Consequences of lesioning the face-cell area:
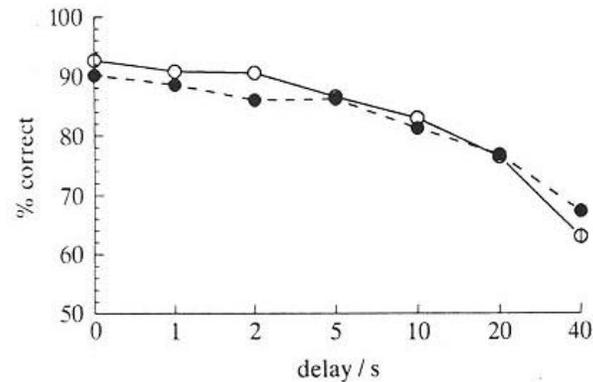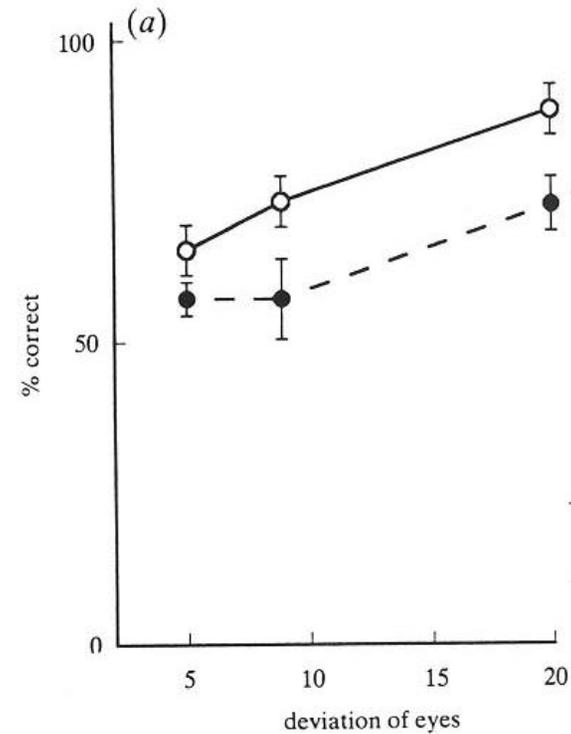
Heywood and Cowey, 1992

Figure 2. Mean percentage correct for unoperated (open circles) and STS (closed circles) group for delayed non-matching to sample where each point is the group mean of scores on novel and familiar faces and objects. Groups did not differ significantly in their performance on each of the tasks.

Inferences: No specific face recognition impairments
Mild impairments in gaze estimation.

"The search for an area of the brain entirely devoted to facial perception and memory and for recognition deficits specific to faces may be no more successful than the hunt for the Holy Grail"

Prosopagnosia: A face-specific disorder

McNeil and Warrington, 1993

Does true face-specific agnosia exist?
Yes.

Do prosopagnosics perform poorly on all within-category tasks?
No

Case study: WJ - a 51 years old male with temporal lobe damage due to 3 strokes. Now a sheep farmer.

Shape discrimination performance:
Buildings: 9/10
Dog breeds: 7/7
Makes of car: 7/7
Flowers: 14/15

Face identification performance:
Famous faces: 2/12

Face-specific disorders - WJ (contd.)

Perhaps the non-face categories are not difficult/confusable enough.

Susan   Brad   Angelina   Thor

Face-specific disorders - WJ (contd.)

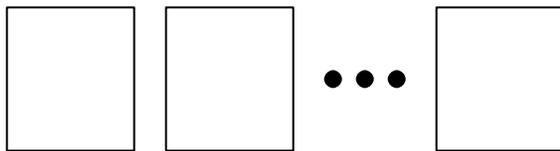Perhaps the non-face categories are not difficult/confusable enough.

Sheep discrimination performance:
Sheep # identification: 8/16

   (for others, could not recall number, but had associated information…
   "I know that sheep very well. She's the one that had three lambs
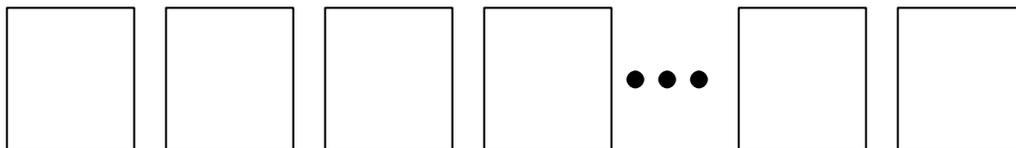   last year, but I can't remember her number")

Recognition memory for sheep and human faces:
Training:

□ □ ● ● ● □   8 sheep/human faces labeled 'pleasant' or 'unpleasant'

Test:

□ □ □ □ ● ● ● □ □   Training instances mixed with unfamiliar pictures

Face-specific disorders - WJ (contd.)

TABLE 2
Recognition Memory for Faces of Sheep and People

| | Mean Percentage Correct (Range) | | |
| | | Controls | |
	WJ	Profession Matched	Sheep Experienced
Familiar sheep	87	66 (44–81)	59 (44–75)
Unfamiliar sheep	81	69 (56–81)	63 (44–81)
Faces	50	89 (75–100)	100

Face-specific disorders - WJ (contd.)

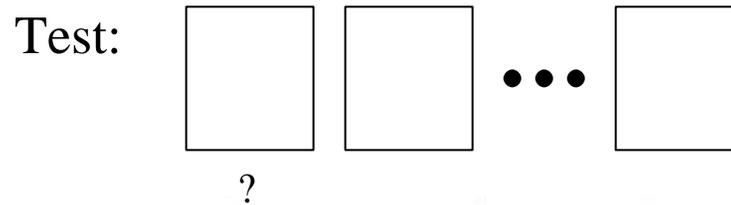Paired associate learning:

Training   6 sheep/human faces with names

Frisky   Friendly

Test: ●●●   ●●●

?

TABLE 3
Paired Associate Learning for Sheep and People

	Mean Percentage Correct		
		Controls	
	WJ	Profession Matched	Sheep Experienced
Faces	23	71	78
Sheep	57	41	55

Face-specific disorders - WJ (contd.)

Summary and inferences:

- WJ good at sheep face recognition task even with novel sheep

- WJ developed sheep recognition abilities after his strokes
  (why not face recognition abilities too?)

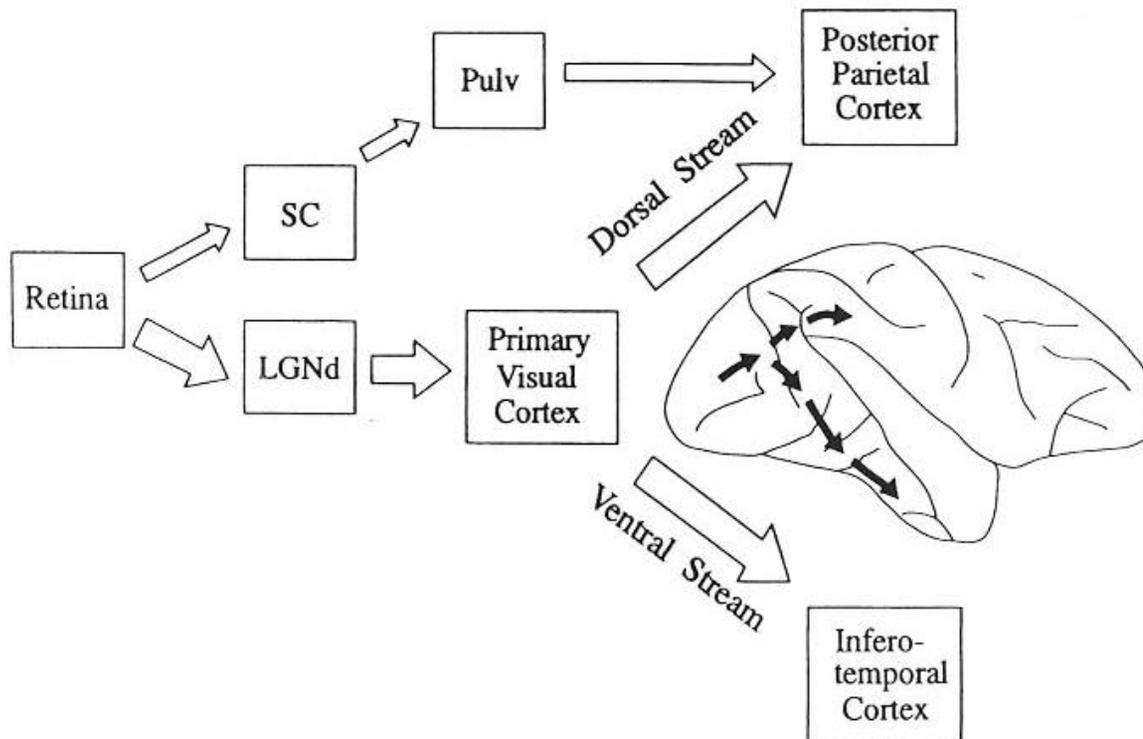- Prosopagnosia can be a very specific face perception disorder

Do IT lesions impair all tasks that require shape perception?

They must.
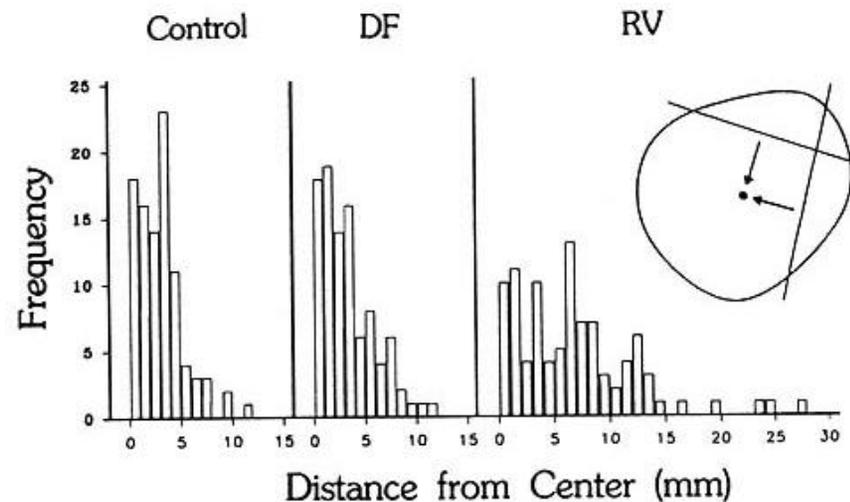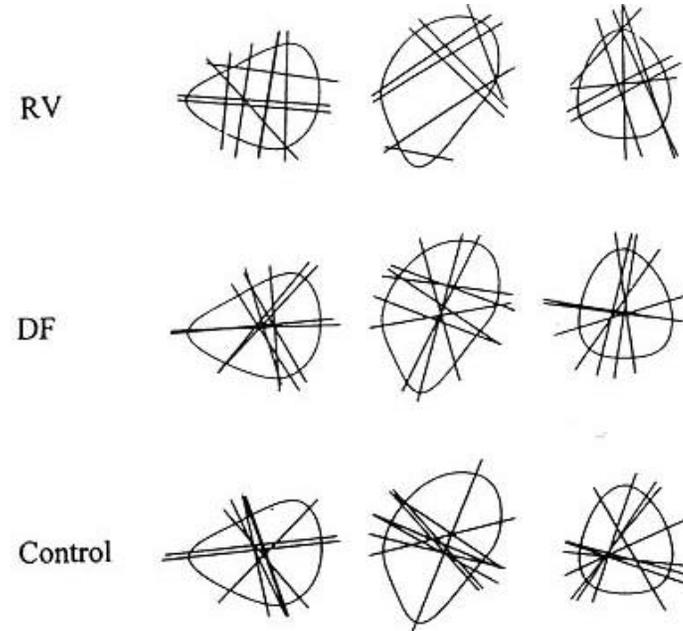> - Mishkin and Ungerlieder

They don't.
> - Goodale

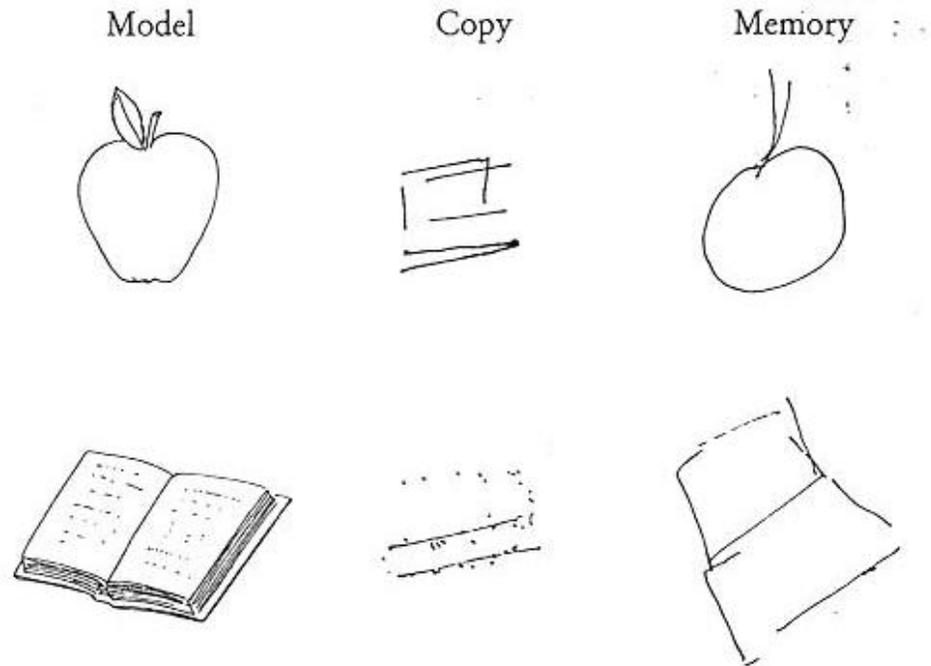# Perception without action:

Parietal lesions lead to:

- problems in visually guided grasping

- problems in aiming movements to targets

- no problems in describing relative positions of objects in space

- no deficits in object perception

Action without perception:

Case study of DF:

- Woman in early 40s

- Damage to ventral areas due to CO poisoning

- problems in face and object discrimination

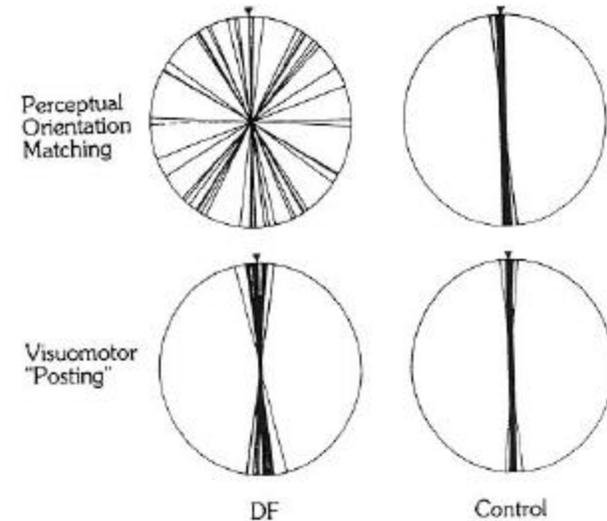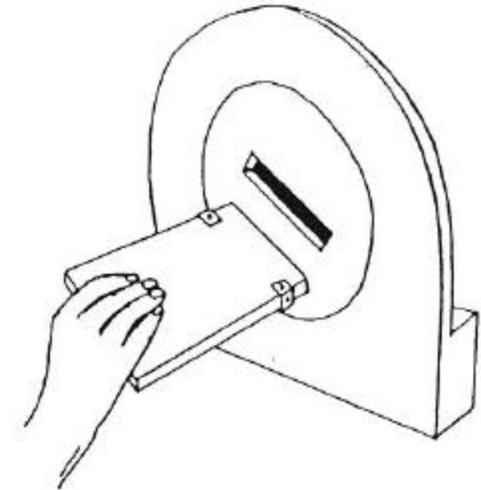- No problems in identification via sound and touch

Action without perception: (DF contd.)

Can use information about size, shape and object orientation to execute visually guided movements (shaking hands, using door knobs)

Can accurately and differentially grasp objects that she cannot discriminate
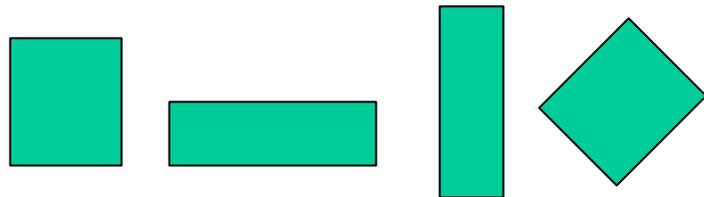
Has good choice of grasp points

Inference: Perhaps the two streams are not strictly 'what' and 'where' streams, but are specialized for visuomotor and visuocognitive functions.

Monkey studies:

- Monkeys with temporal lobe damage show recognition deficits but are able to pick up small objects, catch flying insects and orient their fingers to extract morsels of food from small slots.

- Cells in the parietal region that fire when a monkey manipulates an object are also sensitive to the visual characteristics of objects important for grasping (e.g. size and orientation)

# Perception and action dissociations in normal observers:

Is there a dissociation between the visual information used to control a skilled motor act directed at an object and the perceptual judgments made about the object?

Why would this make sense?
Action system needs to know exact size and distance and should not be fooled by perceptual illusions.

a.

b.
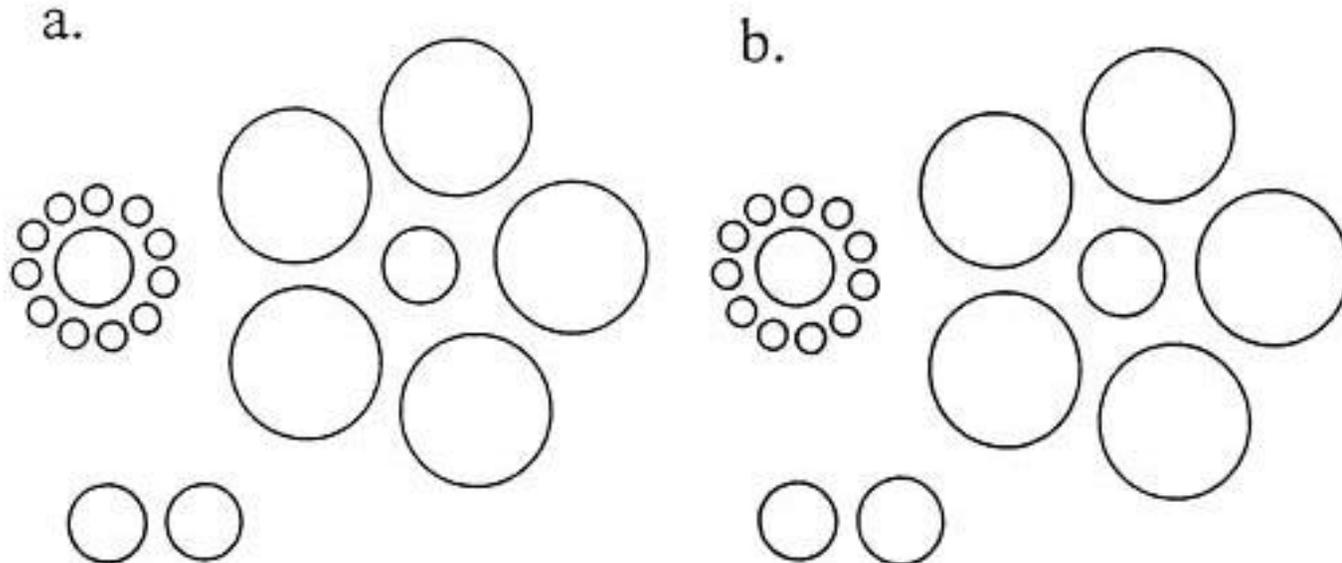
Perception and action dissociations in normal observers:
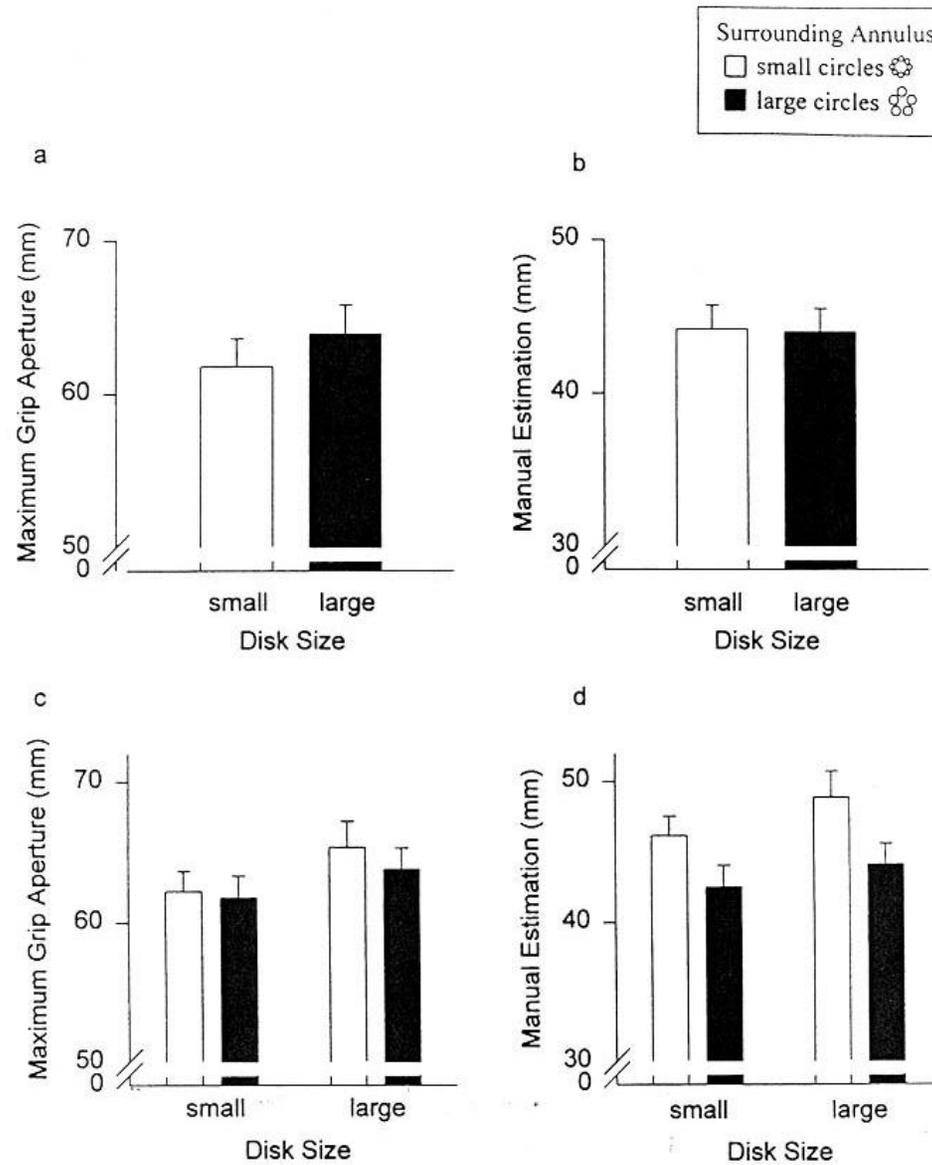
What have we learned?

- The nature of object encoding in the temporal cortex is such that lesions in that region typically do not lead to very object specific deficits (although faces may be an exception).

- The two visual streams in the primate brain may not be specialized for 'what' and 'where' analyses as much as for guiding visuomotor and visuocognitive processes. Object recognition processes may not be localized only in the temporal lobe.