

NST IB Psychology

Emotion and motivation – 1

Psychological basis of emotion

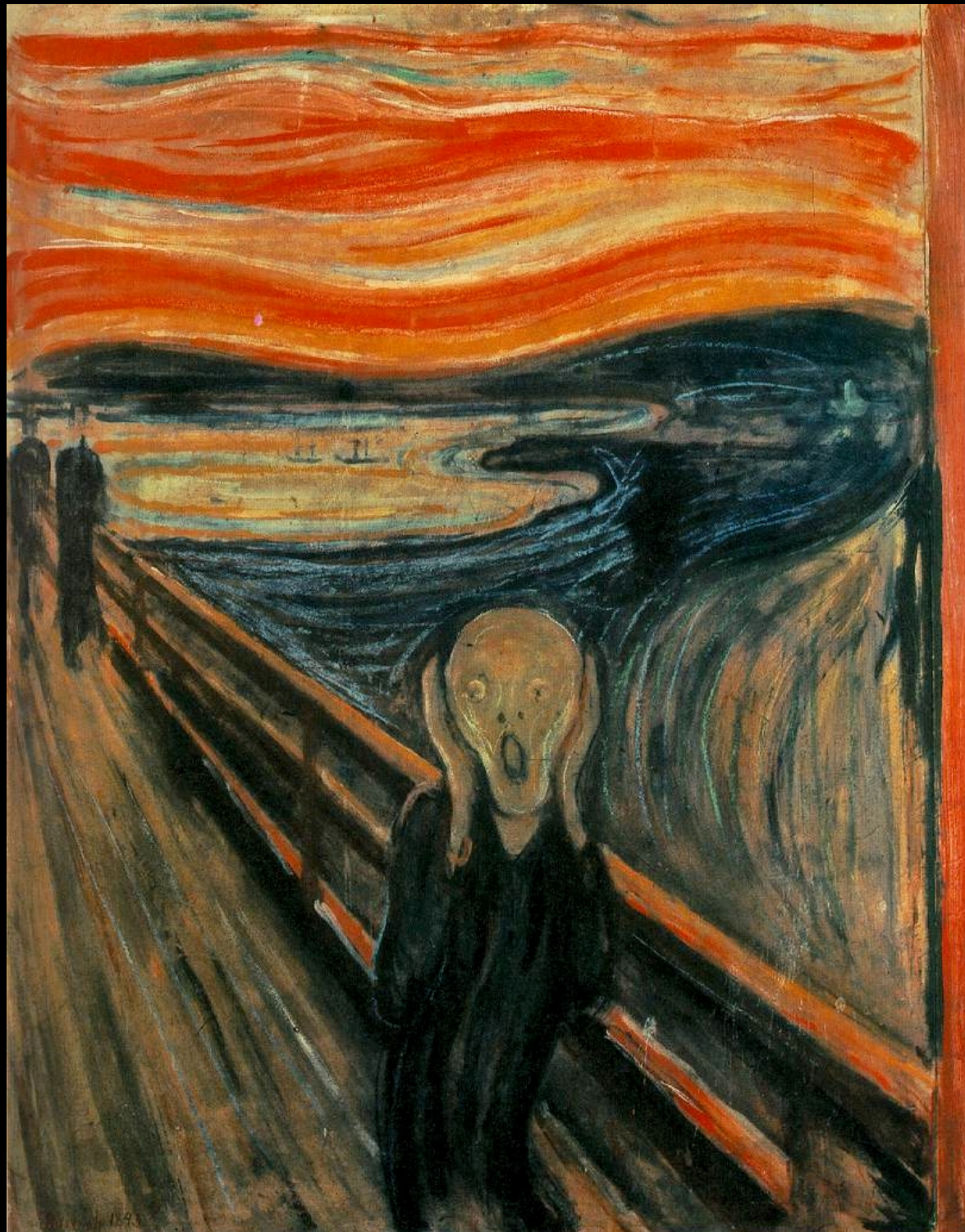
Rudolf Cardinal

Department of Experimental Psychology

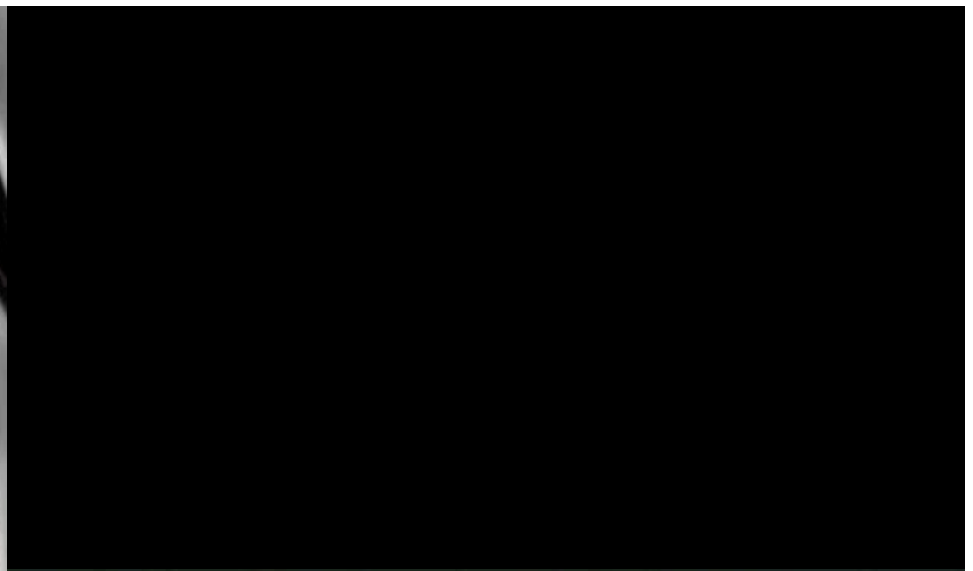
Thursday 4, Saturday 6, Tuesday 9 March 2004; 11am

Physiology Lecture Theatre 3





*Munch (1893)
'The Scream'*



Craven (1996) 'Scream'
Friedkin (1973) 'The Exorcist'



1963















Emotions: a Doomsday device?



Kubrick (1964) 'Dr Strangelove'

SL-2202

Convincing others that you're not rational



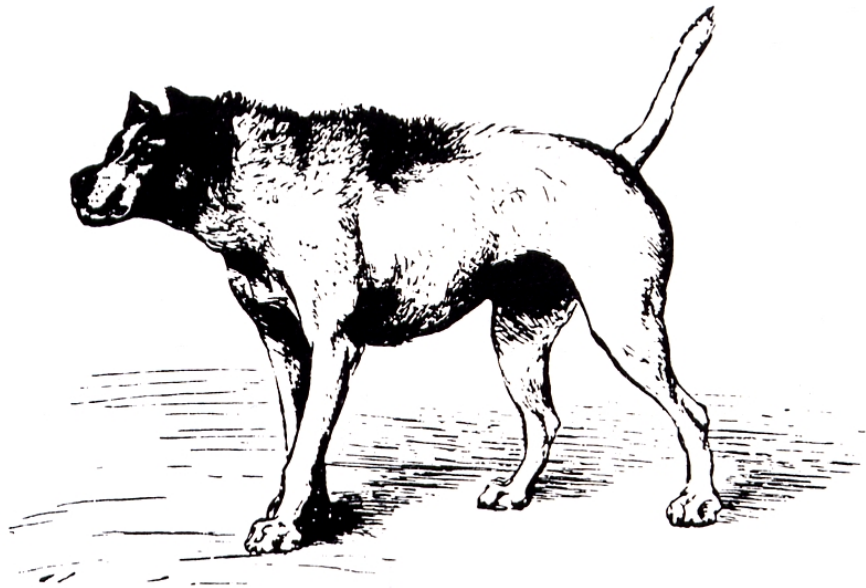
Kubrick (1980) 'The Shining'

Autonomic changes are hard to fake

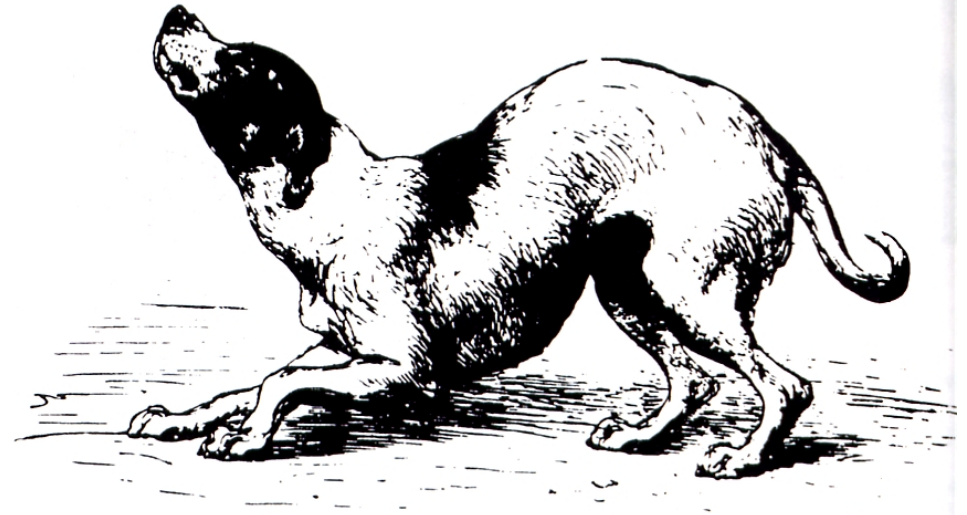


Theories about the evolution of emotions

Aggression



Submission



*Measuring emotion; category-
based and dimensional accounts*

Measuring emotions

Emotions have several components; all can be measured.

- *subjective*
- *behavioural*
- *physiological*

Subjective components cannot be measured in animals, but clever behavioural techniques can still give us clues to their internal mental state.

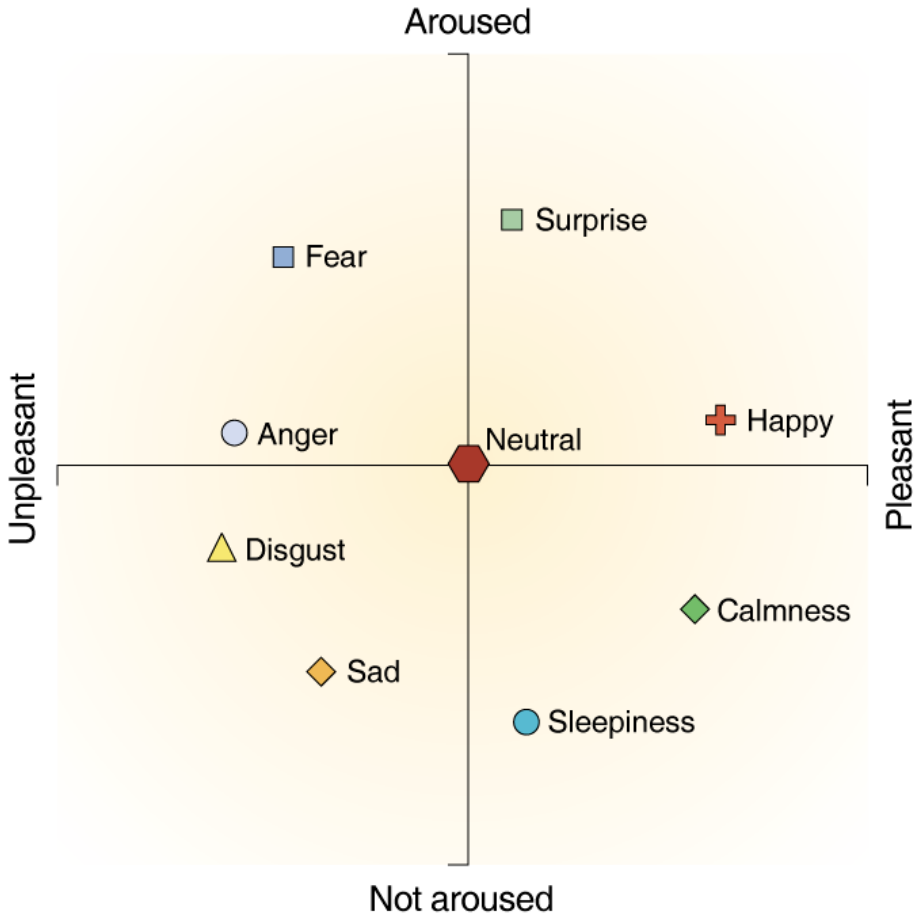
Universal facial expressions? A category-based model



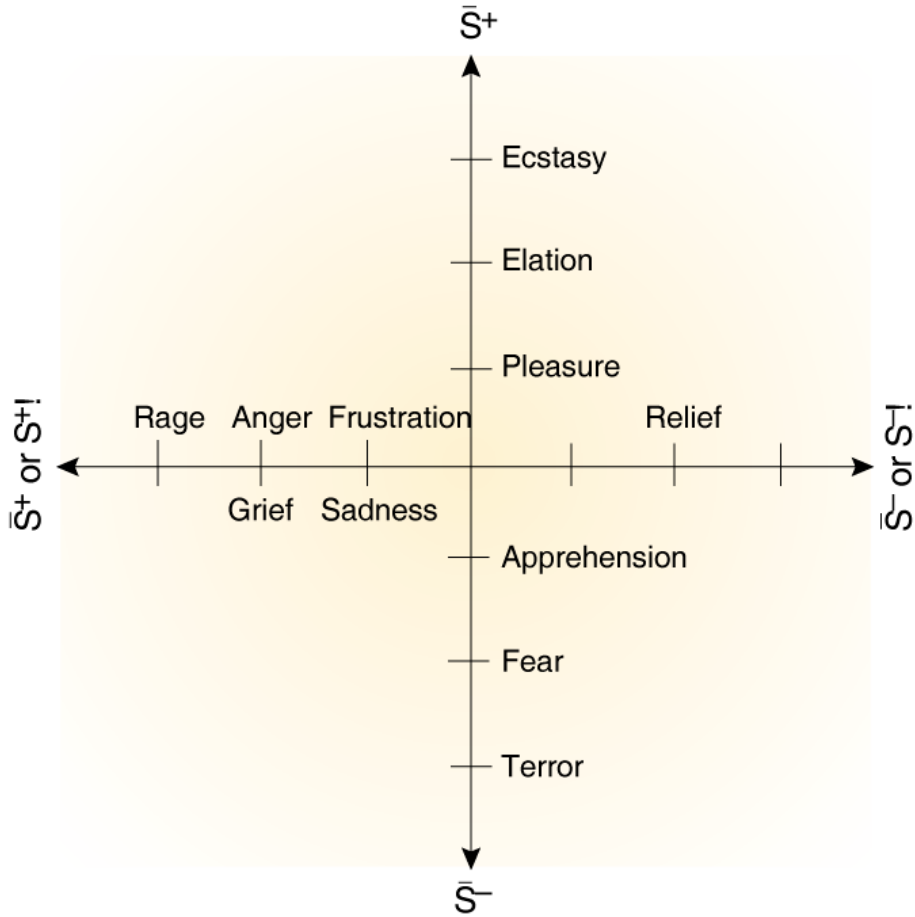
Ekman et al. (1972); Ekman & Friesen (1975)

Dimensional accounts of emotion

The circumplex model — Russell (1980)



Theory of emotion — Rolls (1999)



Theories of emotion

The James–Lange theory of emotion (1)

Common sense says, we lose our fortune, are sorry and weep; we meet a bear, are frightened and run; we are insulted by a rival, are angry and strike.

The hypothesis here to be defended says that this order of sequence is incorrect... [instead] we feel sorry because we cry, angry because we strike, afraid because we tremble...

Without the bodily states following on the perception, the latter would be purely cognitive in form, pale, colourless, destitute of emotional warmth. We might then see the bear, and judge it best to run, receive the insult and deem it right to strike, but we could not actually feel afraid or angry.

The James–Lange theory of emotion (2)

Traditional view

event → perceptual analysis → emotion → response

James–Lange

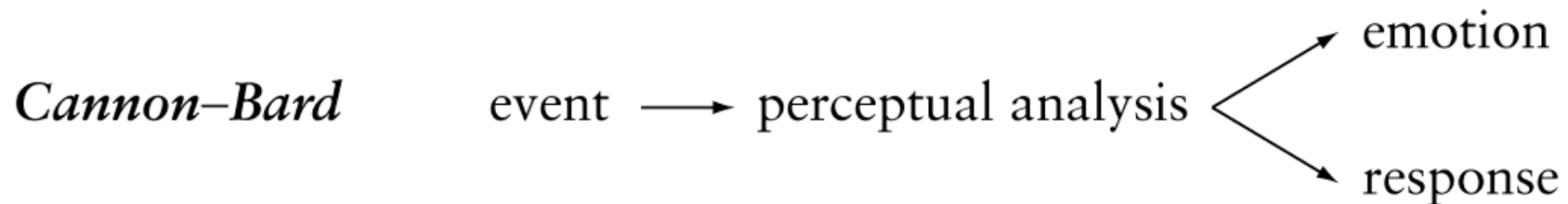
event → perceptual analysis → response (e.g. autonomic arousal, running away)

→ perception of feedback → emotion

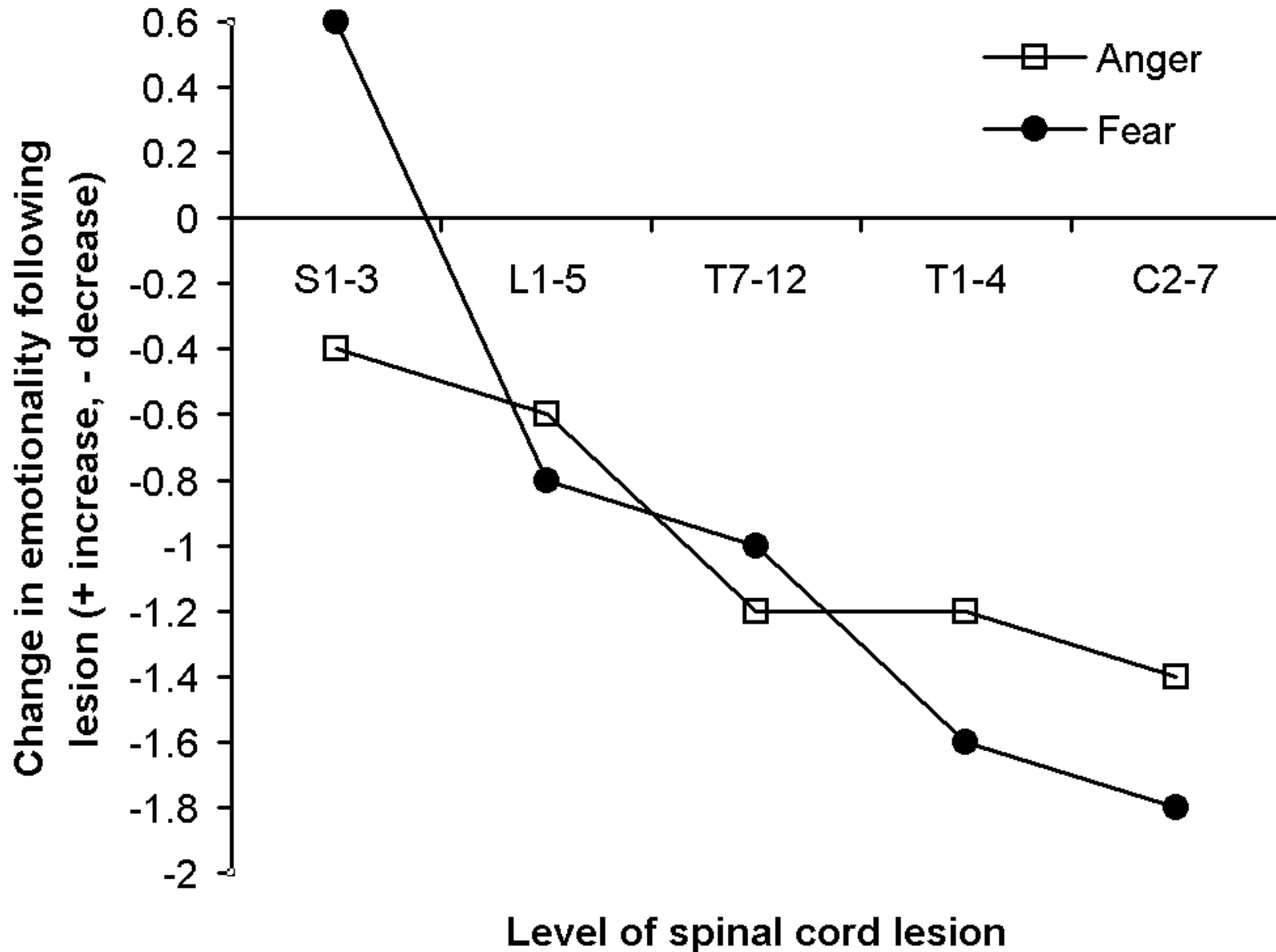
The Cannon–Bard theory of emotion

Objected to James–Lange theory on five grounds:

1. **separation of viscera from CNS** did not impair ‘emotional’ responses in animals (Sherrington, Cannon);
2. the same visceral changes occur in **different emotional states**;
3. the viscera are relatively **insensitive** (e.g. to surgery);
4. visceral changes are **too slow** to account for emotions (some affective reactions over in 0.8s; many autonomic responses slower);
5. **artificial induction** of visceral changes does not induce emotional experience (Marañón, adrenaline injection).



Subjective feelings following spinal cord lesions (1)



Subjective feelings following spinal cord lesions (2)

“It’s a sort of cold anger. Sometimes I act angry when I see some injustice. I yell and cuss and raise hell, because if you don’t do it sometimes, people will take advantage of you. But it just doesn’t have the heat to it that it used to have. It’s a mental kind of anger.”

Visceral changes distinguish emotions (1)

Subjects participated in a fictitious experiment on hypertension and were

*(1) given electric shocks ('faulty apparatus') → **fear***

*(2) insulted by a 'technician' → **anger***



Visceral changes distinguish emotions (2)

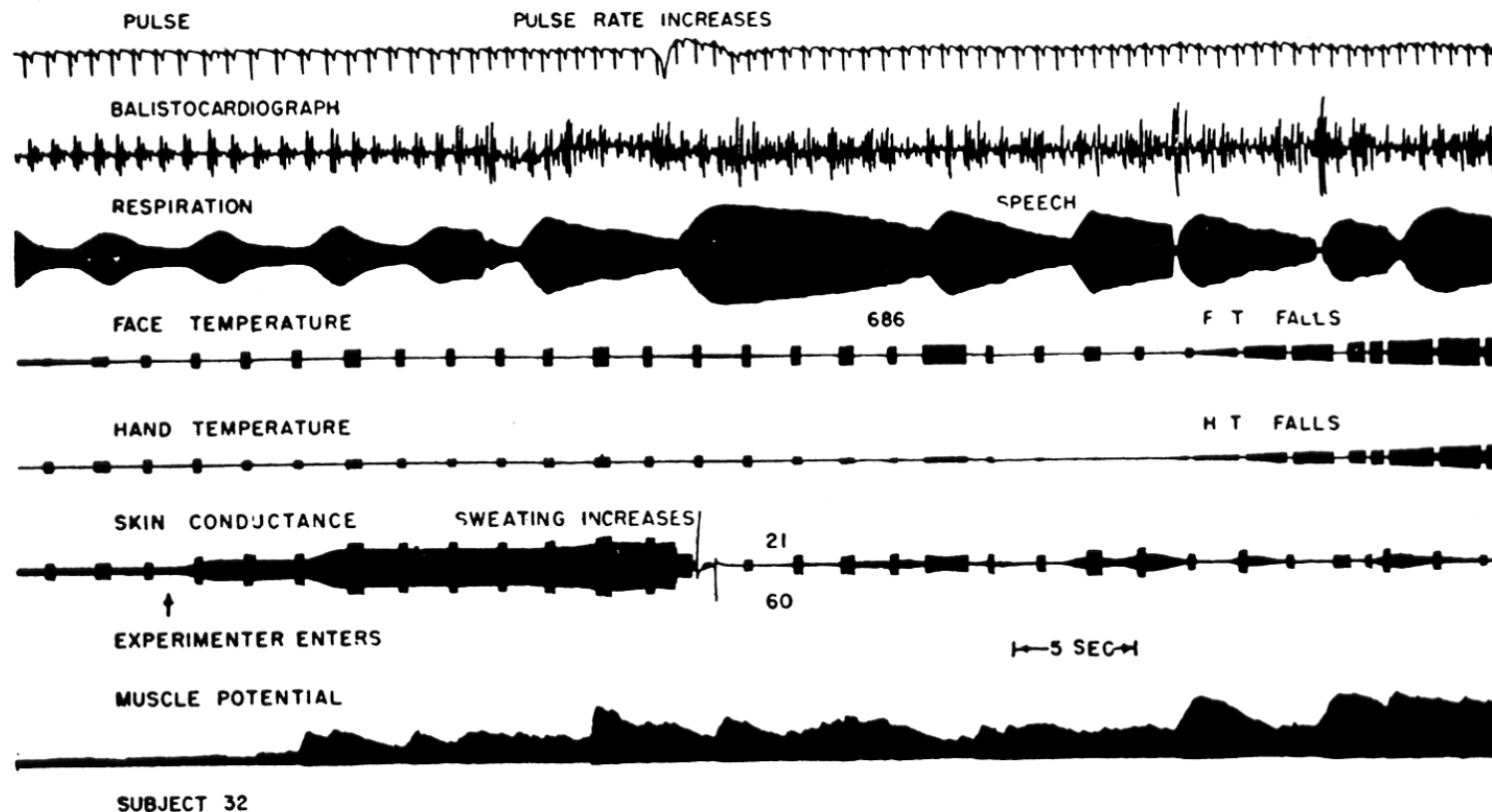


Fig. 1. The variables recorded in this study. The Grass eight-channel electroencephalograph was used as the main recorder and amplifier. Since the Grass has only A. C. amplifiers, modulated A. C. envelopes were used for all continuous variables.

Note also speed of skin conductance change (in general, this can be quite fast).

Visceral changes distinguish emotions (3)

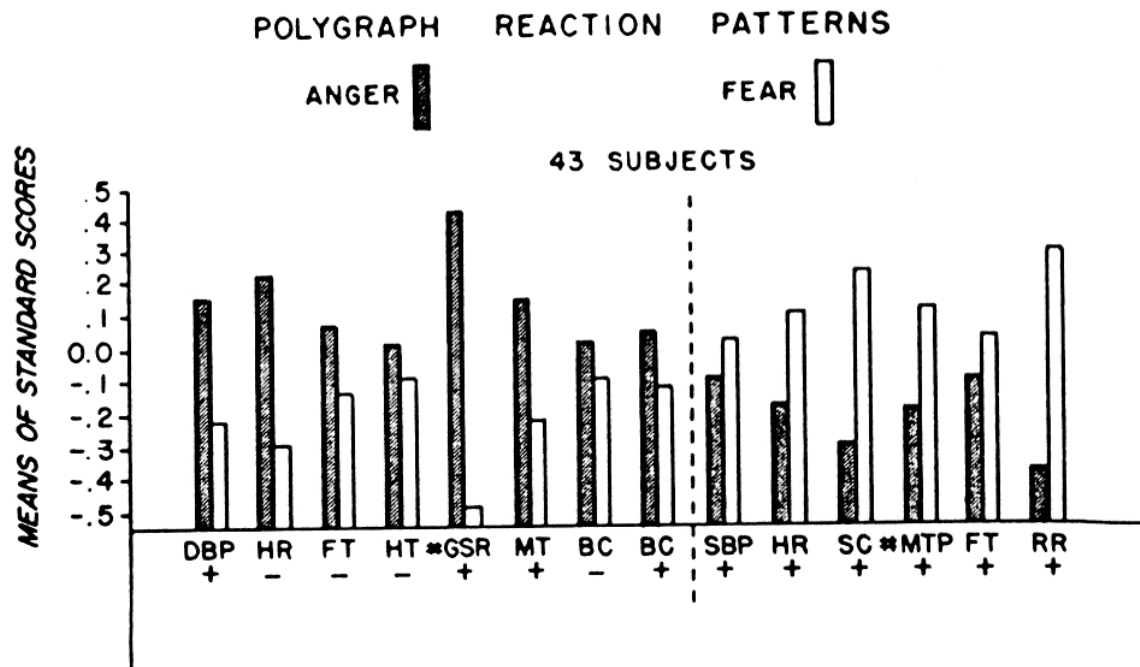


Fig. 2. The polygraph reactions, in standard score units, to the two stress situations called "anger" and "fear."

Anger and fear differentiated by change in diastolic blood pressure, heart rate, skin conductance changes, muscle tension, respiratory rate...

Autonomic responses to relived emotions/ facial expression (1)

Professional actors asked to

(1) relive emotions;

(2) create emotional expressions step-by-step

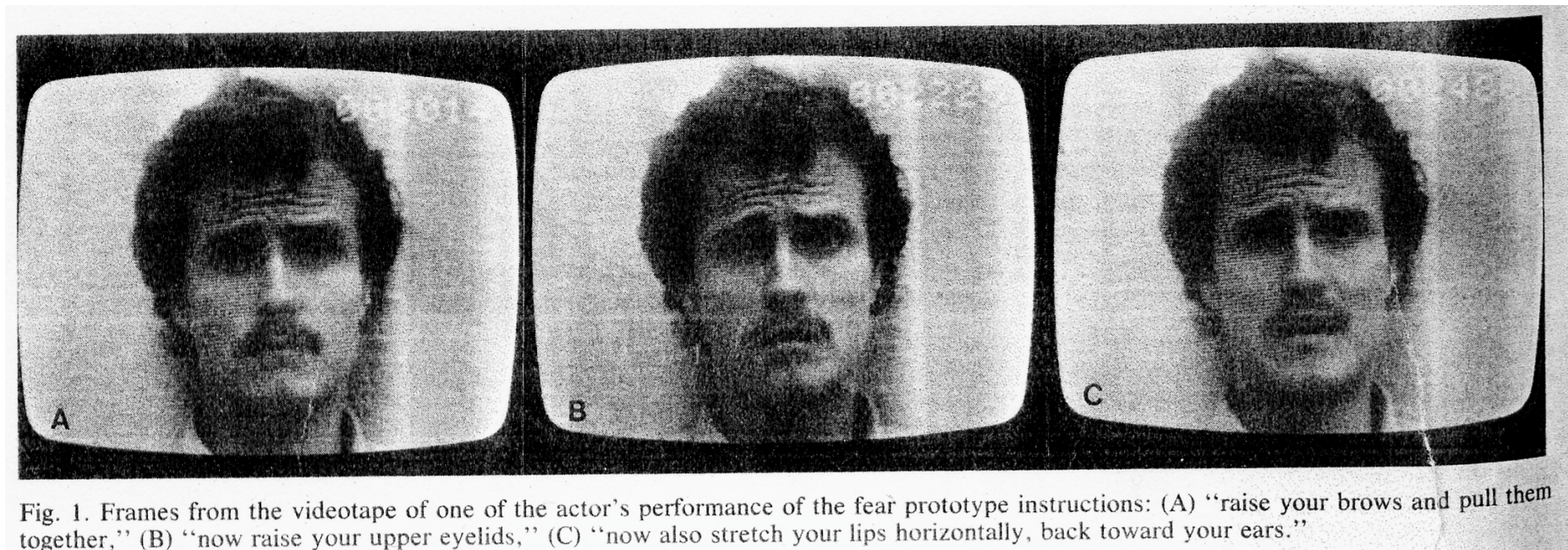


Fig. 1. Frames from the videotape of one of the actor's performance of the fear prototype instructions: (A) "raise your brows and pull them together," (B) "now raise your upper eyelids," (C) "now also stretch your lips horizontally, back toward your ears."

Autonomic responses to relived emotions/ facial expression (2)

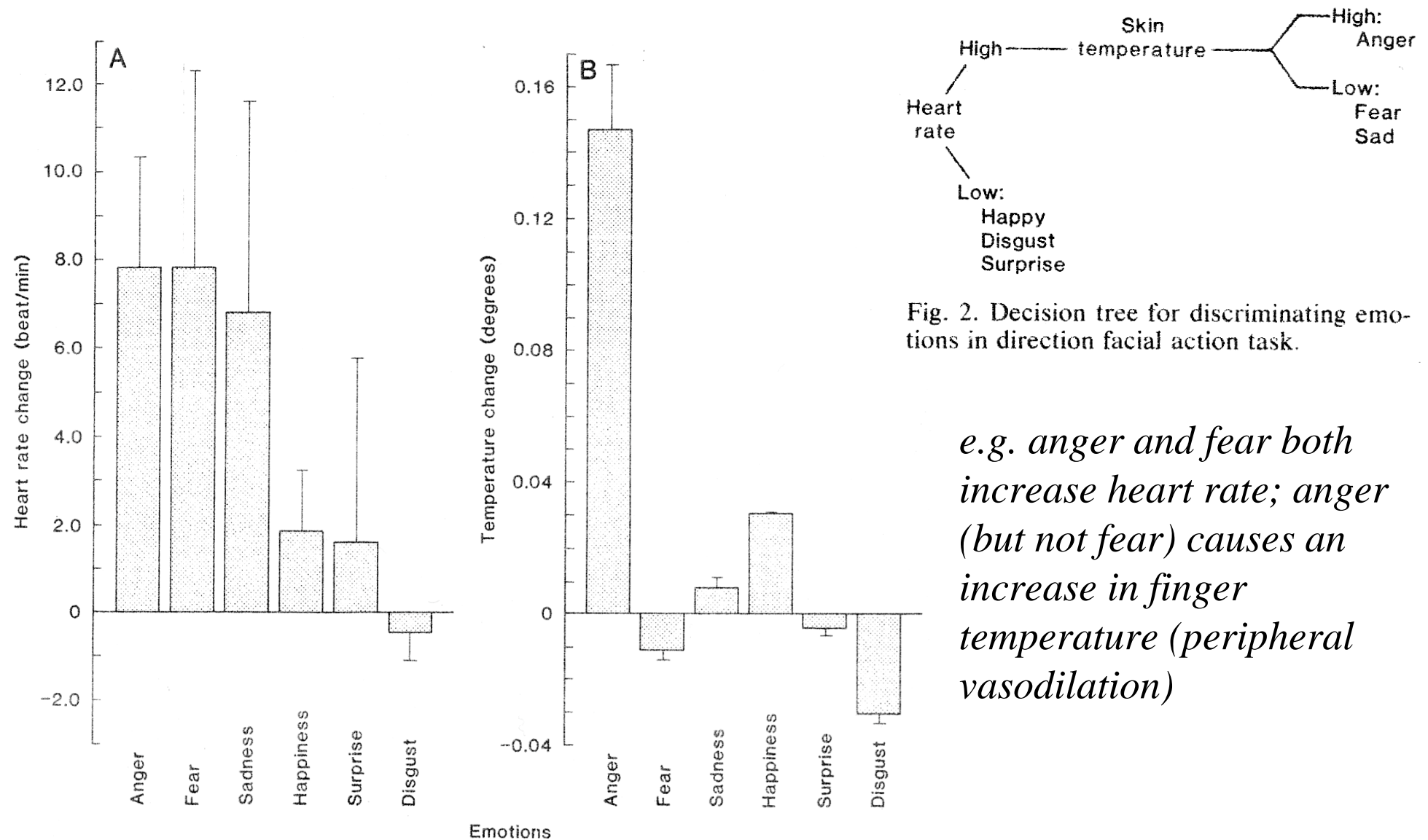


Fig. 2. Decision tree for discriminating emotions in direction facial action task.

e.g. anger and fear both increase heart rate; anger (but not fear) causes an increase in finger temperature (peripheral vasodilation)

Emotional interpretation of peripheral feedback

Naïve subjects asked to move muscle groups one by one (for a 'facial muscle experiment').

Occasionally, they made smiles or frowns, without (apparently) being aware of this.

They described themselves as happier whilst smiling, angrier whilst frowning, etc.

They also rated cartoons they'd seen while smiling as being funnier.

Note: *autonomic as well as skeletal muscle feedback?
(Ekman, previous slide.)*

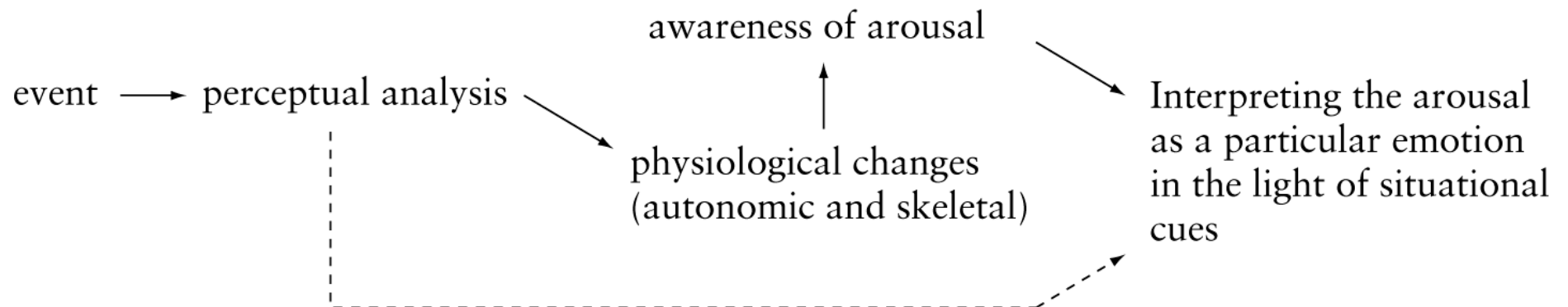
Schachter's cognitive labelling theory of emotion

Suggested that

- emotional experience *does* depend on bodily changes;
- physiological changes precede emotion;
- bodily changes are *not solely* responsible for emotion;
- arousal must be *interpreted*.

Two-factor theory (arousal + interpretation).

Schachter



Schachter (1964)

Unlabelled arousal can become euphoria or anger

Drug condition:

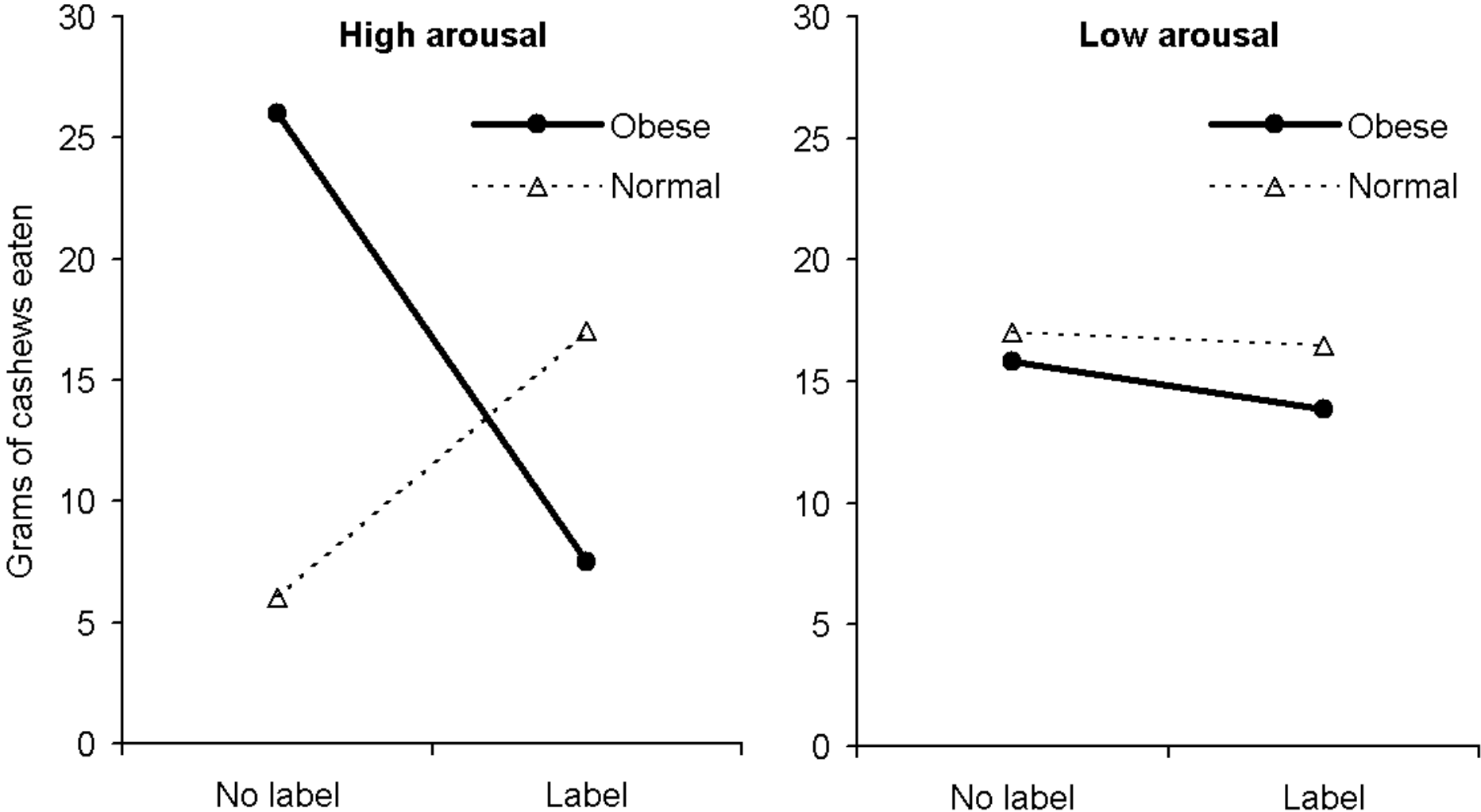
- *Epinephrine informed (arousal, but attributed)*
- *Epinephrine ignorant (**unattributed arousal**)*
- *Epinephrine misinformed (**unattributed arousal**)*
- *Placebo*

Interaction with stooge:

- *Euphoria*
- *Anger*

<i>Self-report results (higher scores indicate greater euphoria; lower scores indicate anger).</i>	Group	Condition	
		Euphoric stooge	Angry stooge
	Epi informed	0.98	1.91
	Epi ignorant	1.78	1.39
	Epi misinformed	1.90	<i>not performed</i>
	Placebo	1.61	1.63

Unlabelled arousal and eating behaviour





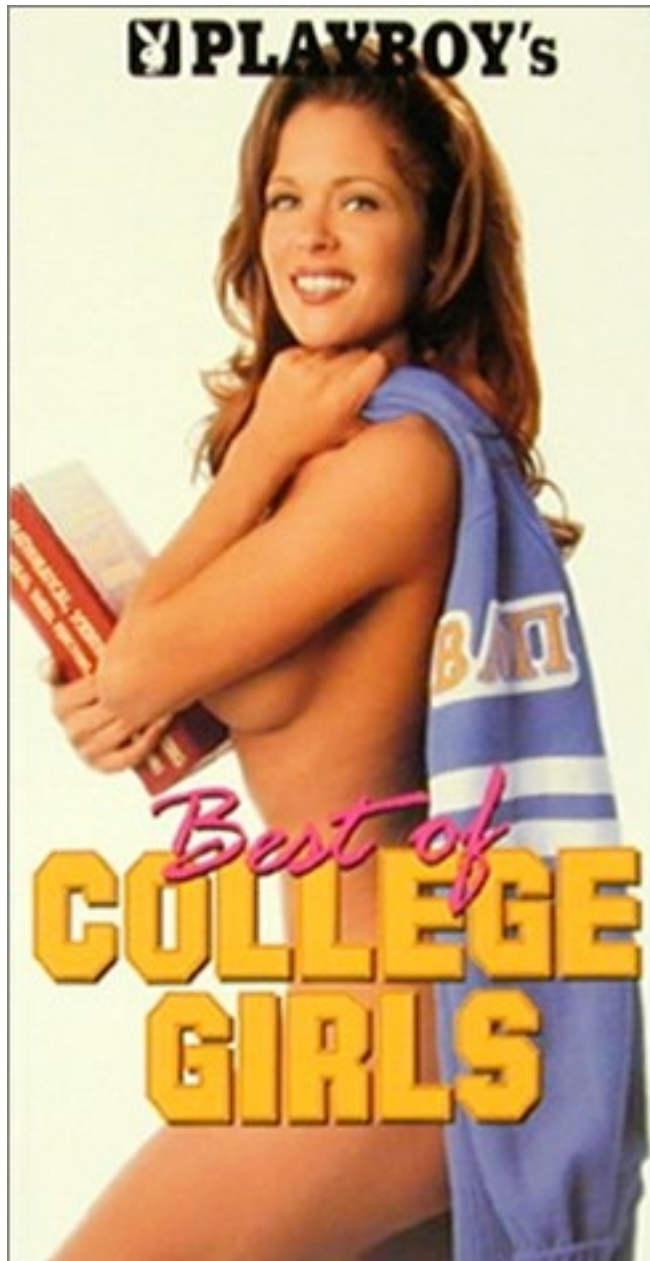
Vancouver, British Columbia, Canada

Arousal on the Capilano Suspension Bridge, Vancouver



Dutton & Aron (1974)

False feedback and attractiveness



Baseline

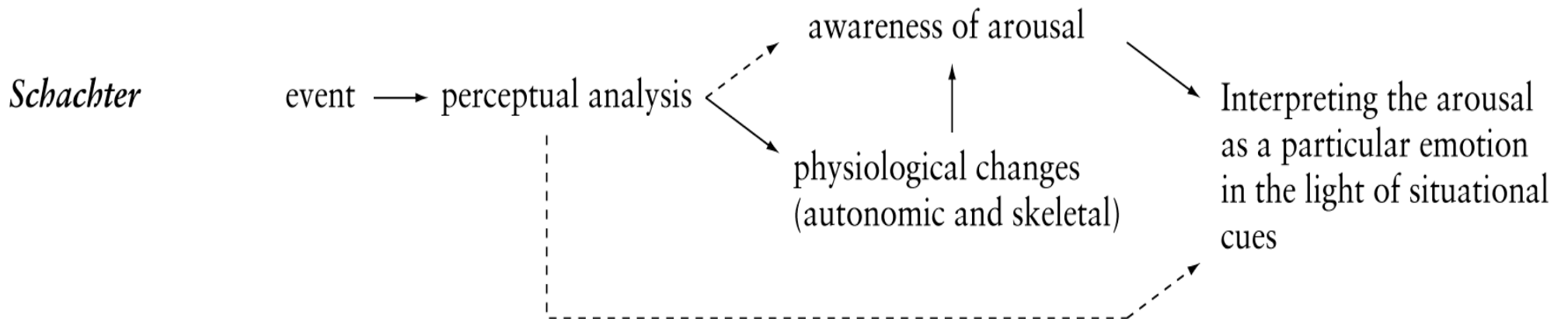
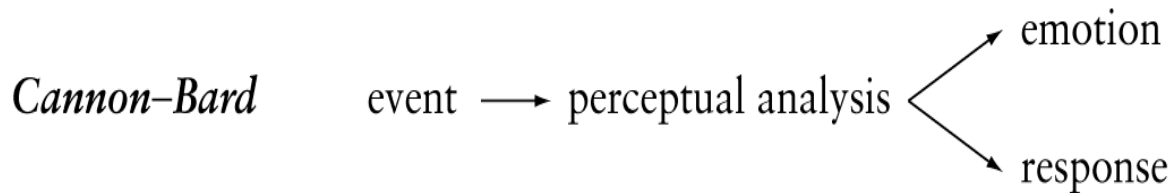
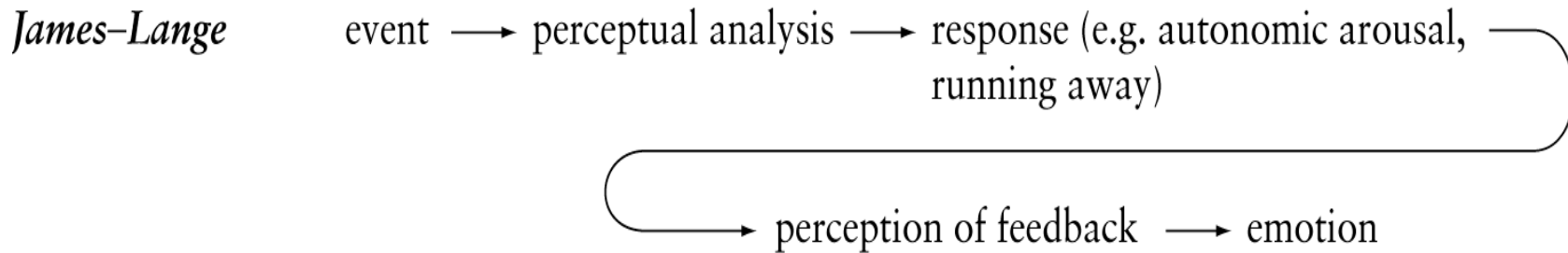


Arousal

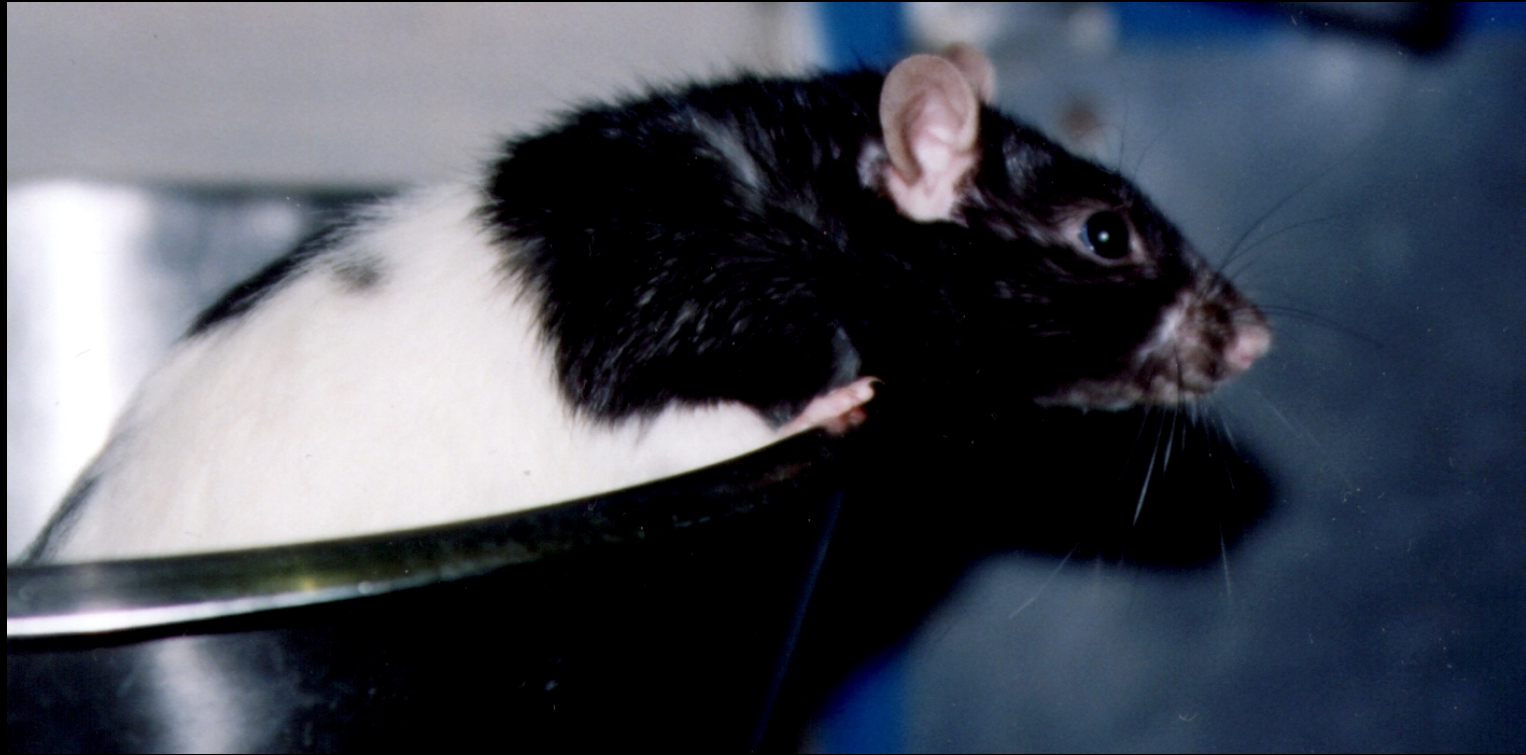
(all heart rates are fake)

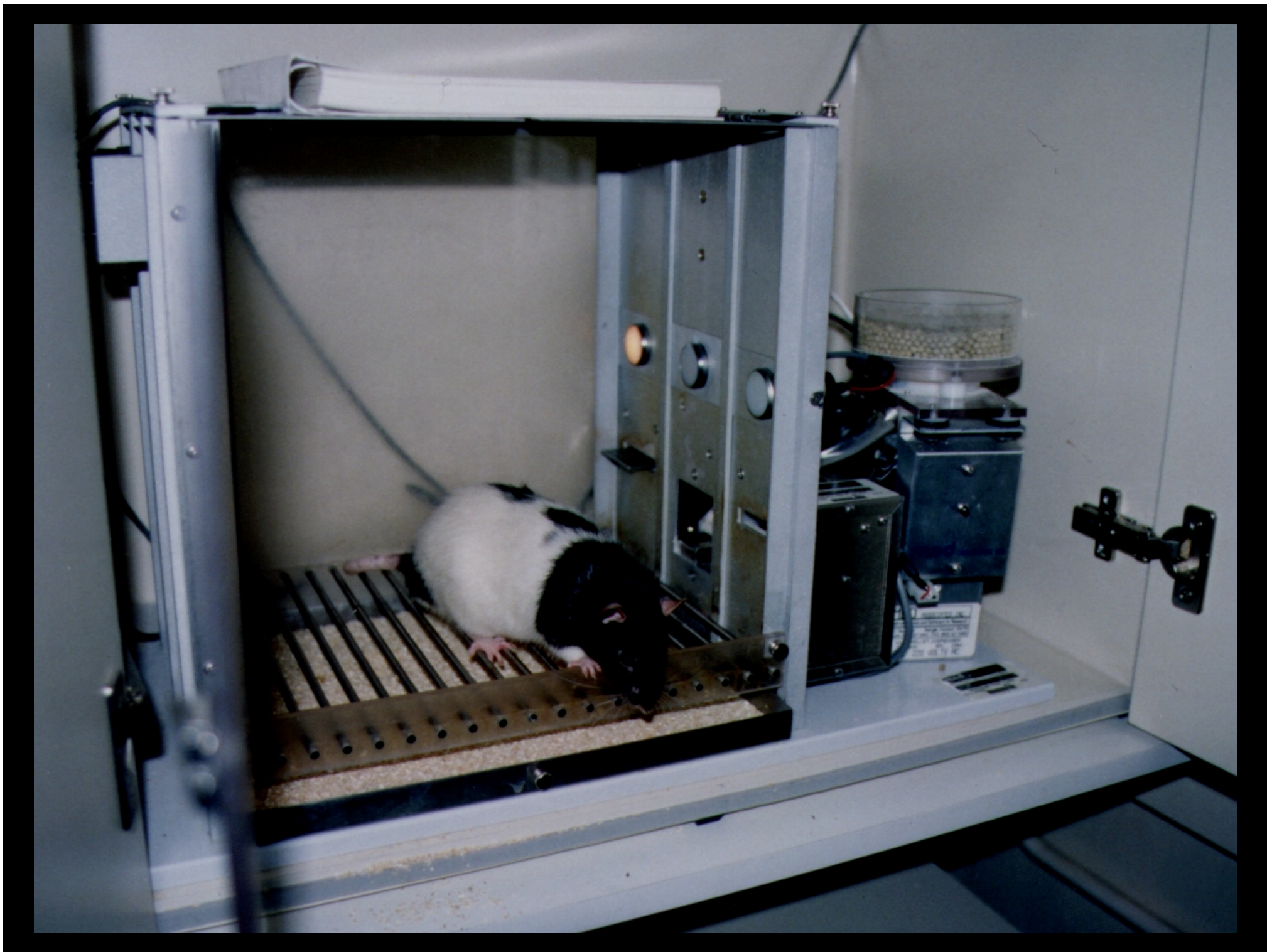
Summary of theories

Traditional view event → perceptual analysis → emotion → response

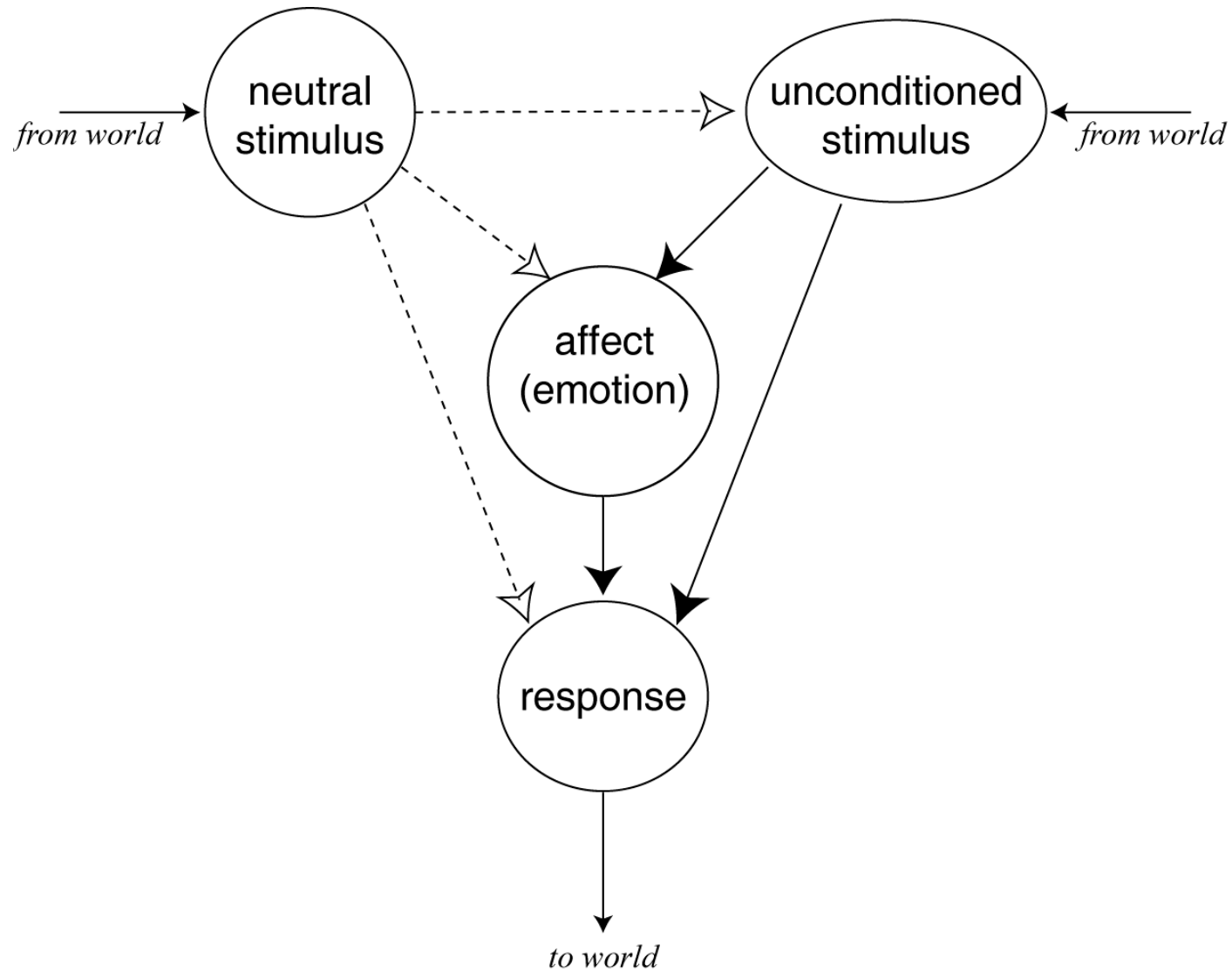


*Animal emotion,
and how to measure it*





Pavlovian conditioning generates multiple associations



CS–response and CS–sensory associations

CS–response associations

*e.g. simple cell-to-cell associations in *Aplysia californica* (a sea slug); Kandel et al.*

Sensory preconditioning

A → B

B → US

If a conditioned response is observed to A (but not to an unpaired stimulus), this must occur through A's association with B.

Blocking

CS (light or noise) → electric shock.

The conditioned response measured (CR) is suppression of responding for food.

Suppression ratio of 0.5 = no effect; 0 = complete suppression.

Group A:	LN (8)	N (16)	Test L	.25
Group B:	N (16)	LN (8)	Test L	.45
Group G:	—	LN (8)	Test L	.05
Group 2-B:	—	N (24)	Test L	.44

Blocking depends on A and B predicting the same US.

Group B:	N-1 ma. (16)	LN-1 ma. (8)	Test L	.45
Group 2-M:	N-1 ma. (16)	LN-4 ma. (8)	Test L	.14
Group 3-U:	N-4 ma. (8)	LN-4 ma. (8)	Test L	.36

Blocking and transreinforcer blocking

Blocking.

A → US

AB → US

Test response to A: substantial conditioning.

Test response to B: much less conditioning than if B had been paired with the US on its own (A already predicted the US, so learning about B was blocked by A).

Transreinforcer blocking.

A → shock

AB → omission of expected food

Test response to A: substantial conditioning.

Test response to B: reduced conditioning (B was blocked by A).

Yet A did not predict food omission! All it predicted was something unpleasant. Therefore transreinforcer blocking depends on affect (in this case, unpleasantness).

Pavlovian conditioning generates multiple associations

