



Quanticate

CONFIDENCE COMES FROM QUALITY

Chernoff face graphs as an efficient
way of creating comprehensive Patient
Profiles in SAS®

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Where's my kid?

I tried to find my 2-year-old son around a large restaurant. He is smaller than a table and table cloths went down to the floor.

How to find a hint quickly?

•Who may be looking at him?

Emotions on their faces:

- Disgust
- Panic
- Hatred

•Where is he then?

Is the information available from a face?

- Direction
- Distance

•Is this an efficient and useful method?

•Can I share it?



Let's face the data

- The idea: have clinical multivariate data represented by faces, with variables attributed to...
 - lengths
 - shapes
 - colors
 - ...of elements of a face.
- A result is a face representation of patient profile. Patient multivariate 'looks' can then be searched for repeating/ outstanding patterns.

Let's face the data with SAS

There's a macro available from Michael Friendly,
<http://www.datavis.ca/sasmac/faces.html>:

```
%macro FACES(  
  data=_last_, /* Name of input data set */  
  out=asym, /* Name of output anno set */  
  id=, /* Character ID variable */  
  idnum=, /* Numeric ID variable */  
  blks=1, /* Blocks per page */  
  rows=4, /* Rows per block */  
  cols=4, /* Columns per block */  
  res=3, /* resolution: 1=high/3=low */  
  frame=Y, /* frame around each face? */  
  color='BLACK', /* color of each face: variable */  
  hcolor='BLACK', /* name or string in quotes */  
  row=, /* use to assign particular */  
  col=, /* locations to faces */  
  blk=, /* block variable */  
  (...)  
);
```

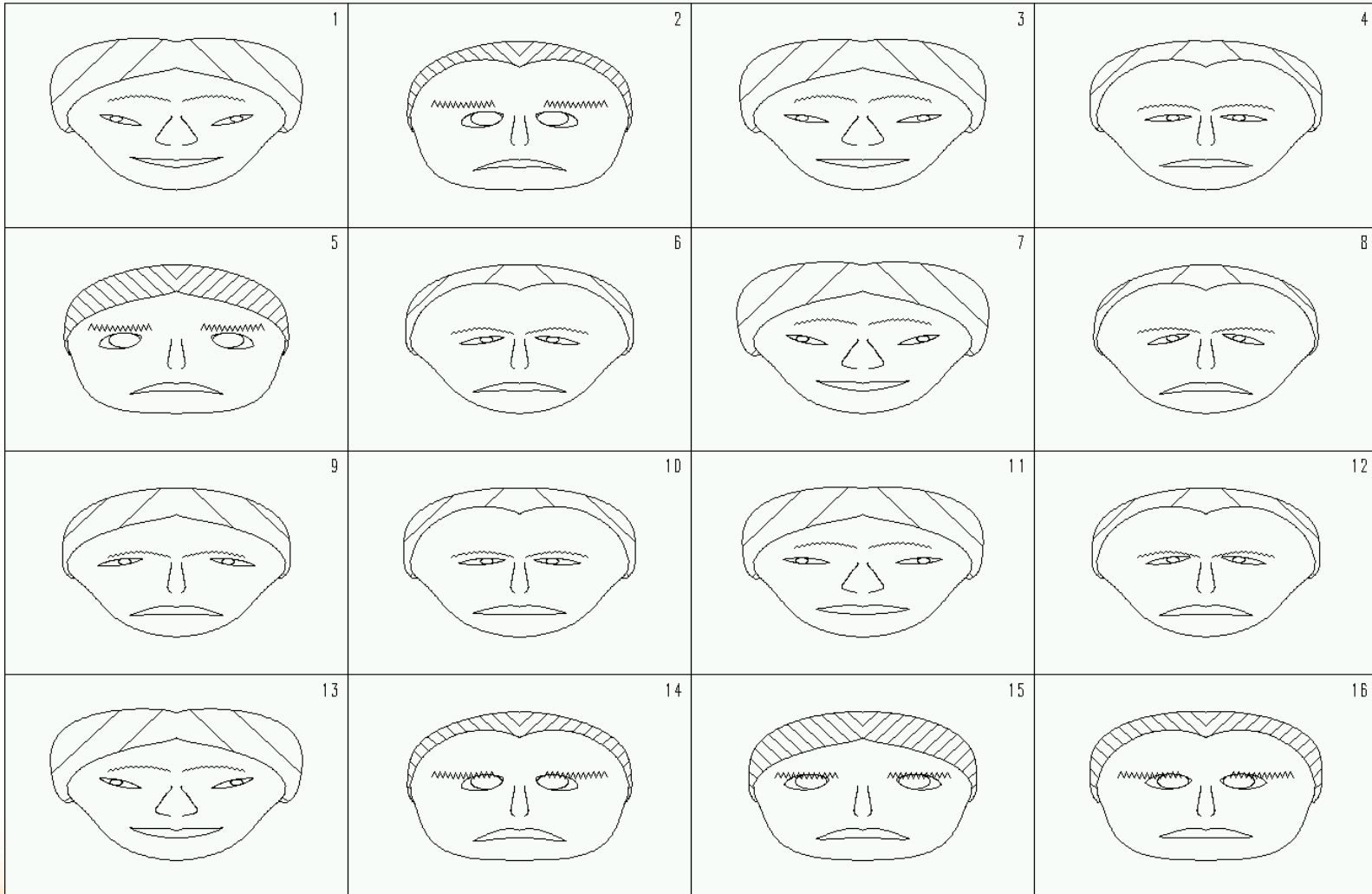
“Variables can be assigned to features either by listing 18 variable names for LEFT and RIGHT or by assigning individually to L and R parameters. Variable names can appear more than once. Use . in LEFT= or RIGHT= to skip a parameter (leave unassigned).”

Example: can it work?

- Let's have sixteen fake patients. Assign them some clinical results you may expect of healthy, ordinary people.
- Change the results for some of them to reflect changes possible with different health state.
- Draw faces, assigning variables representing clinical results to face features.
- Check if you can see the 'modified patients' in the face graph.

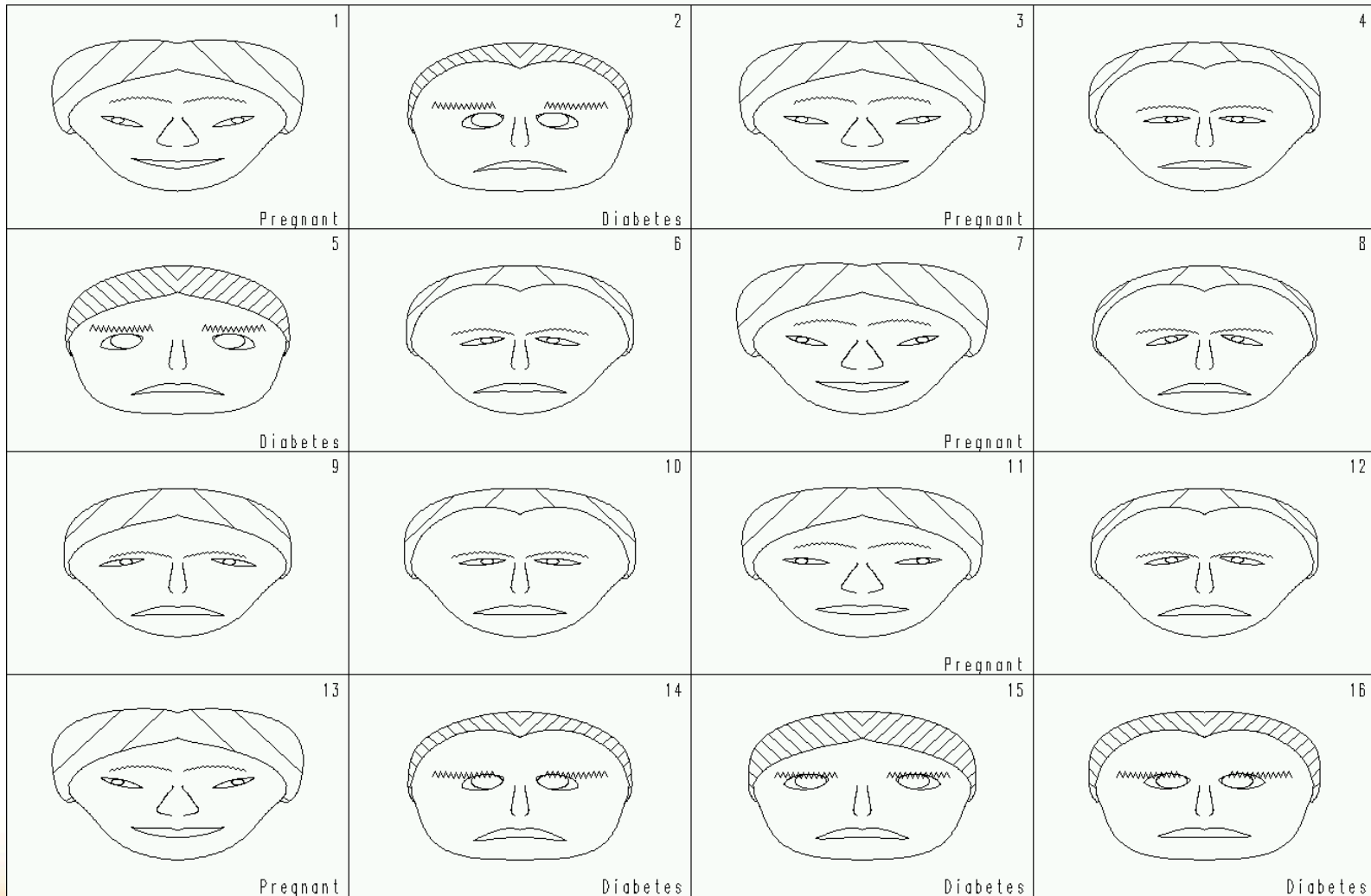
Example: can it work?

Can you see any groups below?



Example: can it work?

Have you guessed?



Does it work for you?

Have you seen the three groups in the first graph as labeled in the second one?

If so, maybe the tool is useful.

If not, possible problems are:

- The picture quality.
- You sit too far away from the screen.
- Scaling and selection of variables to face parameters.
- The example.
- The method itself.

Controversies

- No standard of interpretation/assigning variables to parameters.
- Personal differences in recognition of features.
- Face perception by human brain highly non-linear and not fully explored.



Acknowledgments & References



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References

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- Kosara, R., "A Critique of Chernoff Faces", <http://eagereyes.org/VisCrit/ChernoffFaces.html>

THANK YOU!



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