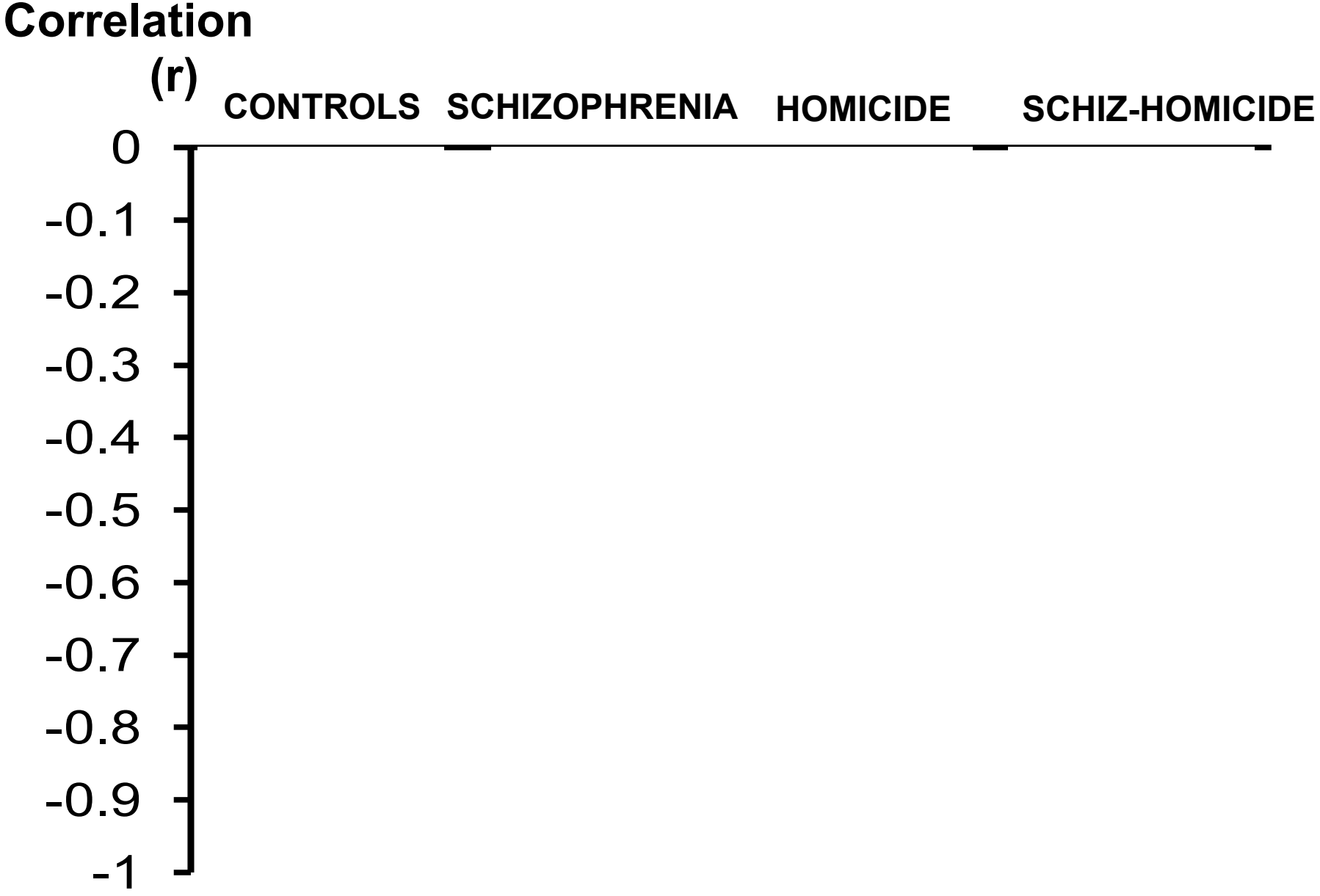
Reduced Amygdala in Callous-Unemotional Children (N = 300)



Reduced Amygdala Volumes in Chinese Murderers



Psychopathy - Amygdala Correlations in Each Group



THE JOURNAL OF CHILD PSYCHOLOGY AND PSYCHIATRY
ACAMH
Journal of Child Psychology and Psychiatry 54:5 (2013), pp 575–581 doi:10.1111/j.1469-7610.2012.02603.x

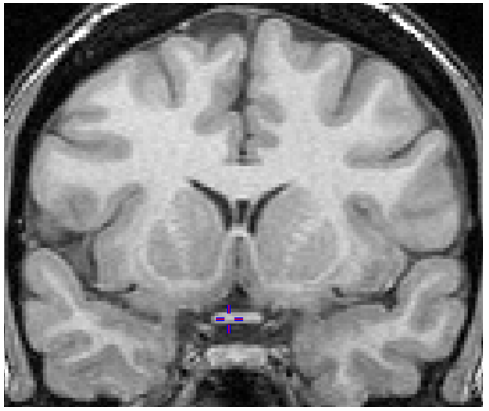
The relationship between large cavum septum pellucidum and antisocial behavior, callous-unemotional traits and psychopathy in adolescents

Stuart F. White, Sarah Brislin, Stephen Sinclair, Katherine A. Fowler, Kayla Pope, and R. James R. Blair

Unit on Affective Cognitive Neuroscience, National Institute of Mental Health, NIH, Bethesda, MD, USA

Cavum Septum Pellucidum is associated with:

- higher psychopathy scores
- increased proactive aggression
- diagnosis of disruptive behavior disorder



CAUSES OF PSYCHOPATHY

Evolution

Genetics

Maternal bonding

Family environment

Stimulation-seeking & low arousal

Classical conditioning

Lack of anticipatory fear

Neurodevelopmental - CSP

Hormones:

Lower cortisol in prison psychopaths

(Holi et al. 2006; O'Leary et al. 2007; Cima et al. 2009)

Increased testosterone to cortisol ratio in psychopaths

(Glenn et al. 2011)

PSYCHOPATHY

1. Clinical manifestation

2. Etiology:
   - Parental bonding
   - Mind-body connection
   - Temperament
   - Brain mechanisms

3. “Successful” vs. “Unsuccessful psychopaths”

Successful vs Unsuccessful Psychopaths

(Ishikawa et al., 2001)

91 males from Temp. Agencies assessed on:

- Psychopathy Checklist - Revised
- Interpersonal Measure of Psychopathy
- Self-Report Crime
- Court Records
- SCID-I
- SCID-II

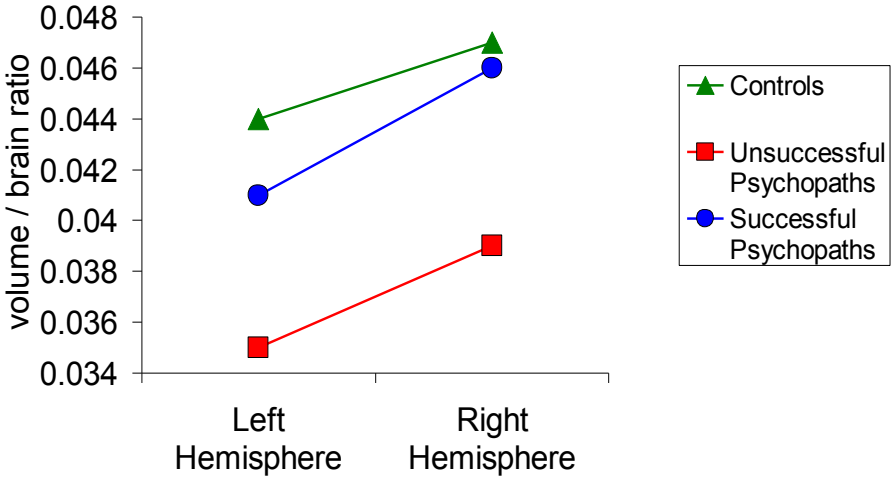
PCL-R Score

13 Successful Psychopaths	27.7
16 Unsuccessful Psychopaths	31.5
26 Controls	10.8

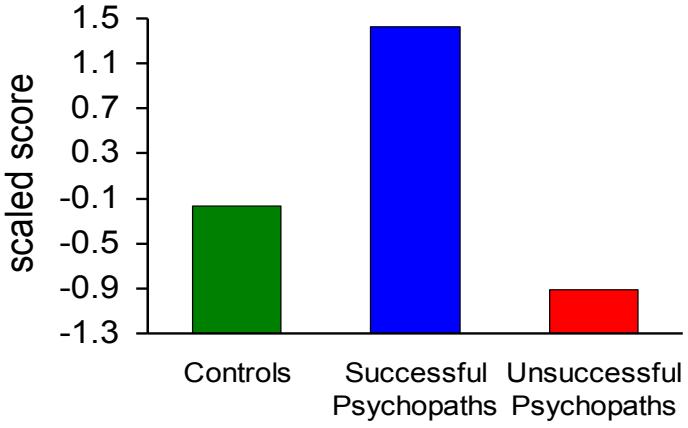
Prefrontal Structure / Function

Autonomic Stress Reactivity

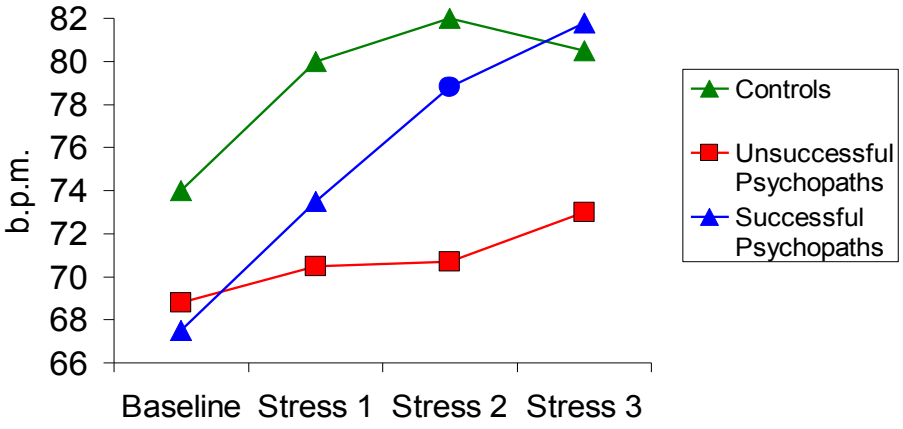
(a) Prefrontal Gray Volume



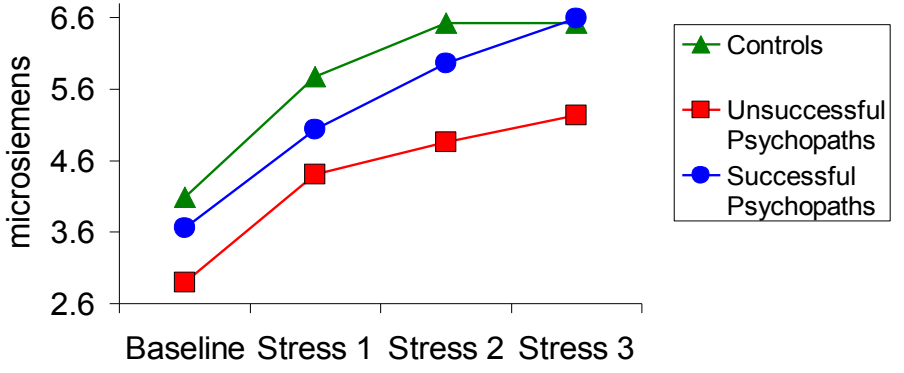
(b) Executive Functioning



(c) Heart Rate



(d) Skin Conductance



Unsuccessful Psychopaths:

- poor frontal functioning
- low autonomic reactivity
- reduced prefrontal gray

Successful Psychopaths:

- *better* frontal functioning
- *high* autonomic reactivity
- *increased* prefrontal gray

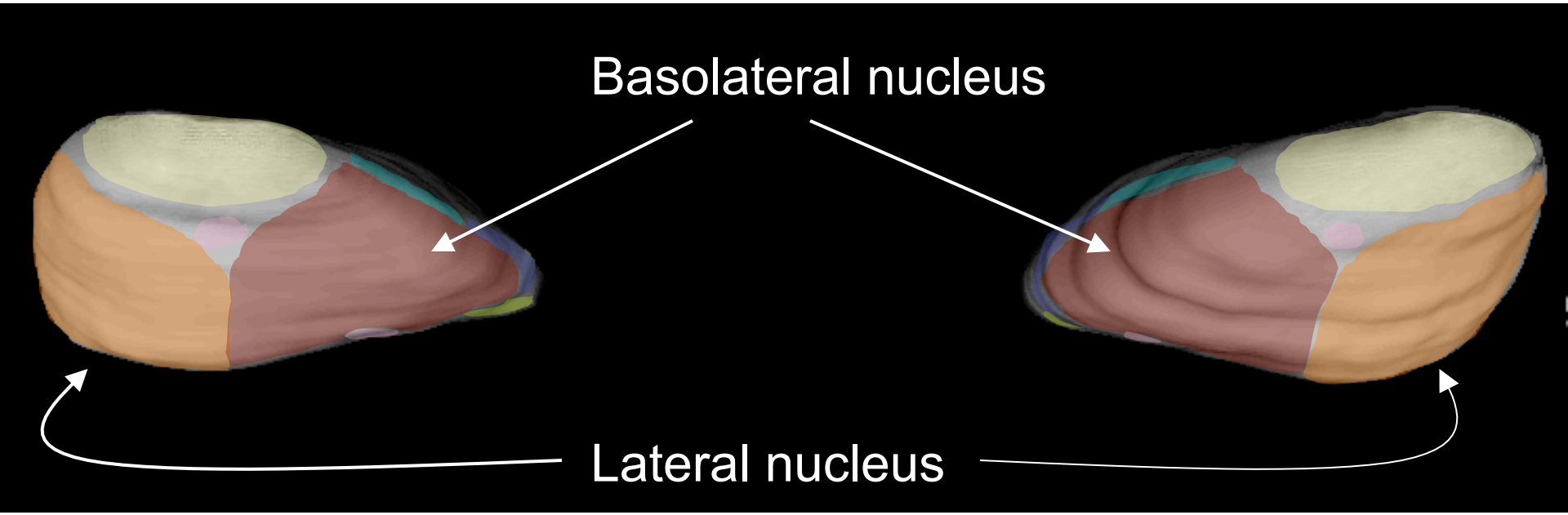
heightened autonomic and frontal functions promotes good decision-making and sensitivity to cues of risky situations that help some psychopaths avoid detection.

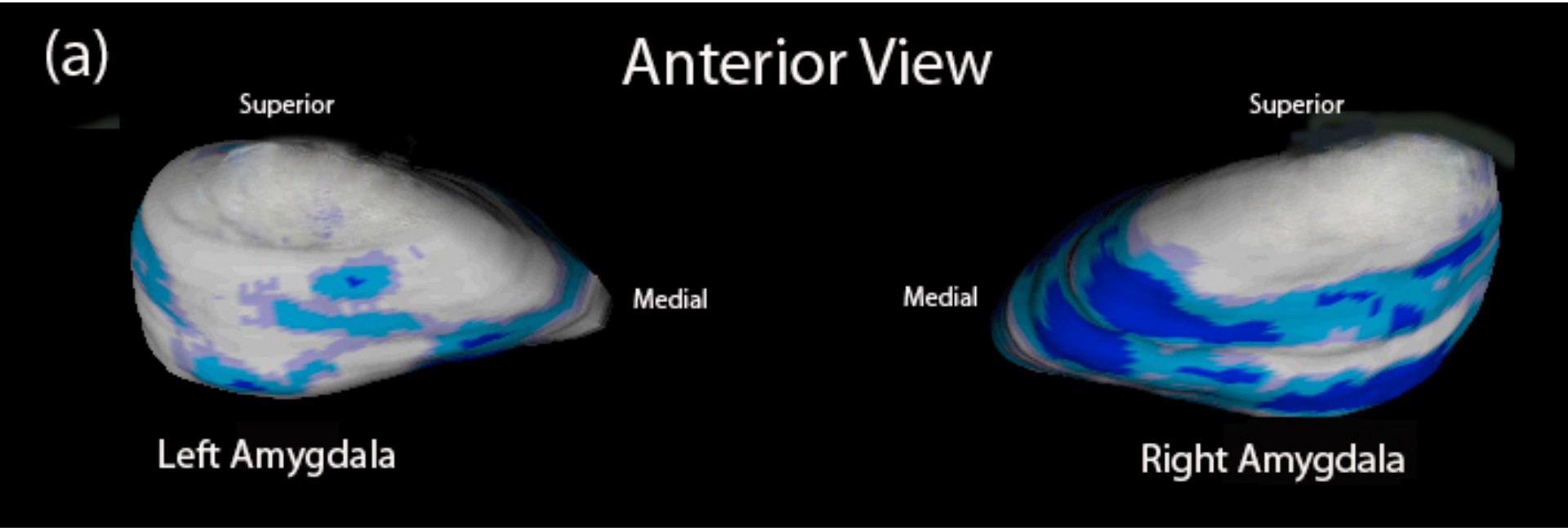
SUMMARY: PSYCHOPATHY

1. Clinical manifestation: four main factors

2. Etiology: early bonding; mind-body disconnect; temperament; amygdala – striatum.

3. “Successful” vs. “Unsuccessful psychopaths”: executive functions; arousal, PFC gray


Basolateral nucleus
Lateral nucleus

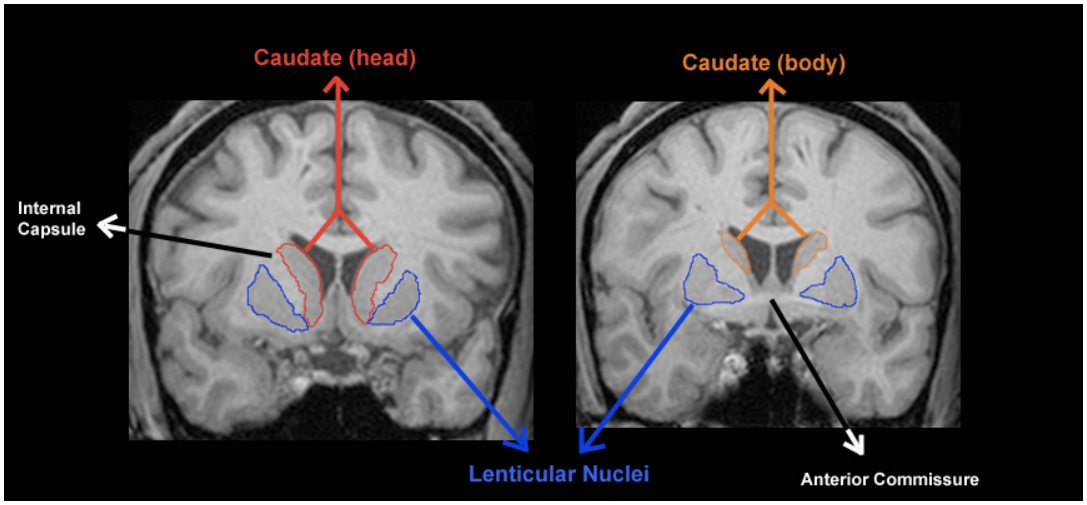

(a)
Anterior View
Superior
Medial
Left Amygdala
Superior
Medial
Right Amygdala

Add Marsh 2011 on OFC-amyg connectivity in moral decisions in kids

Psychopathy and Rewards; Striatum

Striatum

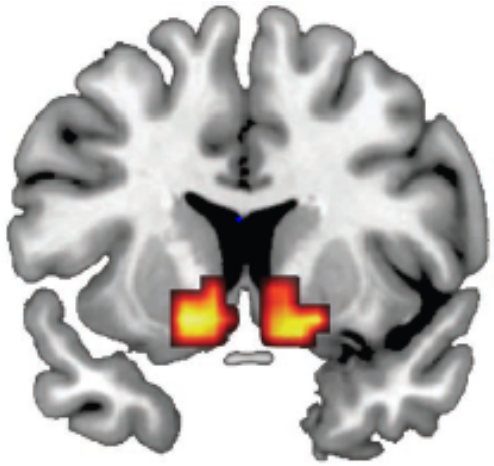
9.6% volume *increase*
in psychopaths



Glenn et al. (2010)
Biol. Psychiatry, *67*, 52-58

Ventral Striatum

Psychopathic traits:
Reward hypersensitivity



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Psychopathy and Rewards

Striatum

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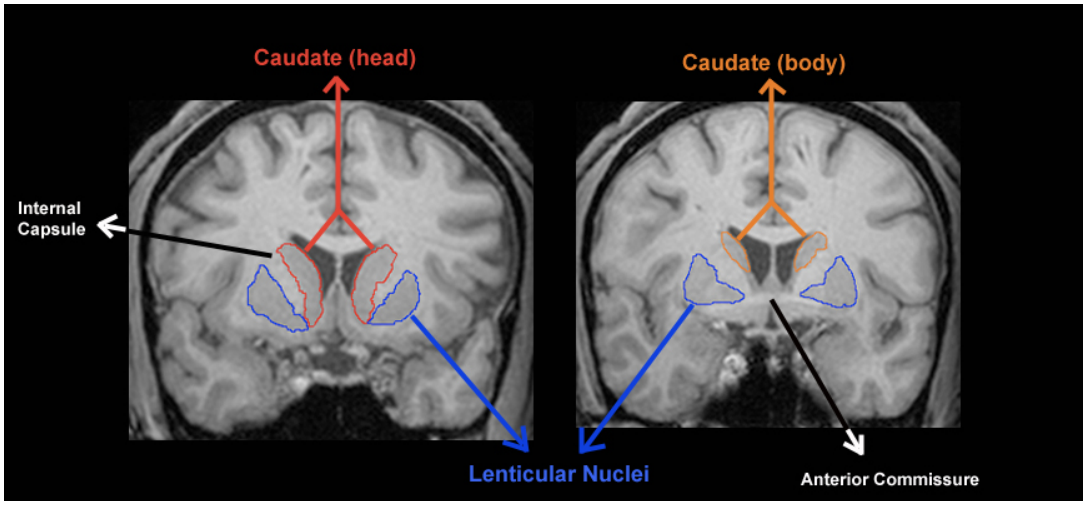

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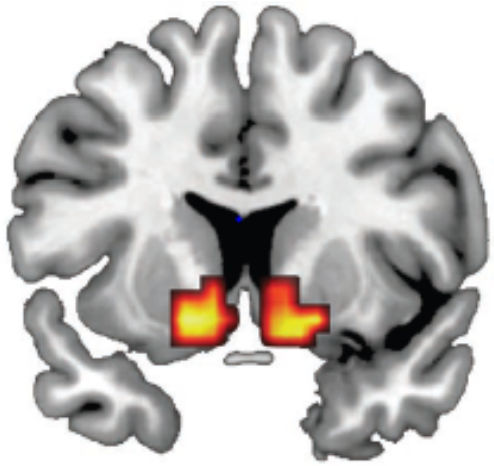
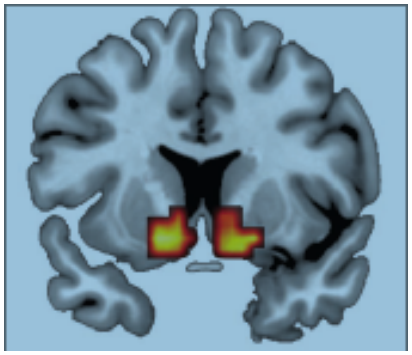


Buckholtz et al. (2010)
Nat. Neuro. 13, 419-421

Psychopathic individuals: striatal hyper-responsivity to anticipation of monetary rewards (Buckholtz et al. 2010)



Striatal functions:

- reward sensitivity: enhanced learning to rewards
- dramatic response to drugs of abuse
- impulsivity
- preference for immediate vs. delayed rewards

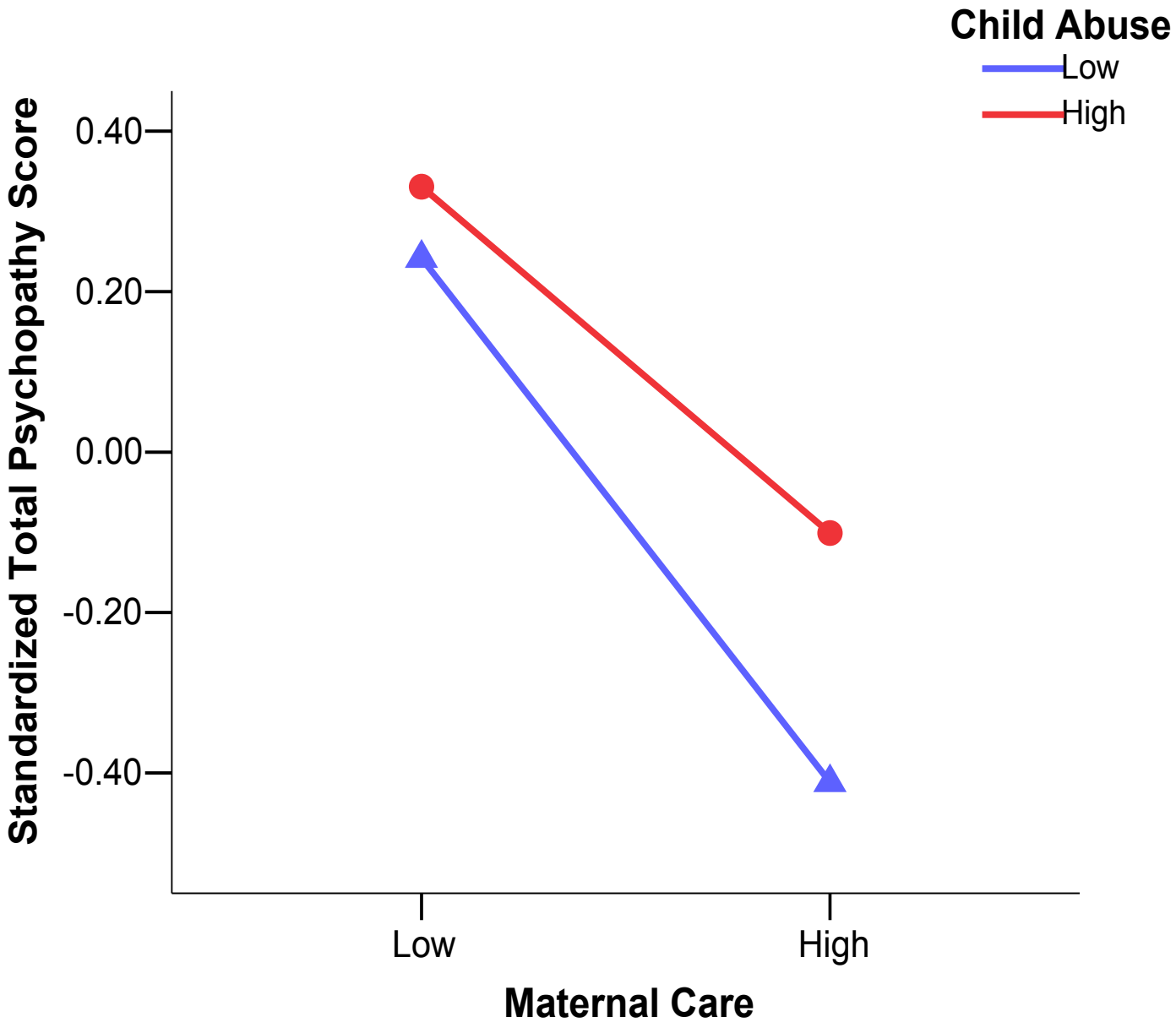
• dense connections to amygdala and VMPFC

• high psychopathy scorers need less money to violate a moral principle (Glenn et al. 2009)

Neurodevelopmental? Lack of synaptic pruning?

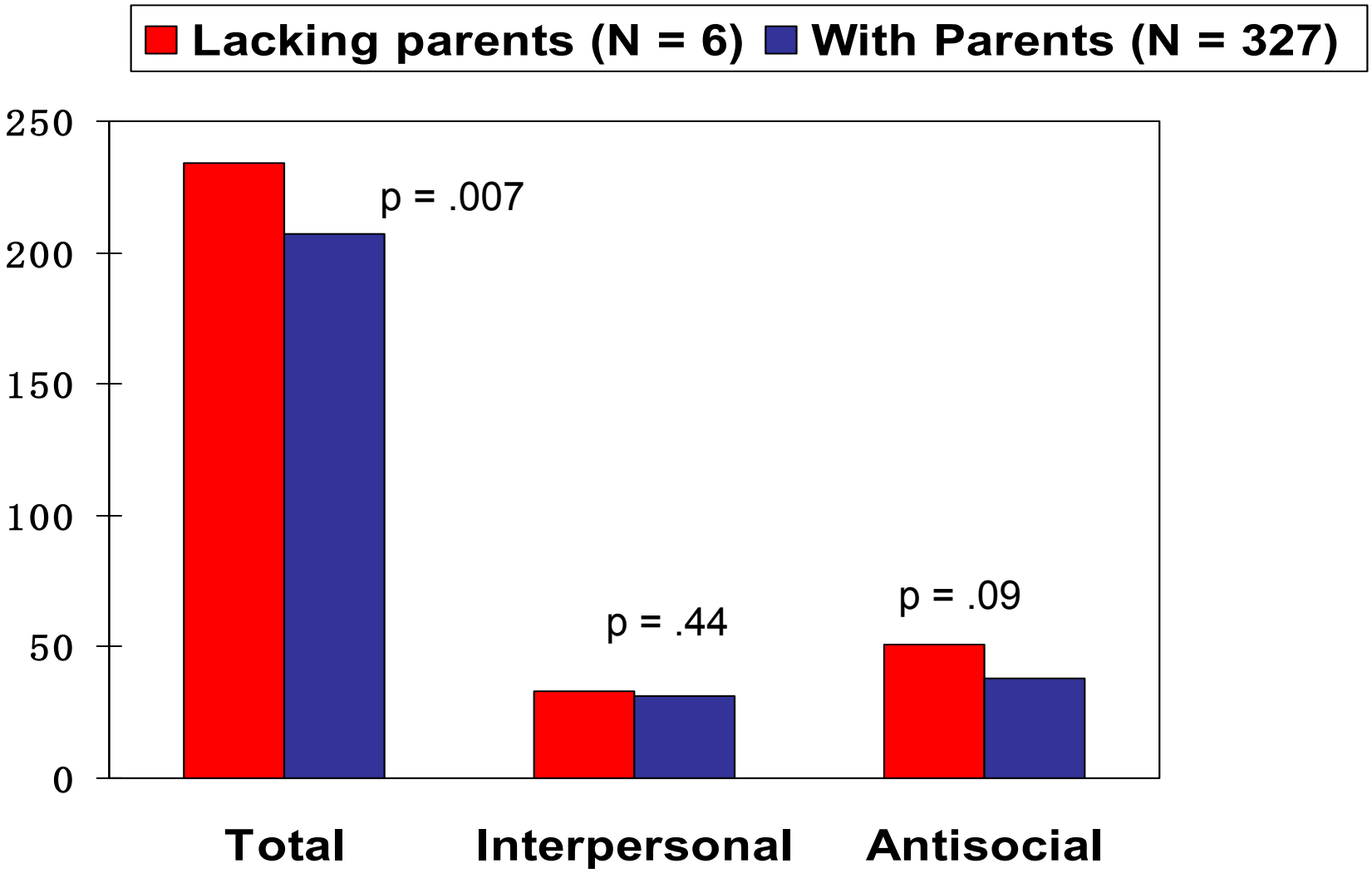
Concurrent Design – Maternal and Paternal Bonding

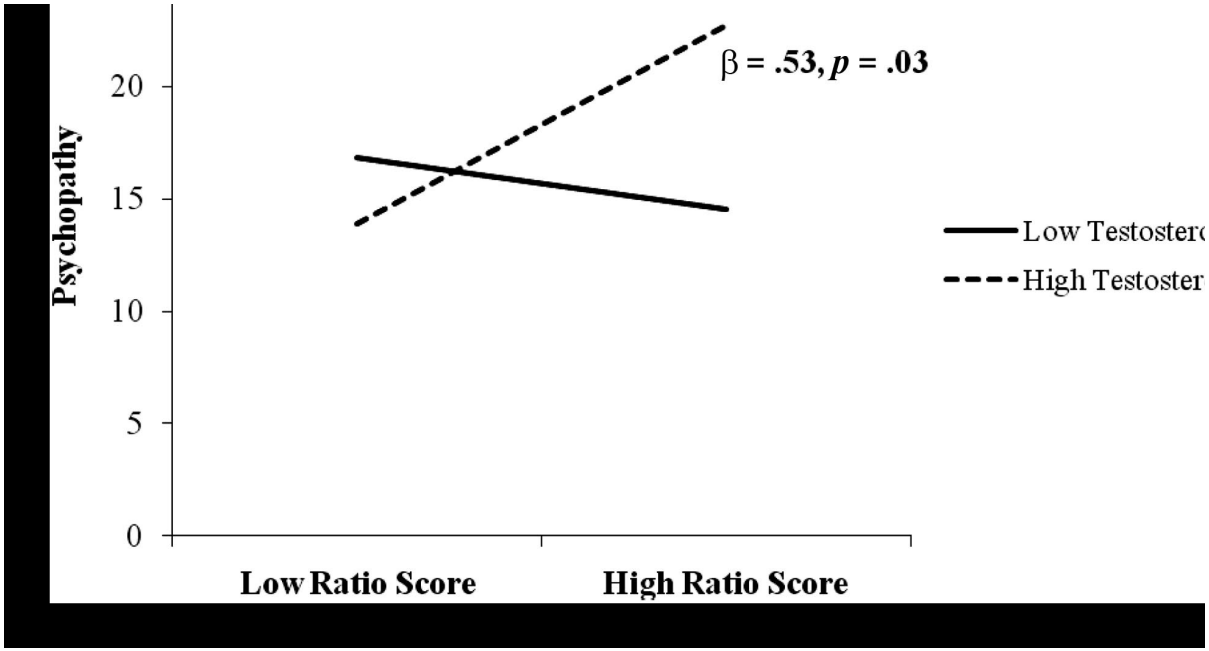
Parental Bonding	Psychopathy scores at 28 years: Total	Interpersonal	Antisocial
Maternal Care	-.38 $p < .001$	-.19 $p < .05$	-.34 $p < .001$
Paternal Overprotection	-.12 $p < .05$	-.23 $p < .001$	-.09 $p < .05$


Child Abuse
Low
High
Standardized Total Psychopathy Score
0.40
0.20
0.00
-0.20
-0.40
Low
High
Maternal Care

Parental Separation at 3 and Psychopathy at 28

Gao et al., (in preparation)




β = .53, p = .03
Psychopathy
20
15
10
5
0
Low Ratio Score
High Ratio Score
Low Testoster
High Testoster

Implications

- differences between successful and unsuccessful psychopaths questions the external validity of research on imprisoned, failed psychopaths.

- different etiological pathways (neurobiological vs. psychosocial) to different forms of psychopathy ?

- research on community samples must grapple with another source of heterogeneity

- Are there precursors to adult psychopathy very early in life?

  Temperament-adult pyshcopaths are disinhibited, fearless, and stimulation seeking

  Psychophysiology-adult psychopaths show lower arousal, reduced orienting responses, and longer half recovery time to aversive stimuli

Temperament and Psychopathy

Temperament (age 3) (N = 335)

Glenn, Raine et al. (2007). *Journal of Abnormal Psychology*

Inhibition / Disinhibition

Fearfulness

Stimulation seeking / sociability

Psychopathy: Hare's Self-Report Psychopathy scale (SRP-II)

Autonomic Measures (age 3)

Heart Rate, SC levels, nonspecific SCR

Amplitude to orienting stimuli

Half-recovery time to aversive stimuli

Age 28

- Comparisons using high/low psychopathy split (above and below 1SD from the mean)

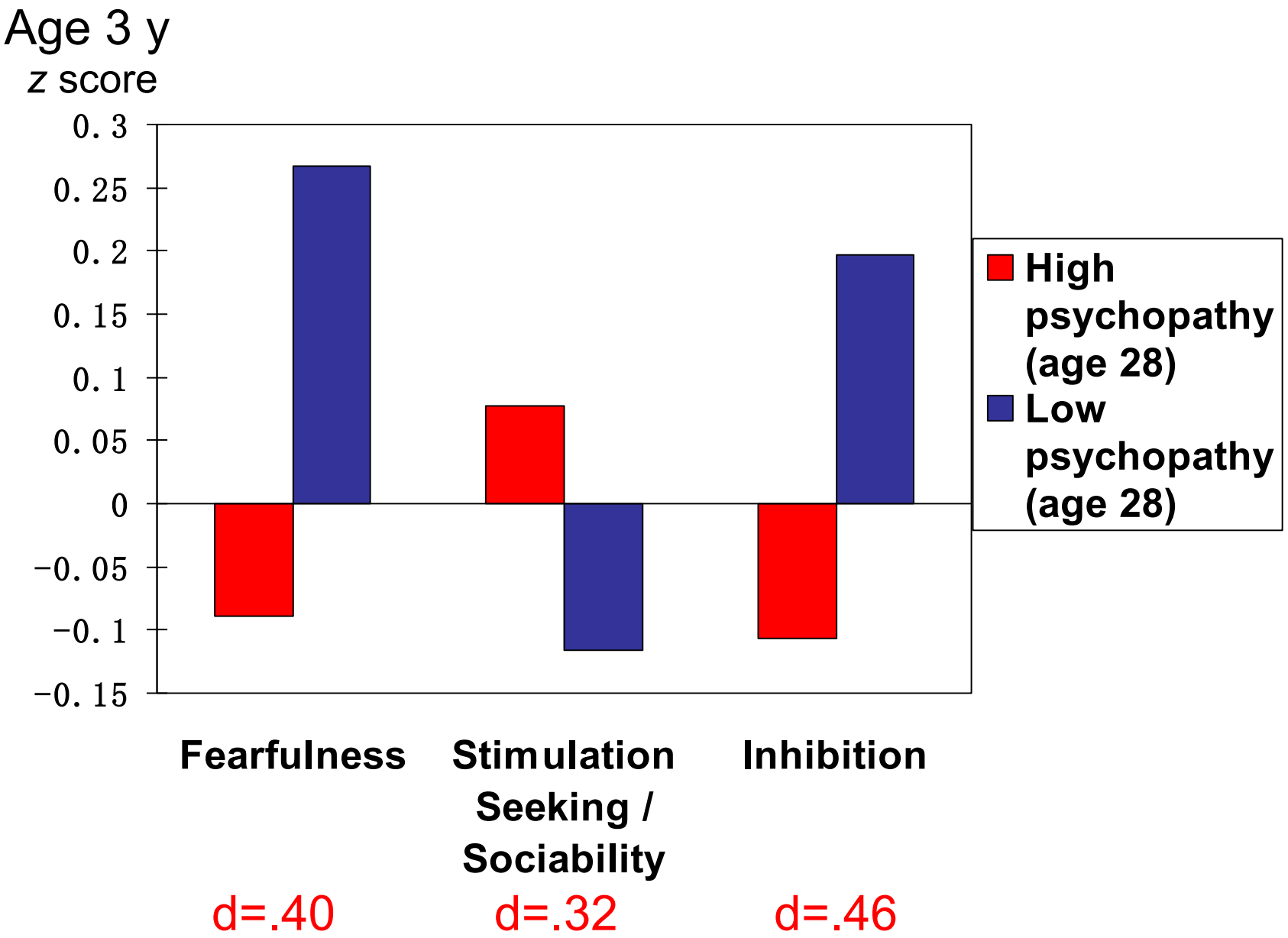
Stimulation-seeking / sociability

- 3 of the 4 components of the measure were indices of sociability:
  - Verbalizations
  - Friendliness toward experimenter
  - Social involvement

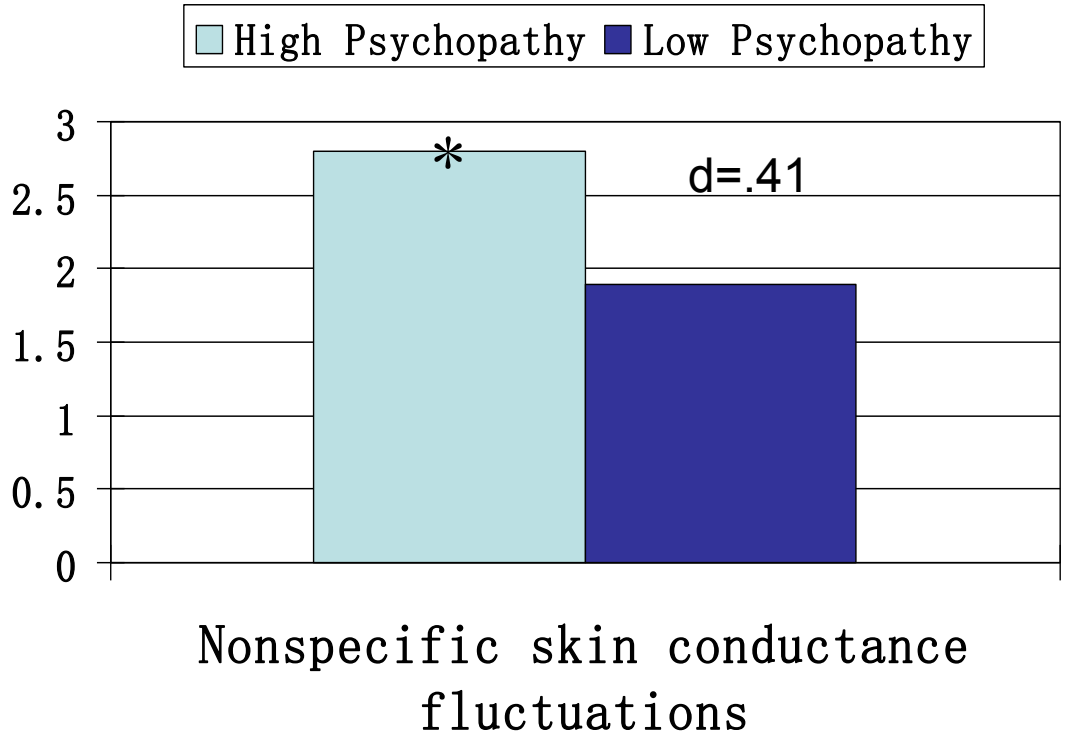
- Sociability found to be significantly higher in the higher-scoring psychopathy group

Age 3 Temperament and age 28 Psychopathy

Glenn et al., (2007) *Journal of Abnormal Psychology*

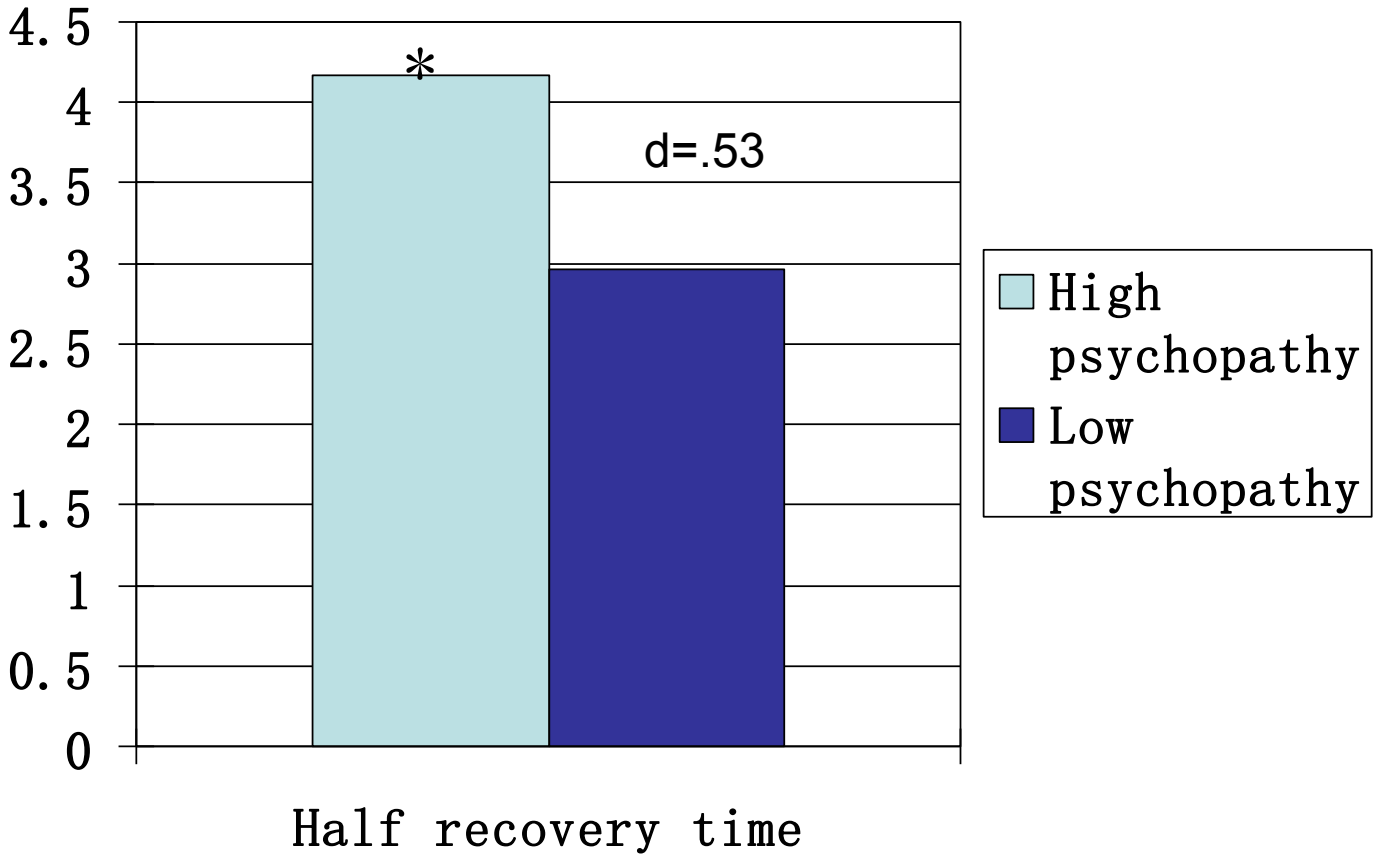


Arousal-first minute



- No difference in mean heart rate
- No difference in initial skin conductance levels

Aversive stimuli



Overall

- Individuals with a psychopathic-like personality at age 28 are characterized at age 3 by:
  - Less inhibition, less fear, more sociable
  - *Increased* arousal and orienting
  - Longer half recovery time to aversive stimuli

Fear and inhibition

- Fearfulness and inhibition contribute to the development of moral emotions such as guilt, shame, and empathy (Kochanska, 1993)
- Children who are less fearful and inhibited are more likely to develop psychopathic traits in adulthood

Stimulation seeking / sociability

- The sociability aspect of the measure seems to be the most significant
- Sociability in childhood may translate into traits such as glibness, superficial charm, conning, and manipulativeness observed in adult psychopaths
- We do not know what might morph normal sociability into the deviant psychopathic form

Why increased orienting and arousal?

- We expected lower autonomic arousal and orienting as is seen in adult psychopaths
- However, adult group is not incarcerated psychopaths, but are community individuals with psychopathic traits
- Perhaps high arousal and orienting is a factor that helps prevent these individuals from being caught and convicted, despite their psychopathic traits

Why increased arousal and orienting?

- Our sample may resemble “successful” psychopaths who are not caught and convicted yet demonstrate psychopathic traits
- Successful psychopaths have been shown to have higher autonomic stress reactivity (Ishikawa, 2001)
- Individuals who are antisocial in adolescence but desist from crime in adulthood also show increased arousal and orienting (Raine, 1995)

Why is increased arousal and orienting helpful?

- Reflects greater attentional processing, so they may be more aware of environmental cues of punishment and consequences
- Reflects better processing of the prefrontal cortex which may be essential in some of the more “adaptive” features of psychopathy such as the ability to be verbally facile, and to lie, con, and manipulate

Longer Half-recovery time

- Consistent with the adult literature
- t2 is important in learning appropriate moral behavior
- Long t2 has been associated with deficits or lesions in the amygdala, which is implicated in psychopathy

Limitations

- Self-report measure, not PCL-R
- Results can only be applied to community samples with psychopathic traits

Conclusions

- Adults with psychopathic traits show differential temperamental and psychophysiological characteristics as early as age 3
- These factors may be influential throughout one's lifetime and can predispose one for the development of psychopathic features

Conclusions

- Increased arousal and orienting may help to prevent certain individuals with psychopathic traits from being caught and convicted
- Long half-recovery time may be present throughout the lifetime in psychopathic individuals

Features of Psychopathy

1. Arrogant and deceitful interpersonal style
   - Glib / superifica
   - Grandiose
   - Pathological lying
   - Conning / manipulative

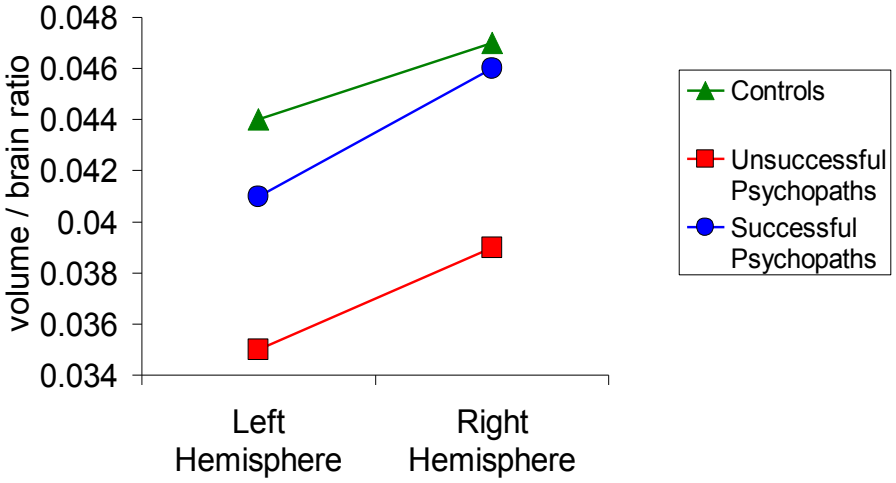
2. Deficient affect
   - Lacks remorse / guilt
   - Shallow affect
   - Callous / lacks empathy
   - Fails to accept responsibility

3. Impulsive – unstable
   - Need for stimulation
   - Parasitic lifestyle
   - Lacks realistic, long-term goals
   - Impulsivity
   - Irresponsibility

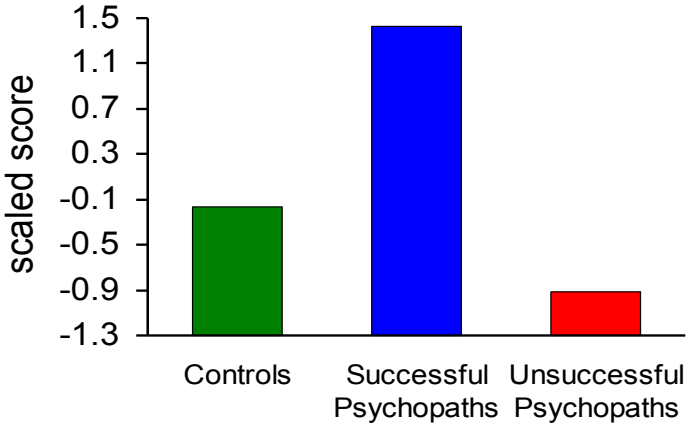
clip

Prefrontal Structure / Function

Prefrontal Gray Volume

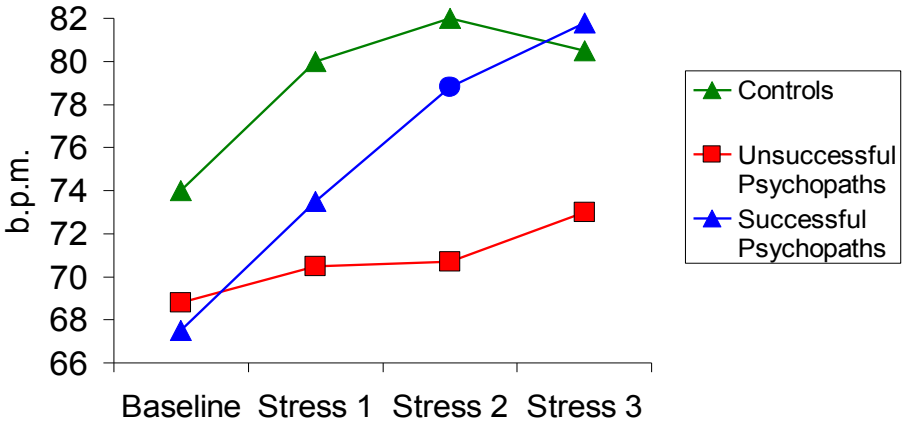


Executive Functioning

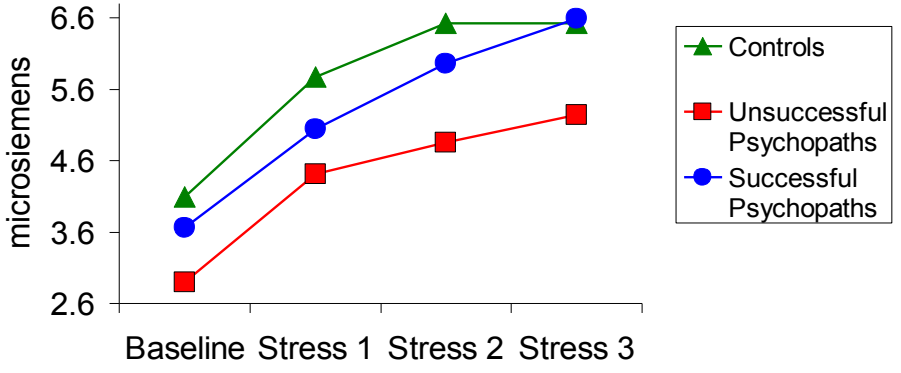


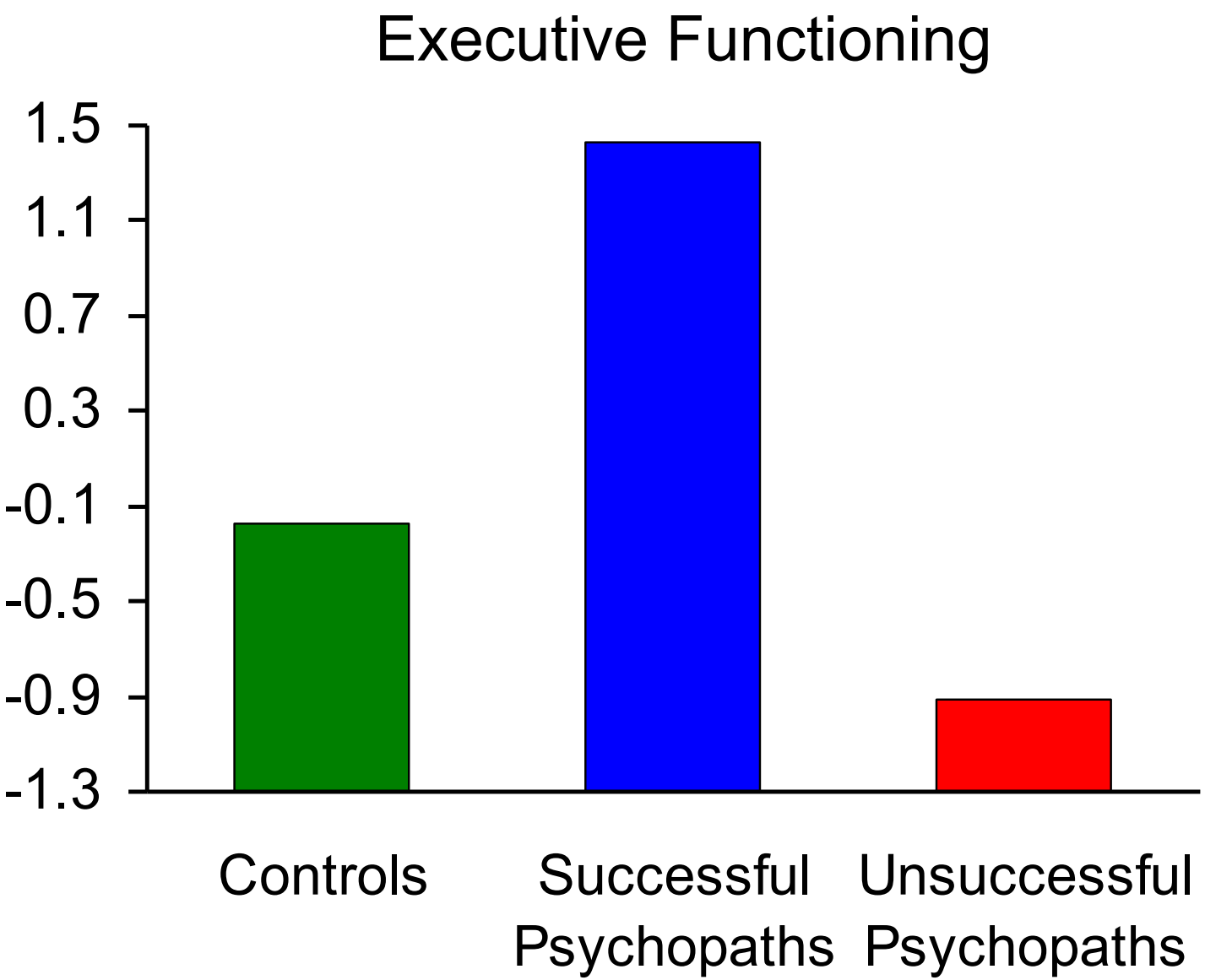
Autonomic Stress Reactivity

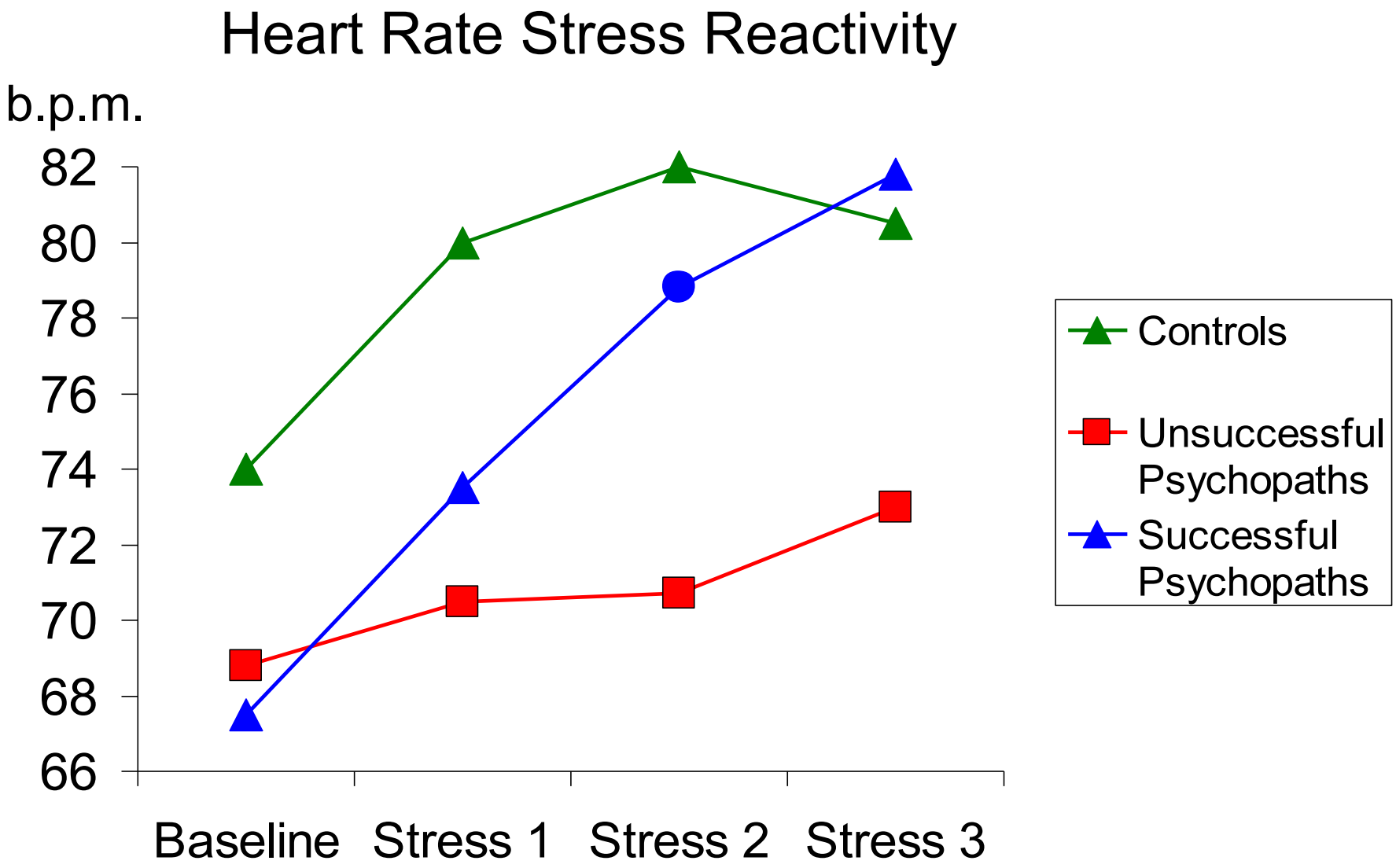
Heart Rate



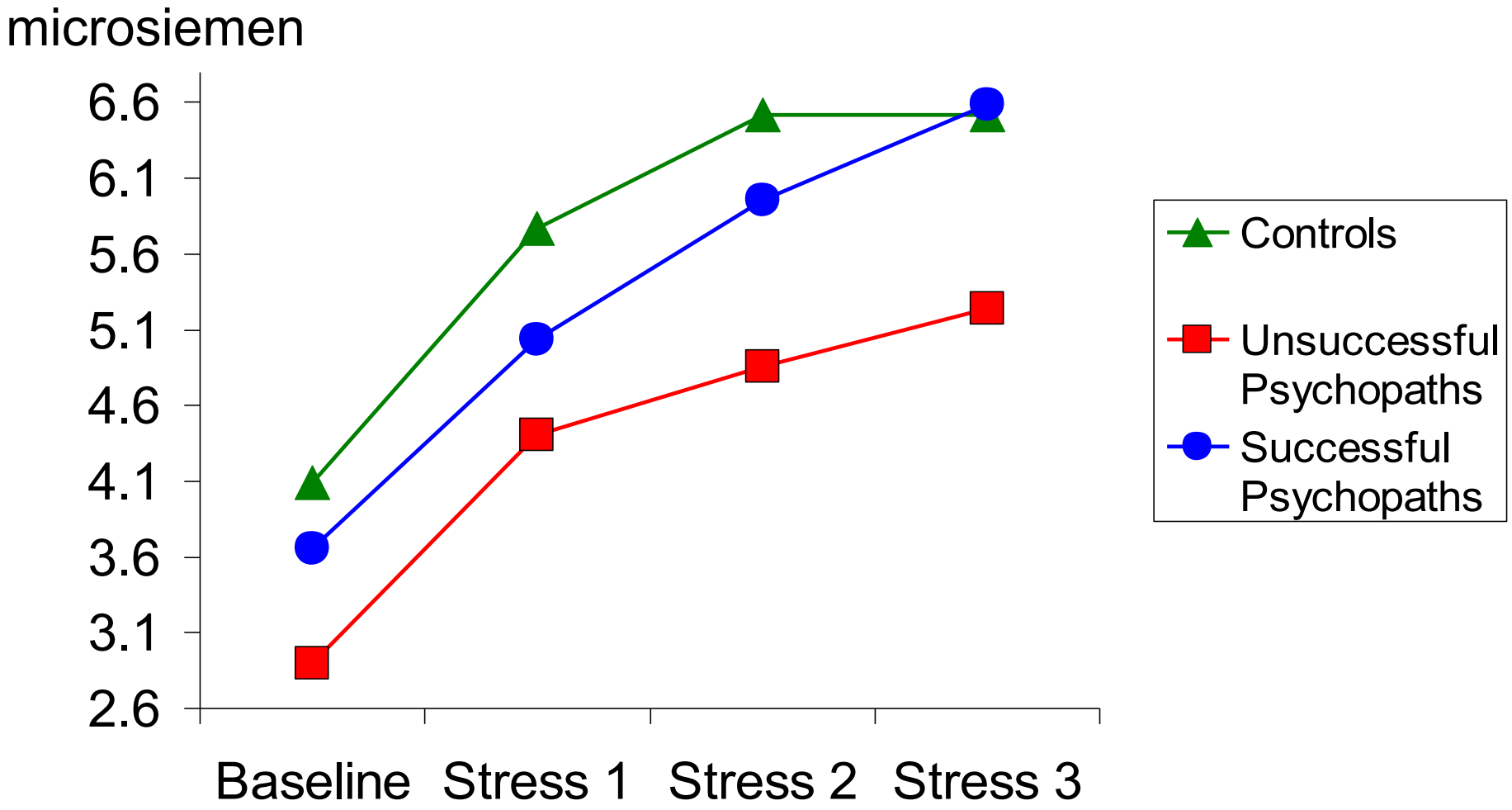
Skin Conductance

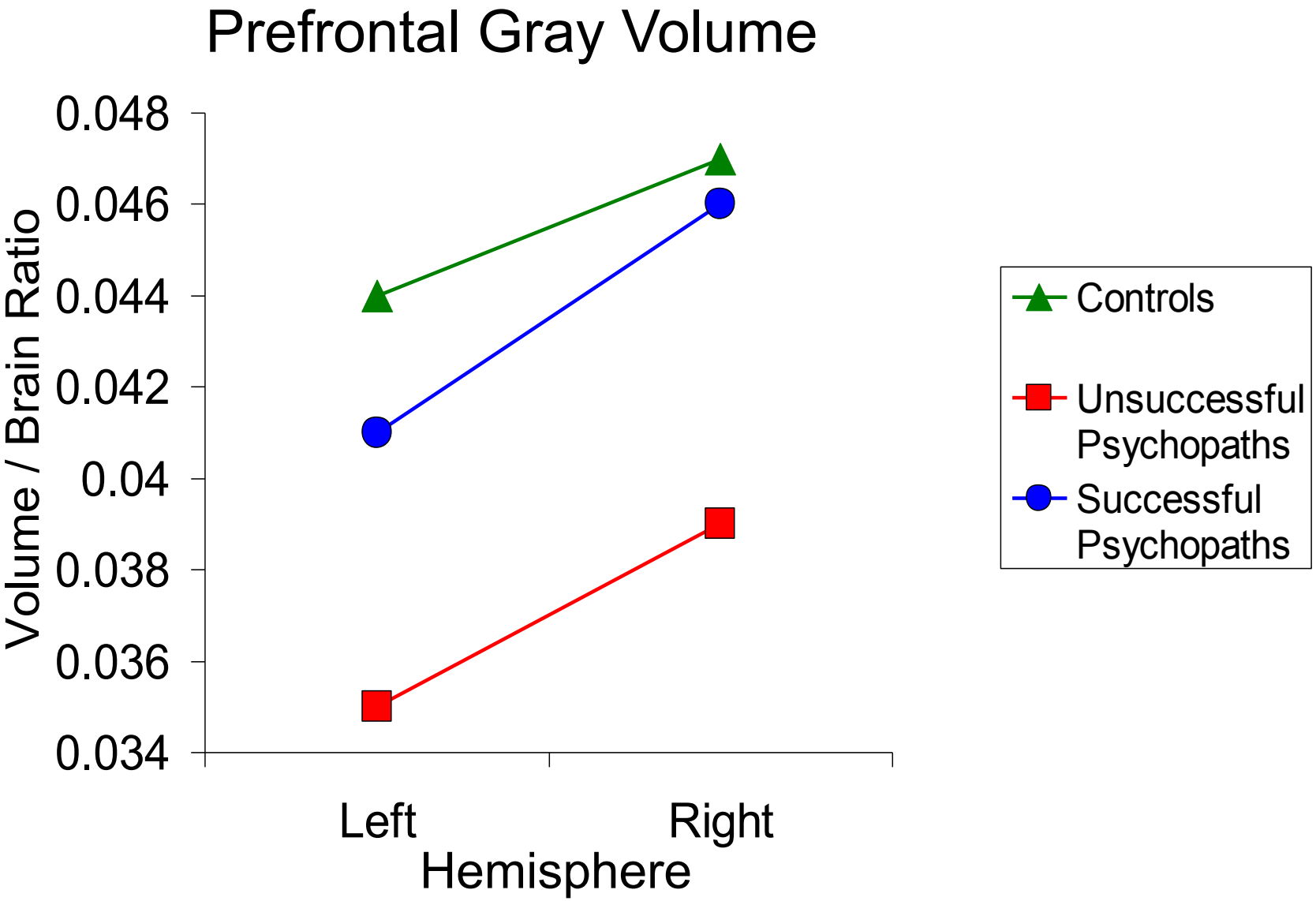



Executive Functioning
1.5
1.1
0.7
0.3
-0.1
-0.5
-0.9
-1.3
Controls
Successful Psychopaths
Unsuccessful Psychopaths

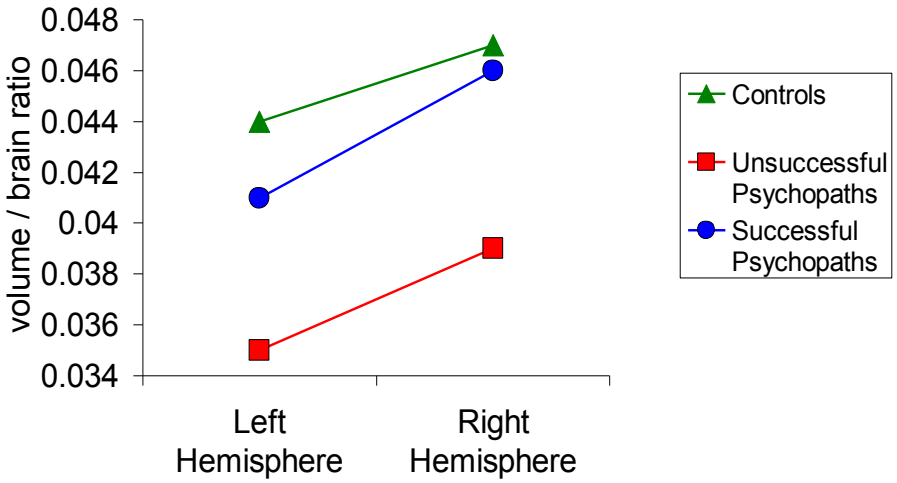

Heart Rate Stress Reactivity
b.p.m.
82
80
78
76
74
72
70
68
66
Baseline
Stress 1
Stress 2
Stress 3
Controls
Unsuccessful Psychopaths
Successful Psychopaths

Skin Conductance Stress Reactivity

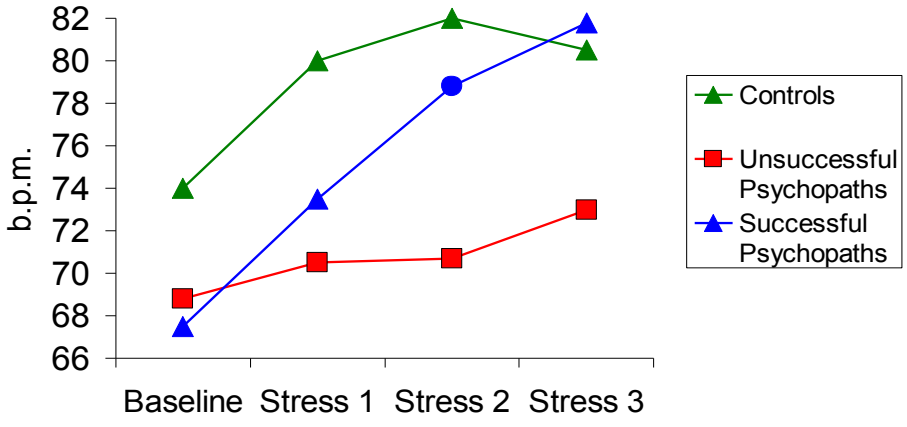



Prefrontal Gray Volume
Volume / Brain Ratio
0.048
0.046
0.044
0.042
0.04
0.038
0.036
0.034
Left
Right
Hemisphere
Controls
Unsuccessful Psychopaths
Successful Psychopaths

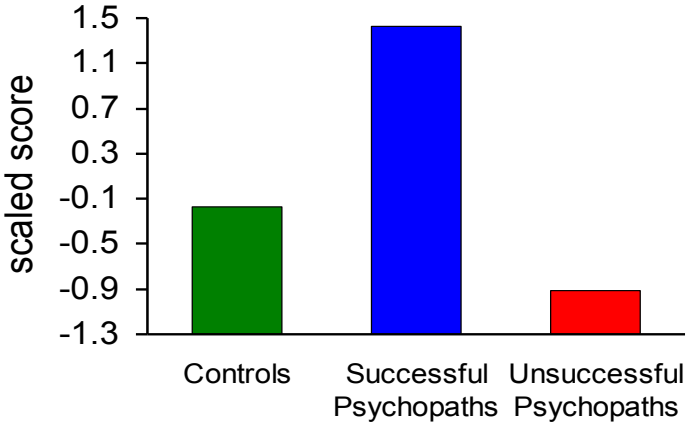
Prefrontal Gray Volume



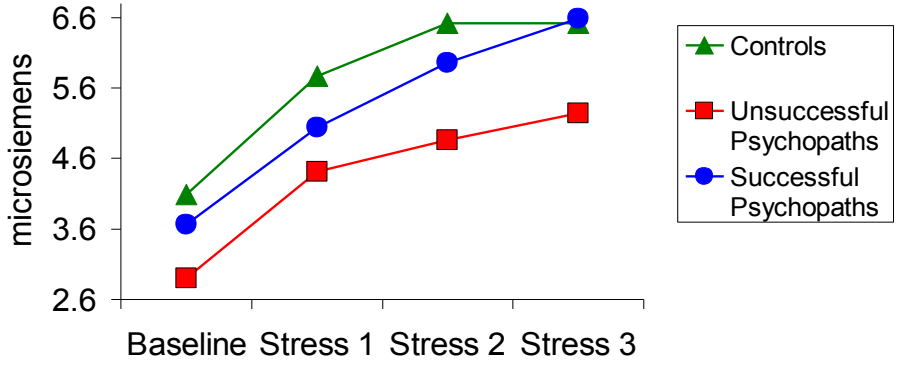
Heart Rate Stress Reactivity



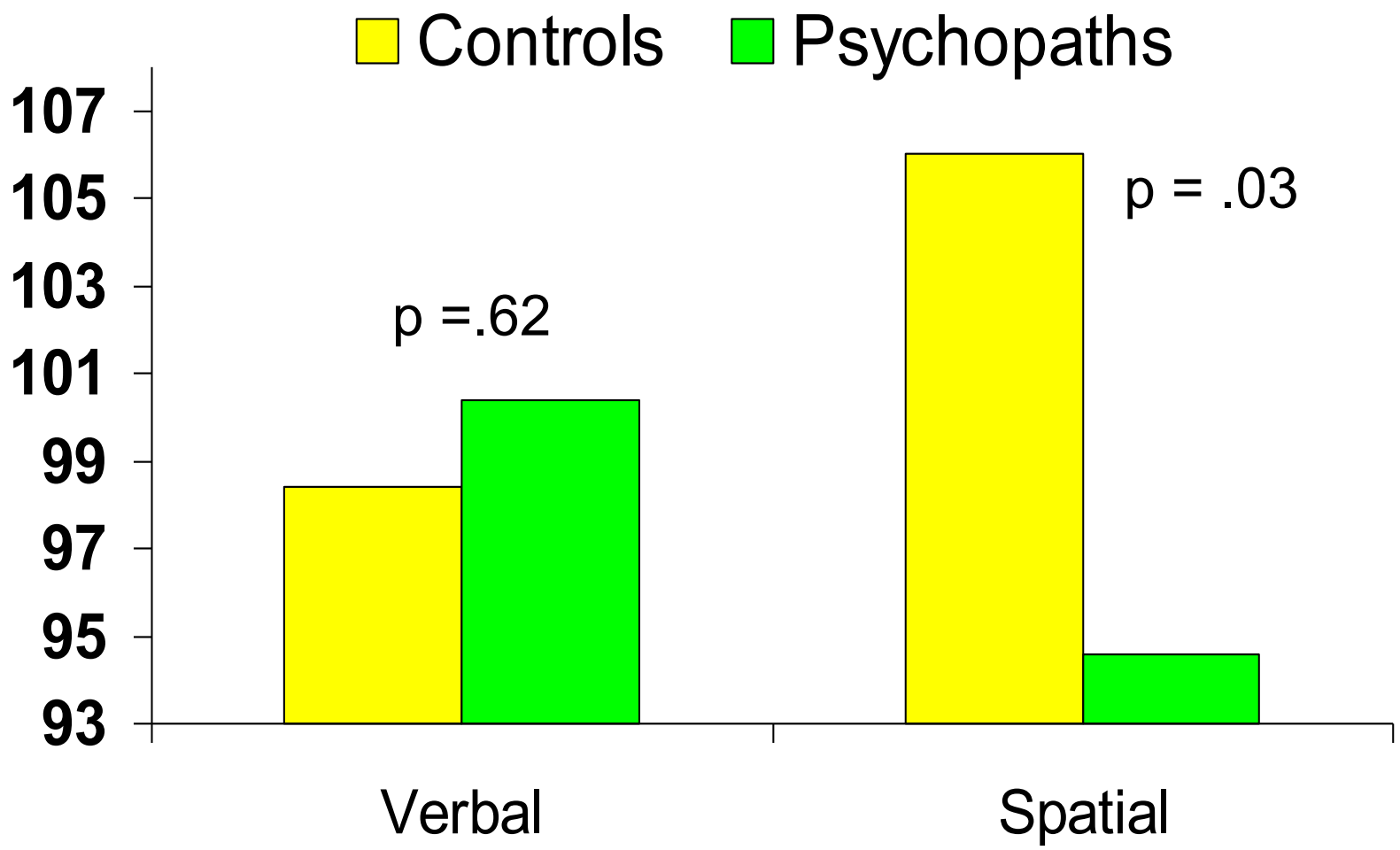
Executive Functioning



Skin Conductance Stress Reactivity



Verbal / Spatial Ability



Does SC hyporesponsivity precede psychopathy?

Temperament

Kagan (1994): uninhibited children:
low HR and increased left frontal EEG activation

Scarpa et al. (1997): uninhibited children: low resting HR + SC

Fowles et al. (2000): fearless temperament: reduced SC lability

Psychopathy

Blair (1999; 2002): reduced SCRs to distress cues

Crowley (2002):

- increased left hemisphere EEG in child “psychopaths”
- no effect for startle modulation (threat)

REWARD DOMINANCE

Quay (1985): CD children overactivated reward system

Newman et al. (1985): Psychopaths difficulty in inhibiting rewarded responses

Shapiro (1988):

- card-playing task
- at beginning, 90% of cards turned over are rewarded; by end only 10% rewarded
- conduct disordered adolescents play more cards than controls : fail to inhibit responses

Scerbo et al. (1990)

- passive avoidance learning task
- learn to respond to cards associated with money and avoid cards associated with money loss
- adolescents psychopaths responded more to reward cards
- also learn task more efficiently

- findings replicated / supported by Daugherty and Quay (1989), O'Brien et al. (1994), Matthys et al. (1998), Barry et al. (2000), Seguin et al. (2002), Wilson & Evans (2002), Frick (2003)
- not supported by Colder & O'Connor (2004)

Are psychopaths more sensitive to rewards and may show superior learning when motivated by rewards?

Brain circuits involved in emotional learning in antisocial behavior and social phobia in humans

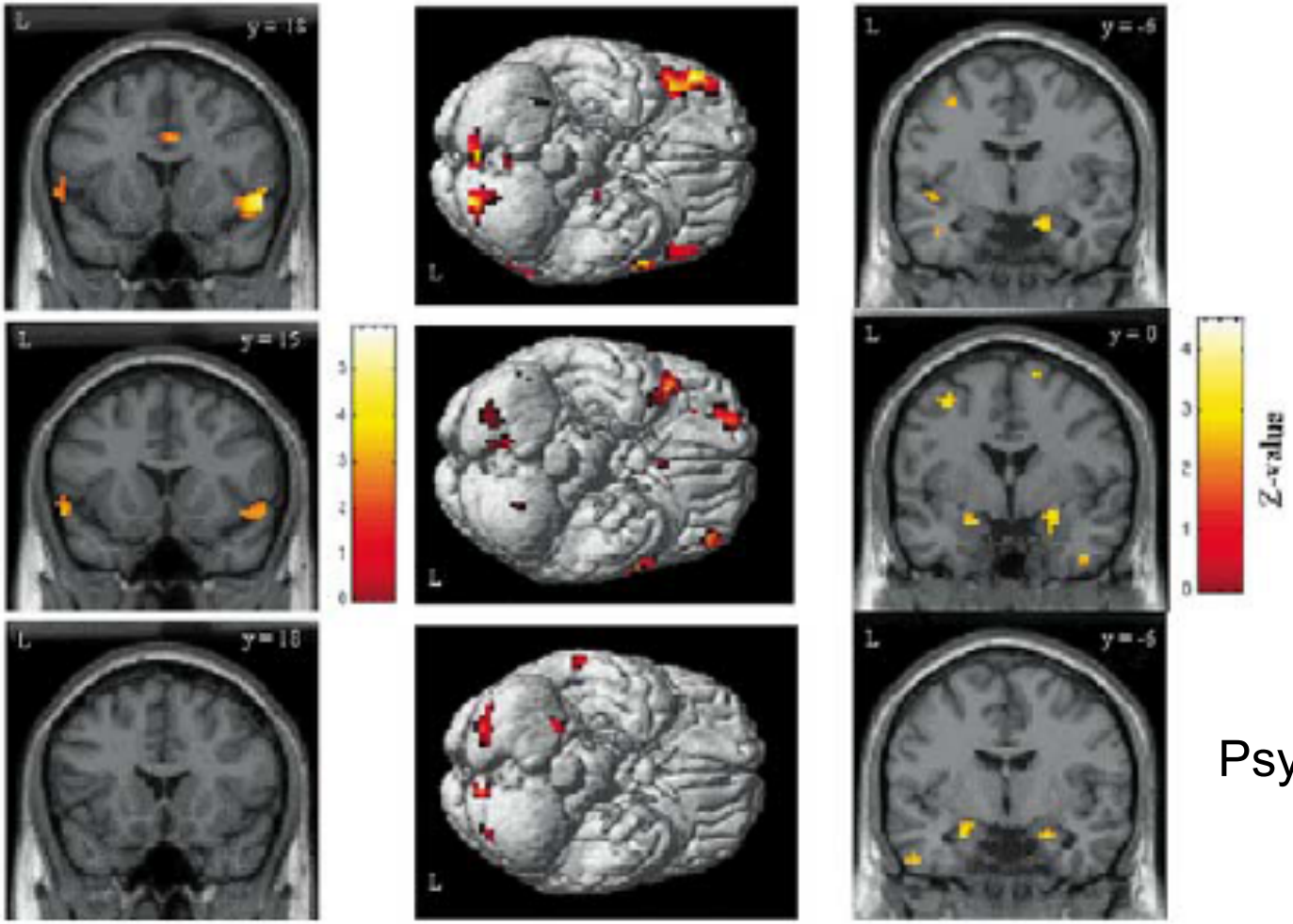
Ralf Veit[a], Herta Flor[b], Michael Erb[c], Christiane Hermann[b], Martin Lotze[a], Wolfgang Grodd[c], Niels Birbaumer[a,d,*]

Neuroscience Letters 328 (2002) 233–236

Anterior insula

OFC

Amygdala



Controls: limbic + prefrontal

Social Phobics

Psychopaths: amygdala

Narcissistic Personality Disorder: DSM-IV Definition

Pervasive grandiosity, need for admiration, lack of empathy

A. 5 or more of:

(1) grandiose sense of self-importance (exaggerates talents)

(2) fantasizes unlimited success/power/brilliance/beauty/love

(3) believes special/unique; only understood by high status

(4) requires excessive admiration

(5) sense of entitlement (favorable treatment)

(6) interpersonally exploitive (takes advantage or others)

(7) lacks empathy (won't recognize feelings / needs of others

(8) often envious of others / believes others envious of them

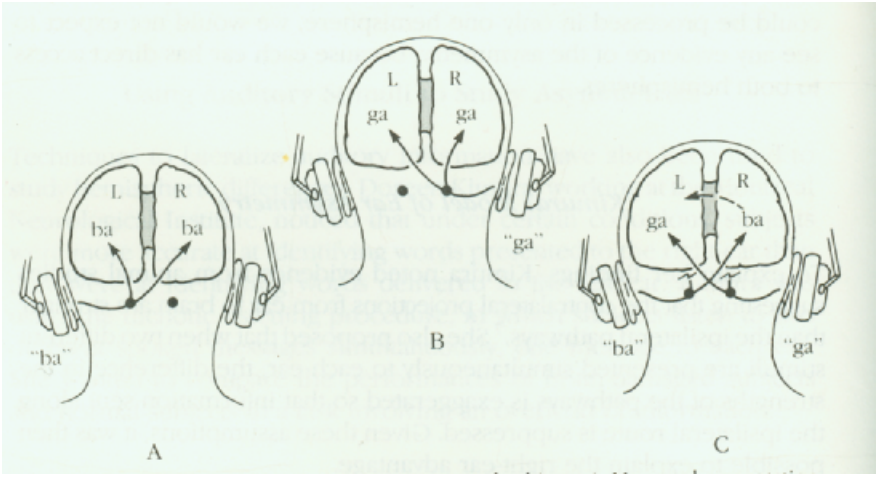
(9) arrogant / haughty behavior or attitudes

Psychopathy may be neurodevelopmental in nature (Raine et al. 1995)

- psychopathy rooted early in life
- unfolds relatively consistently in childhood / adolescence
- relatively impervious to conventional treatments
- in part genetically determined
- psychosocial influences don't explain relationship
- neurodevelopmental disorders have increased callosal size (schizophrenia, schizotypy, dyslexia, velocardiofacial syndrome, developmental language disorder)
- morphological changes complex: dictate against simple environmental trauma / disease processes

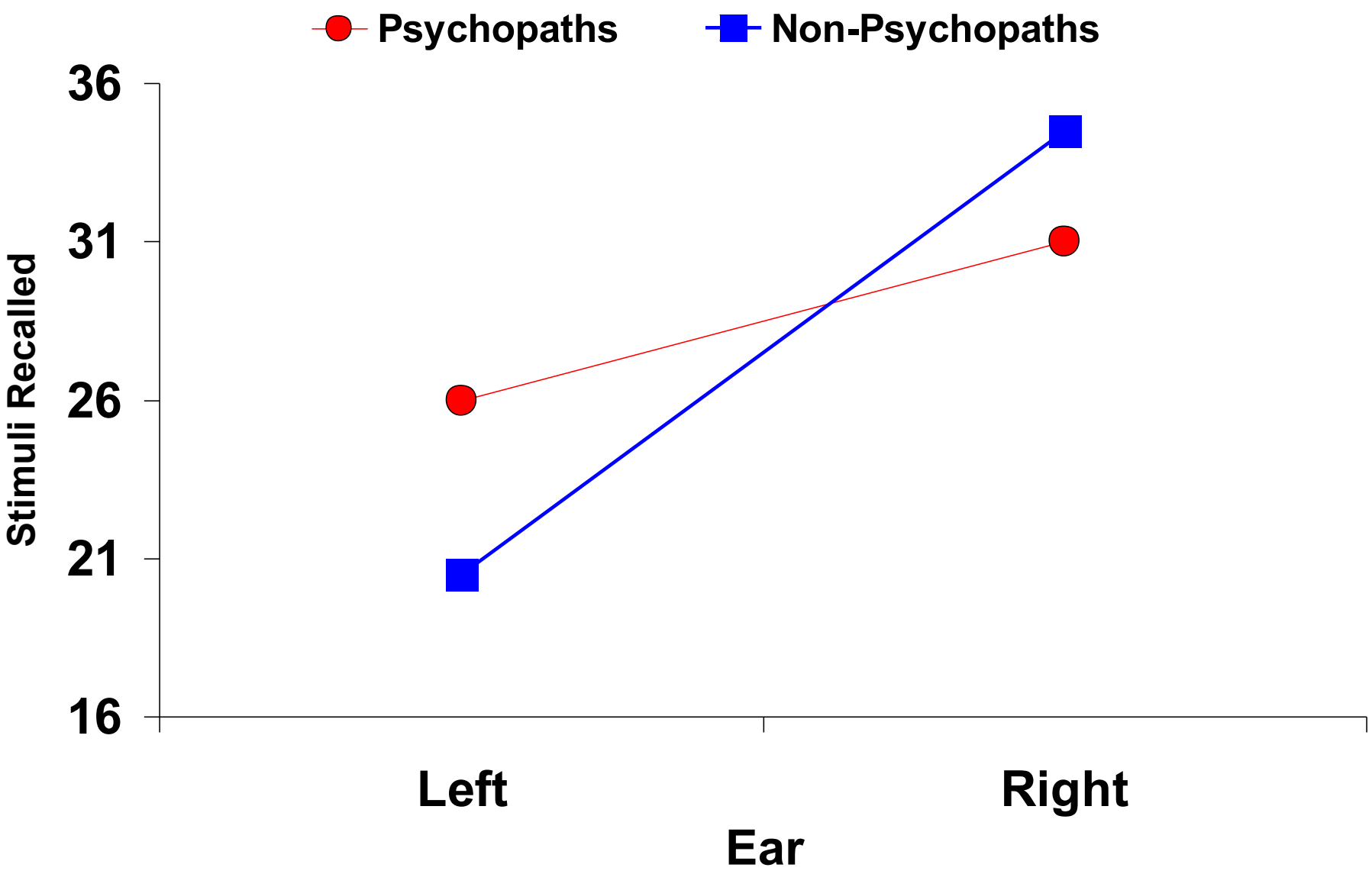
DICHOTIC LISTENING AND PSYCHOPATHY

- present CV (consonant-vowel) stimuli (e.g. ba, da) to left and right ears simultaneously

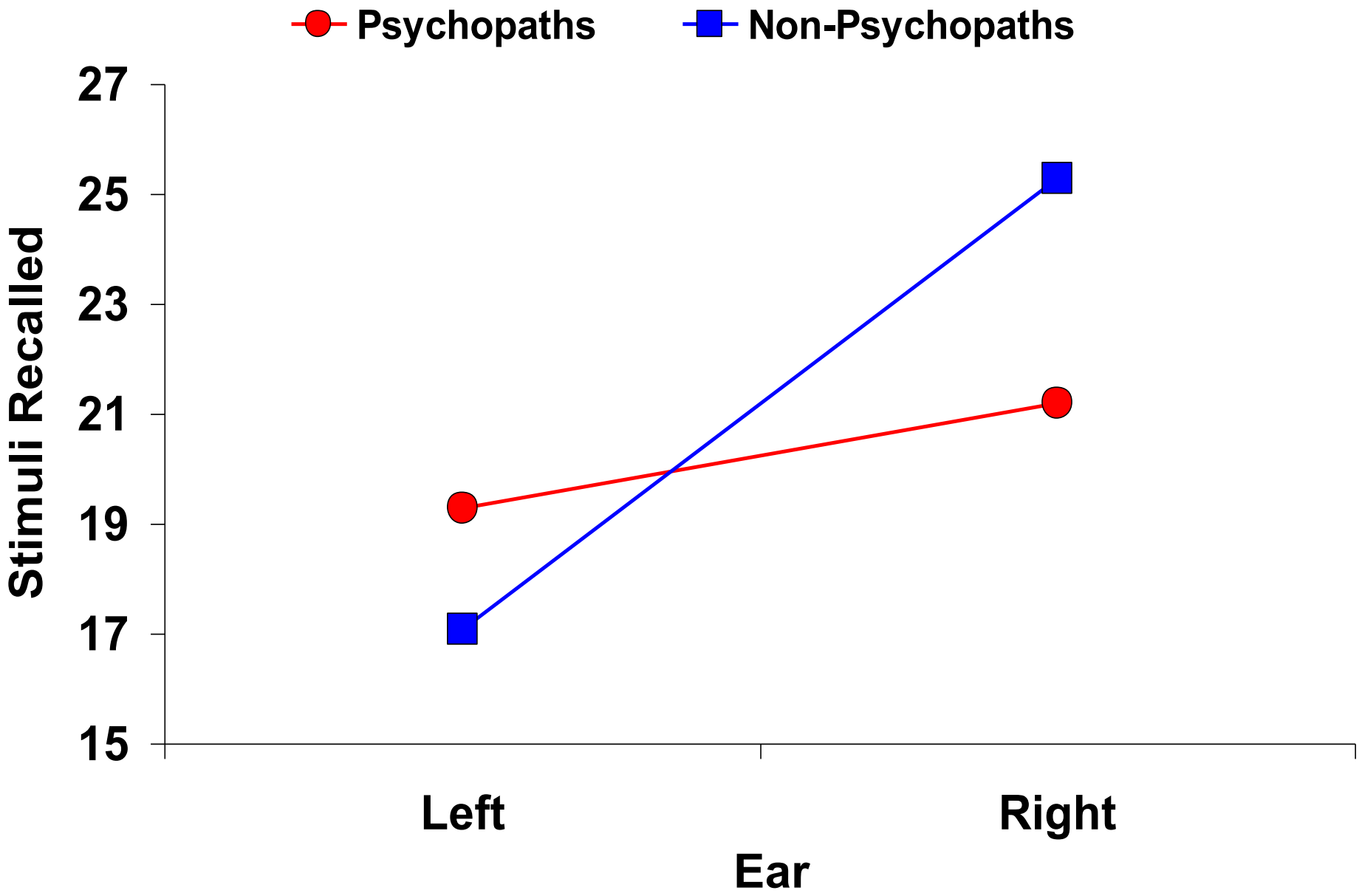


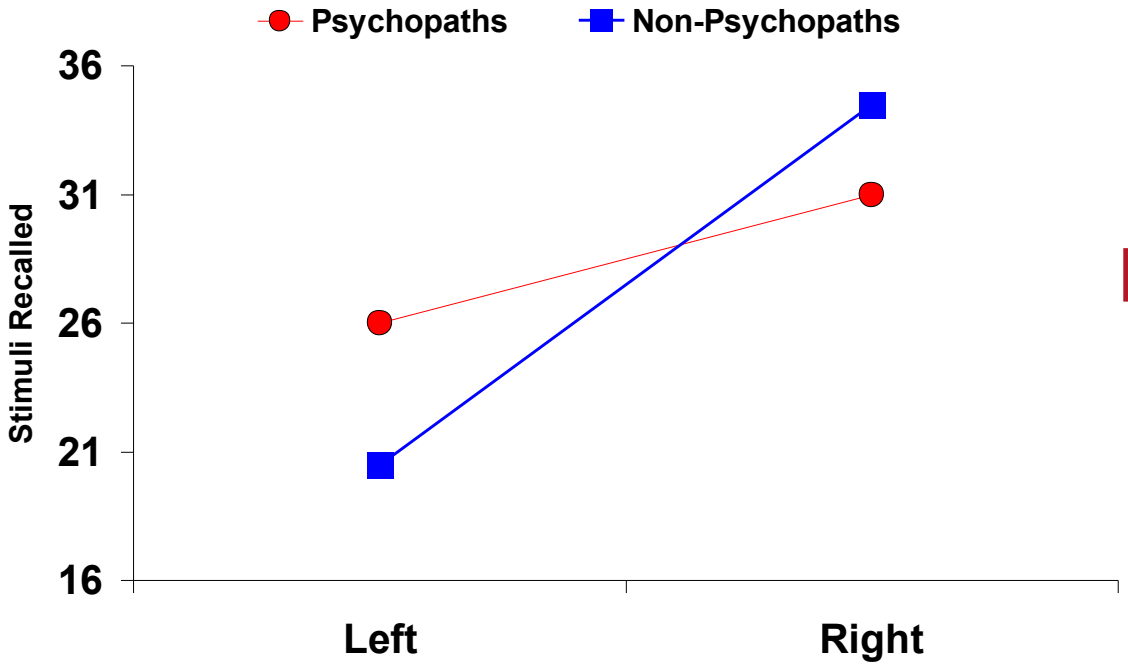
- right ear projects to left (verbal) hemisphere; left ear to right hemisphere
- normals show right ear (left hemisphere) advantage
- Hare and McPherson (1984): psychopaths show reduced laterality
- Raine et al. (1990): replicate findings in adolescent psychopaths

Hare & McPherson (1984)

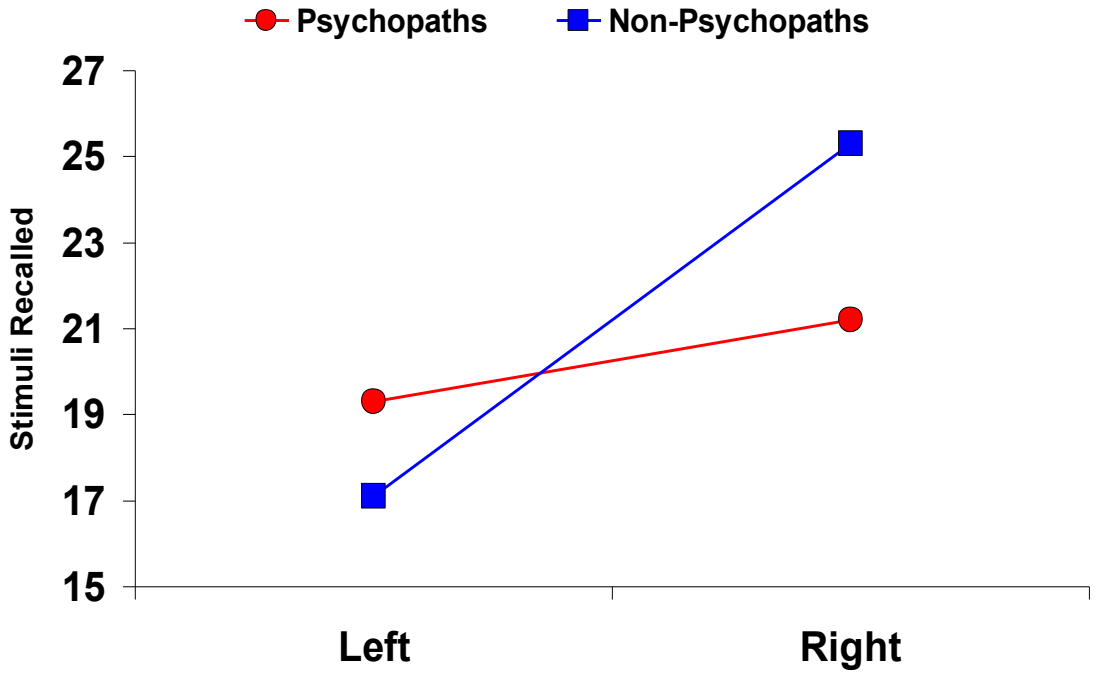


Raine et al. (1990)





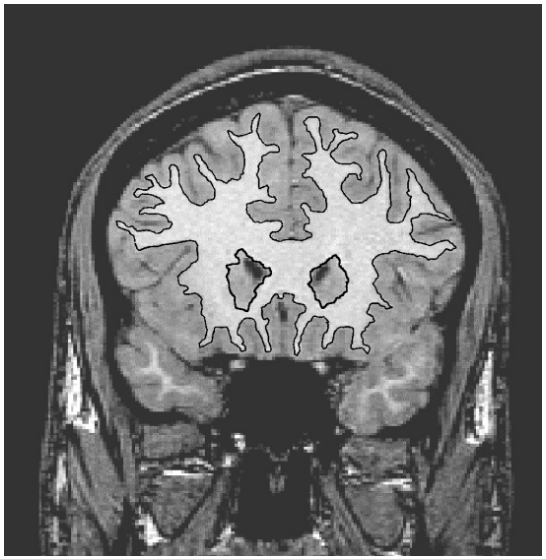
Hare & McPherson (1984)



Raine et al. (1990)

- language less lateralized to left hemisphere and has more representation in right hemisphere
- psychopaths show unusual use of language
- dissociation between what they say and what they do
- reduced role of language in regulating behavior ?
- *increased* interhemispheric transfer?

Raine et al. (2003), *Archives of General Psychiatry* 60 *1134-1142)*



Antisocial Psychopaths show:

22.6% increased volume ($p = .0001$, $d = 1.8$)
15.3% thinner ($p = .002$, $d = 0.81$)
6.9% longer ($p = .043$, $d = 1.1$)

Control for:

- alcohol / Substance Abuse ($p < .004$, $eta^2 = .51$)
- alcohol usage ($p < .0001$, $eta^2 = .57$)
- schizophrenia-spectrum ($p < .003$, $eta^2 = .52$)
- 10 psychosocial risks ($p < .009$, $eta^2 = .59$)
- groups don't differ on head injury

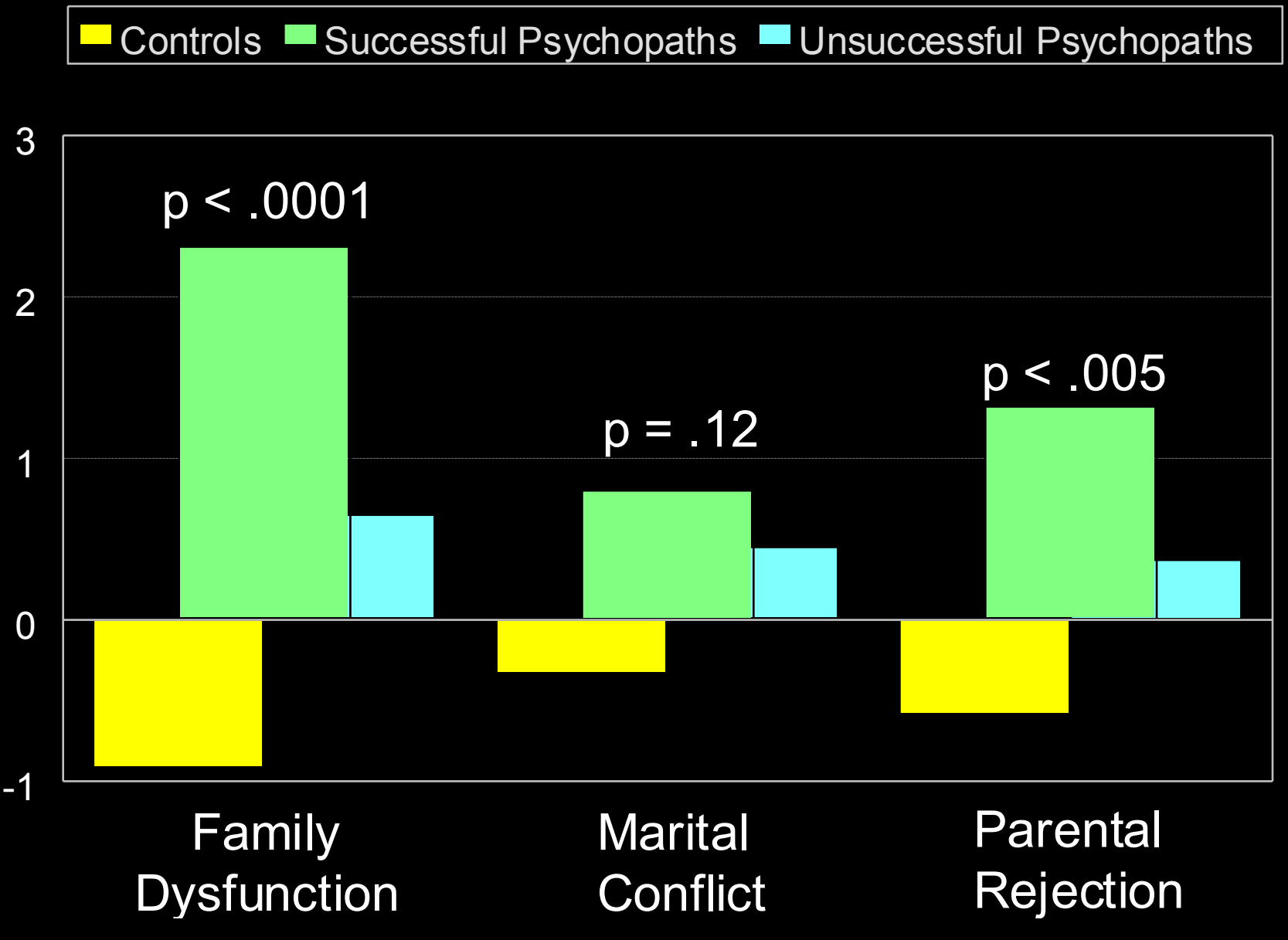
Psychosocial: 32.7% variance explained
Callosal addition: 81.5% variance explained

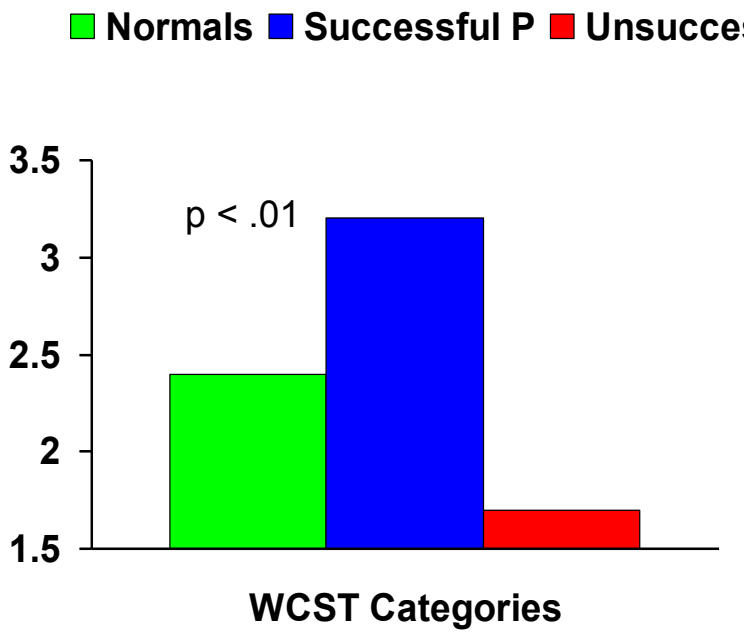
Psychopathy may be neurodevelopmental in nature (Raine et al. 1995; 2003)

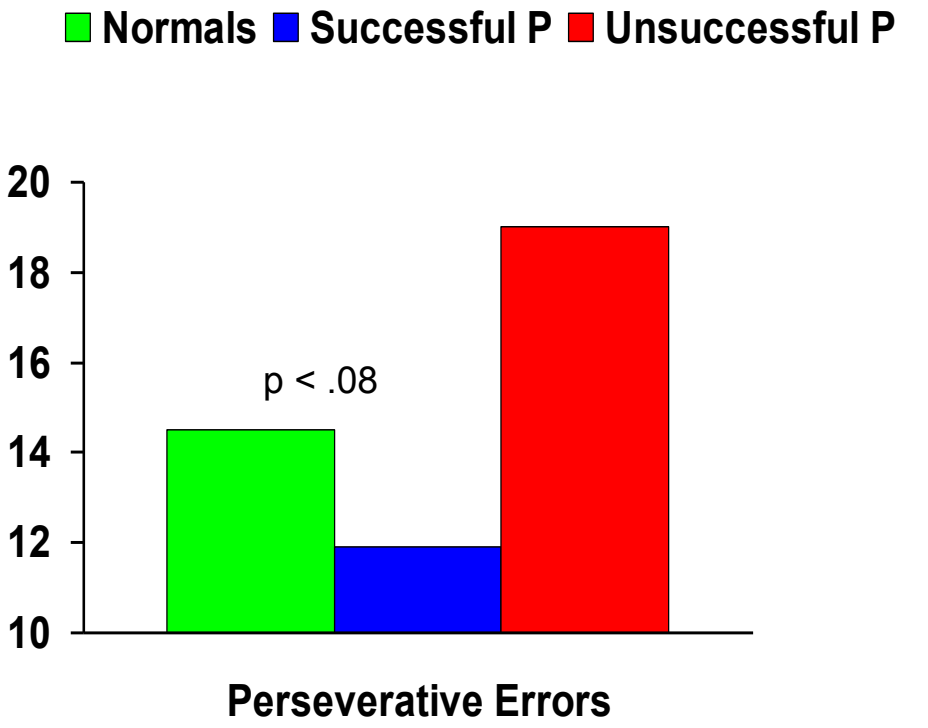
- psychopathy rooted early in life
- unfolds relatively consistently in childhood / adolescence
- relatively impervious to conventional treatments
- in part genetically determined
- psychosocial influences don't explain relationship

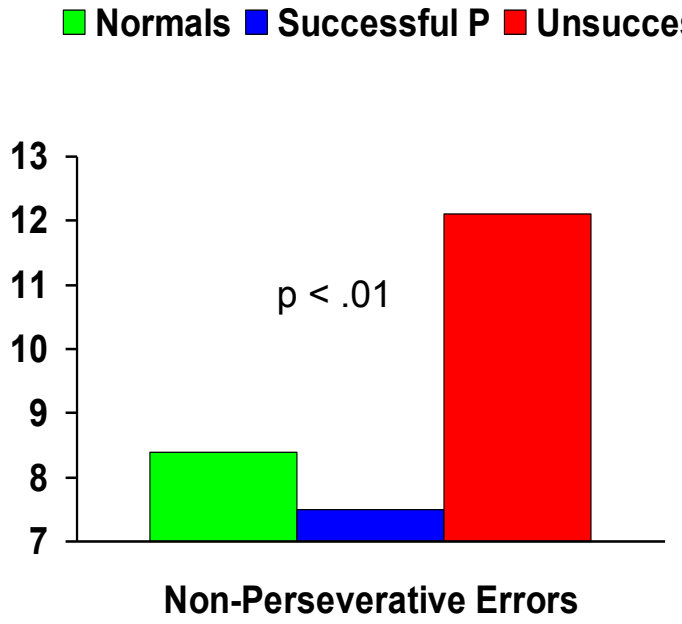
- morphological changes to CC complex: dictate against simple environmental trauma / disease processes

FAMILY FACTORS





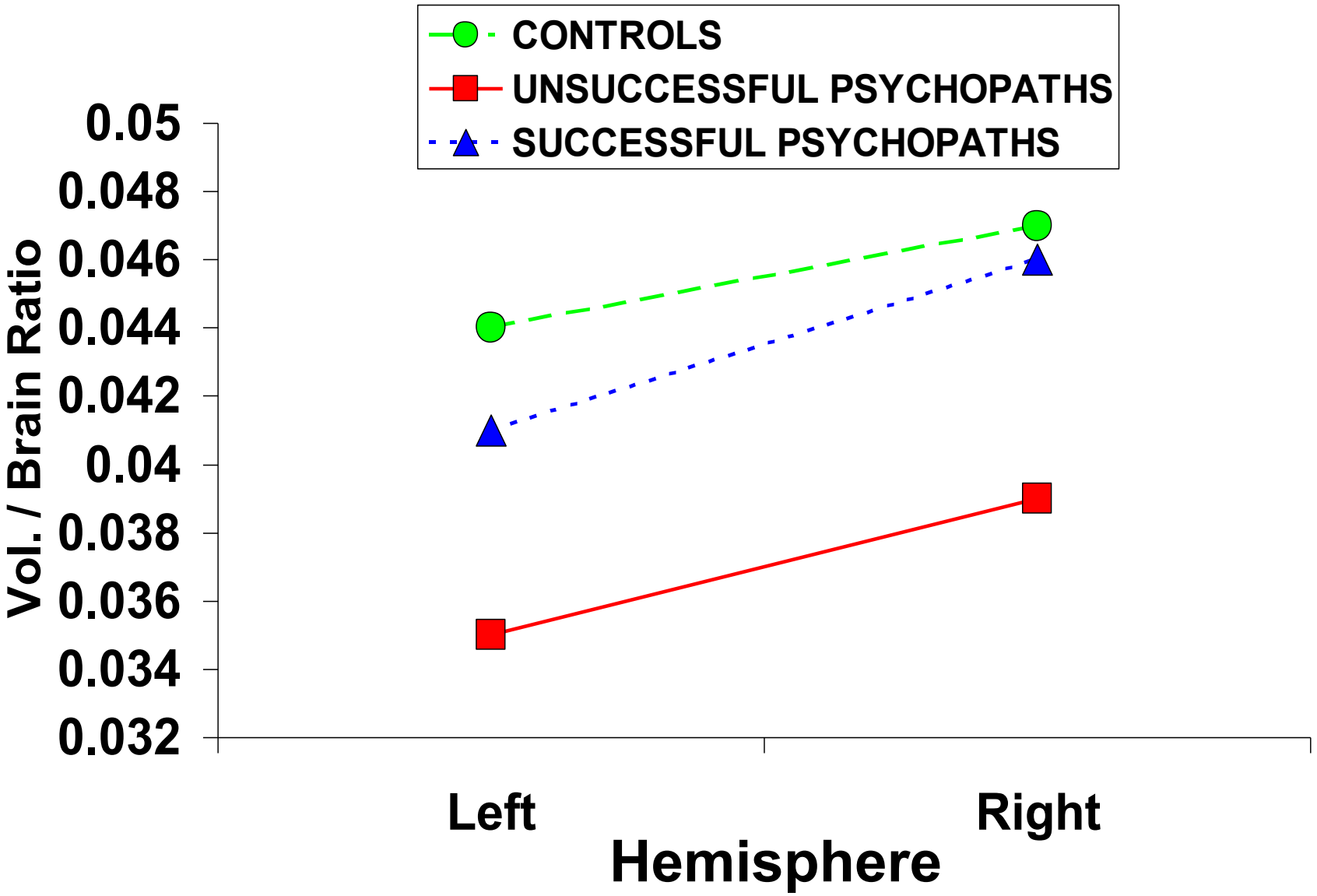




Successful psychopaths have better executive functions

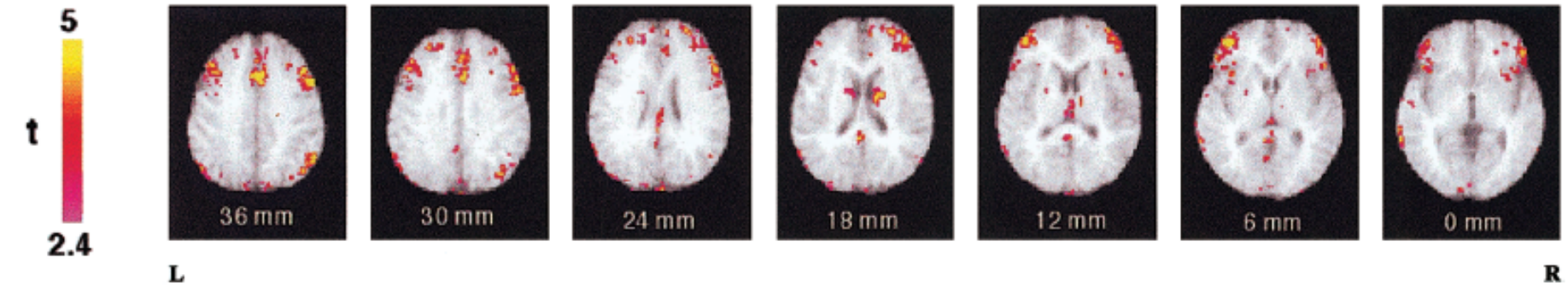
PREFRONTAL GRAY (p < .001)

Yang et al. (2005) *Biological Psychiatry*



Liars

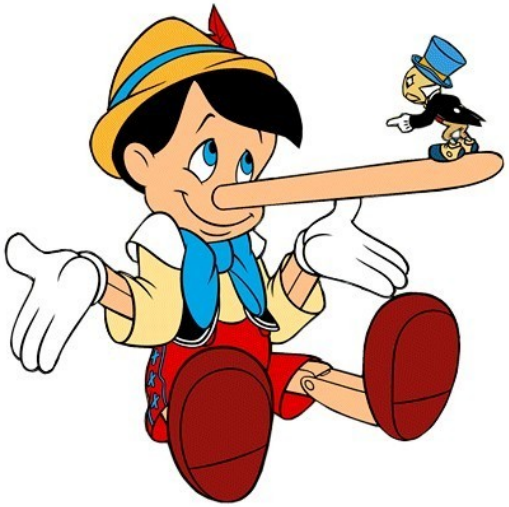
Lee et al. (2002)

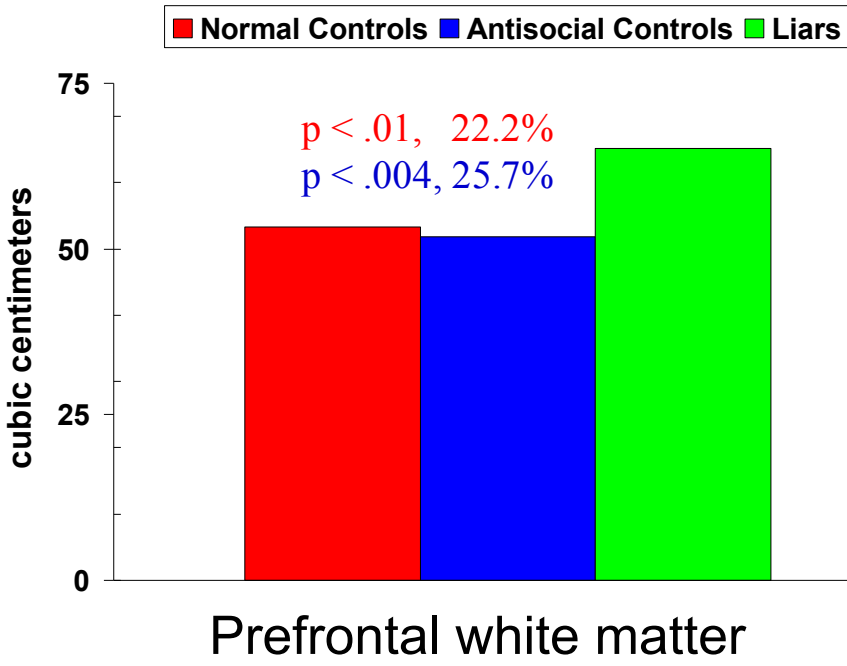


Yang et al. (2005): Liars / Malingerers

Brit. J. Psychiat. 187 320-325

	DSM-IV APD
23 Normal Controls	0 %
16 Antisocial Controls	50 %
12 Liars	66 %





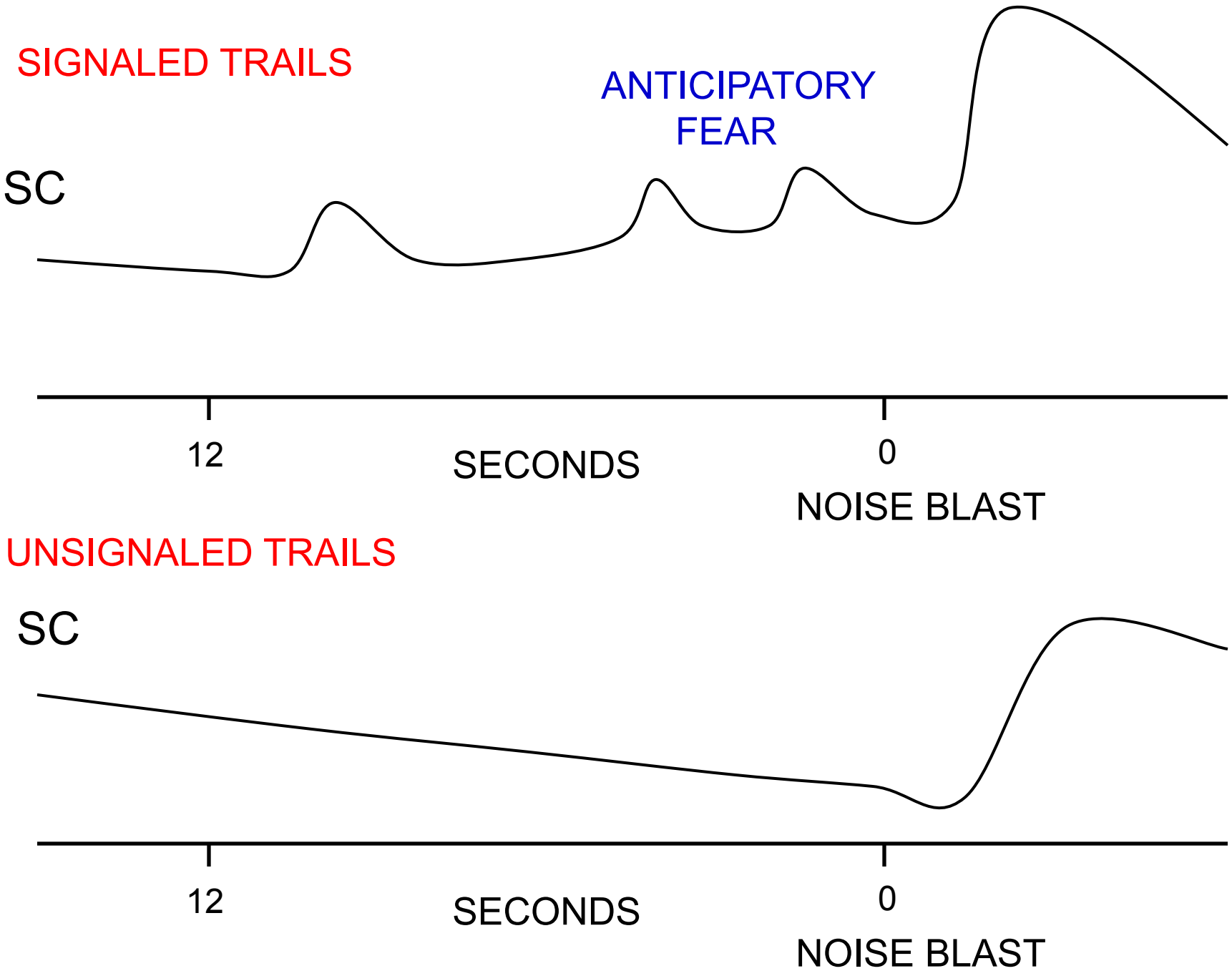
- Adult values of white matter at 10-12 years (Paus et al. 2001)

- Age-related increases in white matter accompanied by decreases in gray matter (Sowell et al. 1999)

- Children become adept liars c. 10 years (McCann, 1998)

- Neurodevelopmental increase in prefrontal white matter as a predisposition to deceitful personality?

Question: are psychopaths skilled liars with *good* executive functions?

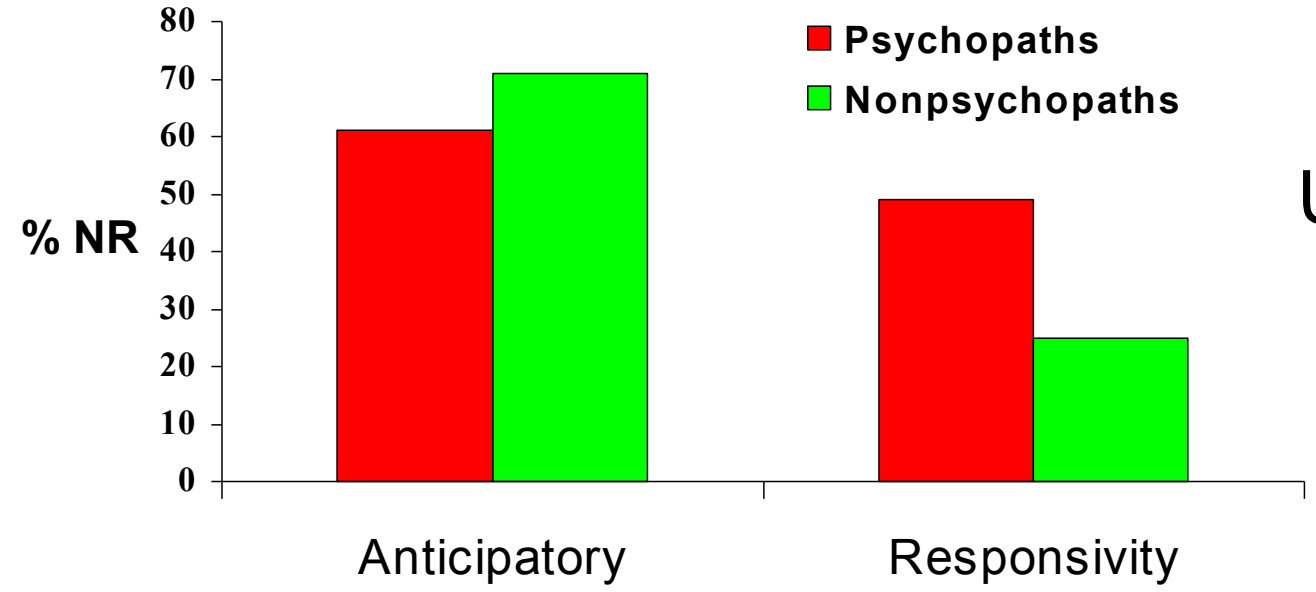

SIGNALED TRAILS
ANTICIPATORY FEAR
SC
12
SECONDS
0
NOISE BLAST
UNSIGNALED TRAILS
SC
12
SECONDS
0
NOISE BLAST

Fung et al. (2005)

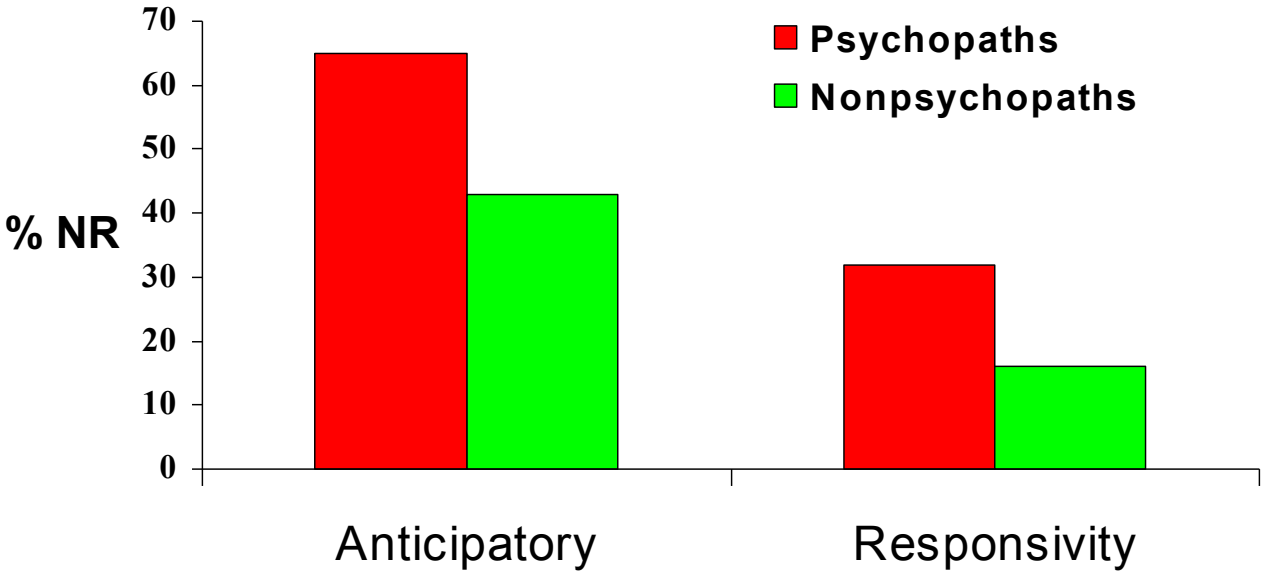
Journal of Abnormal Psychology, 114, 187-196.

- 330 16y-old schoolboys
- SC responsivity during countdown task:
    - (a) Signaled and unsignaled trials
    - (b) Anticipatory vs. responsivity
- Responding – nonresponding dichotomy
- Psychopathy: top 20% on Childhood Psychopathy Scale

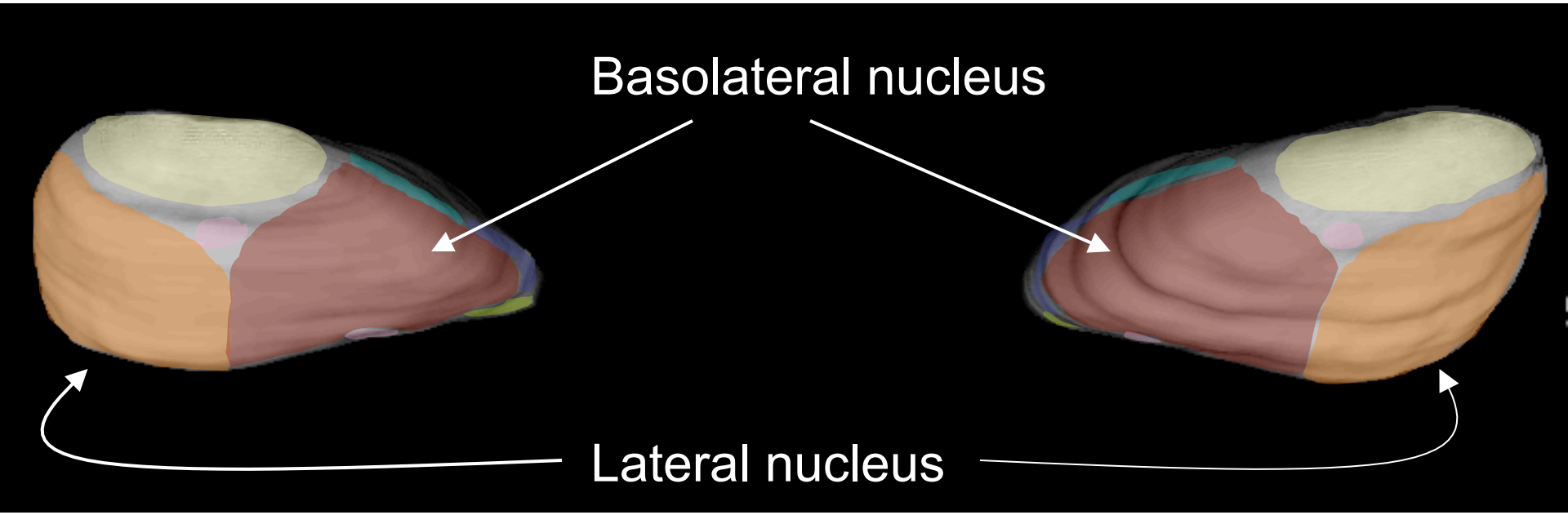
Fung et al. (2005)

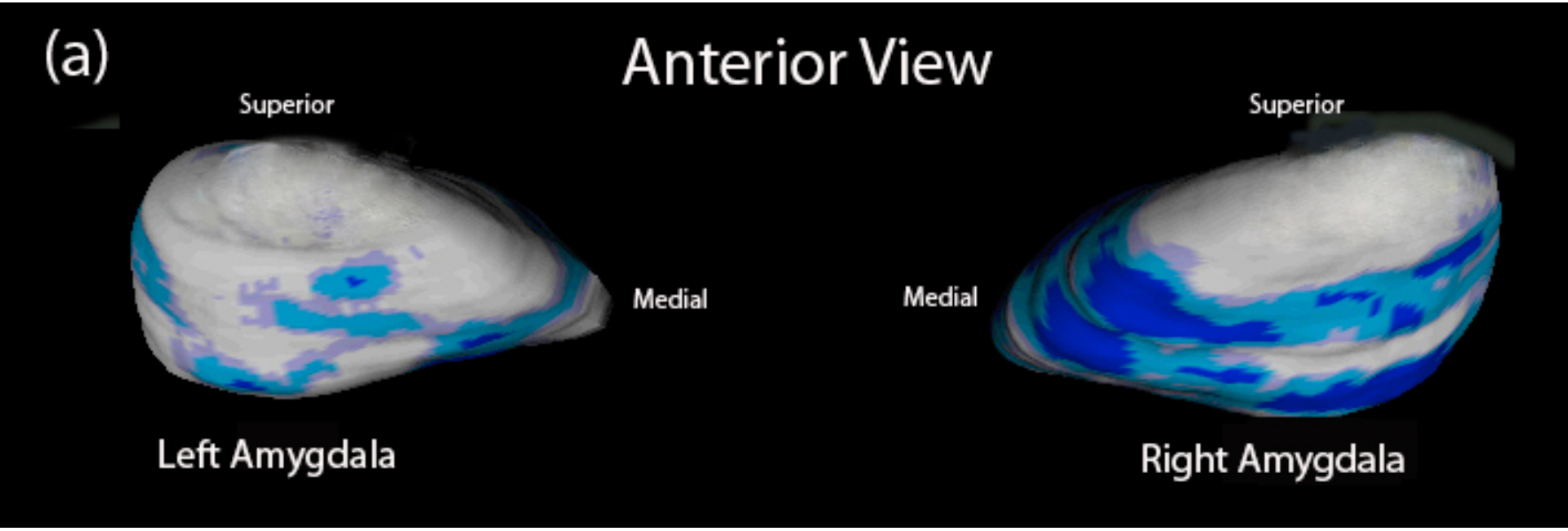


Unsignaled Trials



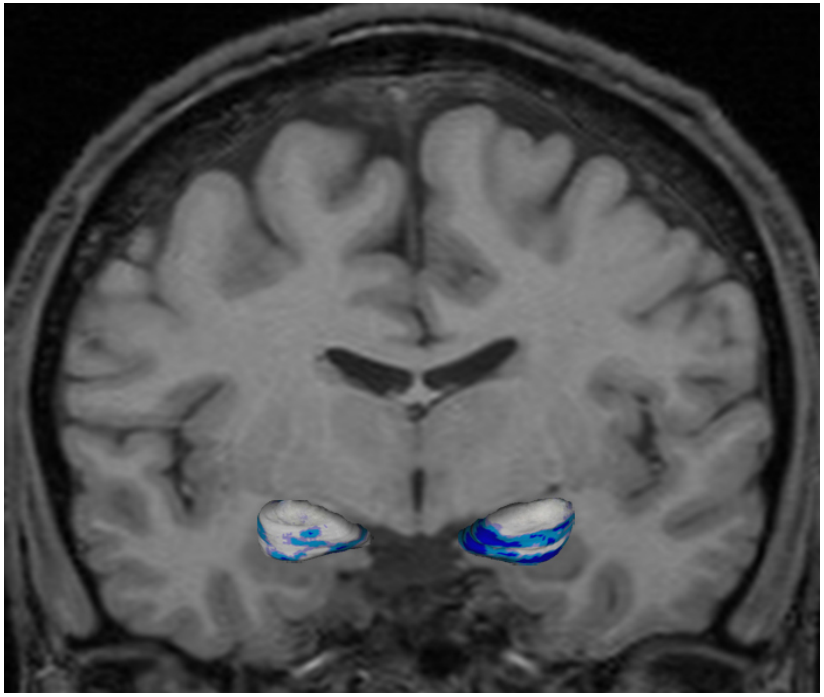
Signaled Trials

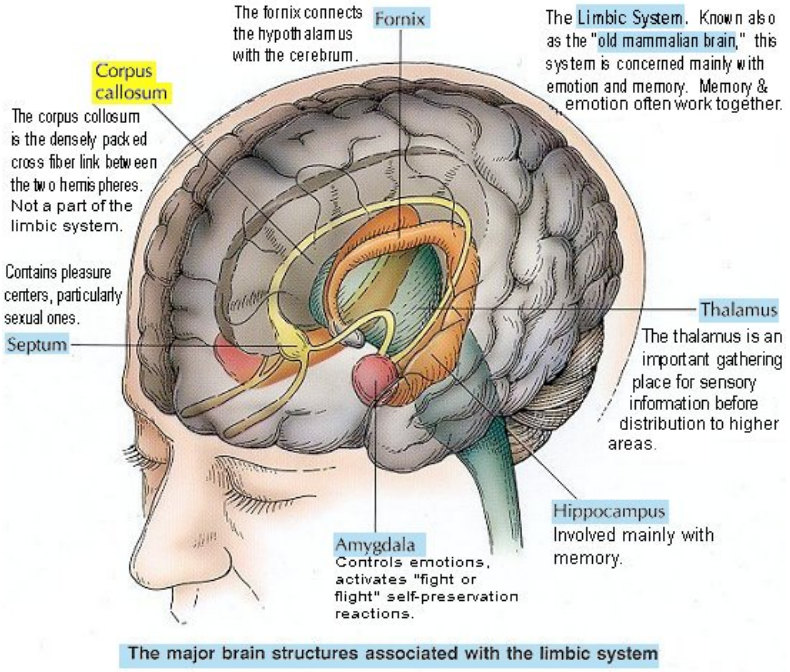

Basolateral nucleus
Lateral nucleus


(a)
Anterior View
Superior
Medial
Left Amygdala
Superior
Medial
Right Amygdala

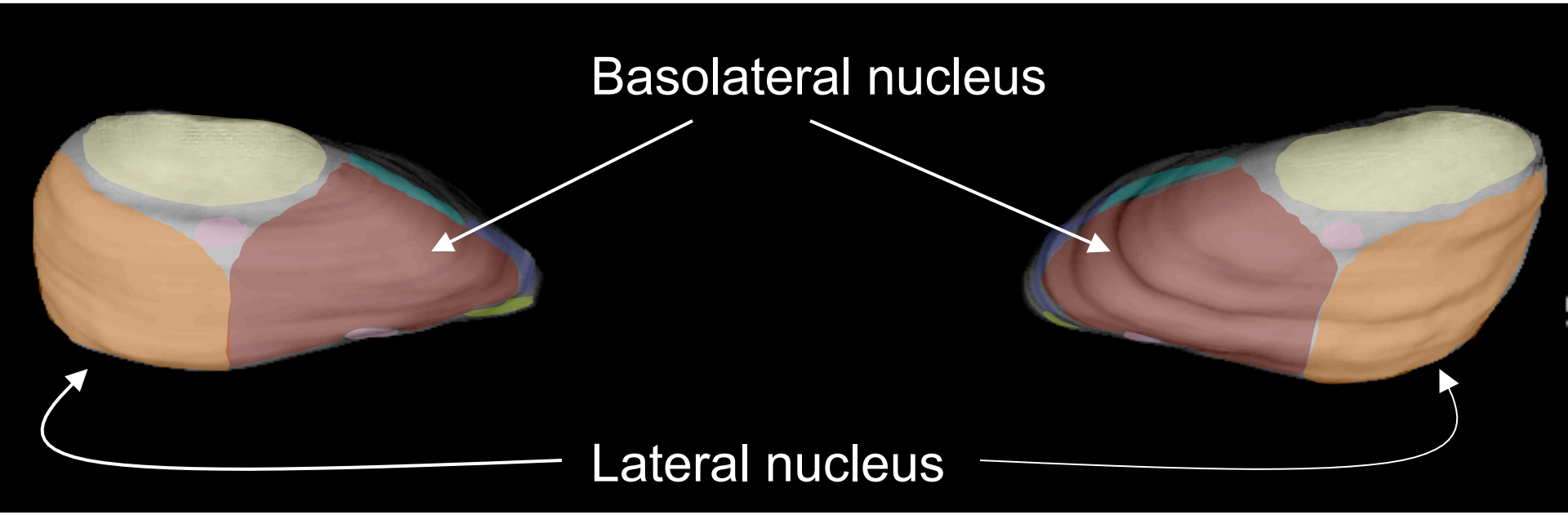
27 psychopaths vs. 32 non-psychopaths

Yang et al., *Archives of General Psychiatry* (2009)





The major brain structures associated with the limbic system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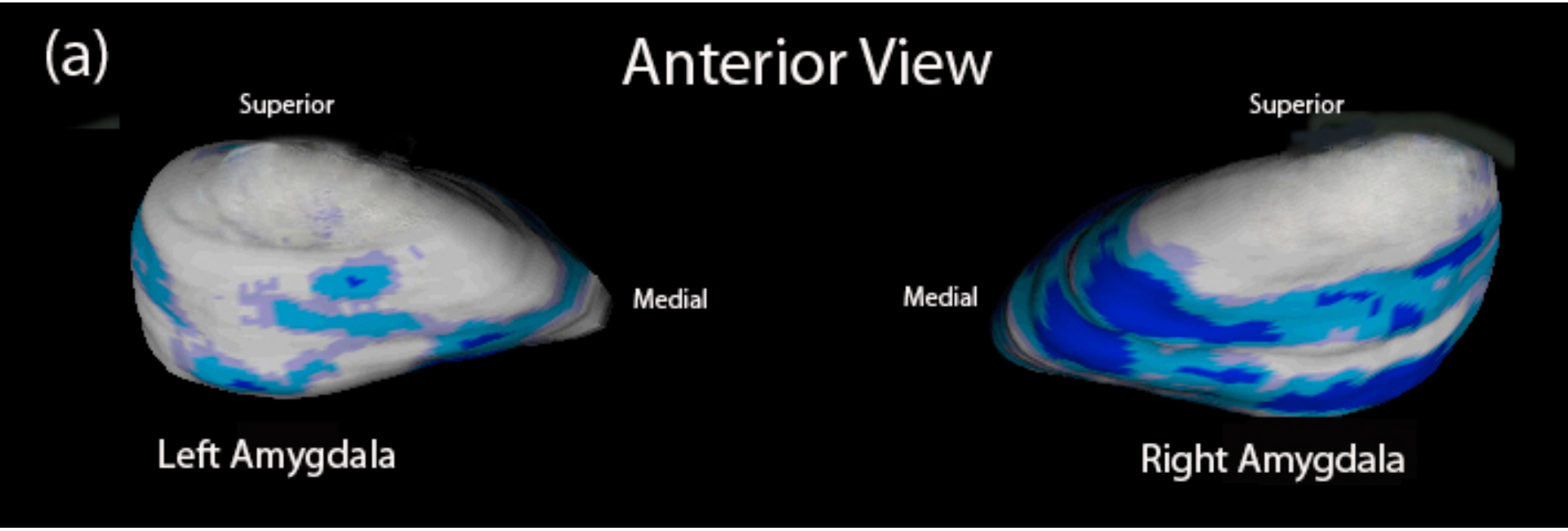
(a)
Anterior View
Superior
Medial
Left Amygdala
Superior
Medial
Right Amygdala

Amygdala – Callous-Unemotional Correlations

Parent-Reported CU Traits (N = 298):

Left Amygdala	r = -.13, p = .002
Right Amygdala	r = -.07, p = .22
Total Amygdala	r = -.12, p = .031

Child-Reported CU Traits (N = 298):

Left Amygdala	r = -.18, p = .001
Right Amygdala	r = -.09, p = .13
Total Amygdala	r = -.15, p = .01

Parent + Child CU Traits (N = 298):

Left Amygdala	r = -.20, p = .000
Right Amygdala	r = -.10, p = .09
Total Amygdala	r = -.17, p = .004

Study Design

- 11-12 year old community-residing children
- N = 300 (145 male, 159 female)
- Amygdala volume: aMRI
- Callous – Unemotional traits
  (Antisocial Personality Screening Device)
- CD and ODD (DSM-IV – DISC)
  19.33% ODD
  14.1% CD
  24.9% DBD
- Social Adversity (18 item scale)

Psychosocial Adversity Scale

1. Mother's uneducated
2. Father's uneducated
3. Parental unemployment
4. Teenage mother
5. Many siblings
6. Bad housing
7. Large family size
8. Maternal deprivation
9. Child uncared for
10. Government housing
11. Overcrowded home
12. Multiple house moves
13. Maternal physical illness
14. Paternal physical illness
15. Maternal mental illness
16. Paternal mental illness
17. Father arrested
18. Mother arrested

Amygdala – Callous-Unemotional Correlations

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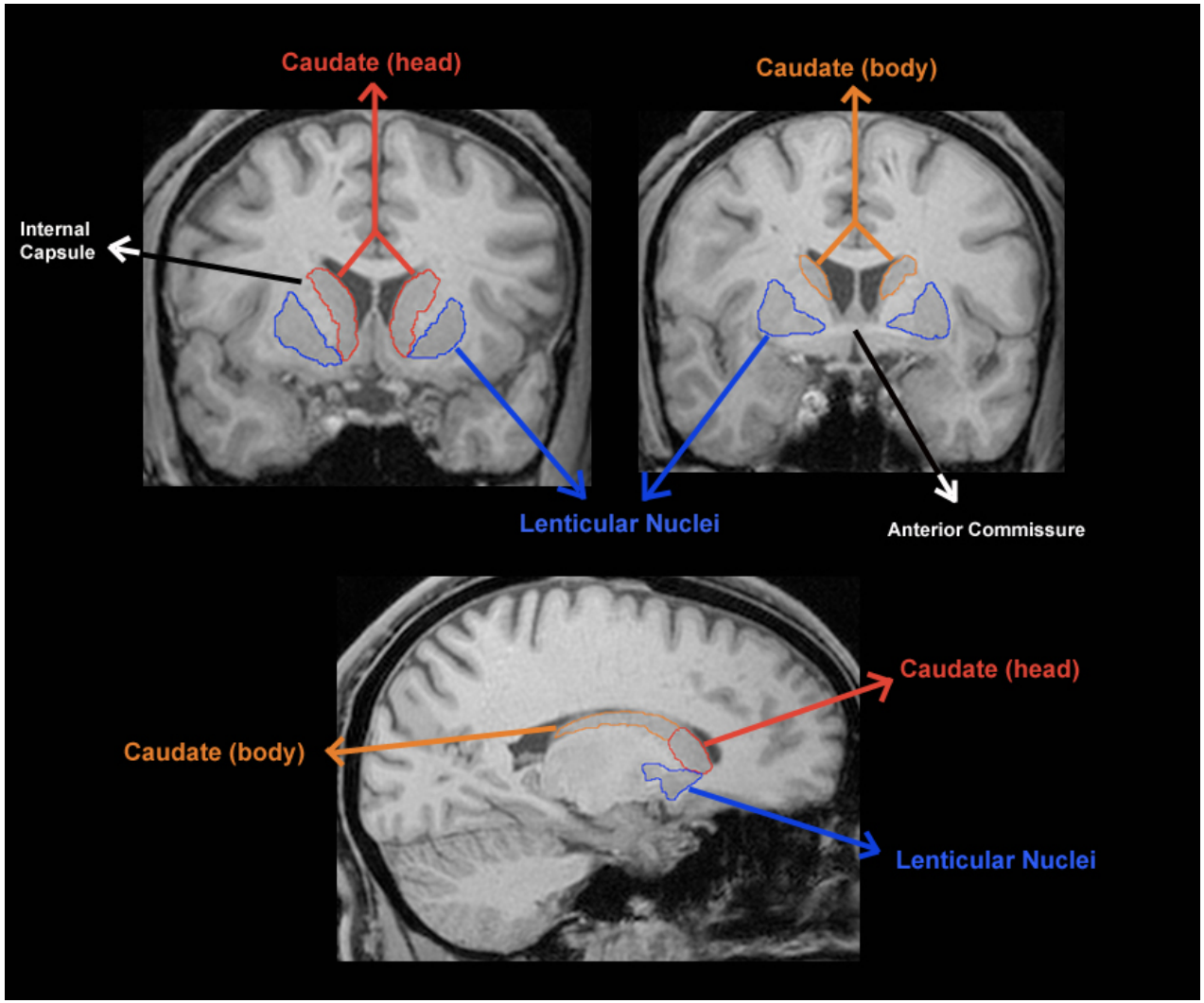
Total Amygdala	r = -.17, p = .004

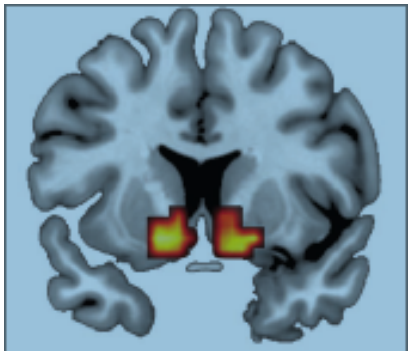
Striatum

9.6% volume *increase* in psychopaths

Glenn et al. (2009), *Biol. Psychiatry*, *67*, 52-58



Psychopathic individuals: striatal hyper-responsivity to anticipation of monetary rewards (Buckholtz et al. 2010)



Striatal functions:

- reward sensitivity: enhanced learning to rewards
- dramatic response to drugs of abuse
- preference for immediate vs. delayed rewards
- dense connections to amygdala and VMPFC
- neurodevelopmental?