How Spontaneous Gestures Connect to Thinking

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Lecture at the Museum of London 4th April 2018, on behalf of Gresham College

Goals of lecture

1. To present ***a new theoretical perspective*** on ***spontaneous*** hand movement and gesture (and body language generally).

2. To persuade you that much of our everyday understanding is wrong. Rarely studied ***spontaneous*** behaviour.

3. To demonstrate the ***practical significance*** of this new theoretical approach.

What's new about the theory?

1. *Function of nonverbal communication*

Traditional theory: nonverbal communication is primarily concerned with emotions and interpersonal relations.

New theory: some nonverbal communication does reveal emotional state/interpersonal relations

But some (particularly hand movements) reveal unconscious aspects of thinking.

2. Power

But *not* 93% of all communication, as is widely believed.

‘Only 7 per cent of communication is verbal, make the other 93 per cent count’ (ad for a credit card)

Much more complex than that.

Where does this claim come from?

Mehrabian: individual words conveying liking, neutral or dislike (‘honey’, ‘maybe’ ‘brute’) delivered in different tones/facial expressions **(face: 55%, tone: 38%, content: 7%).**

Argyle: messages delivered in conflicting styles **(nonverbal 12.5 more powerful than verbal).**

Not ***spontaneous*** communications.

Hostile message:

‘I don’t much enjoy meeting the people who attend these sorts of talks. I often find then rather boring and difficult to deal with. Please make your way out after the talk as quickly as possible.’

Argyle's classic (1971) experiment

- Three verbal messages:
- Hostile
- Neutral
- Friendly

- Delivered in three nonverbal styles:
- Hostile - *harsh voice, frown with teeth showing, tense posture.*
- Neutral - *expressionless voice, blank face.*
- Friendly – *warm, soft tone of voice, smiling face, relaxed posture.*

- Mean ‘friendliness’ ratings:

‘7’ means ‘extremely friendly’,

‘1’ means ‘extremely hostile’.

Mean ratings:			
Verbal		Nonverbal	
	Friendly	Neutral	Hostile
Friendly	6.03	4.27	1.60
Neutral	6.03	4.10	1.37
Hostile	5.17	2.83	1.80

But how general are these findings?

- Are the verbal/nonverbal style representative of real *spontaneous* communications?

- How many senders of the message were used? Does it apply to people generally?

Other utterances

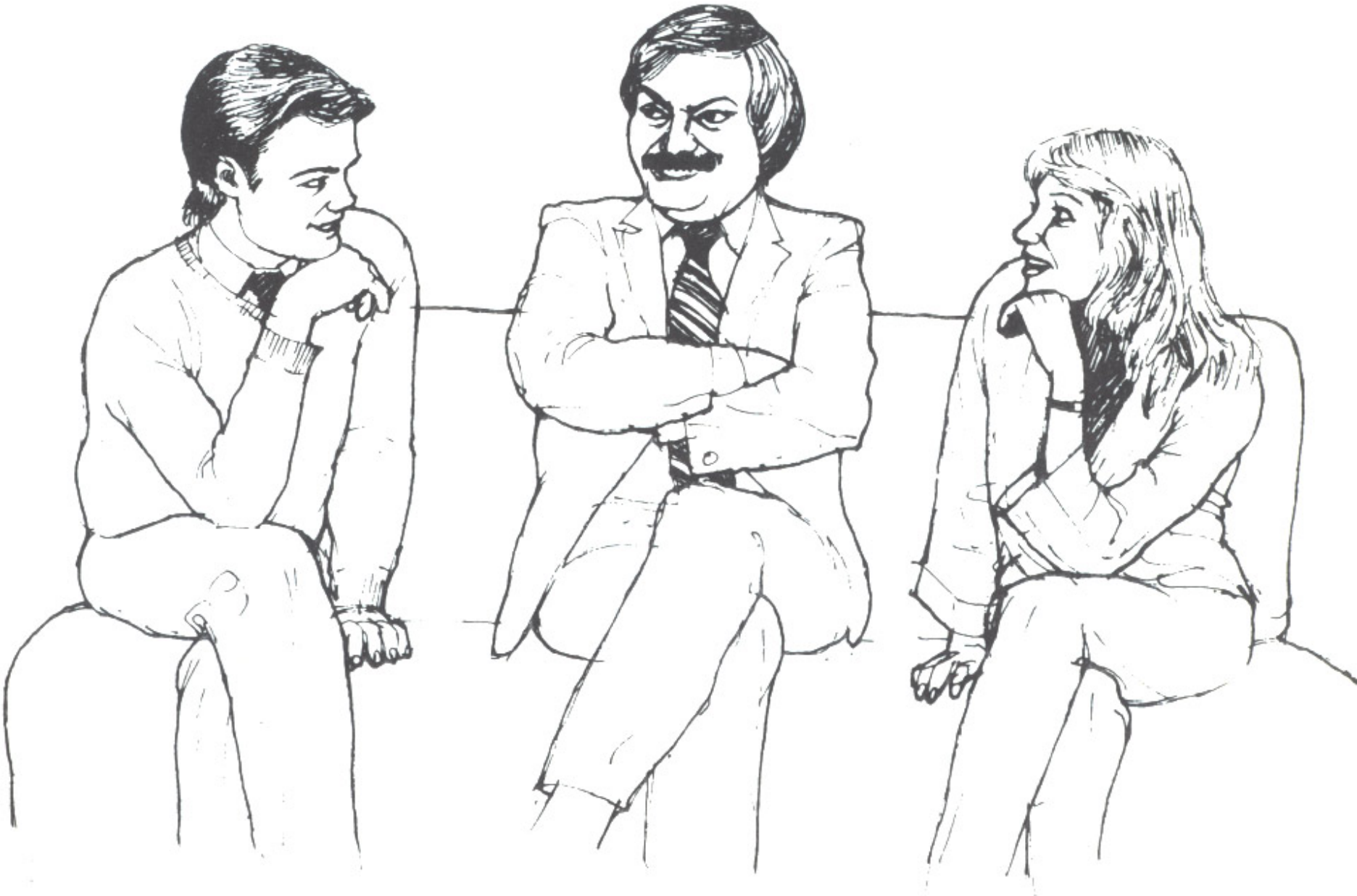
- ‘Would you mind leaving?’
- ‘You used to be such a nice person.’
- Would the NV component really outweigh the verbal component here (by a factor of 12)?

3. *Connection with speech.*

Traditional assumption (in academic/popular literature) is that they're separate.

4. Speed

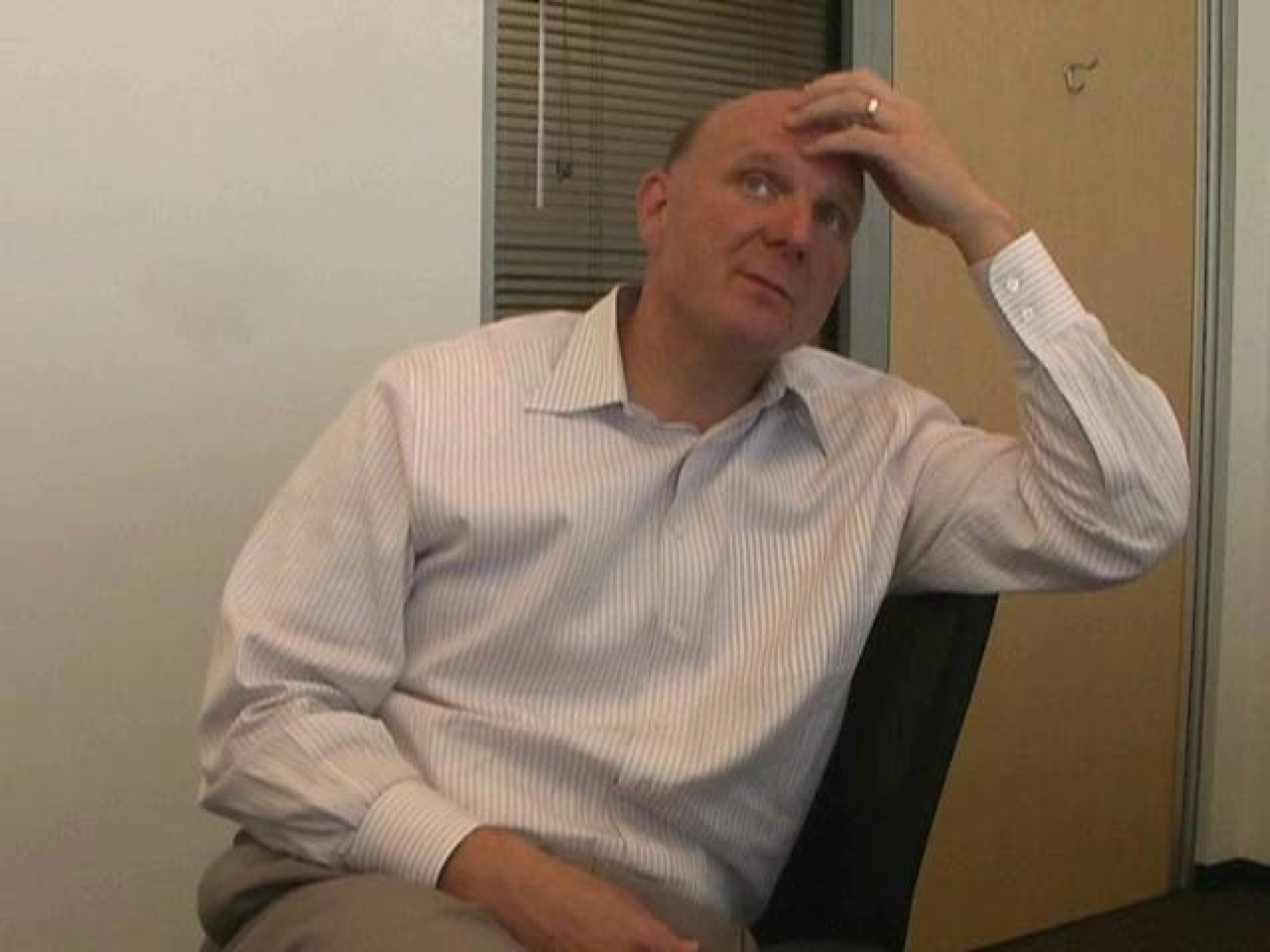
Traditional assumption: bodily communication is slow and easy to recognise.



(From Allan Pease, *Body Language*, 1991)

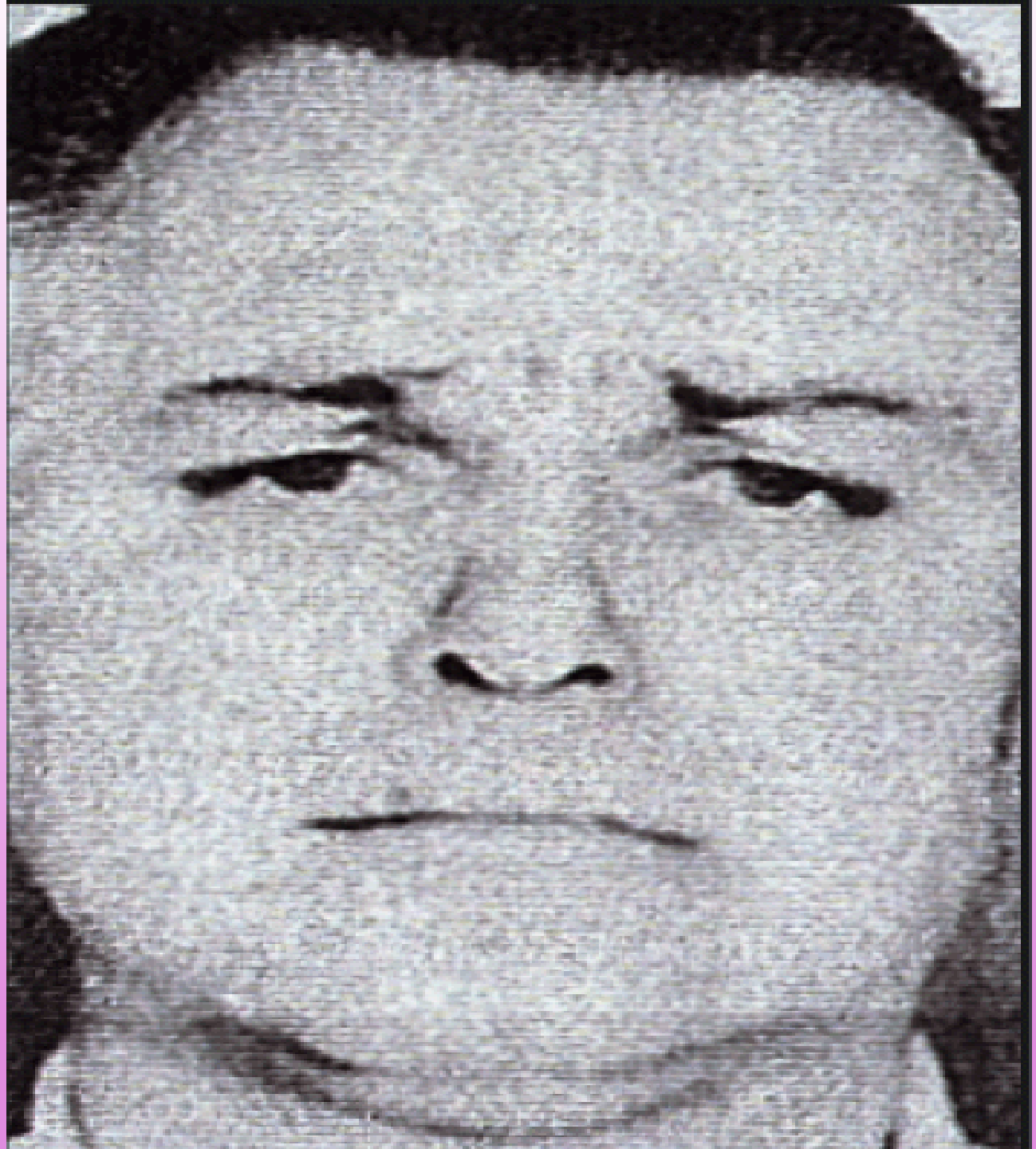
New theory:

bodily communication is quick and fleeting.

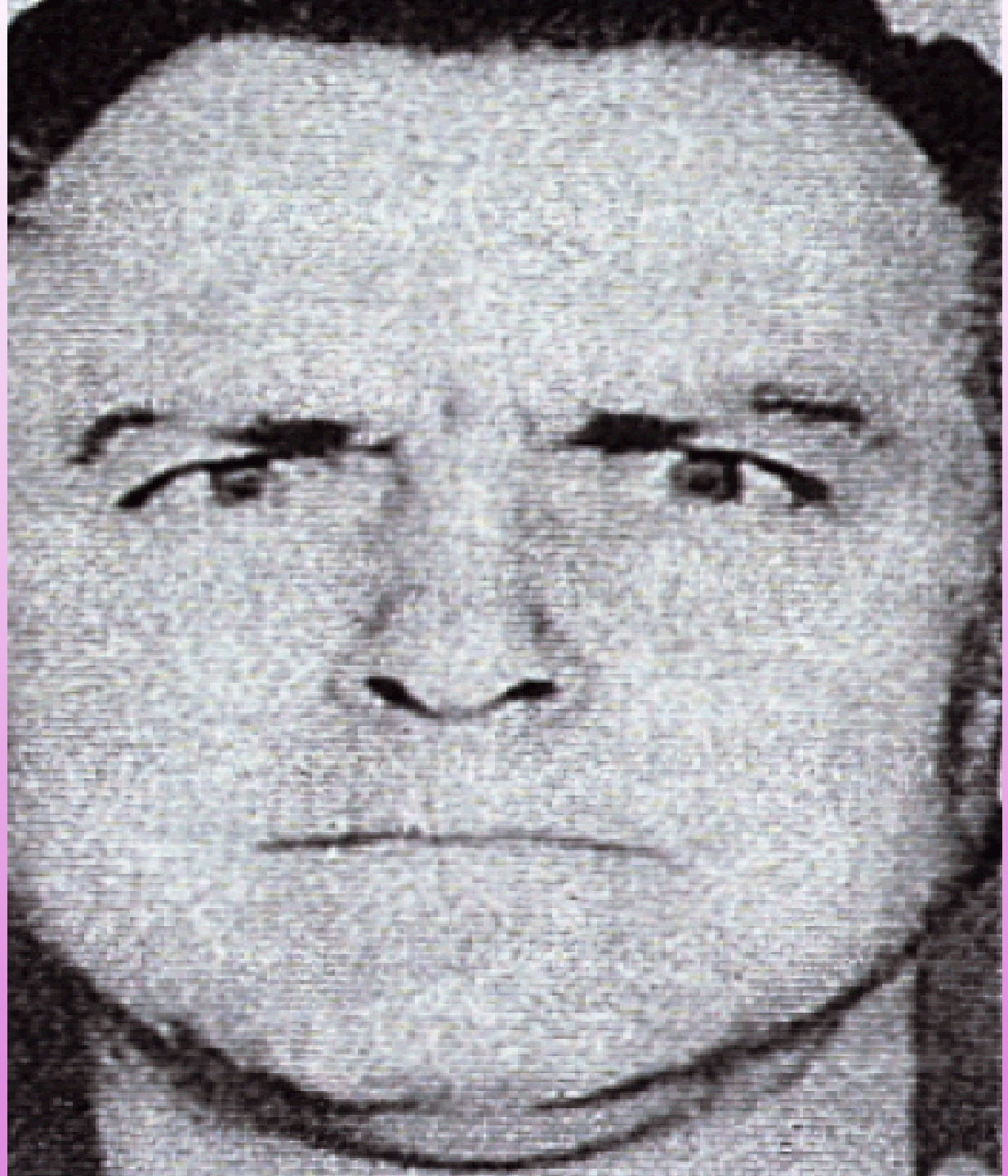


Rethinking function

- Emotional expression has been shown to be a core function of bodily communication, with claims about:
- universality in the expression of 6 core emotions (Papua New Guinea).
- gender differences in ability to send and read facial expression.
- But what expressions were used?

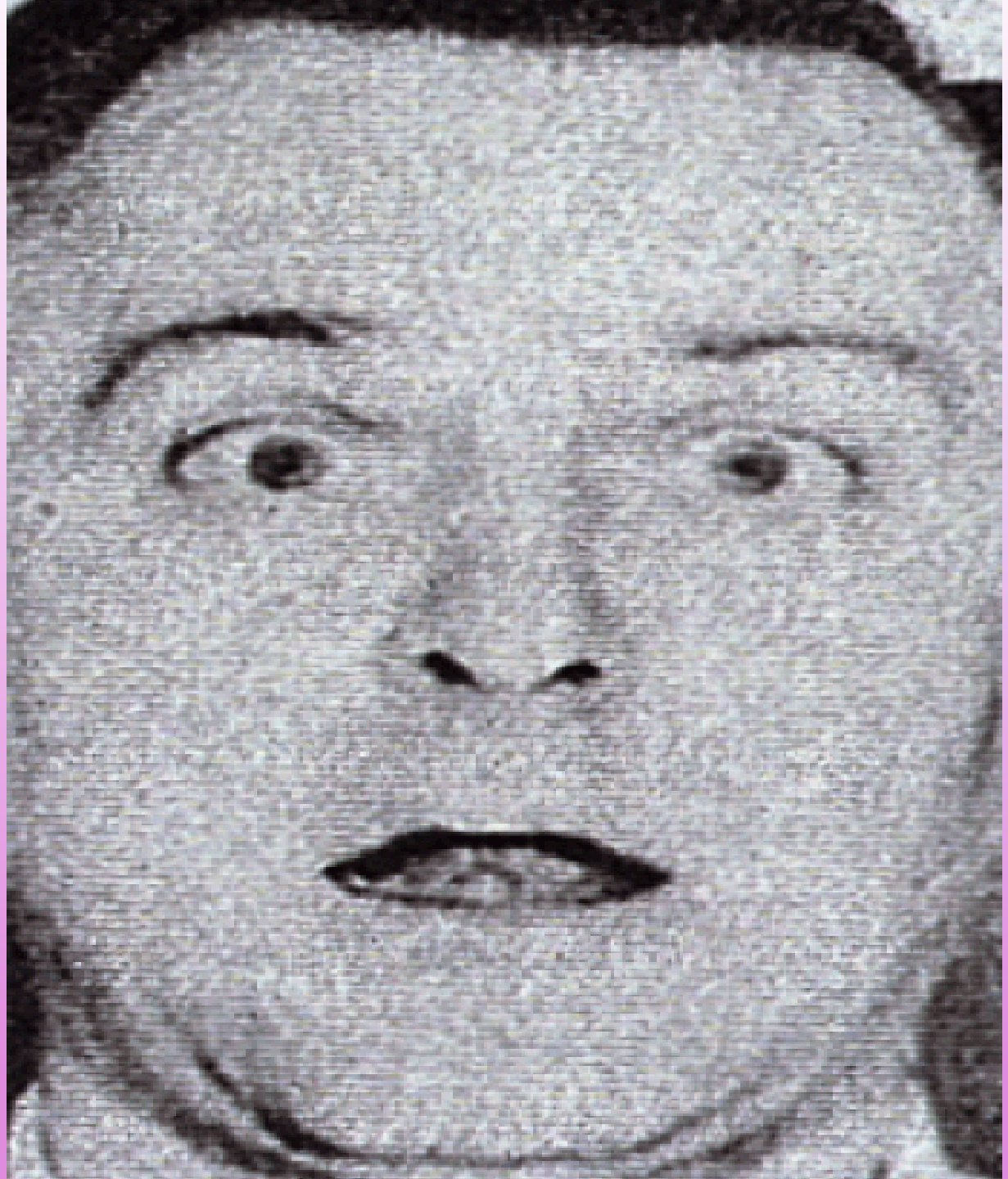


- Sadness



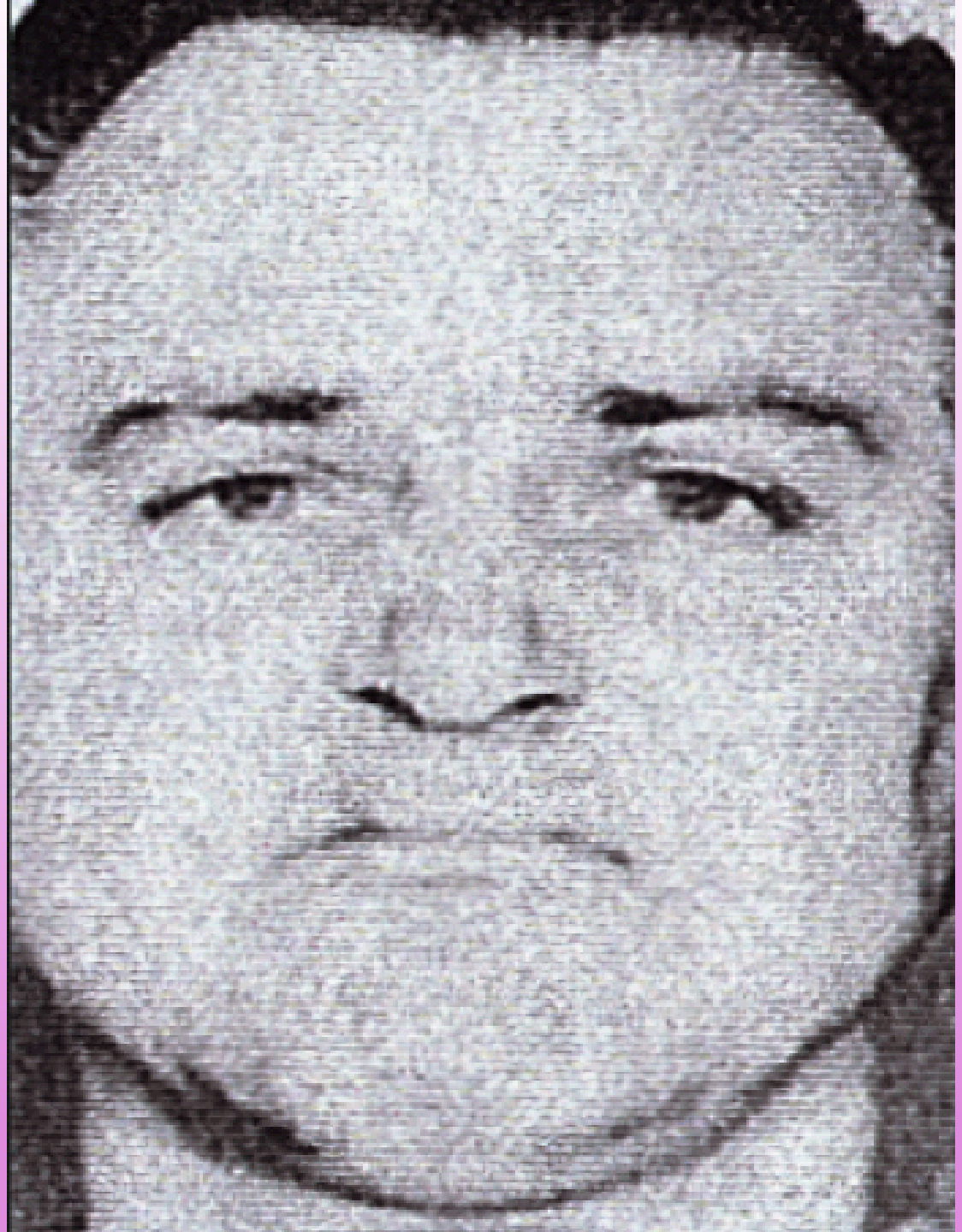
- Anger

- Happiness

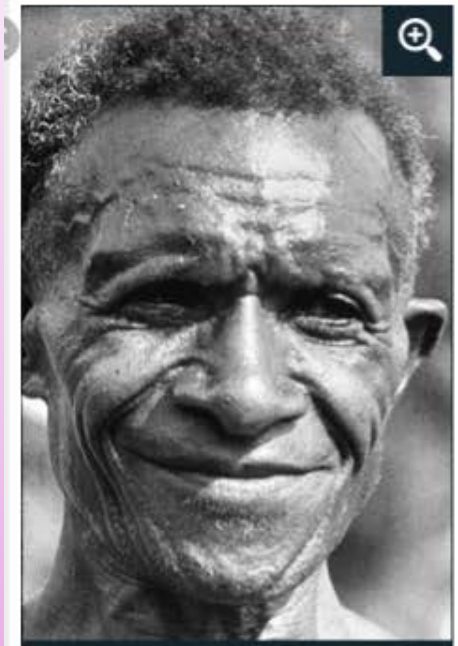


- Surprise

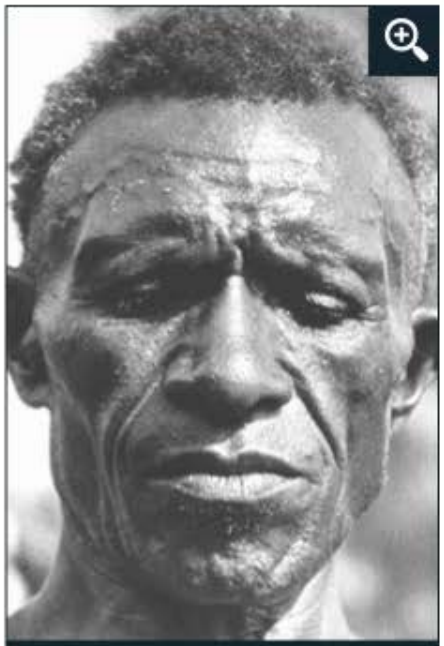
- Fear



- Disgust



Anger
Sadness
Disgust
Happiness



Anger
Sadness
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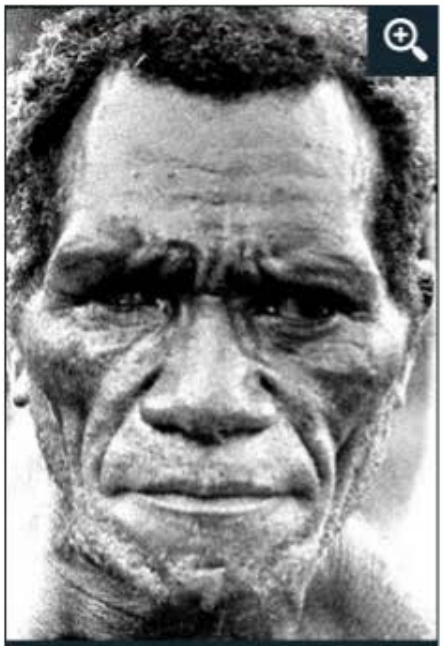
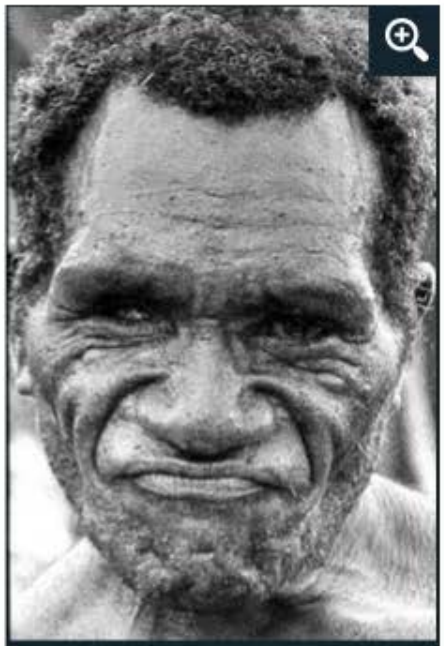
Happiness

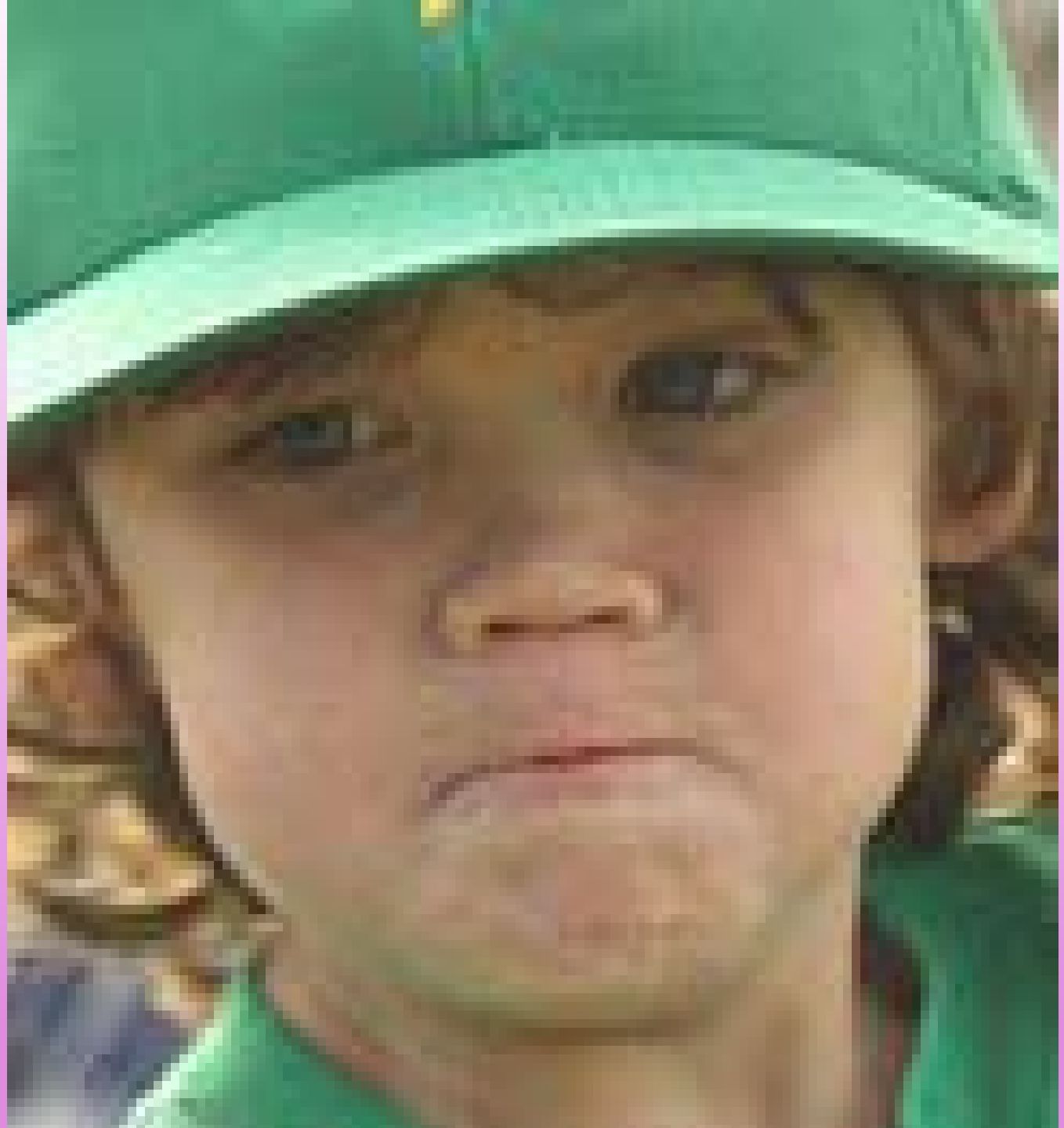


Anger
Sadness
Disgust
Happiness



Anger
Sadness
Disgust
Happiness

- Interpretation of spontaneous expressions much more difficult.



1) Just about to cry.

2) Fighting (and holding back the tears).

1) Neither.


SK

1) Crying.

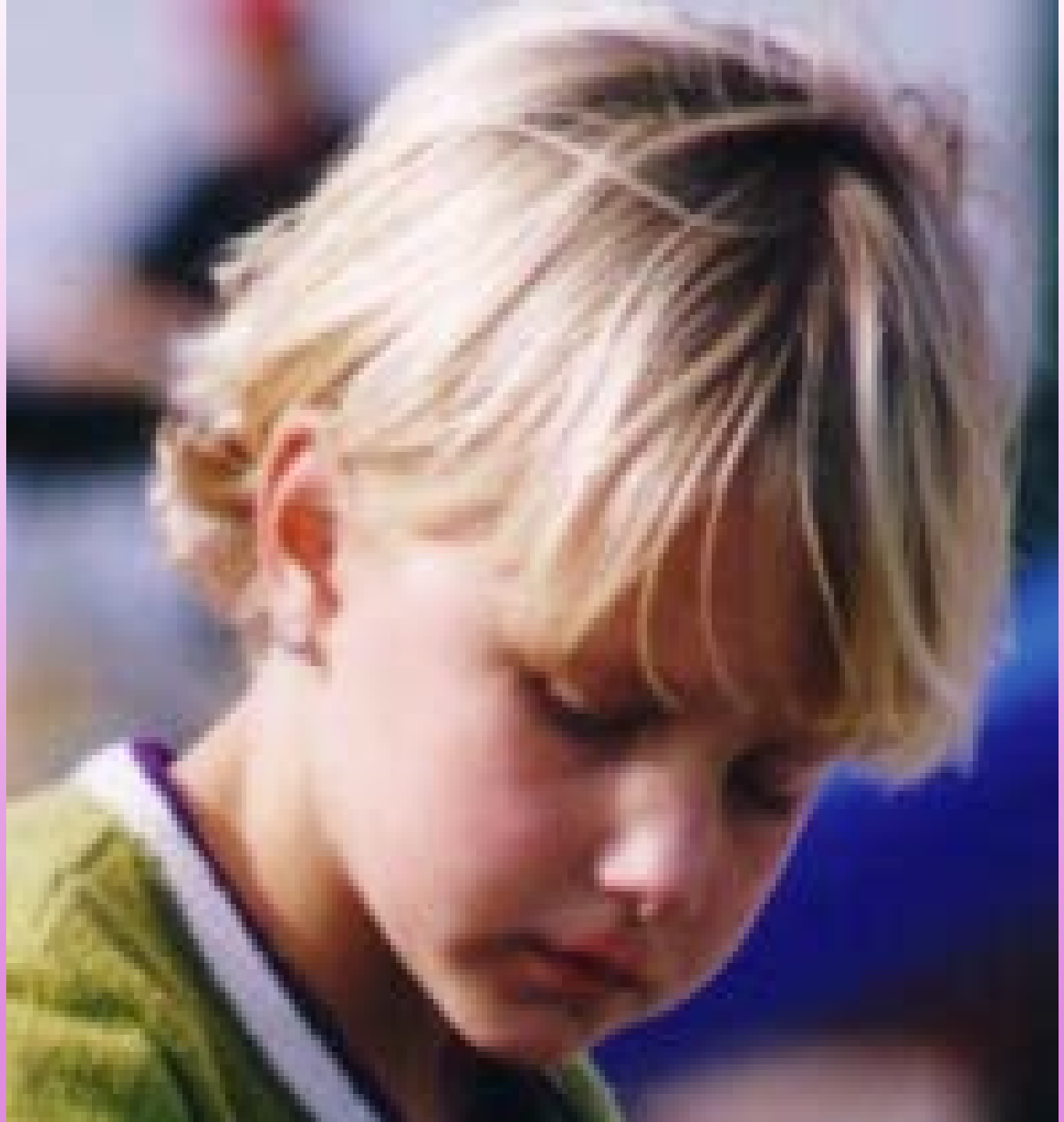
2) Trying to stay in control at a funeral.

3) Neither.

1) Angry and shouting.

2) In pain (just been struck).

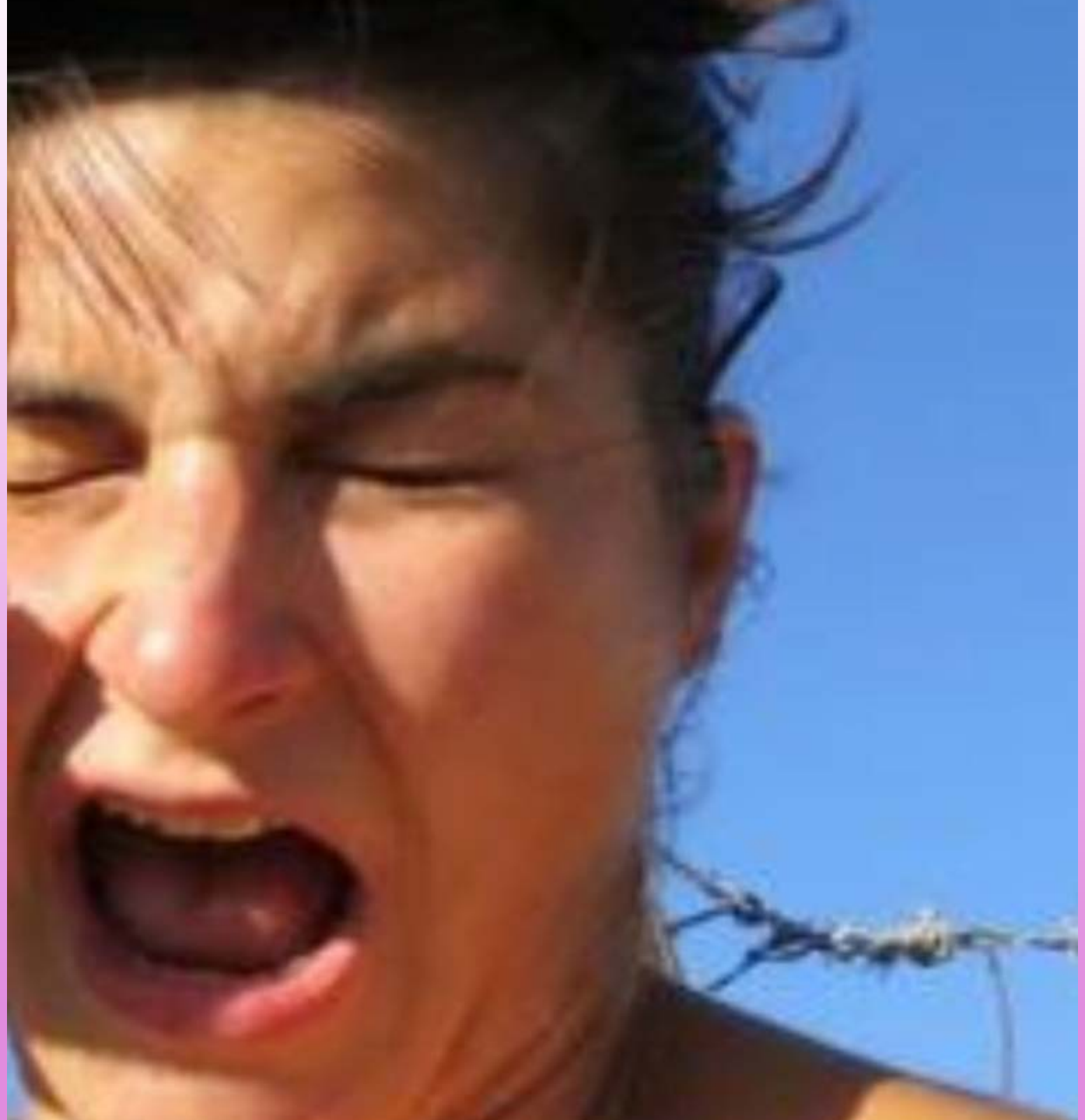
3) Neither.



1) Sad.

2) Ashamed (just been told of).

3) Neither.



1) Excited (fair ground ride).

2) Sneezing (hay fever).

3) Neither.

1. Threatening the US.
2. Wrestling a child.
3. Neither.

1. Giving money to a beggar.
2. Being dumped.
3. Neither.

Conclusions

- Much more difficult interpreting *spontaneous* facial expressions
- even when they are frozen in time.
- Then there is the issue of control.

With control:

1) Many facial expressions of emotion are very quick.

2) Many facial expressions of emotion are inhibited.

Some very quick facial expressions

- **Micro-expressions**
- Full-face emotional expressions compressed in time, flashes on and off the face in less than one-quarter of a second.
- If we miss the micro-expression we will not judge emotional state correctly.

Squelched expressions.

- As the expression emerges, it is covered with a false smile.
- To read people, we have to distinguish genuine and false smiles.
- Then read the underlying expression.

Genuine smile

- Main indicators:
- Bilateral symmetry.
- Slow onset and decline.

Masking smile

- Main indicators:
- Bilateral asymmetry.
- Abrupt onset and decline.

Therefore to decode facial expression accurately

1) We have to be able to interpret *spontaneous* expressions.

2) We have to *detect* micro-expressions.

3) We have to *discriminate* types of smiles.

4) We have to *decode* facial expression as masking smiles fade.

- A little less straightforward than you might think.
- When we do all this, we may get a genuine insight into how someone feels.

Body

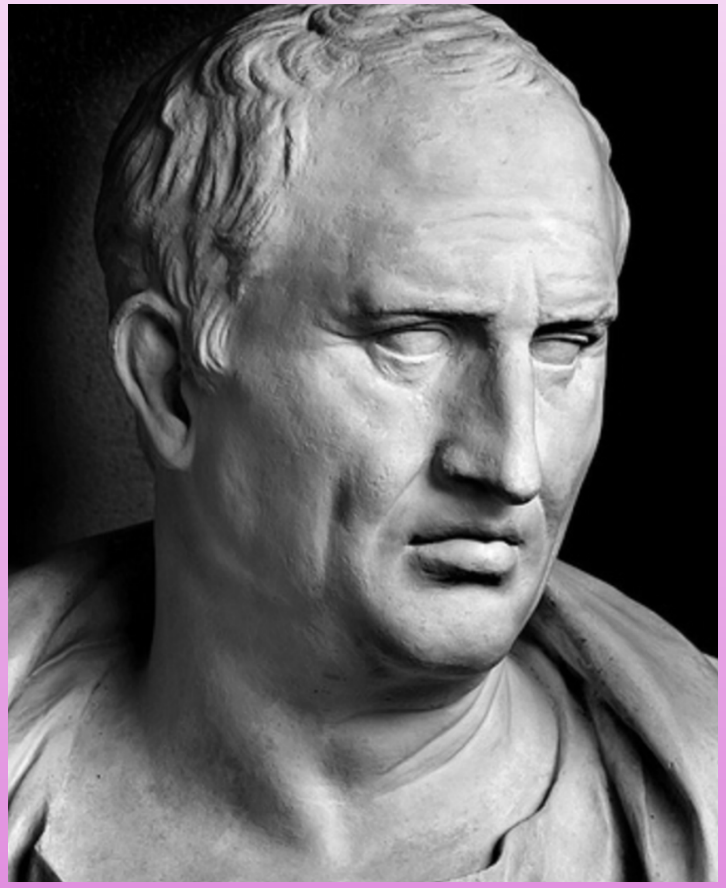
Conclusions so far

1. Body language is dynamic, quick, and presumably harder to read.

2. How important it is depends on many factors.

3. Body language and speech are closely integrated.

The study of hand movements and gesture (considerable history)



Cicero:
‘The body is like a musical instrument with the delivery or action being ‘a sort of eloquence of the body, since it consists in gesticulation as well as speech.’

Quintilian ('Institutio Oratoria', 100 AD)

Precise instructions on how to produce gestures:

'If the first finger touch the middle of the right-hand edge of the thumb-nail with its extremity, the other fingers being relaxed.'
Ring gesture: 'okay').

'the hands may almost be said to speak.'

Bulwer (‘Chirologia - Chironomia’,1644)

- Cautioned against the improper use of ‘manual rhetoricke’.
- Glossary of gestures, with correct interpretation and usage.
- To consciously control hand movements; to make them less spontaneous.


A Suppico.
B Oro.
C Plero.
D Admiror.
E Applaudo.
F Indignor.
G Explodo.
H Despero.
I Otio indulgeo
K Tristi animi signo
L Innocentiã offendo.
M Lucri apprehensionẽ plaudo.
N Libertatem resigno.
O Protego.
P Triumpho.
Q Silentium postulo.
R Iu re.
S Asseuero
T Suffrager.
V Resp uo.
W Invito.
X Dimitto.
Y Miner.
Z Mendico.

Ekman and Friesen

('The repertoire of nonverbal behavior', 1967)

Distinguished between:

1. Emblems
2. Illustrators
    - Iconic/metaphoric gestures
    - Batonic movements
    - Deictics
3. Self-adaptors

Emblems (following Quintillian and others):

- Hand gestures with standard form and precise meaning (culturally-specific).
- Gestures with direct verbal translation.
- Conscious awareness: ‘people know when they are using an emblem, can repeat it if asked to do so.’
- Can occur without speech.

Iconic/metaphoric gestures

- No standard form/no lexicon (spontaneous images in the hands).
- Unconsciously produced (may be aware that we are doing something).
- Closely integrated with the speech itself: start of movement precedes speech (different gestural phases).
- **May tell us a great deal about underlying thoughts**.

Functions:

1) Encoding of speech? Word finding?

2) An evolutionary relic?

3) A core part of the underlying representation?

Word finding in the TOT state

‘Oh it’s a type of circumference thing, I know what it is, it’s that [bloody arc thing. Oh no what’s the word] it’s on the tip of my tongue. It’s…’

Iconic: right hand makes a semi-circular movement, moving quickly up and downward twice with index finger pointing outwards. Right hand and left hand then move quickly round each other five times in circular fashion.

‘[Erm] It’s an arc, no it’s an arch, it’s a ro- something. It’s an, oh God, something arc . . . arch . . . rotor . . . arc.’

Iconic: right hand makes a semi-circle shape.

Results

- Allowing people to gesture didn’t facilitate them finding the words.

A core part of the underlying representation

David McNeill (University of Chicago):

- ‘To get the full cognitive representation that the speaker had in mind, both the sentence and the gesture must be taken into account.’

Consider a description of a simple action sequence

And she

[chases him out again]

Hand appears to swing an object through the air.

- The speech conveys the idea of pursuit (‘chases’) and recurrence (‘again’) but not the means of pursuit.
- The gesture shows the method – swinging an umbrella.
- The sentence is well formed and the gesture is not a repair.

McNeill’s conclusion:

‘Utterances possess two sides, only one of which is speech; the other is imagery… To exclude the gesture side, as has been traditional, is tantamount to ignoring half of the message out of the brain.’

Different vehicles of meaning.

‘The table can be [raised up towards the ceiling]’

Hands are wide apart, palms facing down, hands move upwards.

Differences between speech and gesture

- Speech: linear and segmented

- Identifies:
- What is being raised (‘the table’)
- The action (‘can be raised up’)
- The direction of the action (‘towards the ceiling’)

Gesture : multidimensional

Object

Movement

Speed

Direction

All Simultaneous

- Speech: bottom-up processing
- Gesture: top-down

- Speech: standards of form.
- Gesture: no standards of form.

- We spontaneously create meaning in gesture.

But do imagistic gestures accurately convey information?

- People might not be attuned to gesture (gestural space).
- Information might be too vague.
- Too complex to combine information from visual and auditory modality in real time.

Experimental studies (*'Visible Thought'*, Routledge, 2003):

- Encoders narrated stories.
- Edited clips played to decoders (speech/gesture only/speech and gesture).
- Decoders interrogated about what they had learned.
- ***Conclusion: decoders process gestures quickly and effortlessly.***

‘[she’s eating the food]’

Iconic: fingers on left hand are close together, palm is facing body, and thumb is directly behind index finger. Hand moves from waist level towards mouth.

(character-viewpoint gesture)

‘Billy going [sliding along] and causing all sorts of mayhem’

Iconic: Fingers of left hand are straight and close together, palm is pointing downwards. Hand makes a rapid movement to the left.

(observer-viewpoint gesture)

‘Semantic features’ and viewpoint

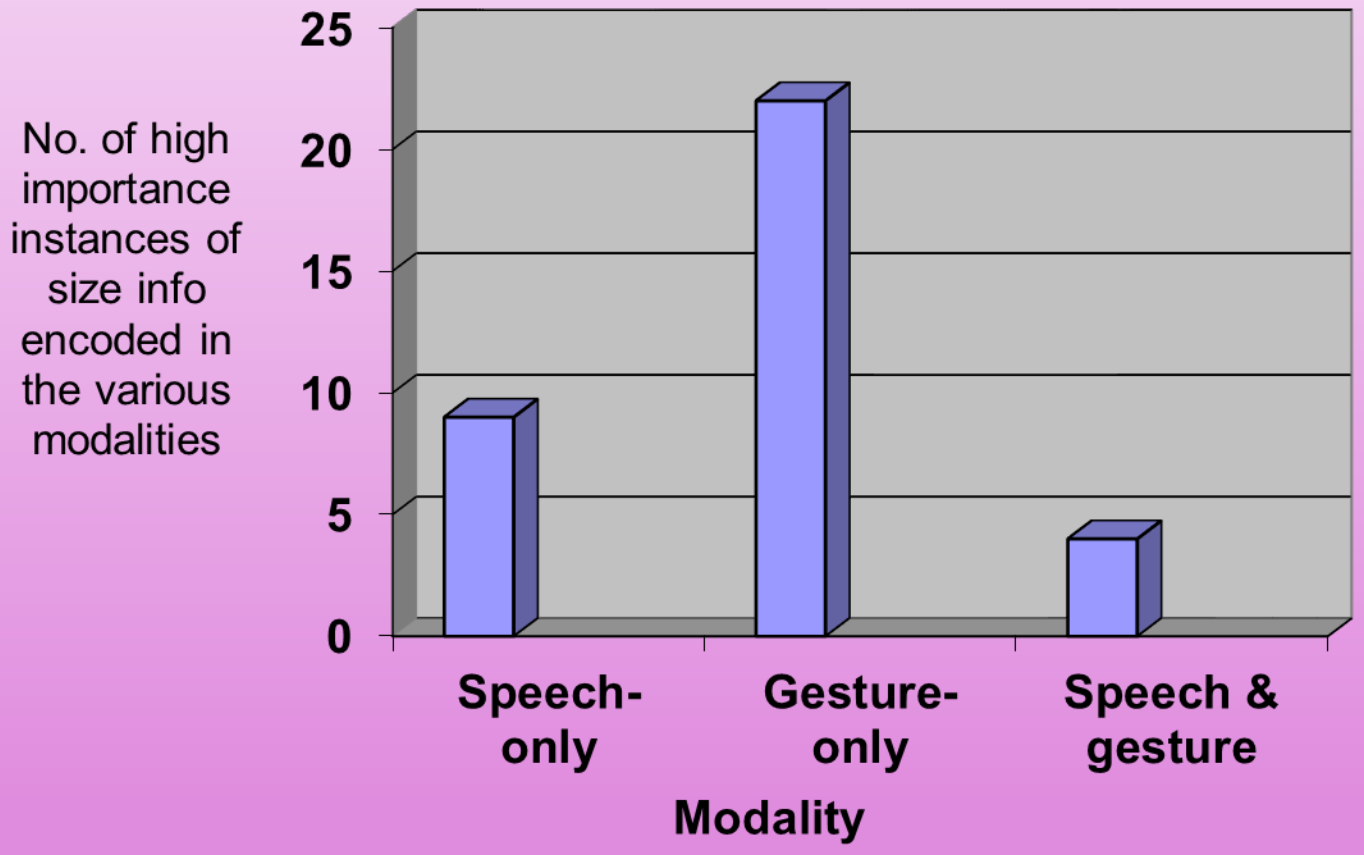
- **Character-viewpoint gestures particularly effective at:**
- Size
- Relative position
- Direction
- Movement
- Identity
- Description of action

- **Observer-viewpoint gestures:**
- Speed
- Shape

Where is important information encoded?

- So gestures convey significant information.
- But how important is this information?

How ‘high importance’ size information was encoded



Applications of the work

i. Reading hidden thoughts.

ii. Detecting deception: forensic implications.

iii. Identifying ‘dissociation’ in attitudes.

iv. Advertising (subliminal advertising?).

(i) Reading hidden thoughts

‘Gestures exhibit images that cannot always be expressed in speech, as well as images the speaker thinks are concealed.’

‘People unwittingly display their inner thoughts and ways of understanding events of the world.’

McNeill (1992) ‘*Hand and Mind’.*

Reading hidden thoughts

- We edit our speech but not our unconsciously generated gestures.
- Gestures and speech may not match.
- Gestures are more accurate indicator of underlying thoughts.


BIG
HER
BIG
HER


Britain forward not back
Britain forward not back
Britain forward not back

(ii) Deception

Darwin (1872): nonverbal behaviours ‘reveal the thoughts and intentions of others more truly than do words, which may be falsified.’

Some movements ‘will be partially repressed by the will…those least under separate control of the will should be highly expressive.’

Deception is a fight between control and nonverbal leakage.

Deception

Meta-analysis of published studies on deception: only 3 forms of behaviour reliably associated with lying:

- Nodding
- Foot and leg movements
- Hand movements

- All three *decrease* in frequency

(crude categories, 'hand movements' etc.)

Tony Blair (2005): inhibition of gesture

I was [completely wiped out] (0.4)

It’s the toughest thing you ever do (0.2)

[It’s also what you’ve got to do and I think] (0.2)

Hand gesture in deception

(*'Rethinking Body Language*', Routledge, 2016):

- Participants asked to give an accurate account based on something they had seen.
- Or asked to 'lie' and change 3 specific critical details of the story.

- **What happened to the frequency of the iconic gestures?**
- Half as many gestures when telling these lies.
- **What happened to the form of the gestures and their structure?**

Mean percentage frequency

Gesture phase	% of time this occurred in truthful condition	% of time this occurred in deception condition
Preparation	96.8	90.9
Pre-stroke hold	9.7	9.1
Stroke	100	100
Post-stroke hold	38.7	18.2
Retraction	67.7	68.2

Mean duration of gesture

Gesture phase	Mean duration in truthful condition	Mean duration in deceptive condition
Preparation	498 ms	441 ms
Pre-stroke	506 ms	450 ms
Stroke	830 ms	372 ms
Post-stroke hold	1380 ms	605 ms
Retraction	459 ms	399 ms

Matching speech/gesture (truthful):

‘So Ivy like [slams him into the boot of his car]’

Mismatching speech/gesture (deception)

‘She like pushes the DJ into the side door of the car and like [slams it shut]’

(iii) Explicit and implicit attitudes.

- Explicit attitudes are what people report
- ('I care strongly about the environment'; 'I prefer low carbon to high carbon lifestyles').

- In many domains, there is a 'value-action' gap between what they say and what they do.

- We need to differentiate explicit and underlying and unconscious *implicit* attitudes.

Measuring implicit attitudes

- **Implicit Association Test (IAT):**
- Computerised classification task (reaction times) to measure underlying ***associative connections***.

Implicit attitudes to carbon footprint

- **No** significant correlation with self-reported attitudes explicit and implicit attitudes are '**dissociated'.**
- Implicit attitude predicts visual attention to carbon labels, and choice of low carbon products.
- But many 'surface greens', positive in explicit attitude, but negative in implicit attitude.
- **How can we identify these 'surface greens'?**

A ‘True Green’ expresses her consumer choice

Implicit/explicit attitude: **convergent**

Speech and gesture: **matching**

“Yeah if it was like **[really high]** and something was **[really low] [and it was the same product]**, but there was a difference in price, then I’d probably feel really guilty about **[buying the high carbon one]** so **[I would buy the low]**”

A ‘Surface Green’ expresses her consumer choice

Implicit/explicit attitude: **divergent**

Speech and gesture: **mismatch**

“… if they were **[next to each other]** and it was quite obvious that **[one was good]** and **[one was bad]** then you’d go for **[the good one]”**

(iv) Advertising

- Some television advertisements use imagistic gestures – but they possess few of the semantic or structural properties of natural gestures.

- They don’t look right because they aren’t right, and we reject them

Create a new sort of TV ad
(for ITV)

- Create a non-existent product (to ensure no existing product knowledge).

- Create different commercials for same product.

  A : Speech and Image.

  B : Speech and Gesture.

Product - ‘F’.

- A fresh fruit juice drink for everyone with your five daily portions of fruit in one small bottle.
- Mango / banana / pear / orange / cranberries.
- Target audience : adults.


pure fruit
Your 5 daily portions of fruit

Communication objectives

- Product name – ‘f’.
- 5 portions of fresh fruit.
- **Freshness of the fruit.**
- **It’s for everyone.**
- **Small convenient size of bottle.**

Two Commercials:

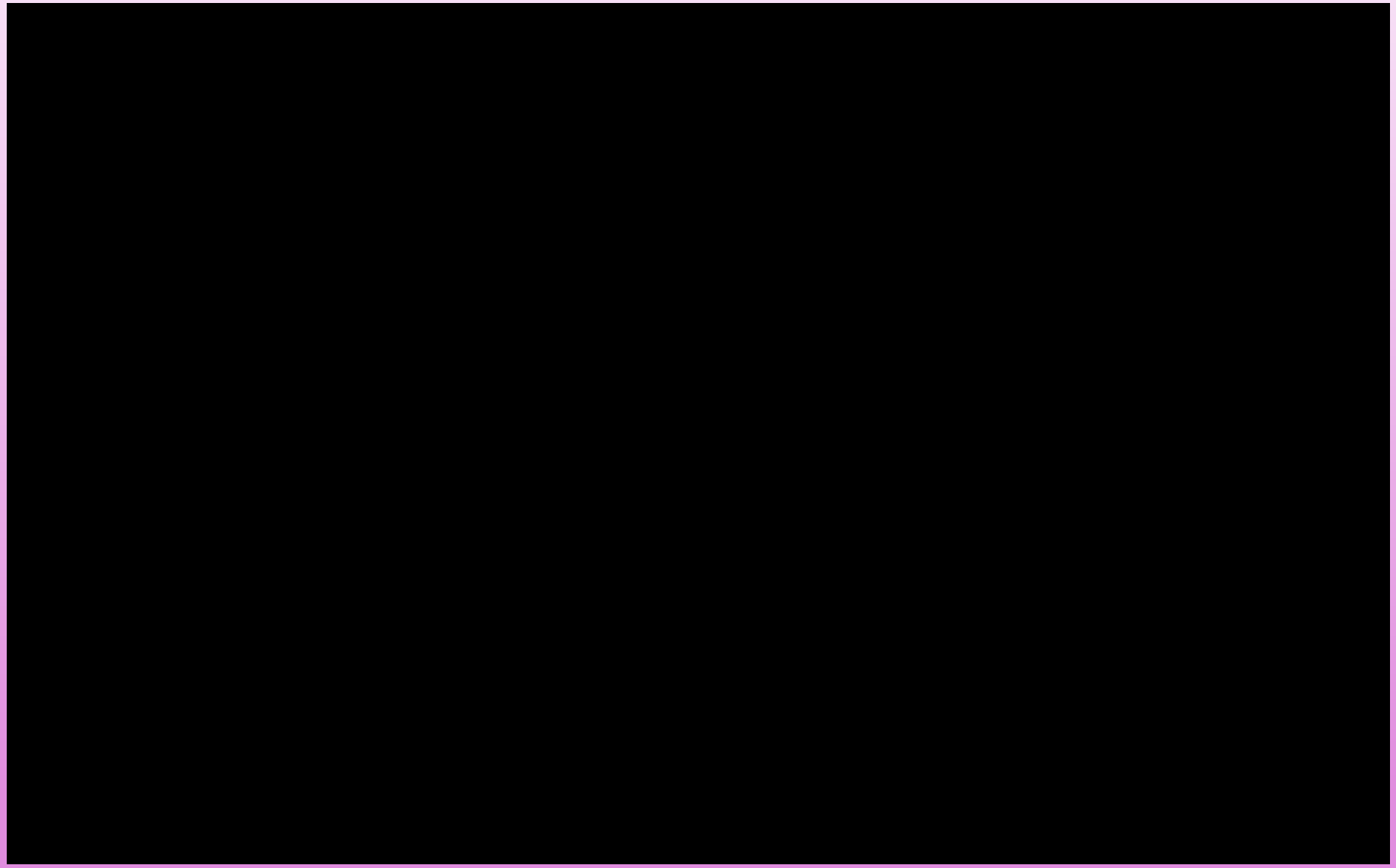
Speech and Image.

- Shows fruit and product, uses no imagistic gestures.

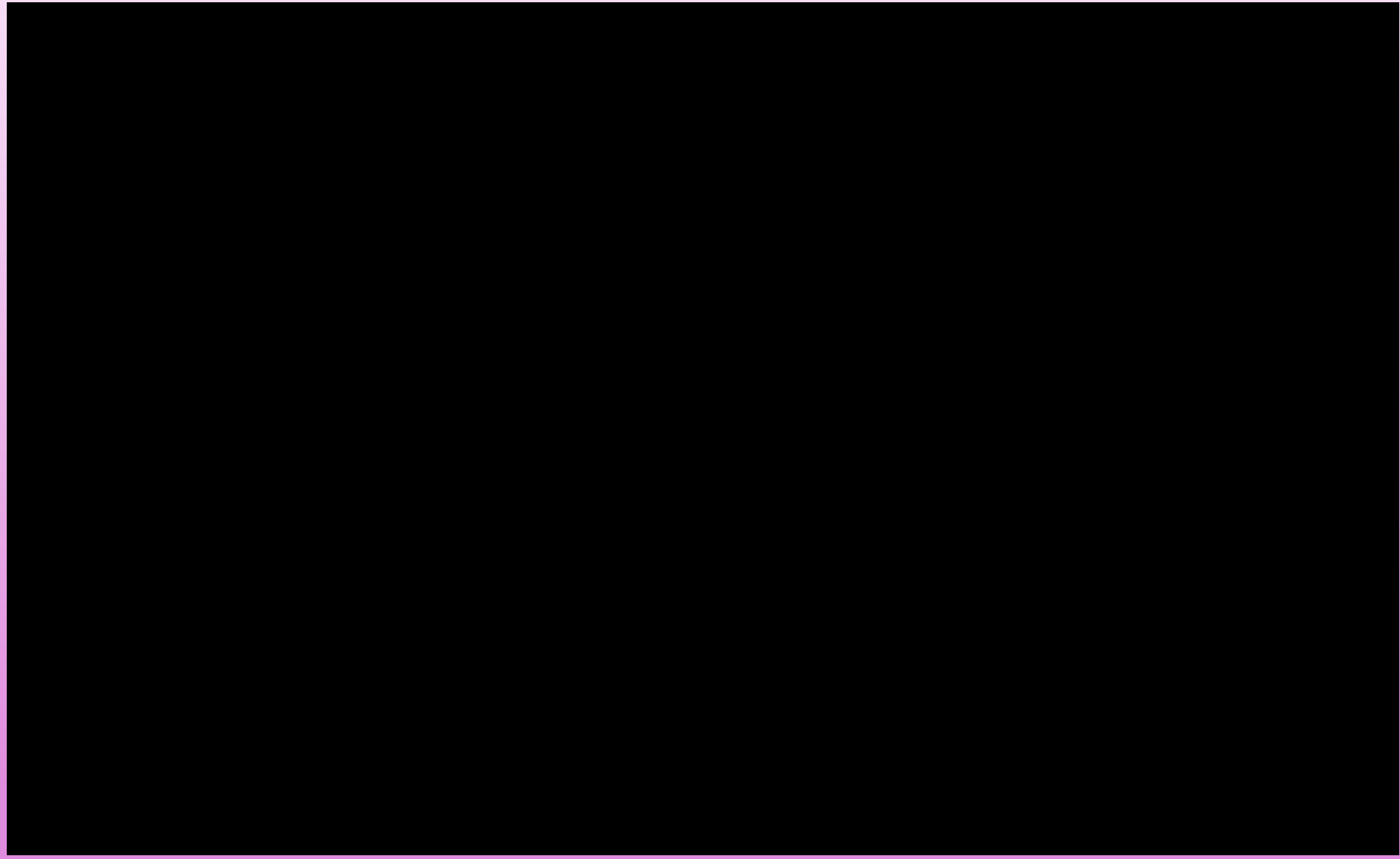
Speech and Gesture.

- Shows no fruit specifically, uses 3 imagistic gestures to convey core properties.

Speech and image ad



Speech and gesture ad



What information do the respondents receive?

	Speech + Image %	Speech + Gesture %
Freshness of the fruit.	86	94
For everyone.	26	50
Small convenient bottle size.	32	46

- Given that speech evolved in the context of or possibly through imagistic gestures our evolutionary past may have profound implications for the design of the most modern advertisements.

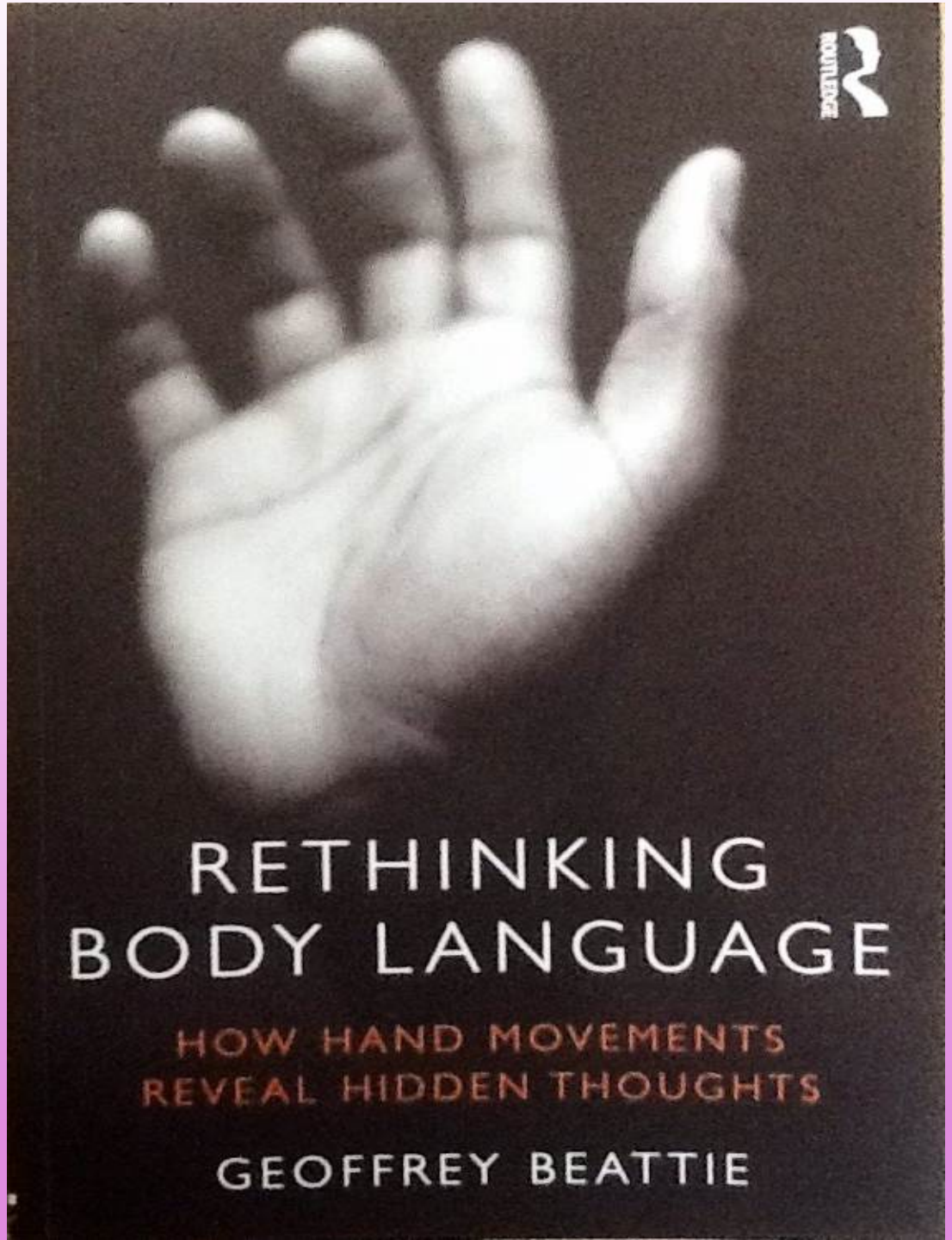
Conclusions

- Bodily communication does reveal emotions, relationships and thoughts (particularly the hands).
- The hands make thoughts visible.
- We often inhibit the hands in deception for good reason.
- We may be able to identify both deception and dissociation in attitudes by analysing gesture-speech mismatches.

Conclusions

- We can make messages more effective (and more persuasive) by putting key components into the ‘unconscious’ gestural channel.

- Our evolutionary past has enormous implications for our present day communications (and possibly for our future survival).


ROUTLEDGE
RETHINKING
BODY LANGUAGE
HOW HAND MOVEMENTS
REVEAL HIDDEN THOUGHTS
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