Assessing Emotion Perception

Andrew Bateman

Oliver Zangwill Centre for Neuropsychological Rehabilitation

CLAHRC-CP

Dept Psychiatry, Cambridge

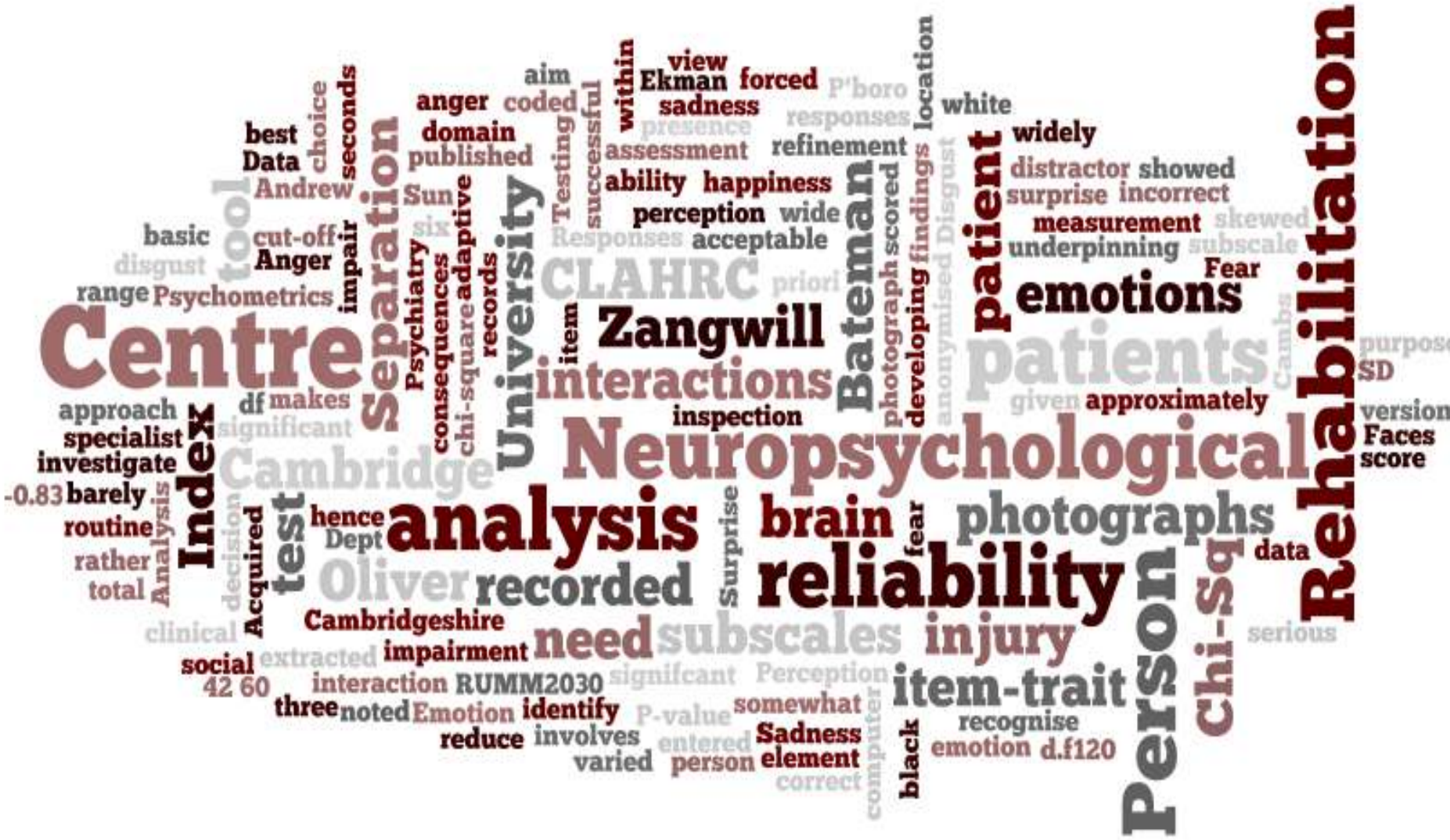
Luning Sun

Psychometrics Centre, University of Cambridge

Jonathan Evans

Section of Psychological Medicine

University of Glasgow


Centre
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Separation
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skewed
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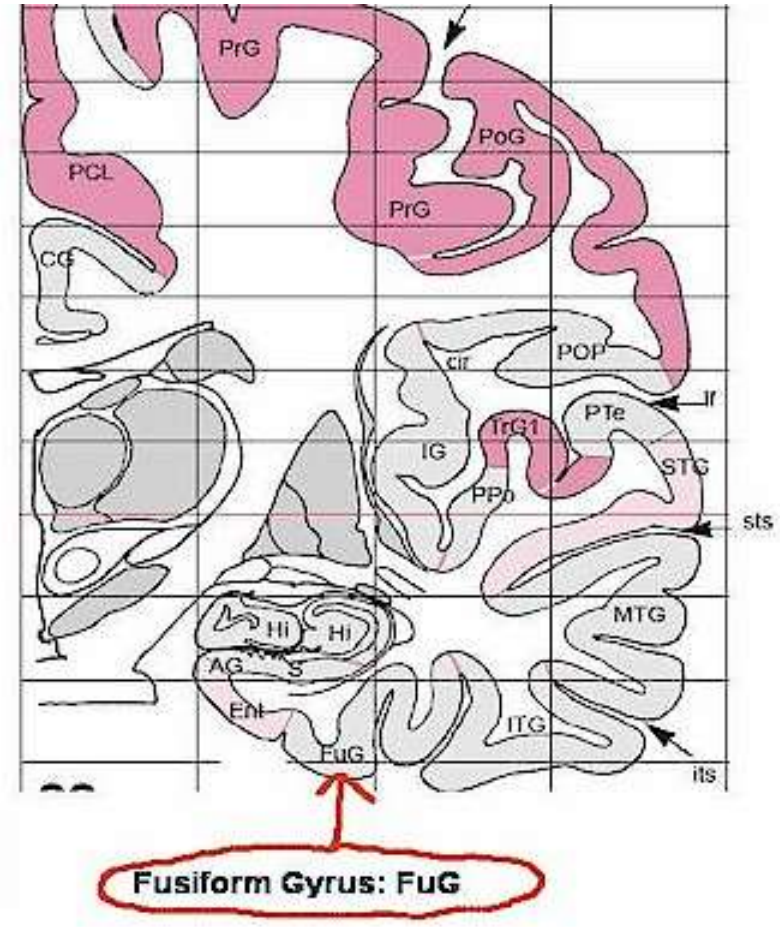
Fear
photograph
scored
developing
anonymised
Disgust
given
approximately
Cambs
purpose
SD
version
Faces
score
data
serious
inspection

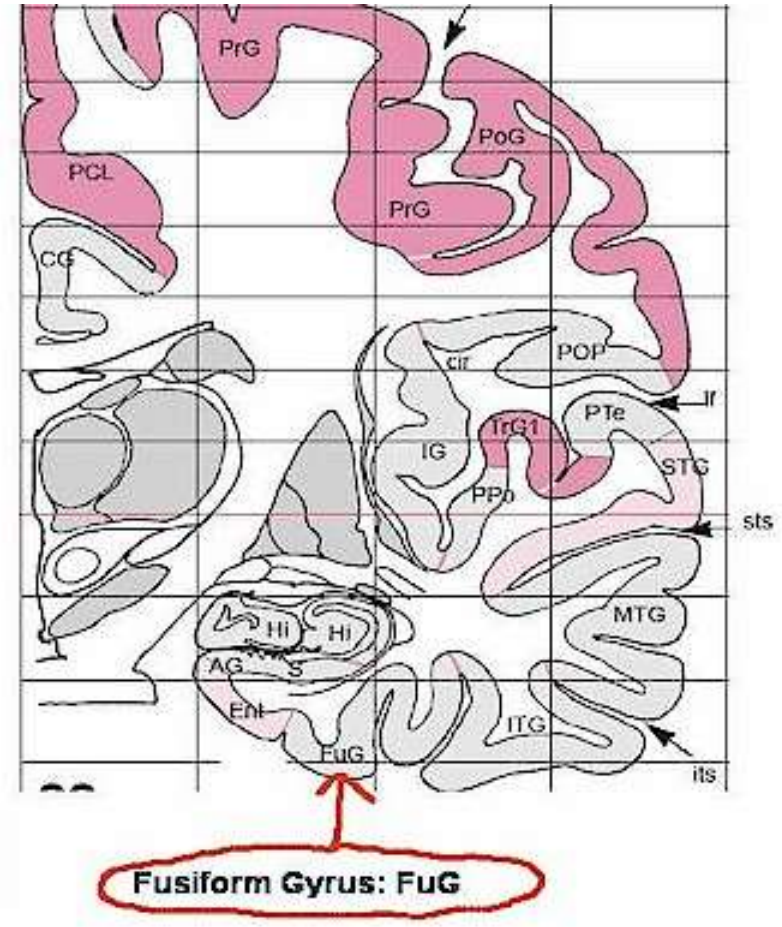
Neuroanatomy of face processing

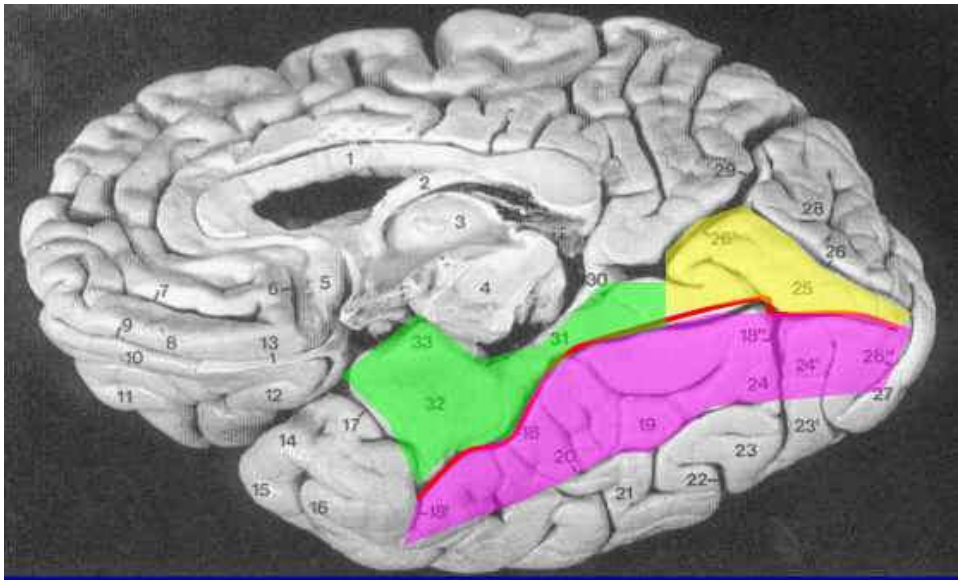
- Many regions involved in processing faces, but one of the most critical, and specific to faces, is the fusiform gyrus.
- Grill-Spector, Knouf and Kanwisher 2004, Nature Neuroscience, 7, 5, 555.



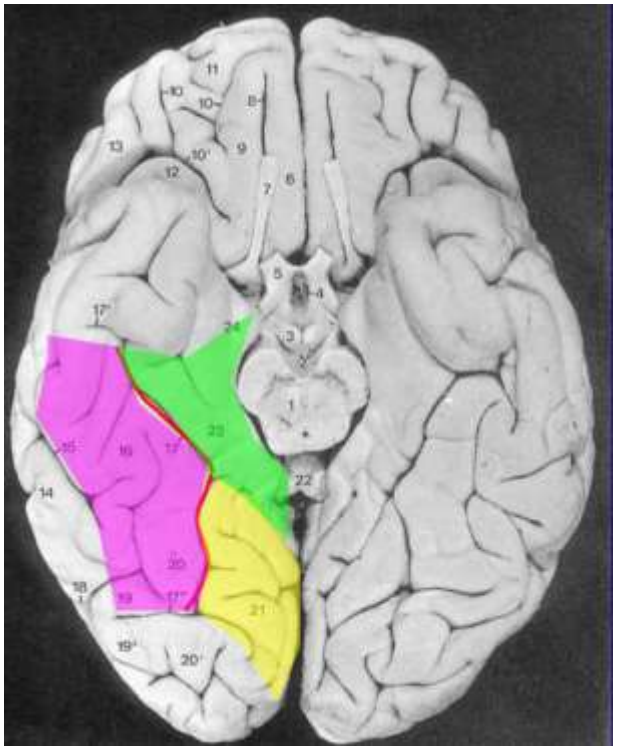
Neuroanatomy of face processing

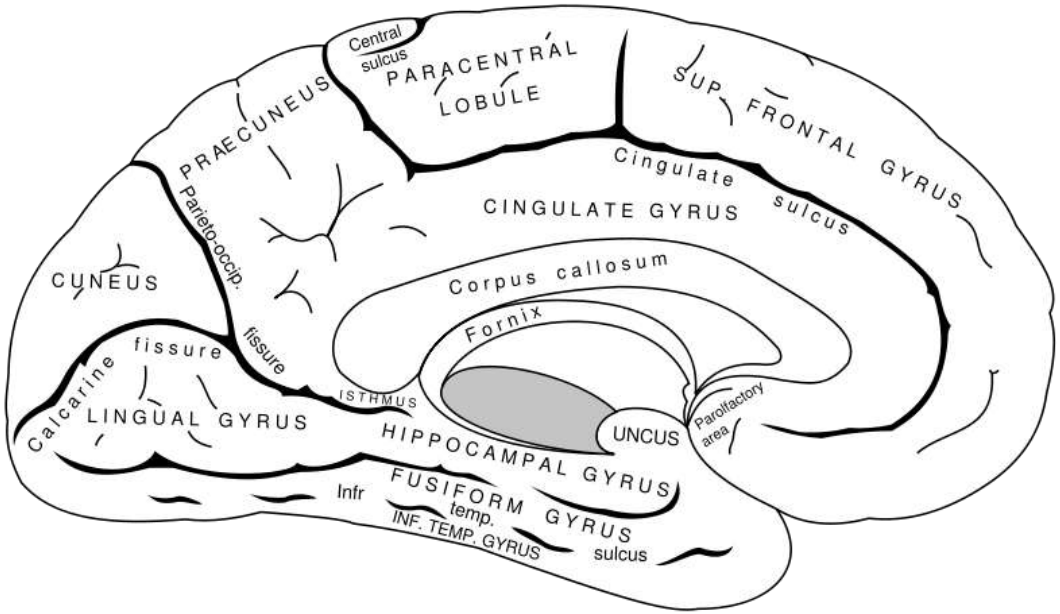
- Haxby, Hoffman and Gobbini (2000; Trends in Cognitive Science, 4,6, 223-233)
- Three important regions
  - Inferior occipital gyri (OFA)
  - Lateral fusiform gyri (FFA)
    - Identity
  - Superior temporal sulcus
    - Representation of changeable aspects of faces- e.g. eye gaze.





Lingual gyrus
Parahippocampal gyrus
Fusiform gyrus





Haxby et al (2000)

Inferior occipital gyri
Early perception of facial features

Superior temporal sulcus
Changeable aspects of faces- perception of eye gaze, expression and lip movement

Intraparietal sulcus
Spatially directed attention

Auditory cortex
Prelexical speech perception

Amygdala, insula, limbic system
Emotion

Lateral fusiform gyrus
Invariant aspects of faces- perceptions of unique identity

Anterior temporal
Personal identity, name and biographical information

Emotional expressions

- Assessment
  - Ekman faces
  (Pearson's FEEST)

  - TASIT (dynamic).

Deficits in facial emotion expression perception.

- The ability to interpret emotional expressions from the faces of other people can be impaired as a result of neurological damage.
- Studies have implicated posterior regions of right hemisphere.
- Some selective deficits associated with amygdala damage (fear perception) and with cortico-striatal-thalamic circuit damage (impaired perception of disgust in Huntington's disease).

How common are facial emotional expression deficits?

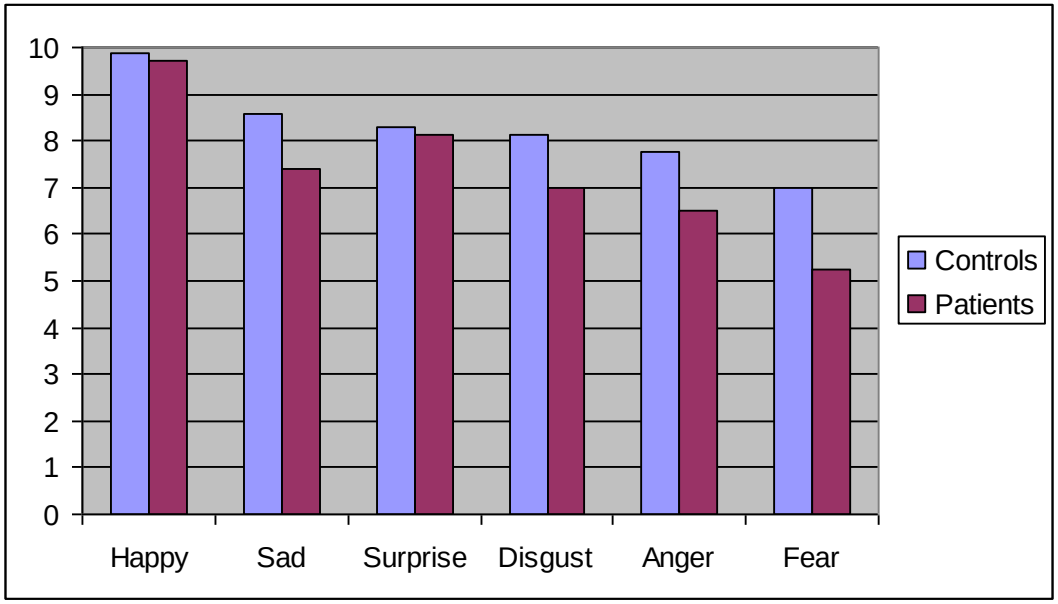
- Oliver Zangwill Centre Study (2003)
- 60 Ekman faces, 10 per emotion (Happy, Fear, Anger, Disgust, Sad and Surprise)
- Assessment of rate of impairment and nature of errors.
- Data from 104 patients, consecutive admissions to service for assessment; mixed aetiology.
- Compared with 90 controls, matched for age and IQ.

How common are facial emotional expression deficits?

- No difference between patients and controls on happiness and surprise

- Sad 18% impaired
- Fear 33% impaired
- Anger 20% impaired
- Disgust 18% impaired

- 53% of patients impaired on at least one emotion.



Evans, Calder , Bateman, INS Bilbao 2005

The aim of this analysis was to investigate the measurement properties of this tool with a view to developing a computer adaptive version.

Data from 194 patients were extracted from patient records, anonymised and entered into RUMM2030.

For the purposes of this analysis responses were coded as correct or incorrect,

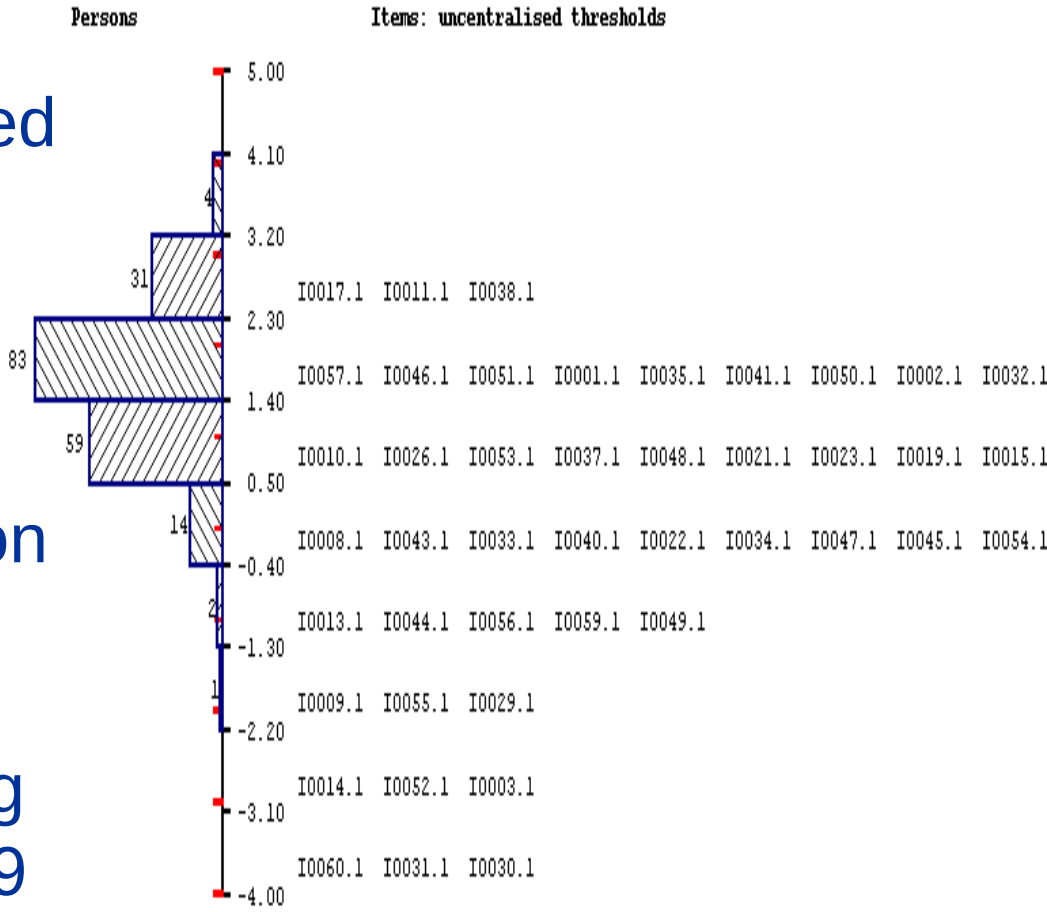
There's no specific a priori theory underpinning any potential distractor analysis. (advice needed about how to handle this issue)

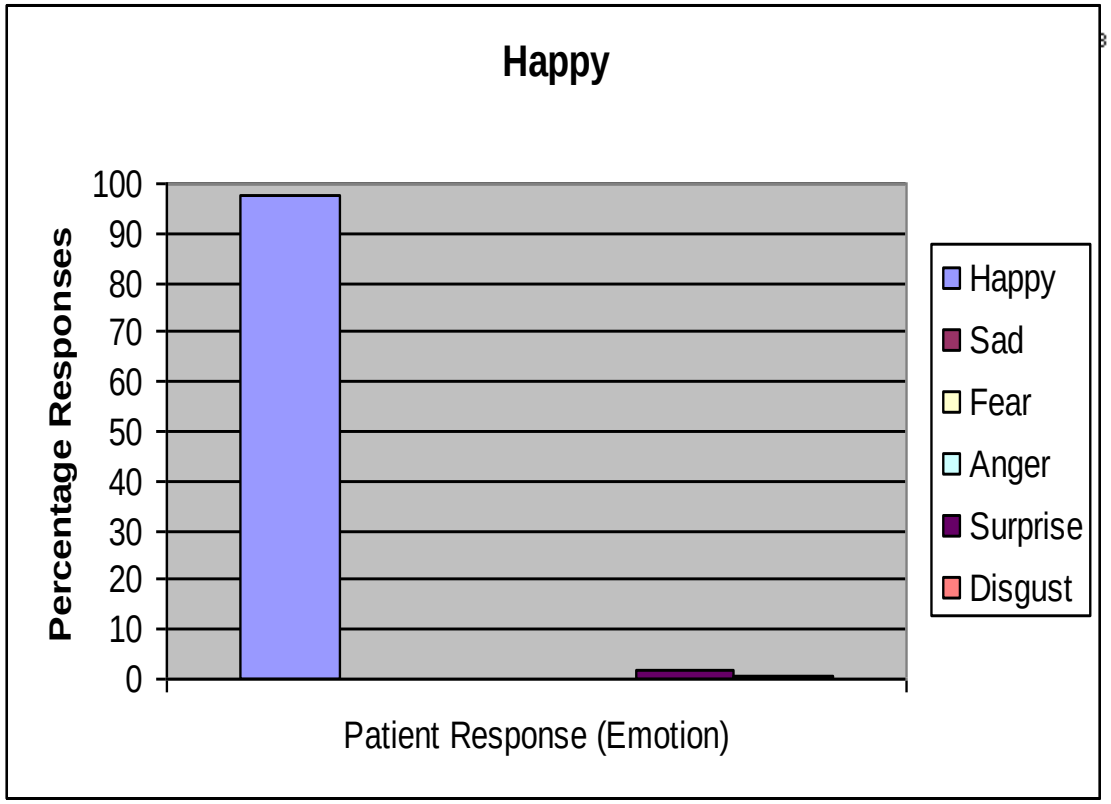
63 (32.5%) patients scored a below the total score published cut-off of 42/60

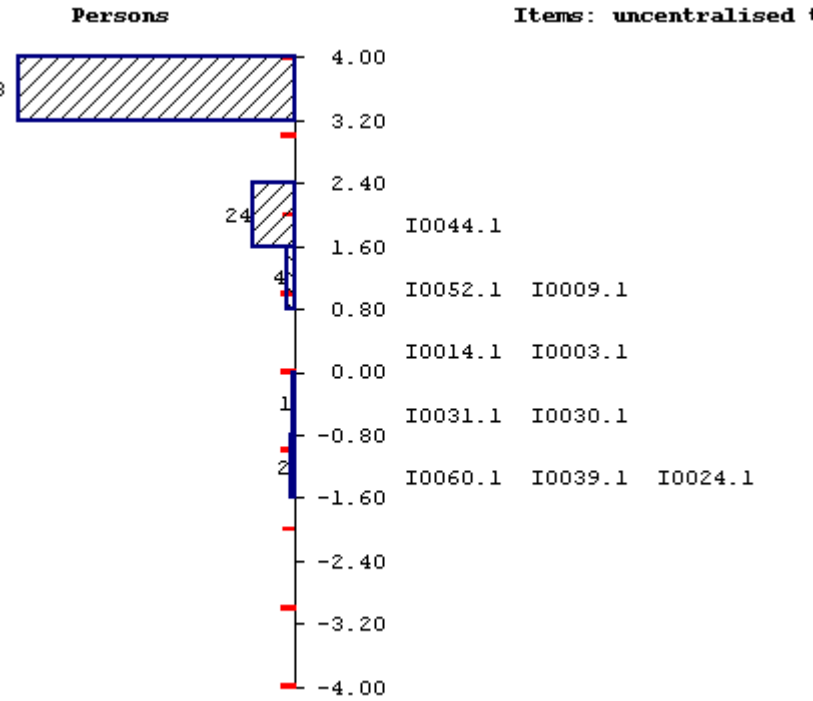
The scale as a whole showed a significant item-trait interaction (Chi-Sq 174.38, p<0.0001,d.f120)

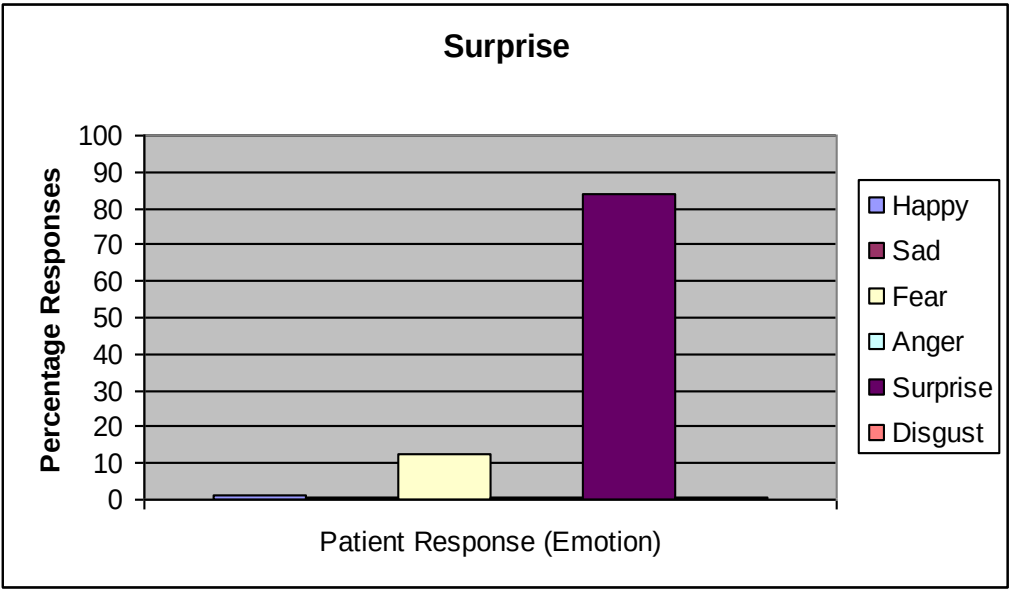
satisfactory reliability (Person Separation Index =0.84),

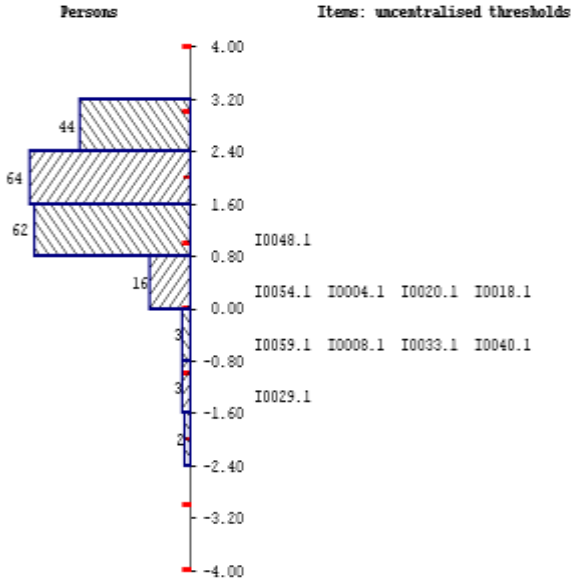
somewhat skewed targeting (mean person location +1.59 +/-0.83).

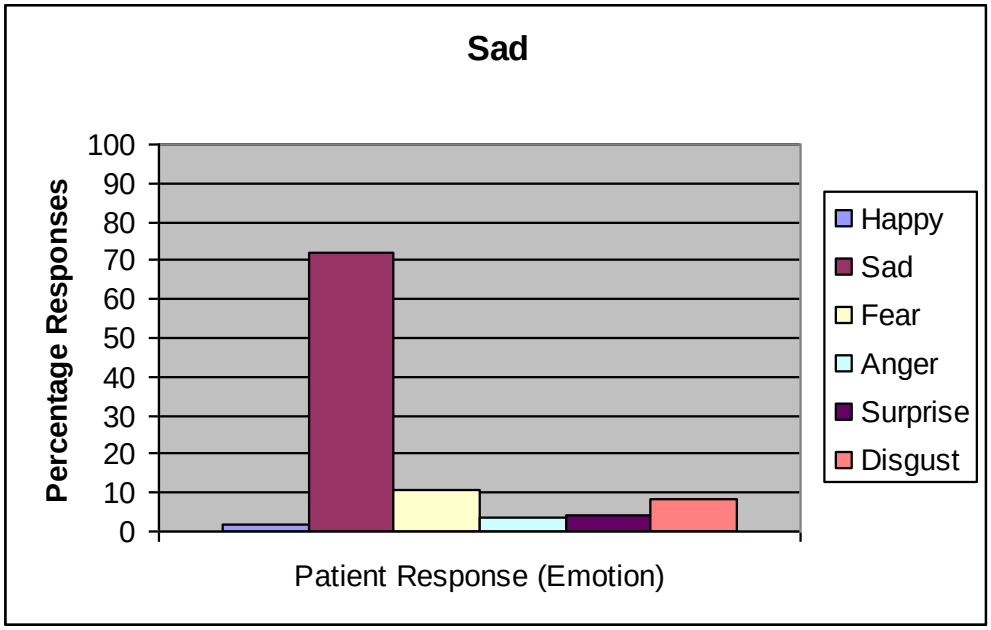


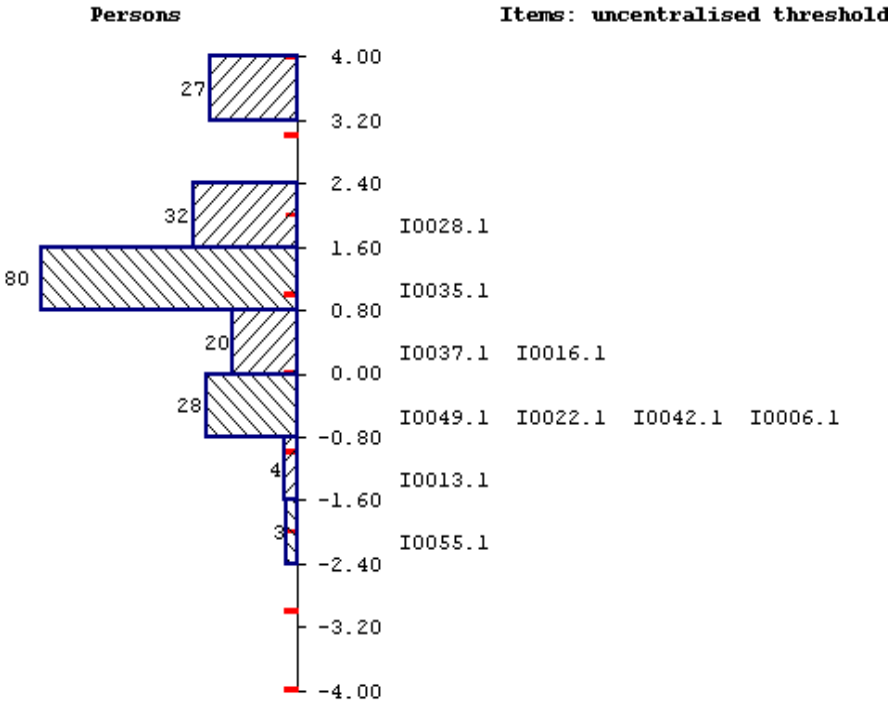

Happy
Percentage Responses
100
90
80
70
60
50
40
30
20
10
0
Patient Response (Emotion)
Happy
Sad
Fear
Anger
Surprise
Disgust

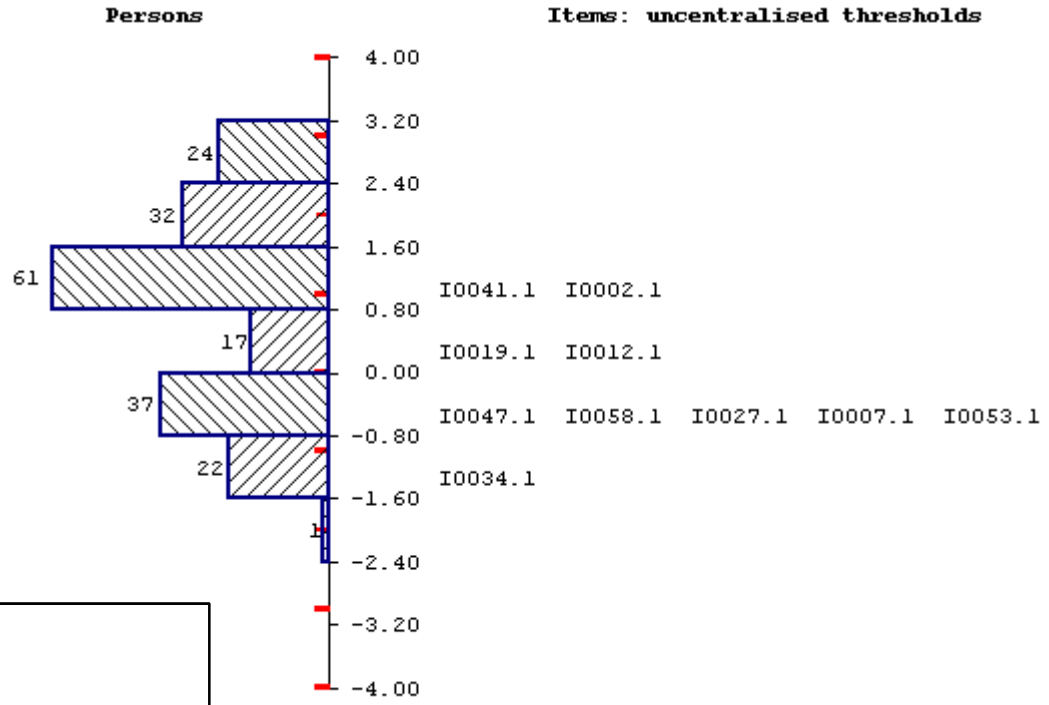

Persons
Items: uncentralised
4.00
3.20
2.40
1.60
0.80
0.00
-0.80
-1.60
-2.40
-3.20
-4.00
24
4
1
2
I0044.1
I0052.1 I0009.1
I0014.1 I0003.1
I0031.1 I0030.1
I0060.1 I0039.1 I0024.1

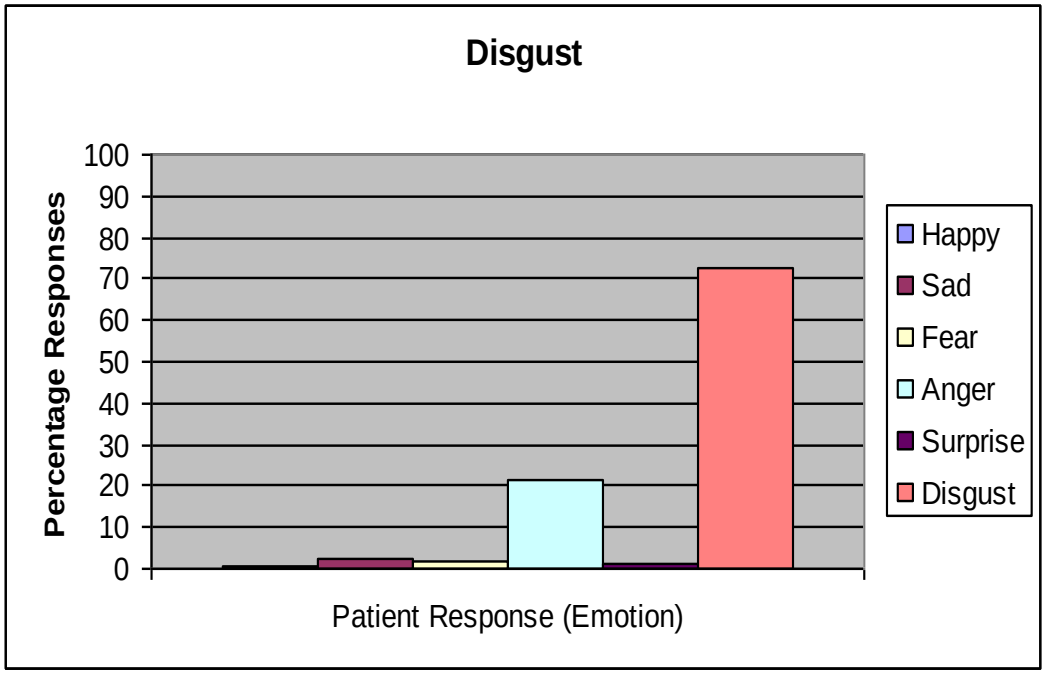

Surprise
Percentage Responses
100
90
80
70
60
50
40
30
20
10
0
Patient Response (Emotion)
Happy
Sad
Fear
Anger
Surprise
Disgust

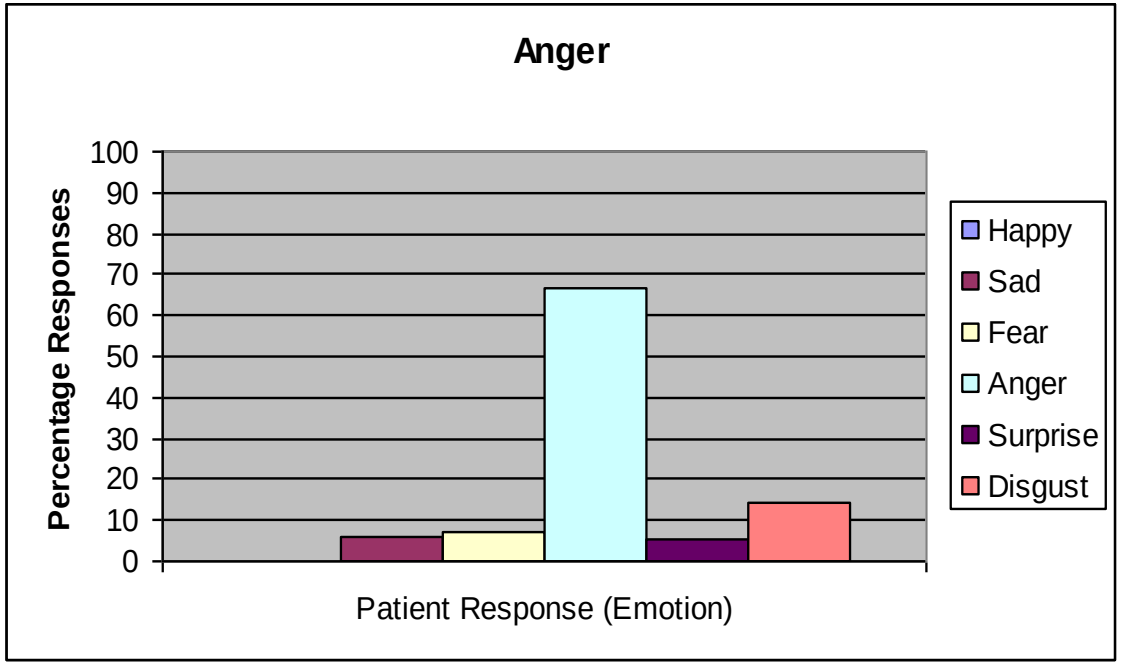

Persons
Items: uncentralised thresholds
4.00
3.20
2.40
1.60
0.80
0.00
-0.80
-1.60
-2.40
-3.20
-4.00
44
64
62
16
3
3
2
I0048.1
I0054.1
I0004.1
I0020.1
I0018.1
I0059.1
I0008.1
I0033.1
I0040.1
I0029.1

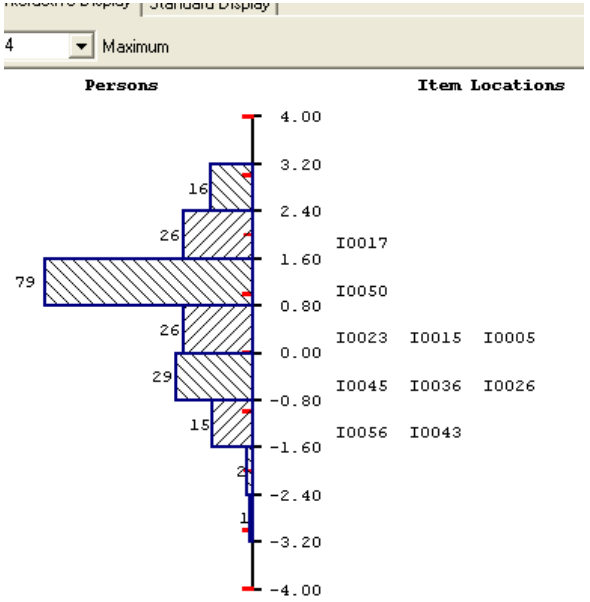

Sad
Percentage Responses
100
90
80
70
60
50
40
30
20
10
0
Patient Response (Emotion)
Happy
Sad
Fear
Anger
Surprise
Disgust


Persons
Items: uncentralised threshold
27
32
80
20
28
4
3
4.00
3.20
2.40
1.60
0.80
0.00
-0.80
-1.60
-2.40
-3.20
-4.00
I0028.1
I0035.1
I0037.1
I0016.1
I0049.1
I0022.1
I0042.1
I0006.1
I0013.1
I0055.1


Persons
Items: uncentralised thresholds
4.00
3.20
2.40
1.60
0.80
0.00
-0.80
-1.60
-2.40
-3.20
-4.00
24
32
61
17
37
22
1
I0041.1
I0002.1
I0019.1
I0012.1
I0047.1
I0058.1
I0027.1
I0007.1
I0053.1
I0034.1


Disgust
Percentage Responses
100
90
80
70
60
50
40
30
20
10
0
Patient Response (Emotion)
Happy
Sad
Fear
Anger
Surprise
Disgust


Anger
Percentage Responses
100
90
80
70
60
50
40
30
20
10
0
Patient Response (Emotion)
Happy
Sad
Fear
Anger
Surprise
Disgust


Maximum
Persons
Item Locations
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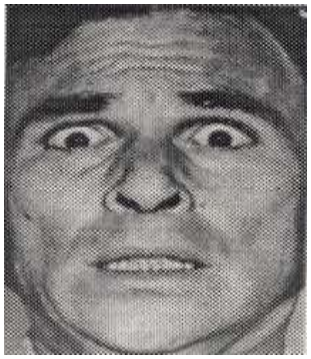
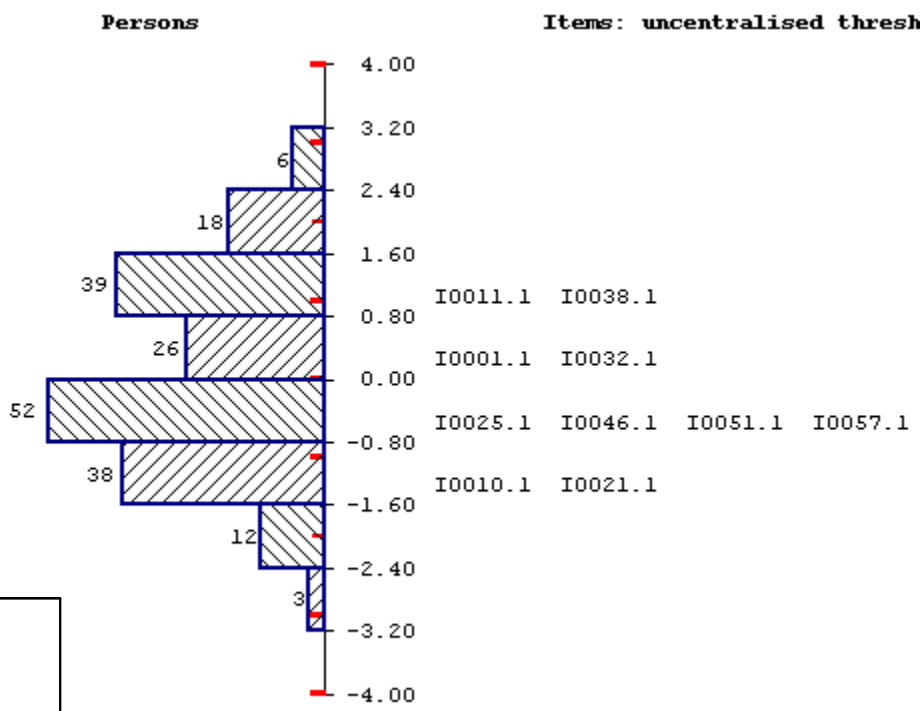
3.20
2.40
1.60
0.80
0.00
-0.80
-1.60
-2.40
-3.20
-4.00
16
26
79
26
29
15
I0017
I0050
I0023
I0015
I0005
I0045
I0036
I0026
I0056
I0043




Persons
Items: uncentralised thresh
4.00
3.20
2.40
1.60
0.80
0.00
-0.80
-1.60
-2.40
-3.20
-4.00
6
18
39
26
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38
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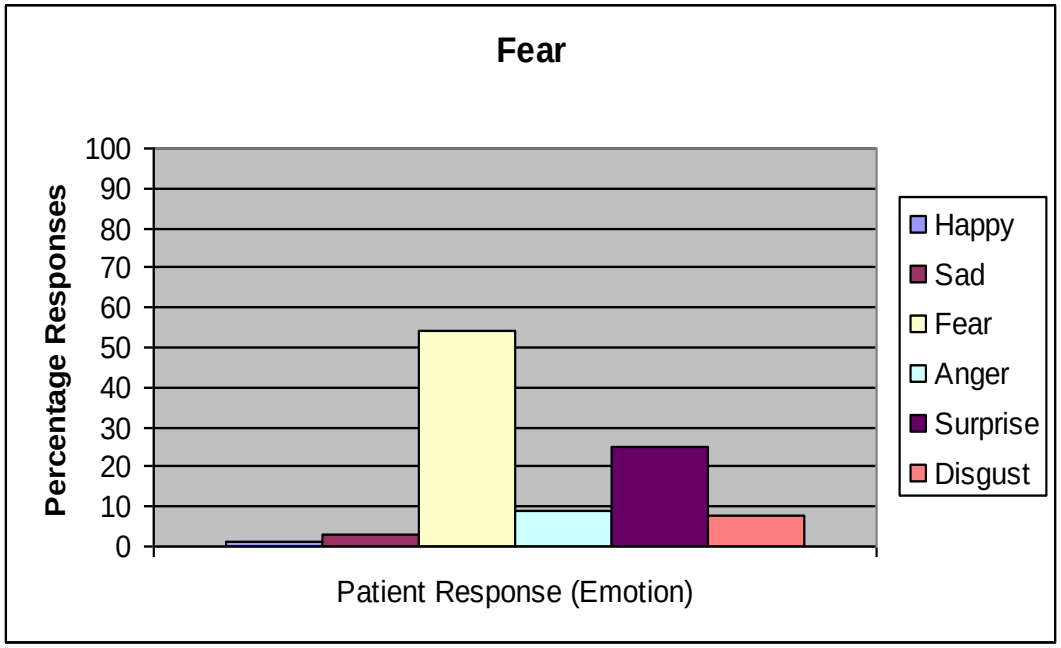
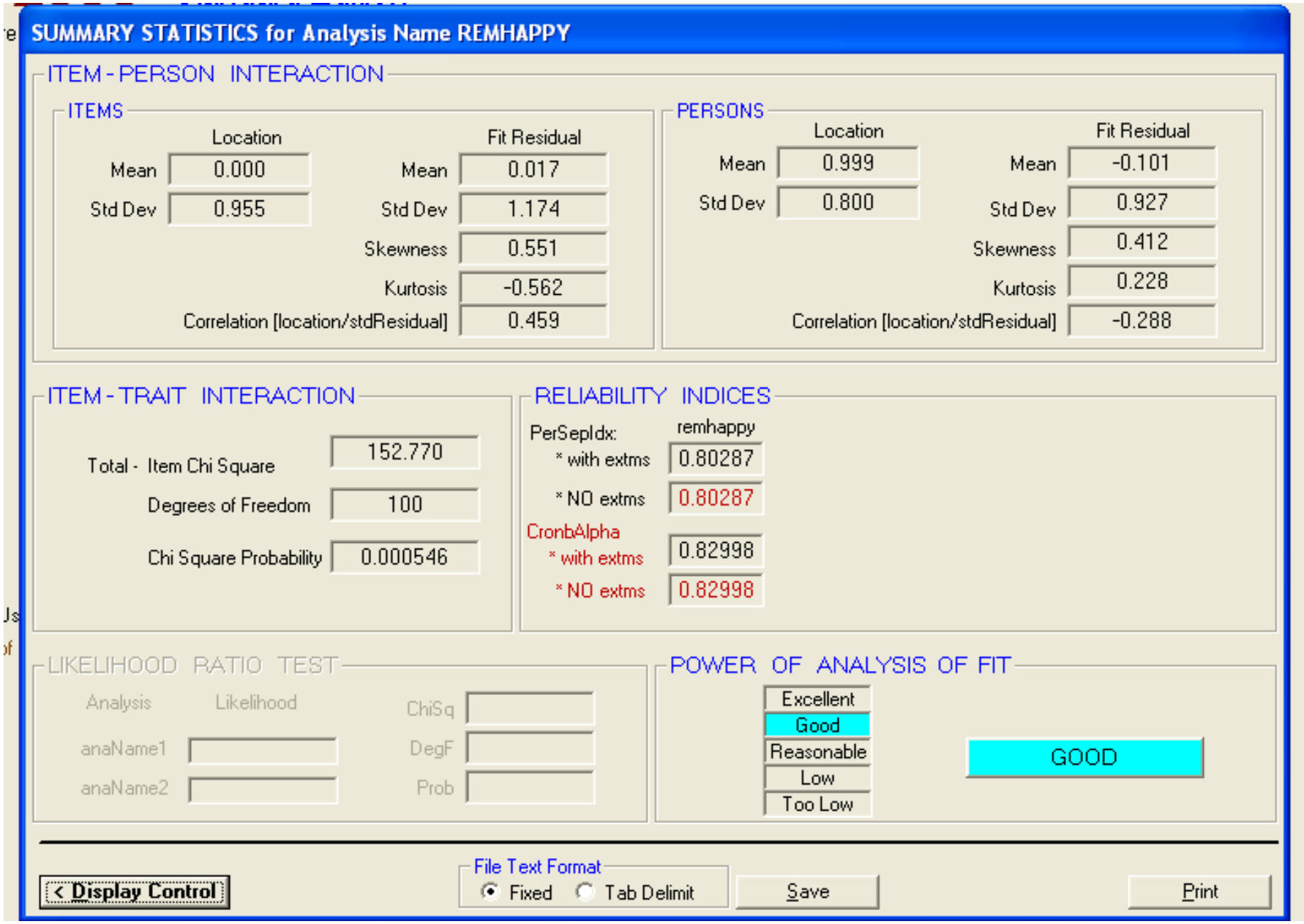
I0010.1 I0021.1


Fear
Percentage Responses
100
90
80
70
60
50
40
30
20
10
0
Patient Response (Emotion)
Happy
Sad
Fear
Anger
Surprise
Disgust

Problems with the subscales

	Chi-Sq (df 20)	P-value	Person locn (SD)	Person Separation Index
Happiness	4.4	“0.000	3.09 (.64)	-3.33 (!)
Surprise	17.35	0.06	1.62 (.96)	“0.001
Anger	32.16	0.04	0.96 (1.22)	0.5
Disgust	25.34	0.19	.95 (1.22)	0.5
Fear	26.37	0.15	0.09(1.25)	0.6
Sadness	48.66	“0.0003	1.35 (1.23)	0.44

Removing Happiness (!) :-(



Rehabilitation of emotional expression impairments

- Some work in ASD
  - Baron Cohen –
    - Autism Research Centre

- Golan and Baron Cohen (2006)
- Development and Psychopathology 18, 591-617
- Training led to improvement on close generalisation tasks, but not distant generalisation tasks

Rehabilitation of emotional expression impairments

- Also work in Schizophrenia
  - Wolwer et al (2005; Schizophrenia research, 80, 295-303).
  - Russell et al (2007; BJCP, 45, 579-583)
    - Using METT
    - Also used Emotion matching task to test for generalisability.
    - Compared 20 Scz and 20 HC. Both improved with training. Scz group improved to pre-training levels of HC.

Rehabilitation of emotional expression impairments

- Acquired brain injury
- Bornhofen & McDonald (2008), Neuropsychological Rehabilitation, 18, 1,22-44.
- 12 TBI patients, RCT design
- Treatment- 25 hours over 8 weeks.
  - Knowledge of emotion in common contexts
  - Judging static emotion cues
  - Judging dynamic emotion cues
  - Making social inferences from emotion cues.
- Treatment group showed evidence of greater improvement on several measures.

Conclusions and advice sought

- Individual subscales not “working”
- Some promise
- Luning has put the items into Concerto with a demo CAT version of the test now working...