

**Cognitive Modes Detectable with Task-based fMRI:**  
**Anatomical Comparisons between Modes**

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## Table of Contents

<b>Re-Evaluation (RE-EV).....</b>	<b>5</b>
Bilateral Eyeball Sitters.....	5
Bilateral space Invaders Shooters.....	7
Above the Line .....	9
Sad Face Antennae & Flushed Cheeks.....	11
X Marks the Spot .....	13
<b>Language (LAN) .....</b>	<b>16</b>
Rail Shot Coronal .....	16
Tears Blown Leftwards & Eyebrows.....	18
Rail Shot Axial.....	20
Disappearing Face.....	22
<b>Maintaining Internal Attention (MAIN) .....</b>	<b>24</b>
Left-Lateralized Upper Triangle .....	24
Left-Lateralized Lower Triangle .....	26
Right-Handed Crab Claw.....	28
Found a Peanut .....	30
<b>Multiple Demand (MD).....</b>	<b>32</b>
Jumping Jack Flash .....	32
Ape Nostrils.....	34
Flexing Hands .....	36
Wipe Your Mouth Bear Triple Jam .....	38
<b>Initiation (INIT) .....</b>	<b>41</b>
Raised Eyebrows.....	41
When I'm 64.....	43
De Divina Proportione Front Guy .....	46

<b>Response (One-Handed 1RESP &amp; Two-Handed 2RESP) .....</b>	<b>48</b>
Bat.....	48
Thalamus Kite Surfer .....	51
Butterfly.....	53
Compact Crab Claw.....	57
<b>Default Mode Networks (DMNB vs DMNA) .....</b>	<b>59</b>
Snowman Nose vs. Mouth .....	59
Medial Temporal Dots- Prominent vs. Muted.....	60
T-Bird vs. Stickman.....	61
Tripod vs. Baby Dragon.....	62
Mandibles vs. Laughing Clown .....	63
Angel Wings-Muted vs. Prominent .....	64
<b>Auditory Perception (AUD) .....</b>	<b>65</b>
Thing 1.....	65
Thing 2.....	67
<b>Auditory Attention for Response (AAR) .....</b>	<b>69</b>
Happy 28 <sup>th</sup> Birthday Long Face/Right Angle.....	69
On Fire.....	71
Small Smile.....	73
<b>Focus on Visual Features (FoVF) .....</b>	<b>75</b>
Stay Puft .....	75
Wishbone.....	77

## **Cognitive Modes**

1. Re-Evaluation (RE-EV)
  - a) Lavigne Schiz Bull 2019 3 - Exemplar
  - b) Lavigne NeuroImage 2015 1
  - c) Percival MS\_SA 3
  - d) Qiyang ATTN 3
  - e) Sanford Diss TSI Task alone 3 (may be internal attention)
2. Language (LAN)
  - a) Wong et al. in press 3
  - b) Lavigne & Woodward 2017 2
  - c) Chantal MS-TGT-SA 1
  - d) Sara MS 2
3. Maintaining Internal Attention (MAIN)
  - a) Sanford TGT\_WM 3
  - b) Addis 3
4. Multiple Demand (MD)
  - a) Lavigne OTT 1
  - b) Lavigne Animal BADE 5
  - c) Lariviere\_MS 1
  - d) Addis 2
5. Initiation (INIT)
  - a) Cortex TGT\_WM 2
  - b) Manoach 1
  - c) Metzak 2
6. Right handed/Two handed response (!RESP; 2RESP)
  - a) ABADE 4
  - b) Sanford WM\_TGT 1
7. Two handed response (merged with right handed response)
  - a) Goghari 1
  - b) Sanf diss TSI 2
8. Default Mode B (DMB)
  - a) Addis 4
  - b) Goghari 2
  - c) Lavigne HBM 2
  - d) Lavigne Schiz Bull 2
  - e) LD 1

- f) Metzak mmcc 2
- g) MS 3
- h) TSI\_TGT 3
- i) Whitman 2
- j) WM\_TGT 4

9. Default Mode A (DMNA)

- a) MMCC 2
- b) MS 2

10. Auditory Perception (AUD)

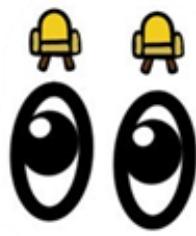
- a) MS\_TGT\_SA 5
- b) WM\_TGT 7

11. Auditory Attention for Response (AAR)

- a) Lavigne 2017 HBM 1
- b) HCP Social 2
- c) Sanford Diss Chap 5 C3
- d) Vina merged C2

12. Focus on Visual Features (FoVF)

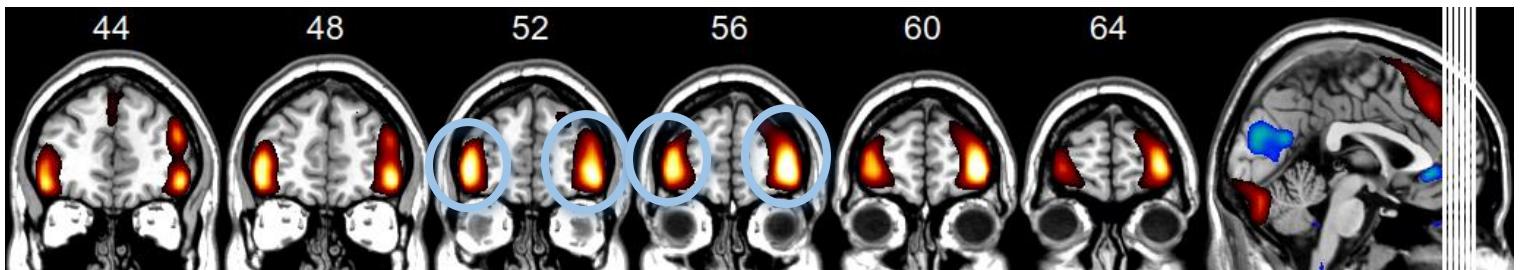
- a) Brotchie TO alcohol unrotated C2
- b) Manoach WM hrfmax C4
- c) Sanford Cortex varimax C6



**Re-Evaluation (REEV)**  
Previous Name: Cognitive Evaluation (CE)

1. **Bilateral Eyeball Sitters: 170, 174, 178, 182, 186, 190**

Bilateral activity centered above eyeballs.

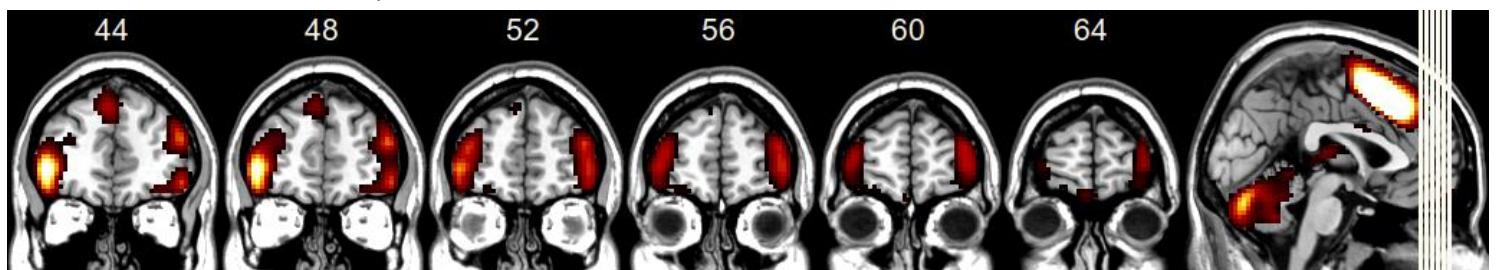


Other Networks:

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*Language*

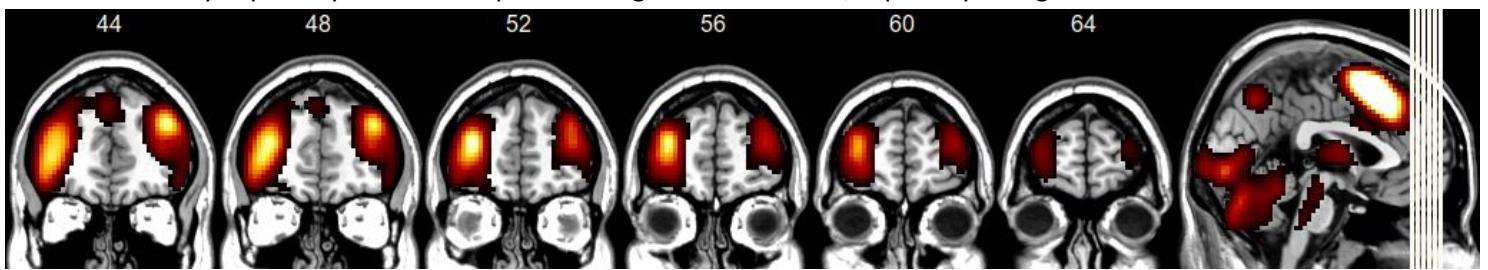
Left-dominant activity.




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*Maintaining Internal Attention*

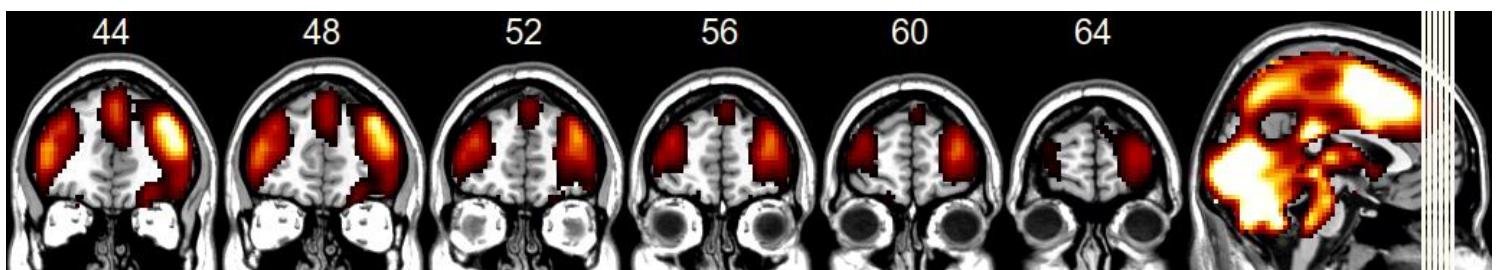
Activity superiorly located compared to cognitive evaluation, especially on right side.




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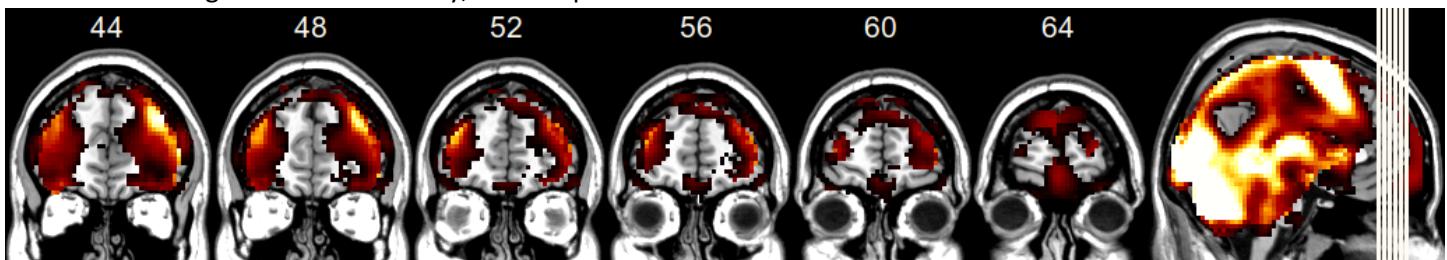
*Multiple Demand*

Right-dominant activity, more superior.

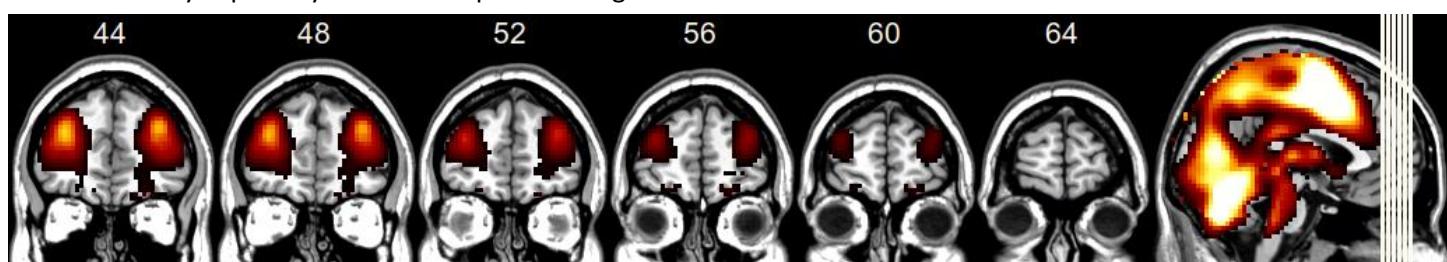
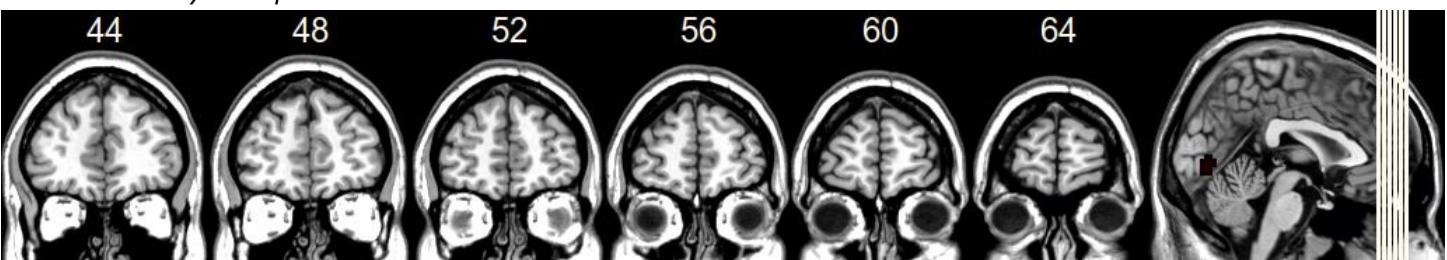


*Initiation*

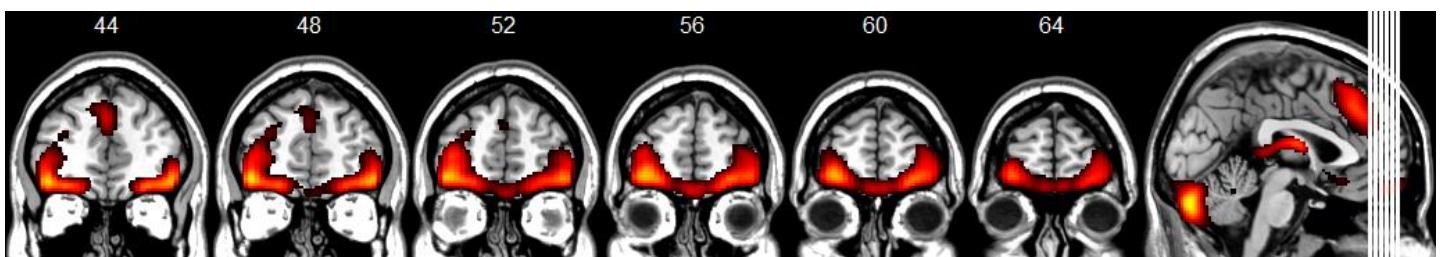
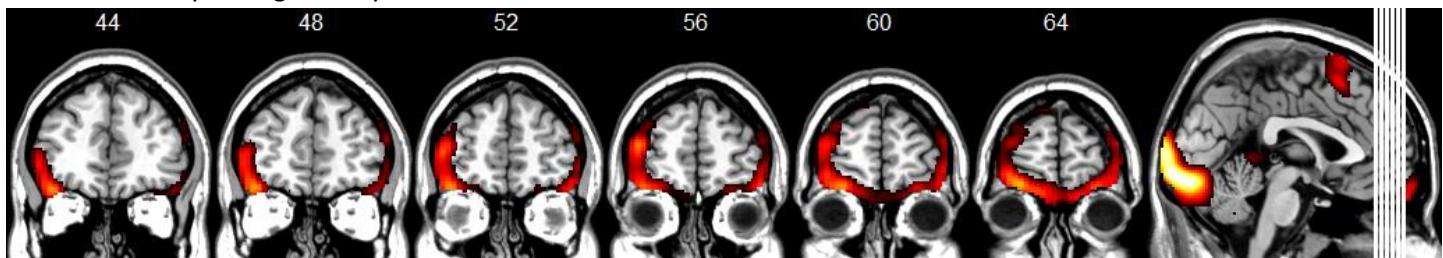
Muted right-dominant activity, more superior.

*Response*

Activity superiorly located compared to cognitive evaluation.

*Auditory Perception**Eye Movement*

Activity sits right on eyeball.



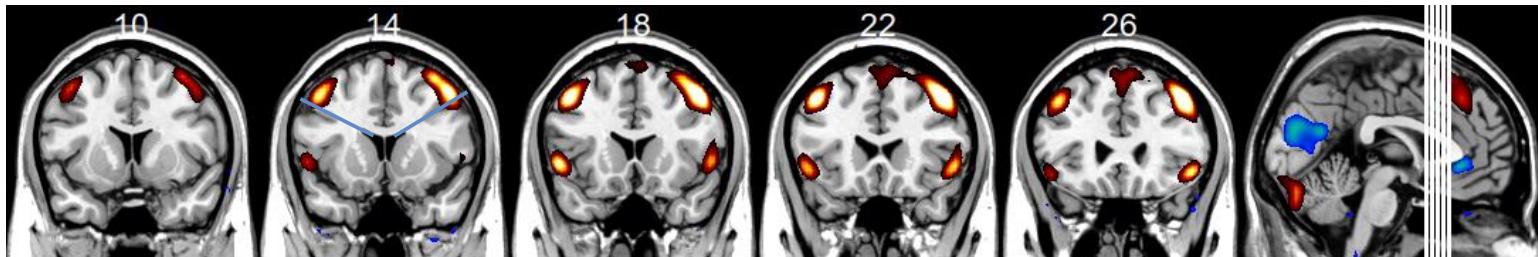


## Re-Evaluation (REEV)

Previous Name: Cognitive Evaluation (CE)

### 2. Bilateral Space Invader Shooters: 136, 140, 144, 148, 152

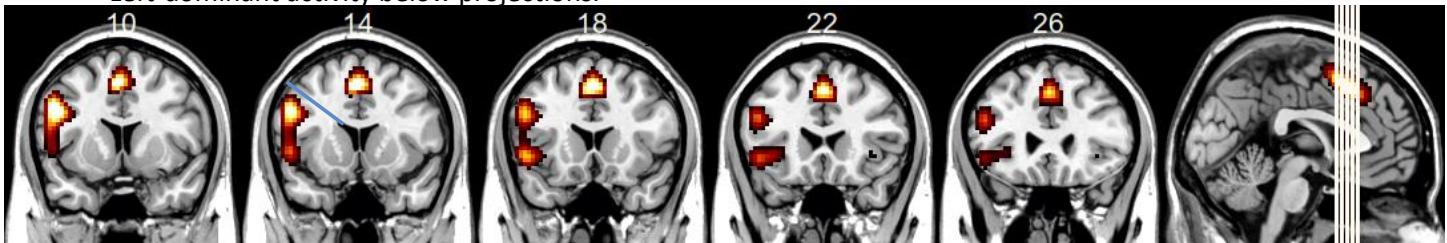
Activation is located in the bilateral frontal gyri superior to a line extending outward at an angle aligning with the angle of direction of the anterior lateral ventricles, as if the lines track a shot out of the ventricles, such as would be seen in a video game that may be called something like *Space Invaders*



#### Other Networks:

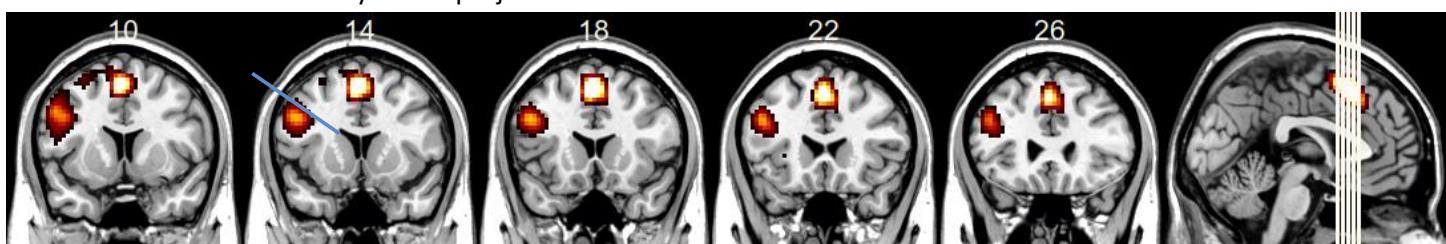
##### *Language*

Left-dominant activity below projections.



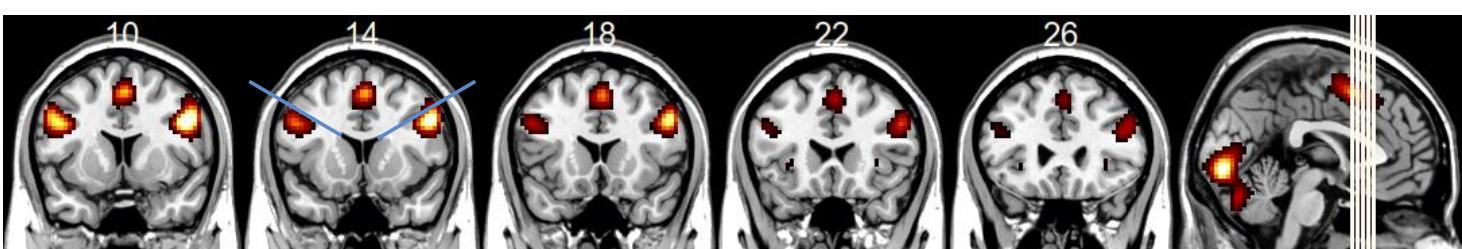
##### *Maintaining Internal Attention*

Left-dominant activity below projections.



##### *Multiple Demand*

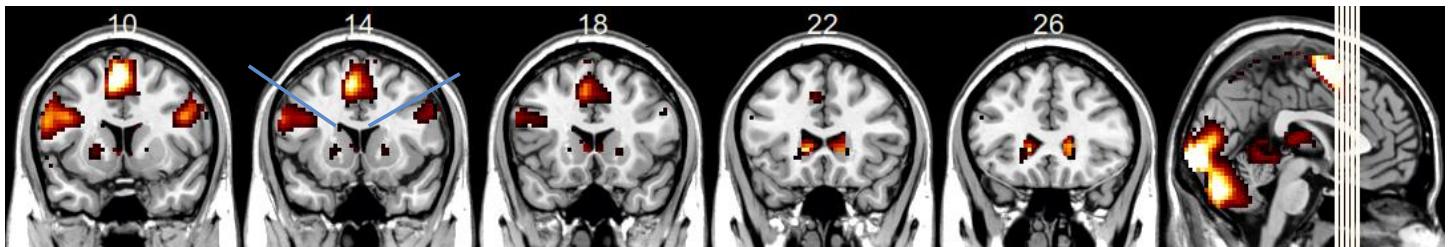
Bilateral, right-dominant activity below projections.



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*Initiation*

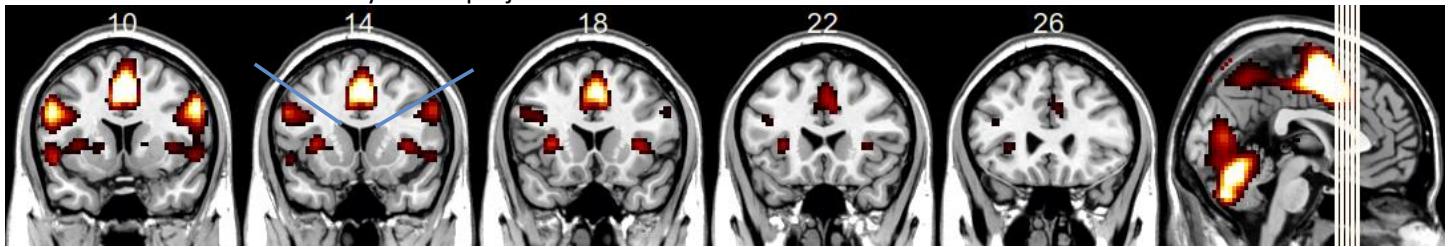
Muted bilateral activity below projections.



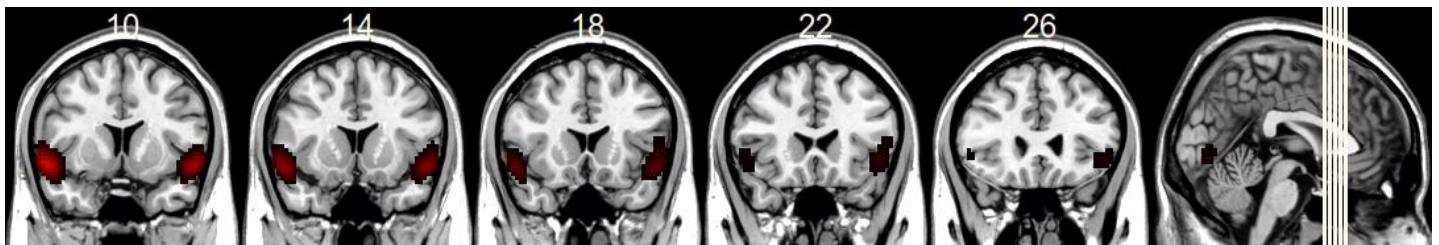
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*Response*

Muted bilateral activity below projections.



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*Auditory Perception*

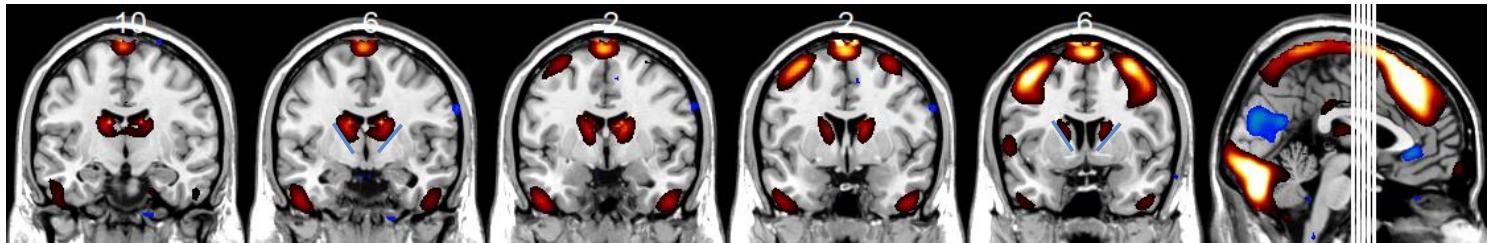


## Re-Evaluation (RE-EV)

Previous Name: Cognitive Evaluation (CE)

### 3. Above the Line: 116, 120, 124, 128, 132

Bilateral activity in caudate region, above the lines indicated in slice -6 and 6 with blue lines. The cartoon depicts a man walking on a tightrope. The tightrope line should be drawn on the internal capsule, with the tightrope walker depicting a bilateral cluster of activation on the caudate nuclei of the basal ganglia



#### Other Networks:

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#### *Language*

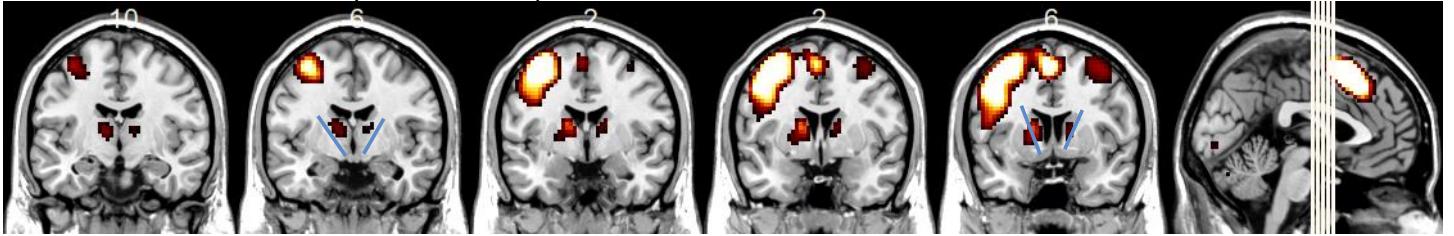
Left-dominant activity on internal capsule lines in slice 6.




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#### *Maintaining Internal Attention*

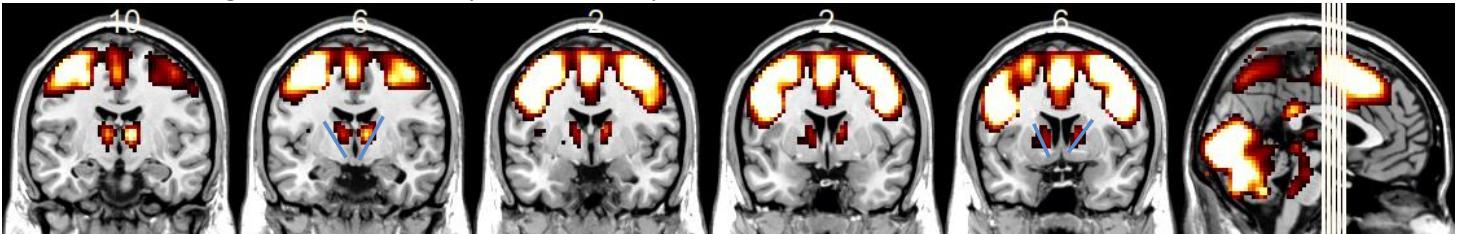
Left-dominant activity on internal capsule lines in slice 6.




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#### *Multiple Demand*

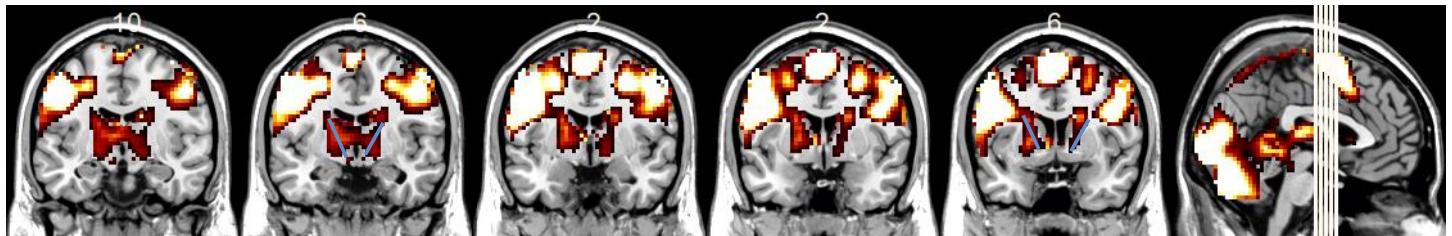
Bilateral right-dominant activity on internal capsule lines in slice 6.



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*Initiation*

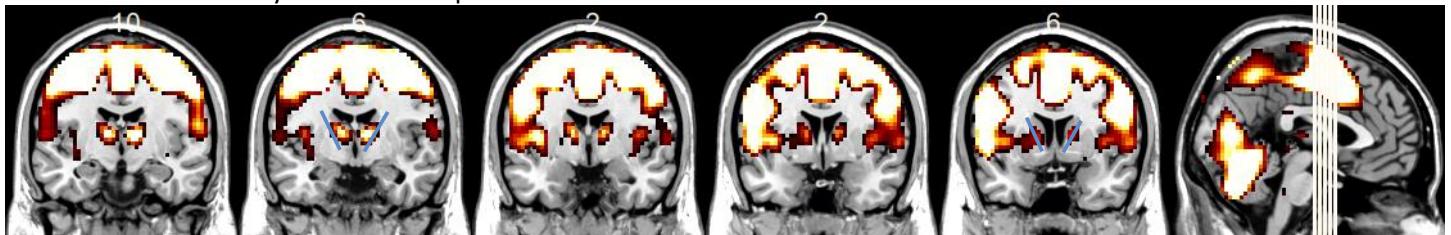
Bilateral activity on internal capsule lines, not well defined.



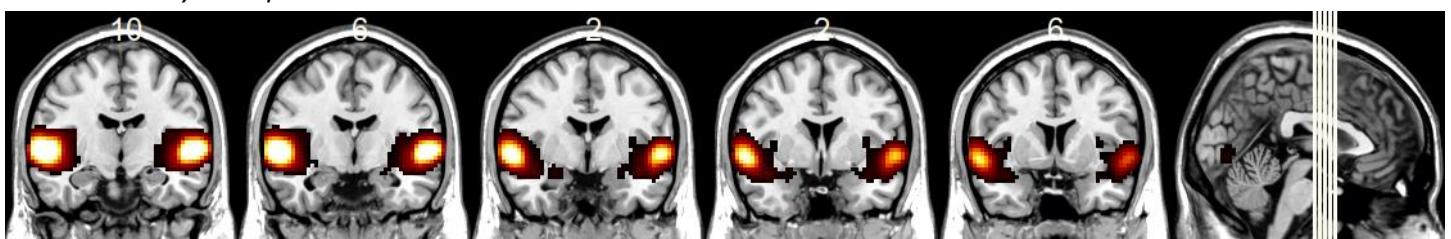
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*Response*

Bilateral activity on internal capsule lines.



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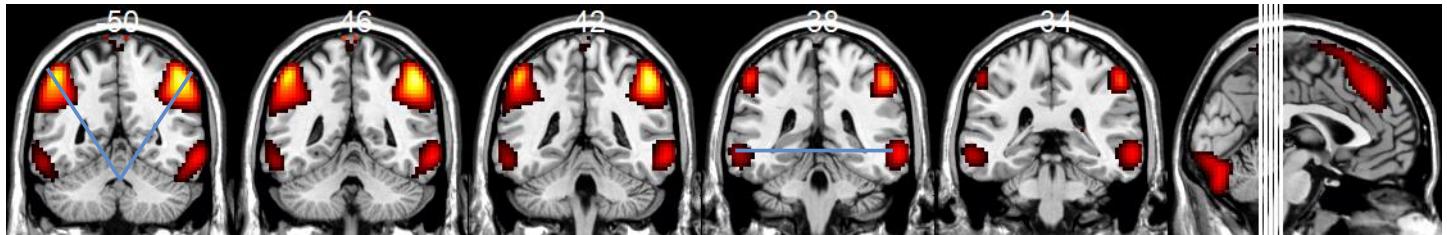
*Auditory Perception*

**Re-Evaluation (RE-EV)**  
Previous Name: Cognitive Evaluation (CE)



**4. Sad Face Antennae & Flushed Cheeks: 76, 80, 84, 88, 92**

Bilateral activity from sad face antennae projections extend from the “sad face mouth” (fourth ventricle) and eyes (lateral ventricles), see blue lines in slice -50. Flushed cheeks are in line with the “sad face nose” (third ventricle) on slice 38.

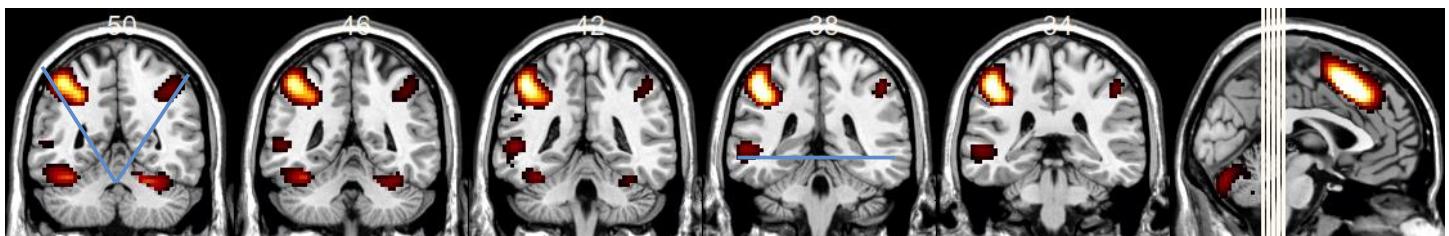


Other Networks:

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*Language*

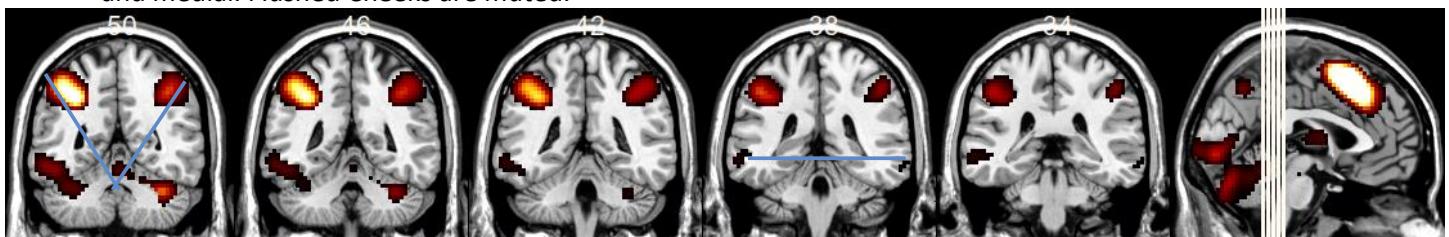
Sad Face Antennae left activity more medial. Right activity more medial and inferior. Superior activity is more left-dominant and medial. Flushed Cheeks are muted and left lateralized.




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*Maintaining Internal Attention*

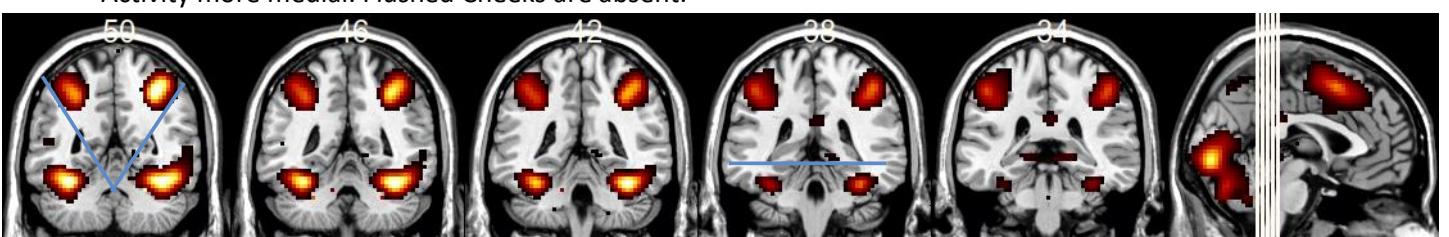
Left activity more medial. Right activity more medial and inferior. Superior activity is more left-dominant and medial. Flushed Cheeks are muted.




---

*Multiple Demand*

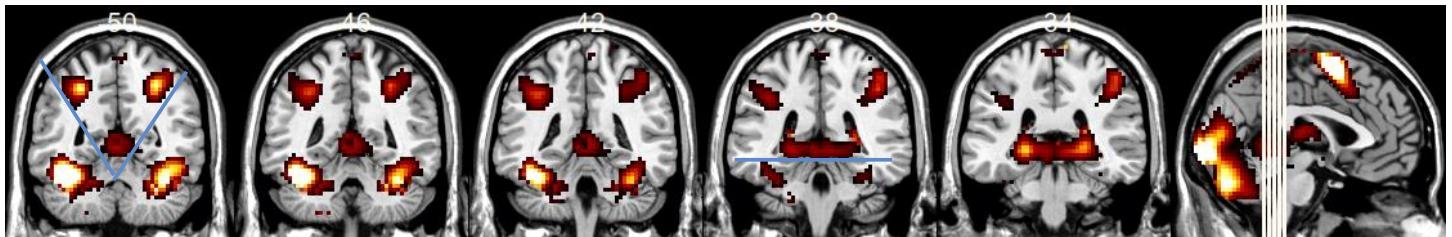
Activity more medial. Flushed Cheeks are absent.



---

*Initiation*

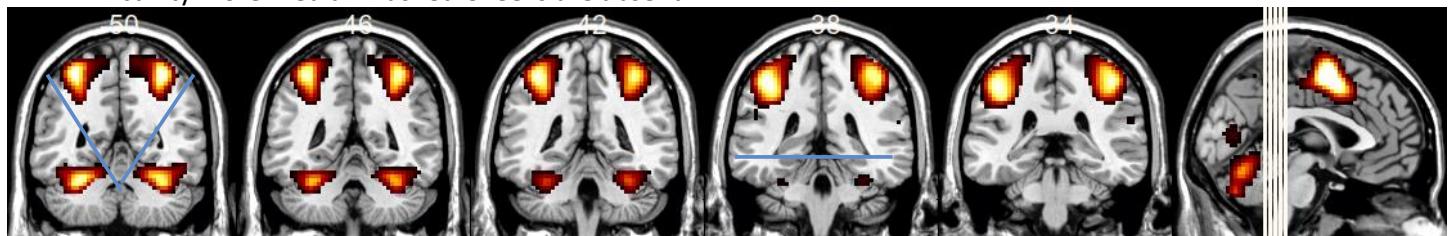
Sad Face Antennae activity more medial.



---

*Response*

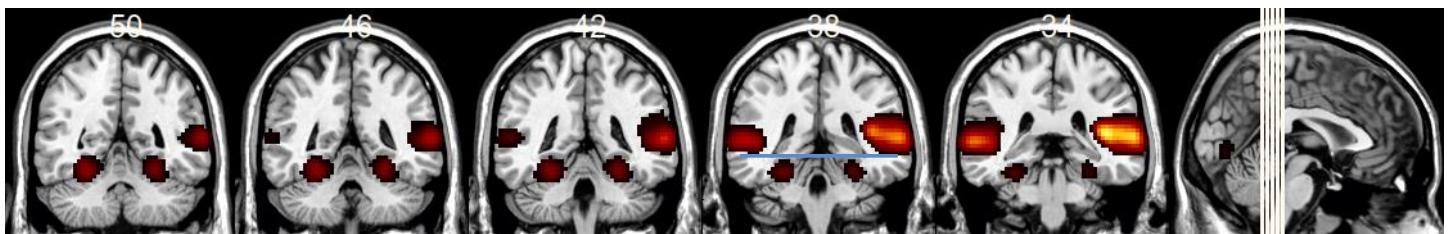
Activity more medial. Flushed Cheeks are absent.



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*Auditory Perception.*

Flushed Cheeks are too superior. Sad Face Antennae are absent.

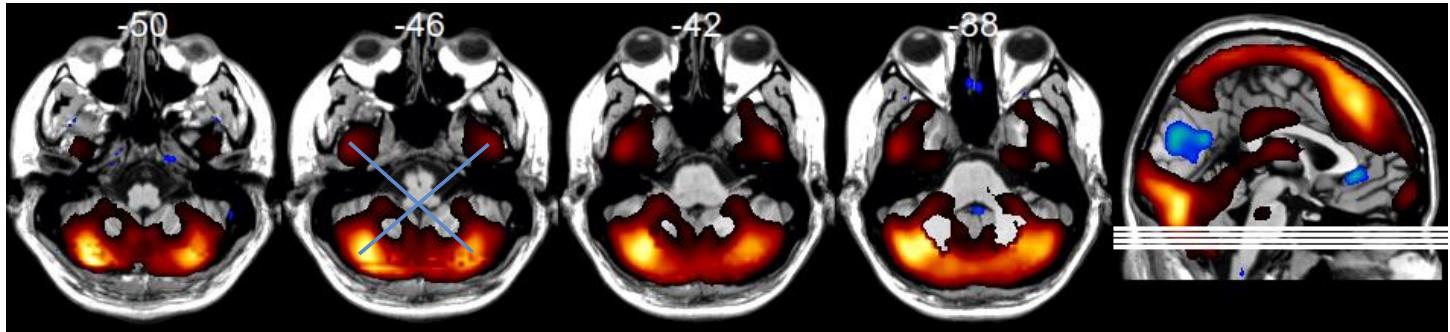


**Re-Evaluation (RE-EV)**  
Previous Name: Cognitive Evaluation (CE)



5. X Marks the Spot: 22, 26, 30, 34

Bilateral activation at X endpoints, see blue lines in slices -50 and -46.

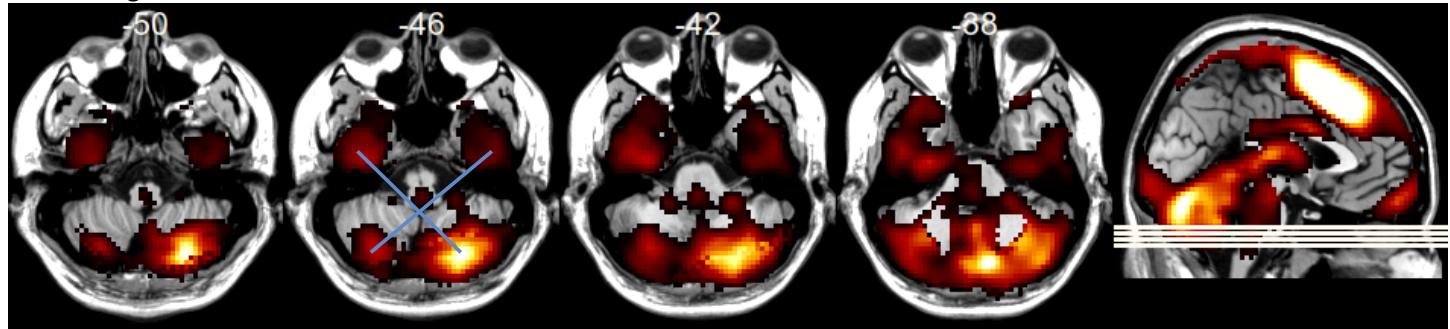


Other Networks:

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*Language*

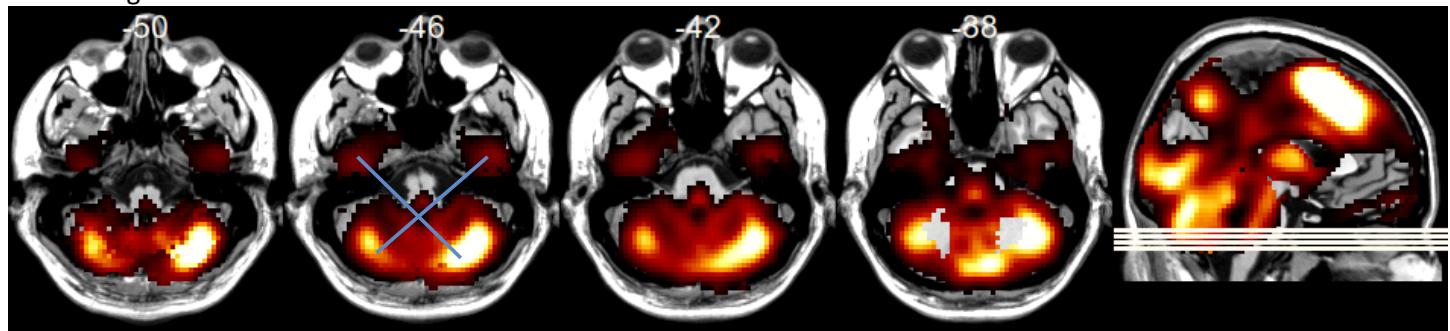
Right-dominant X.




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*Maintaining Internal Attention*

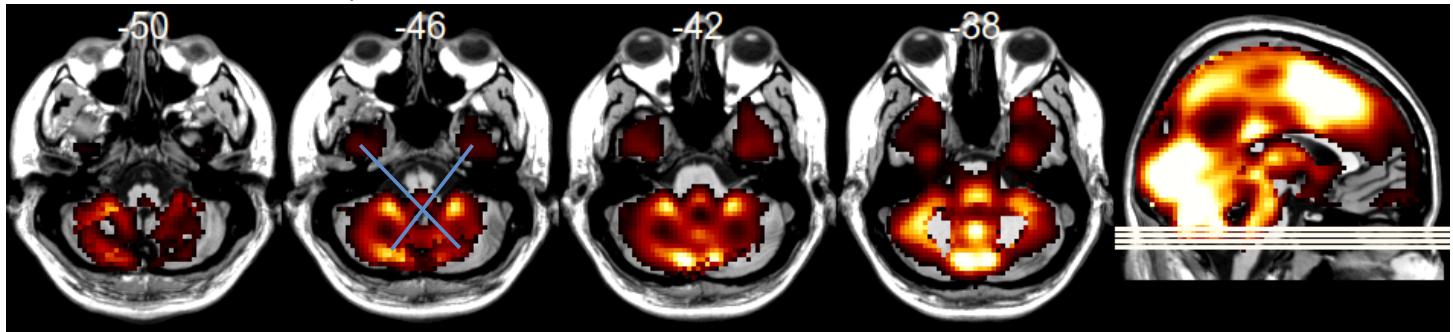
Right-dominant X.



---

*Multiple Demand*

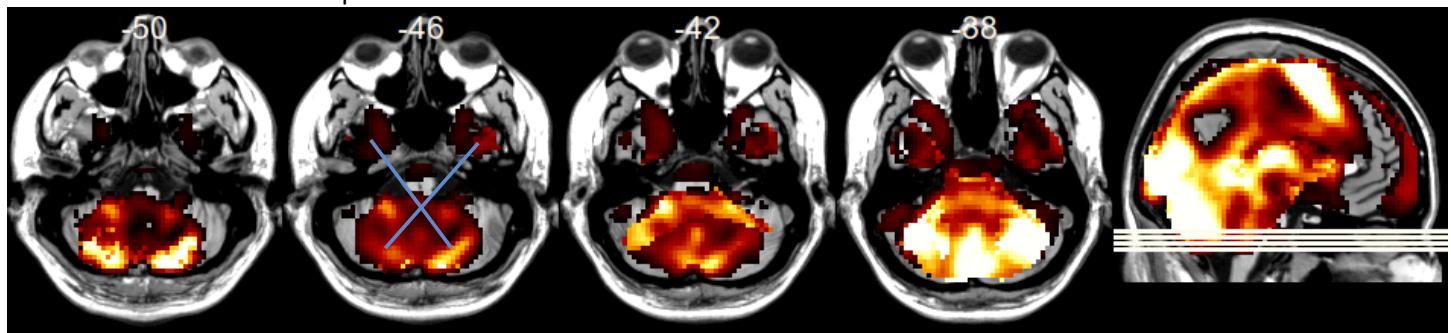
No defined lower X points.



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*Initiation*

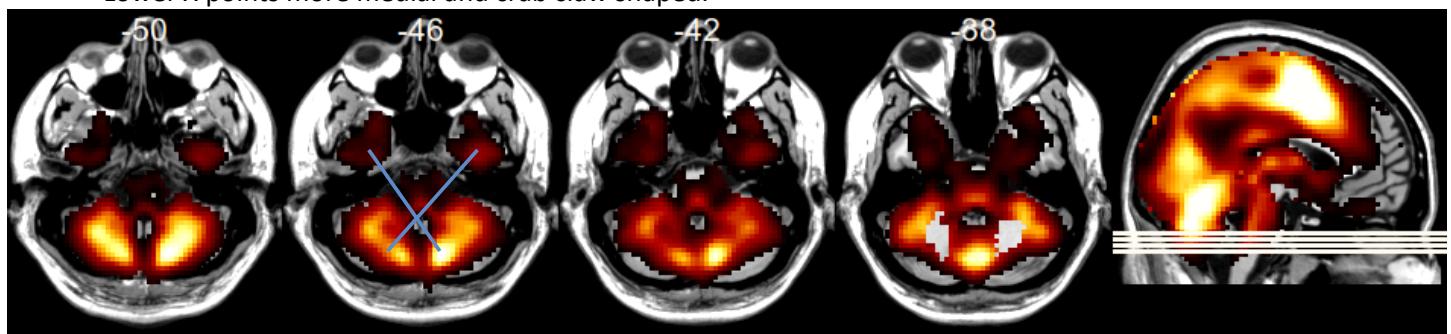
No defined lower X points.

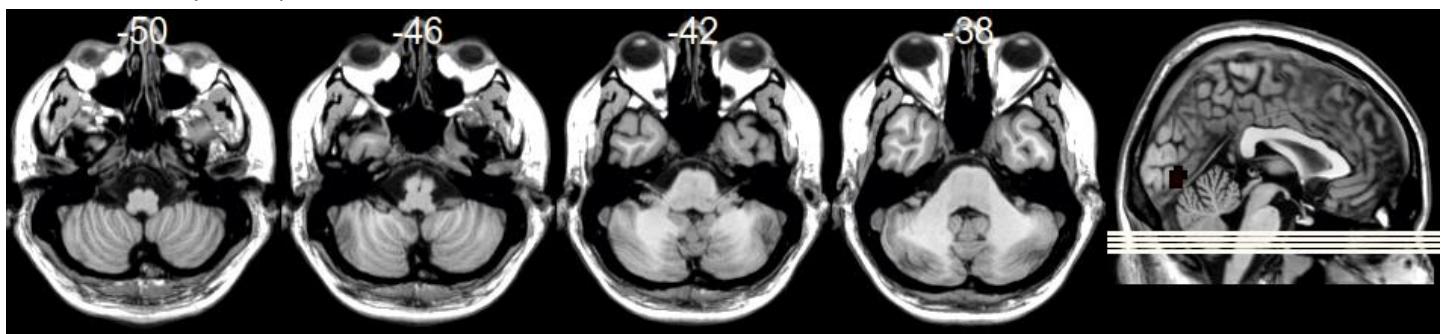


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*Response*

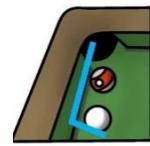
Lower X points more medial and crab claw shaped.



*Auditory Perception*

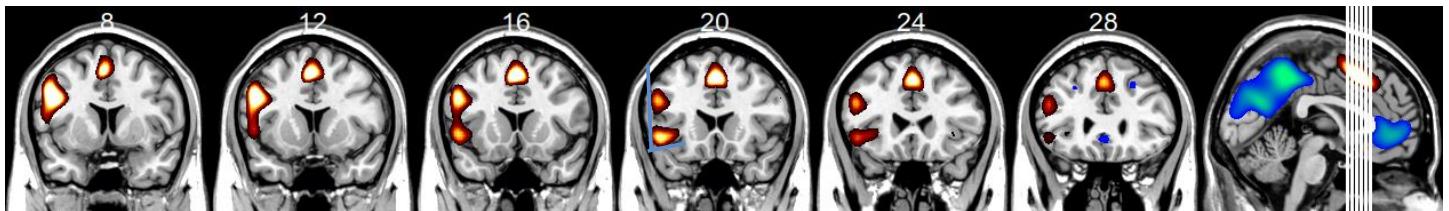
## Language (LAN)

Previous Names: Extraction of Meaning (EOM),  
Linguistic Processing (LANG), Language (LPN)



### 1. Rail Shot Coronal: 134,138,142,146,150,154

Left lateralized activity, two peaks in line similar to pool rail shot, see blue lines in slice 20.

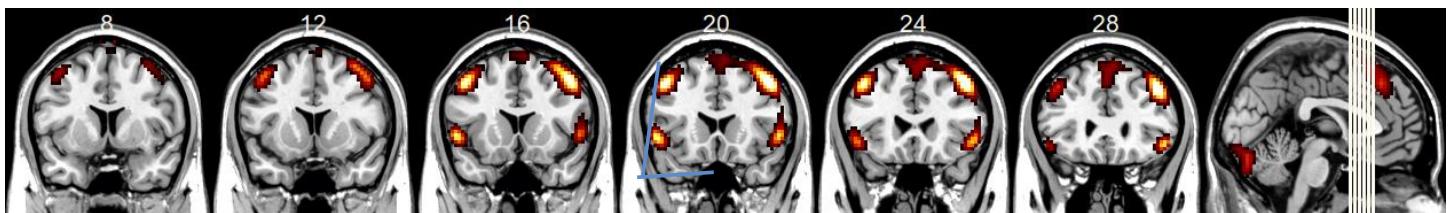


### Other Networks:

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#### *Re-Evaluation*

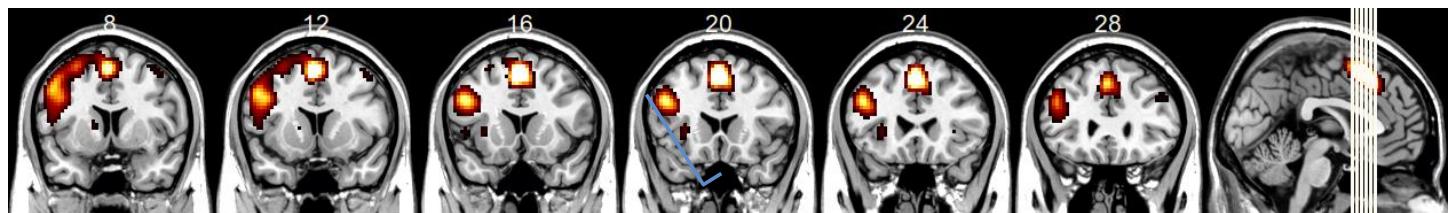
Higher pool ball more superior and medial. Lower pool ball more inferior and lateral.




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#### *Maintaining Internal Attention*

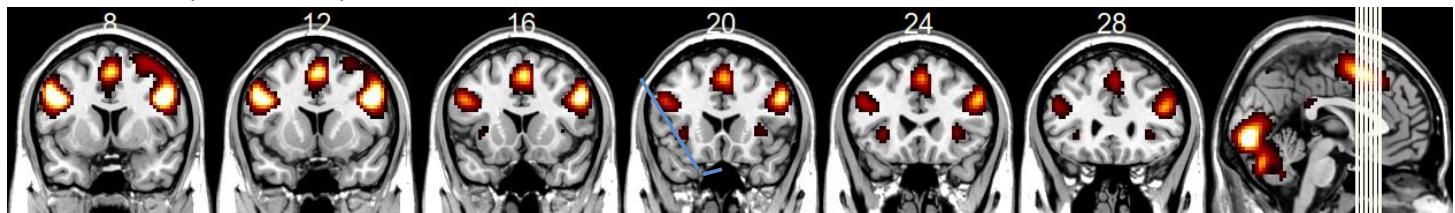
Left-lateralized and lower pool ball very muted and medial.




---

#### *Multiple Demand*

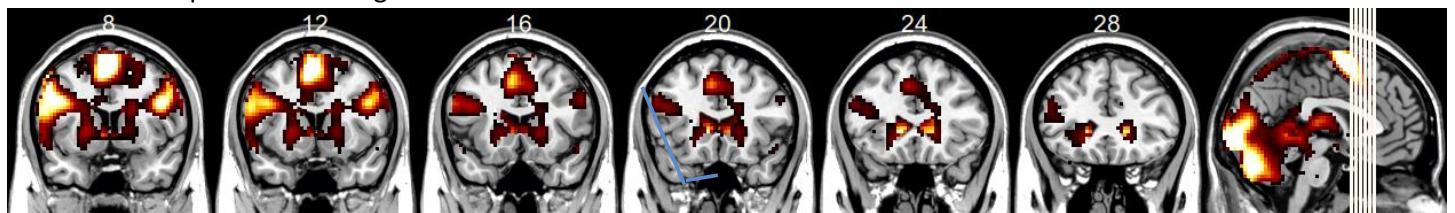
Lower pool ball very muted and medial.




---

#### *Initiation*

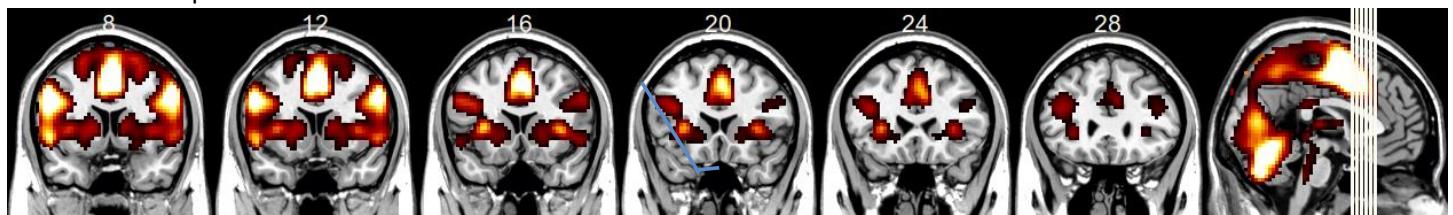
Lower pool ball missing.



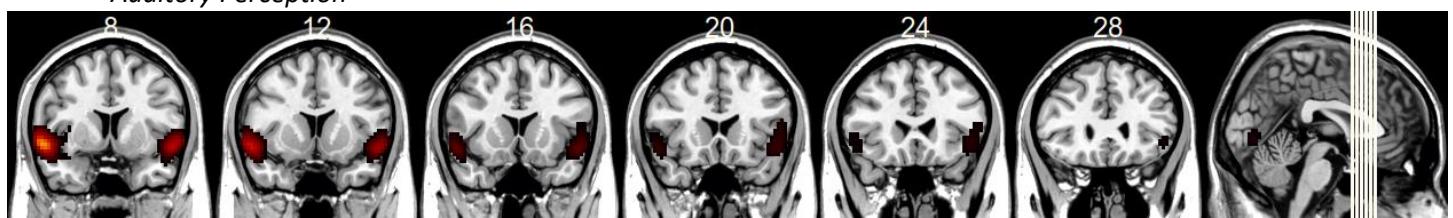
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*Response*

Lower pool ball more medial.



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*Auditory Perception*

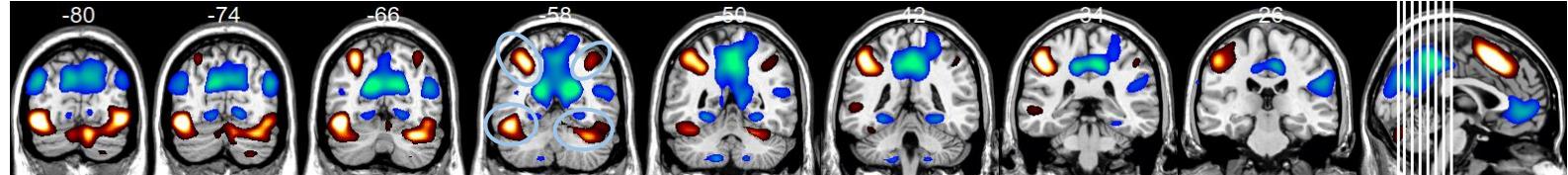


### Language (LAN)

Previous Names: Extraction of Meaning (EOM),  
Linguistic Processing (LANG), Language (LPN)

#### 2. Tears Blown Leftwards & Eyebrows: 46, 52, 60, 68, 76, 84, 92, 100

Sad face with tear drop blown leftwards, left-dominant angry eyebrows, see slice -58 and -5s0.

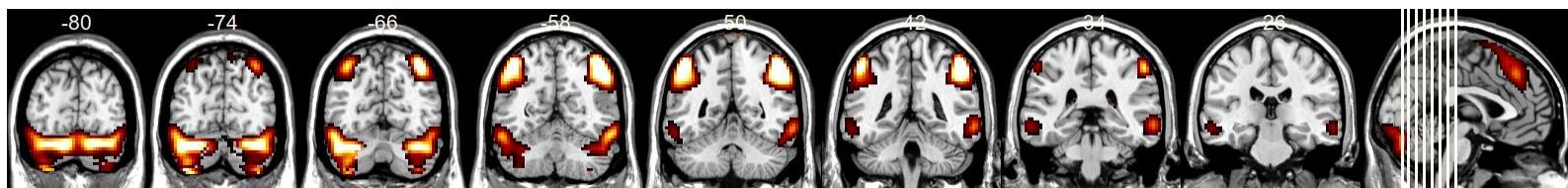


#### Other Networks:

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#### *Re-Evaluation*

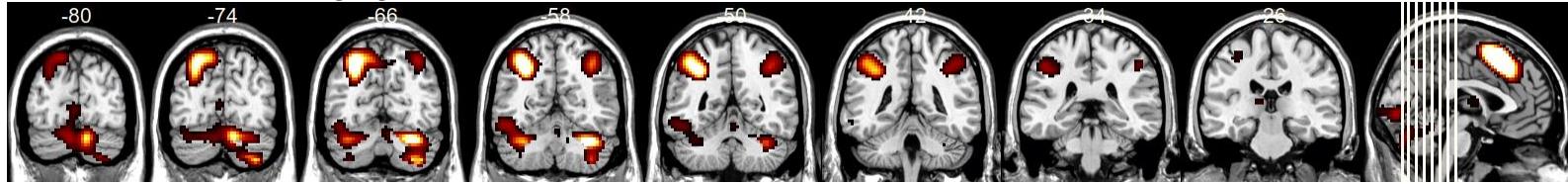
No distinct eyebrows, lateral cheek activity not tears.




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#### *Maintaining Internal Attention*

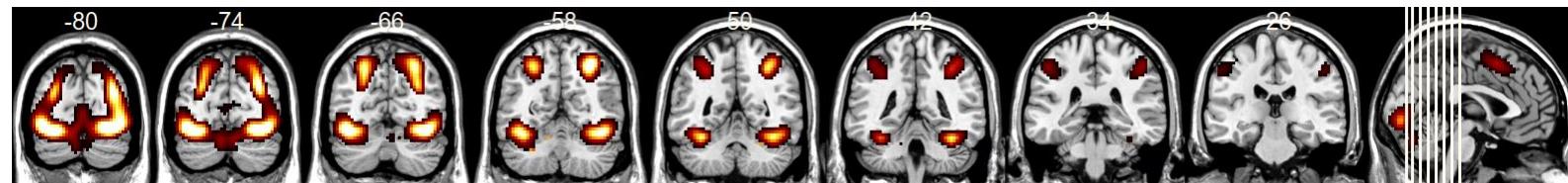
Similar to Language but left tears less defined.




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#### *Multiple Demand*

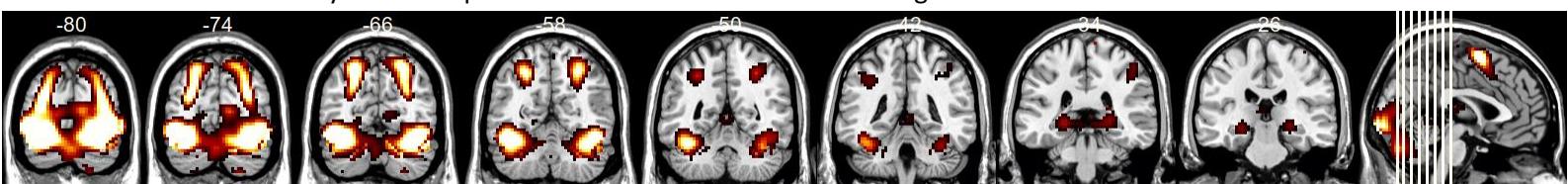
Right-dominant eyebrow. Right tear more superior.




---

#### *Initiation*

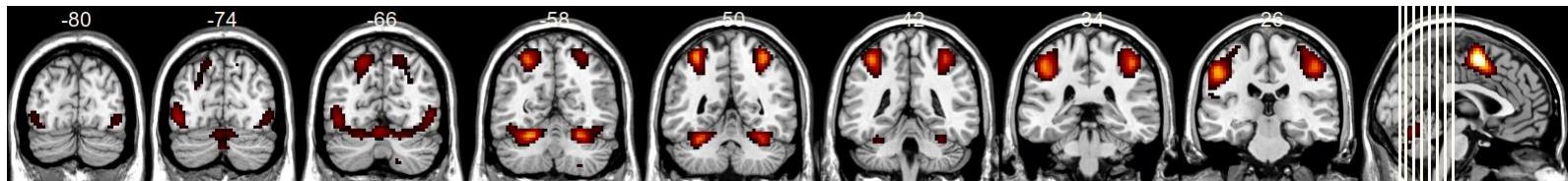
No distinct eyebrow shape and more medial. Tears more enlarged



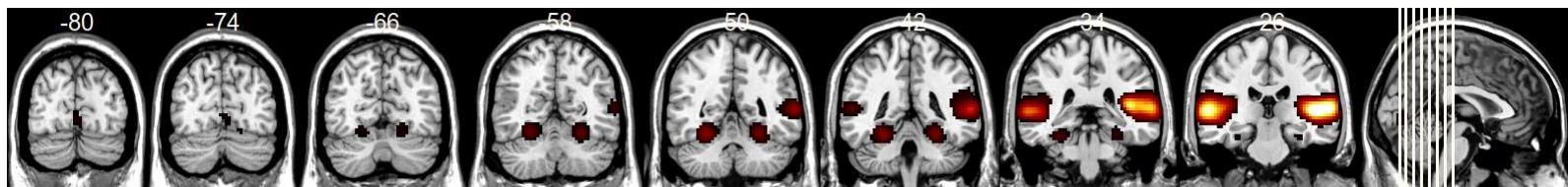
---

*Response*

No distinct eyebrow shape and more medial. Left tear more inferior.



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*Auditory Perception*

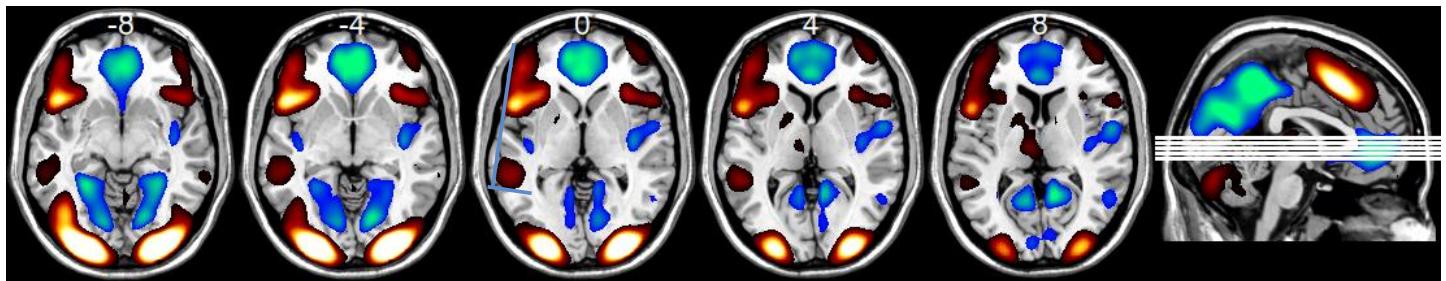


### Language (LAN)

Previous Names: Extraction of Meaning (EOM),  
Linguistic Processing (LANG), Language (LPN)

#### 3. Rail Shot Axial: 64, 68, 72, 76, 80

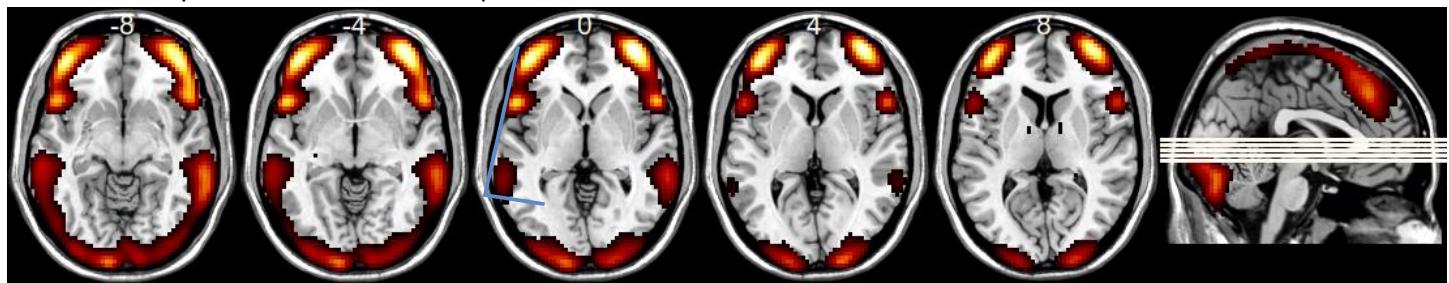
Left lateralized activity, two peaks in line similar to pool rail shot, see blue lines in slice 0.



#### Other Networks:

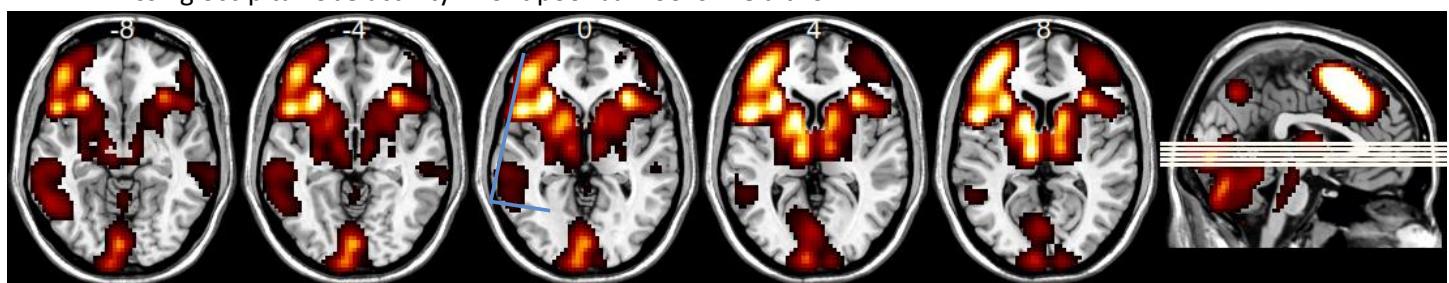
#### *Re-Evaluation*

Activity more anterior for front pool ball.



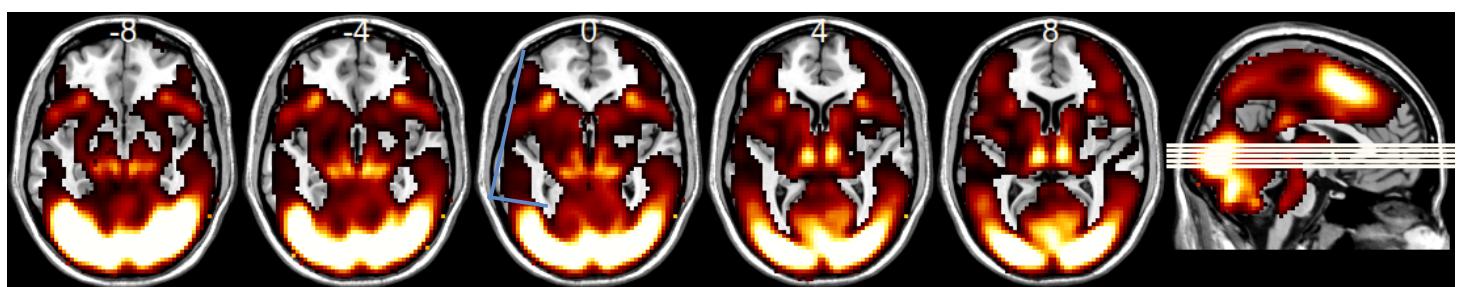
#### *Maintaining Internal Attention*

Missing occipital lobe activity. Front pool ball looks like a trio.



#### *Multiple Demand*

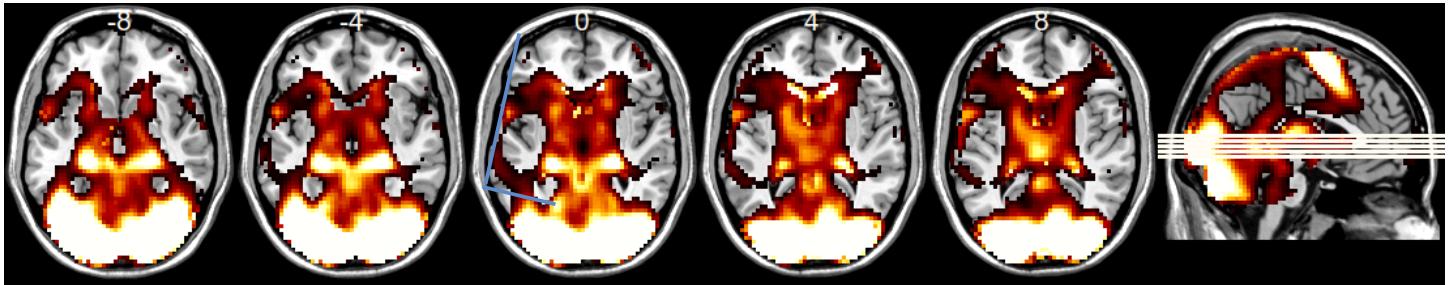
Neither pool ball well defined.



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*Initiation*

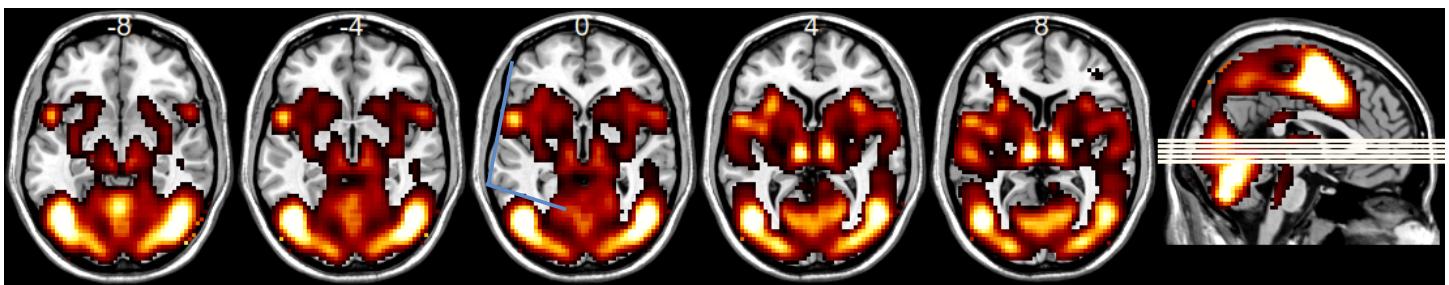
Neither pool ball well defined.



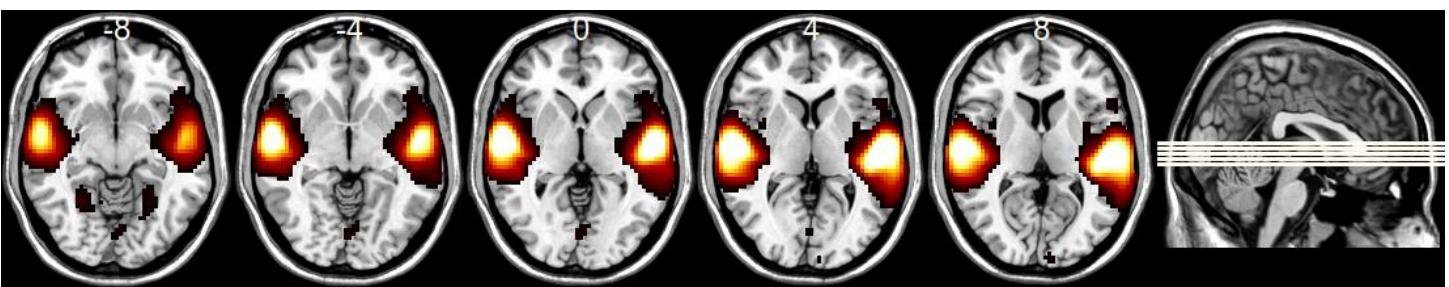
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*Response*

Missing posterior pool ball.



---

*Auditory Perception*

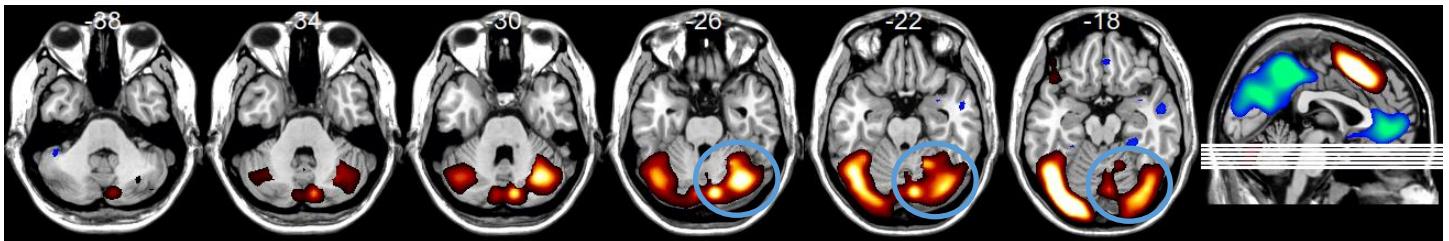
## Language (LAN)

Previous Names: Extraction of Meaning (EOM),  
Linguistic Processing (LANG), Language (LPN)



### 4. Disappearing Face (Start Right, Disappear Left): 34, 38, 42, 46, 50, 54

Diagonal smiley face apparent on right side of slice -18 and disappears by slice -36.

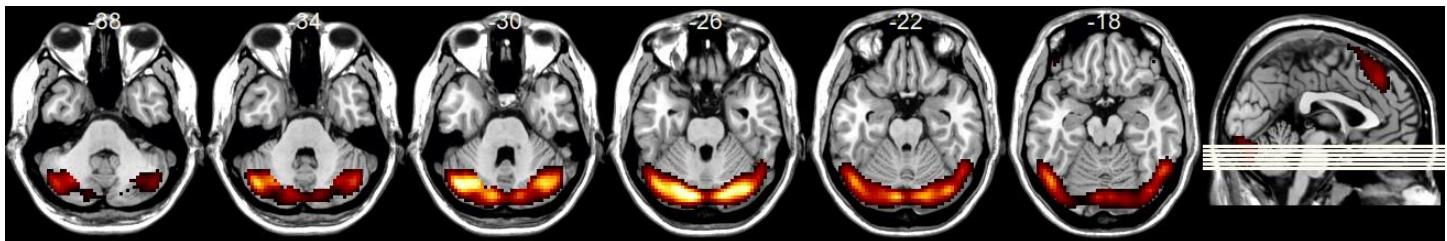


### Other Networks:

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#### *Re-Evaluation*

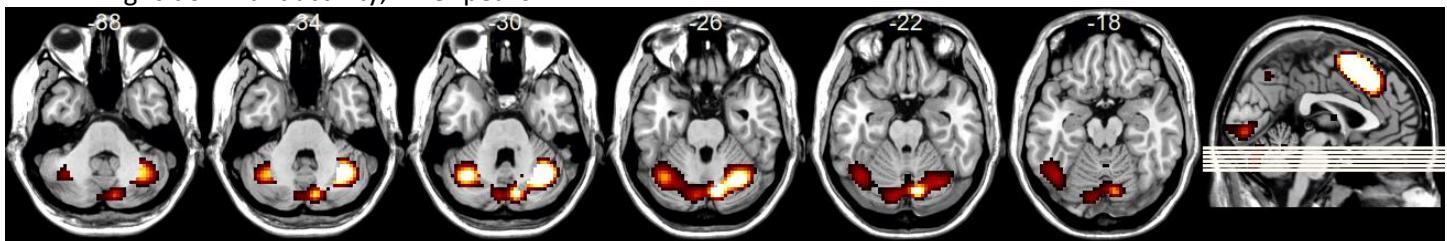
Bilateral posterior and lateral activity.




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#### *Maintaining Internal Attention*

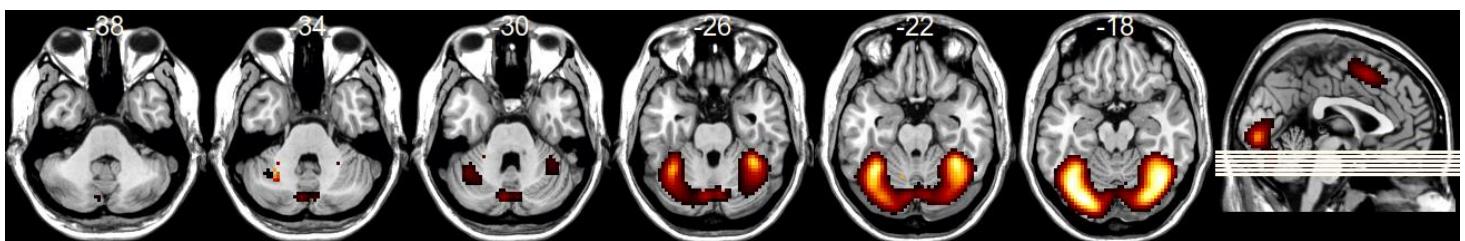
Right-dominant activity, inner peaks




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#### *Multiple Demand*

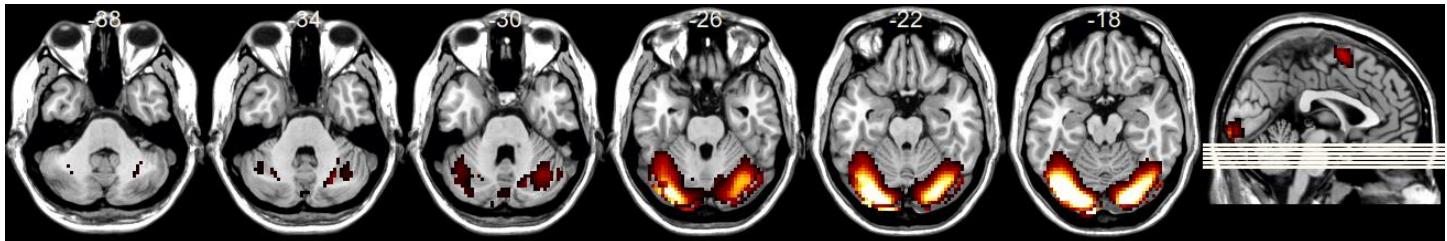
No face.



---

*Initiation*

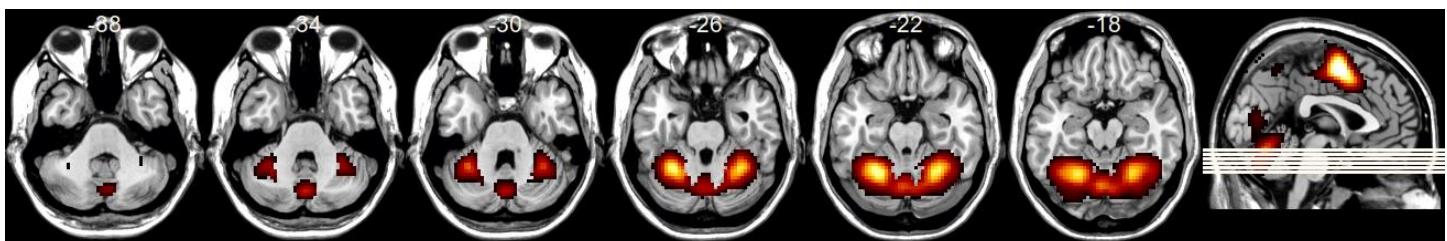
No face.



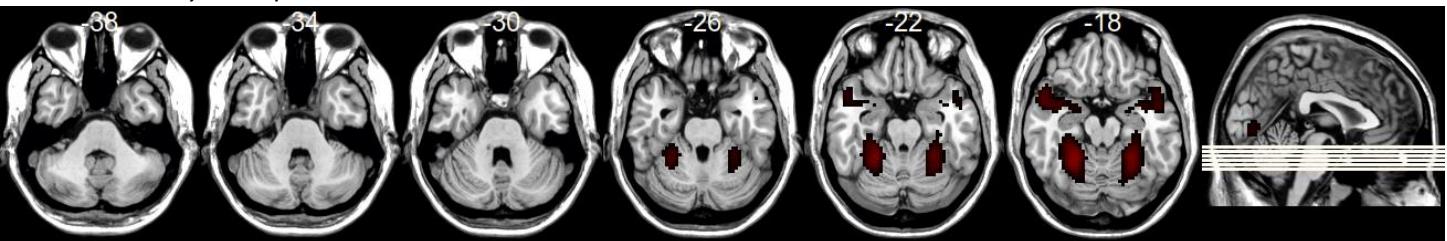
---

*Response*

No face.



---

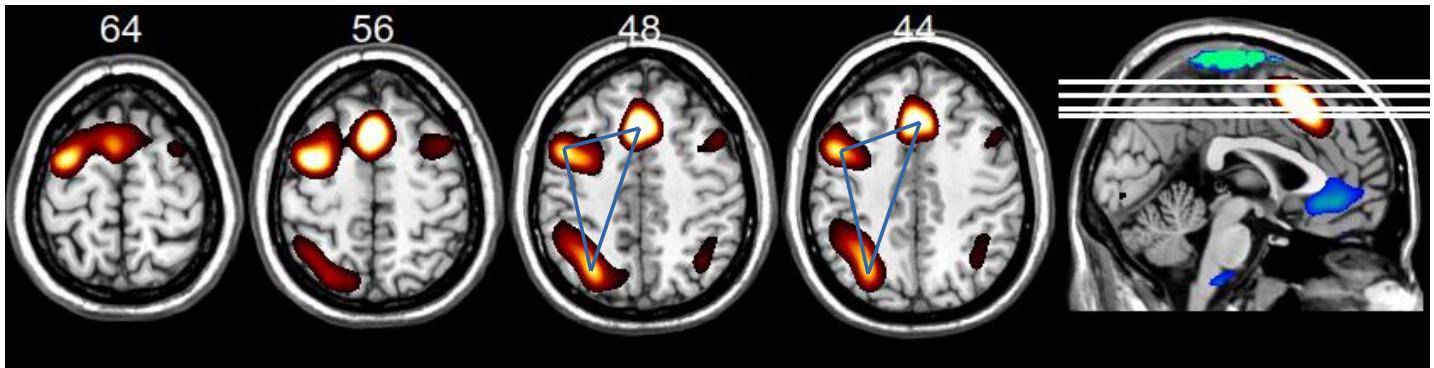
*Auditory Perception*

**Maintaining Internal Attention (MAIN)**  
 Previous Names: Access to Internally Stored Information (AISI)  
 Internal Attention (INT)



**1. Left-Lateralized Upper Triangle: 136,128,120,116**

Left-lateralized triangle, see blue lines in slices 48 and 44.

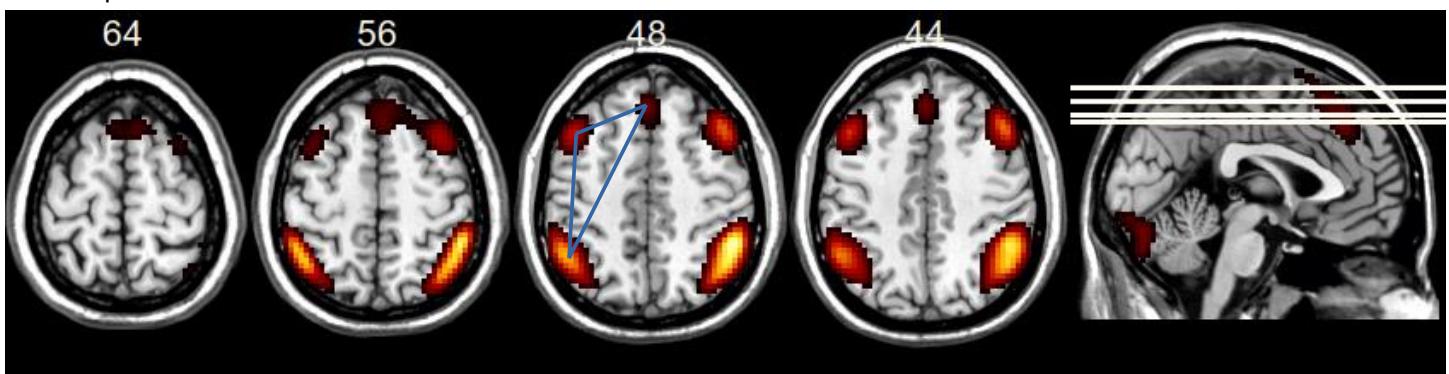


Other Networks:

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*Re-Evaluation*

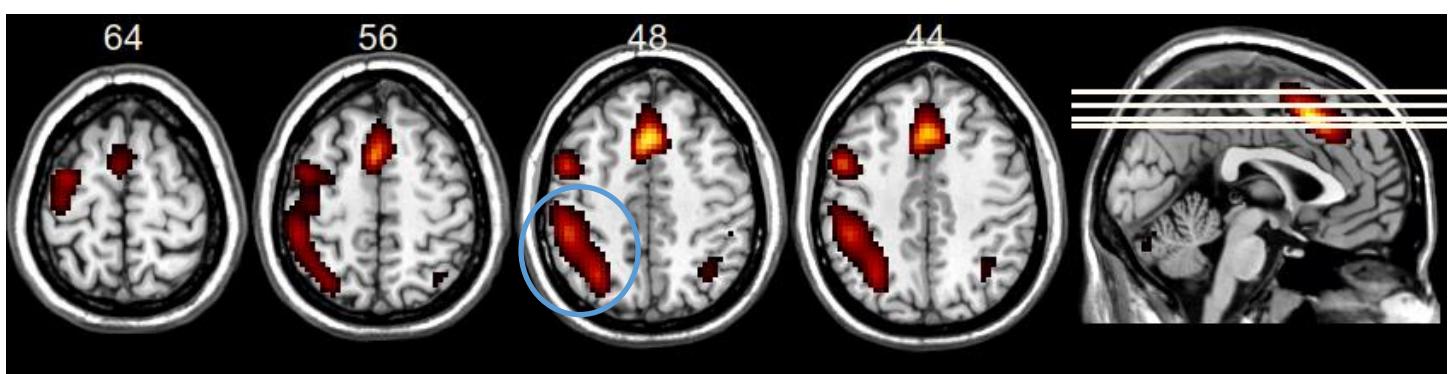
Bilateral larger triangles, front corner is further anterior and lateral corners more lateral. Muted centre point.




---

*Language*

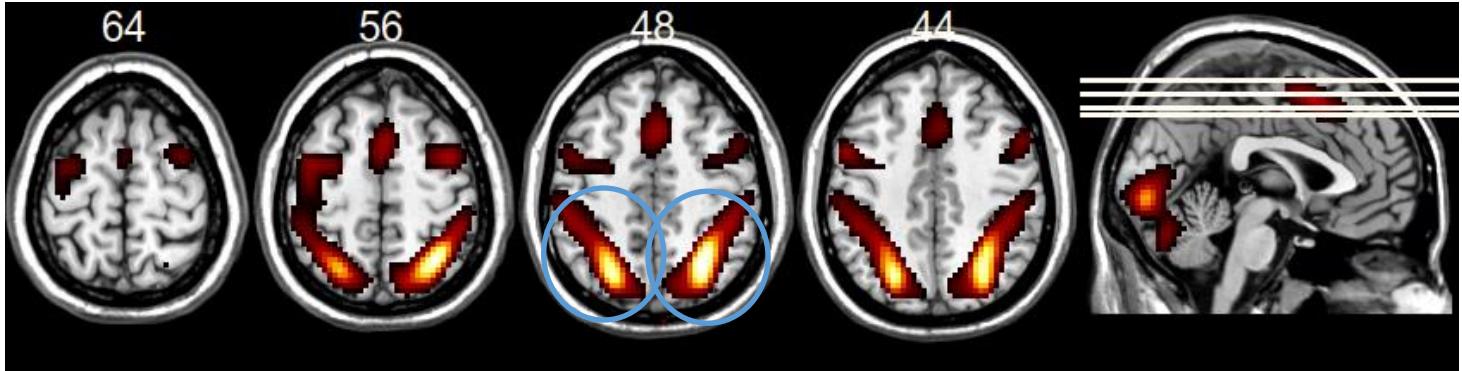
Similar to Internal Attention but bottom of triangle extends more along edge.



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*Multiple Demand*

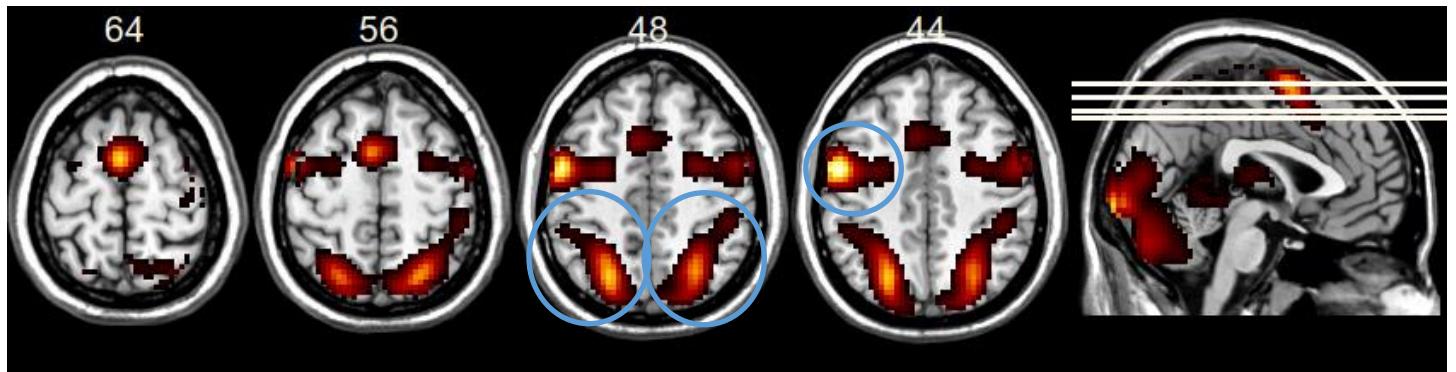
Bilateral, bottom of triangle extends along edge and dominant bottom of triangle. Muted centre point.




---

*Initiation*

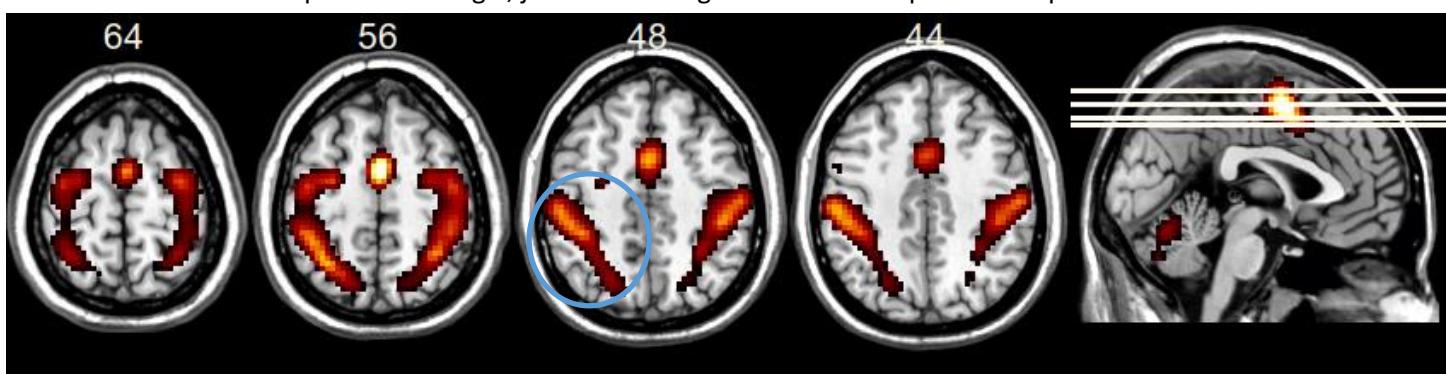
Bilateral, bottom of triangle extends along edge and dominant left outer point. Muted centre point.



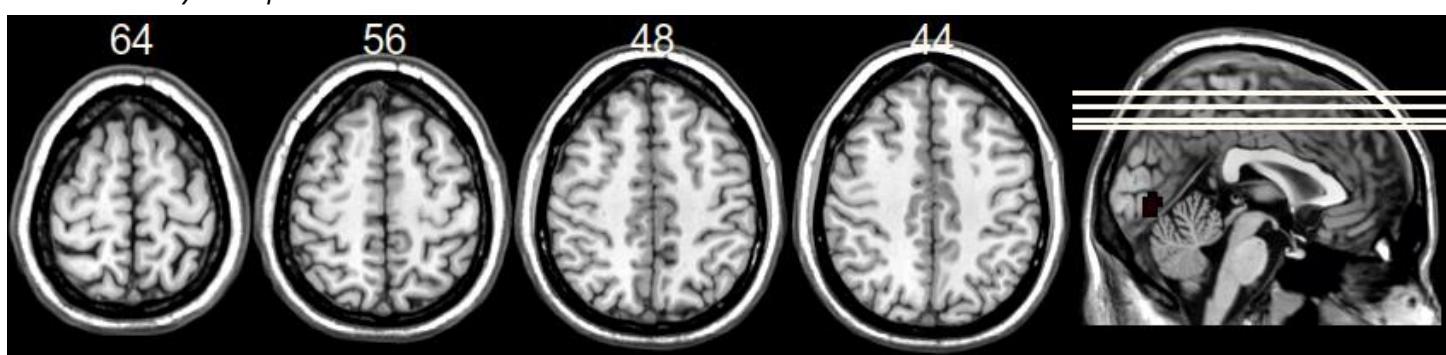

---

*Response*

No defined outer points of triangle, just bottom edge visible. Centre point more posterior.




---

*Auditory Perception*


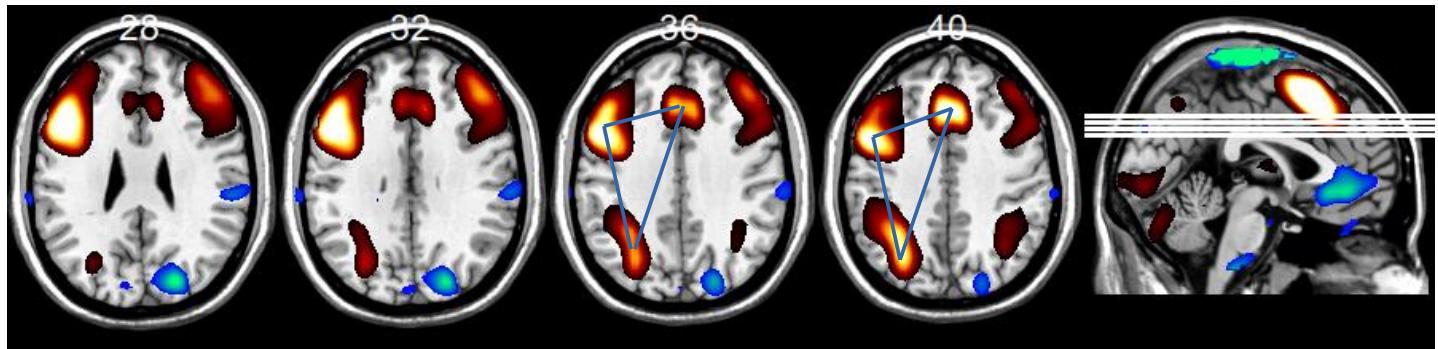
## Maintaining Internal Attention (MAIN)

Previous Names: Access to Internally Stored Information (AISI)  
Internal Attention (INT)



### 2. Left-Lateralized Lower Triangle: 100, 104, 108, 112

Left-lateralized triangle, see blue lines in slices 36, 40.

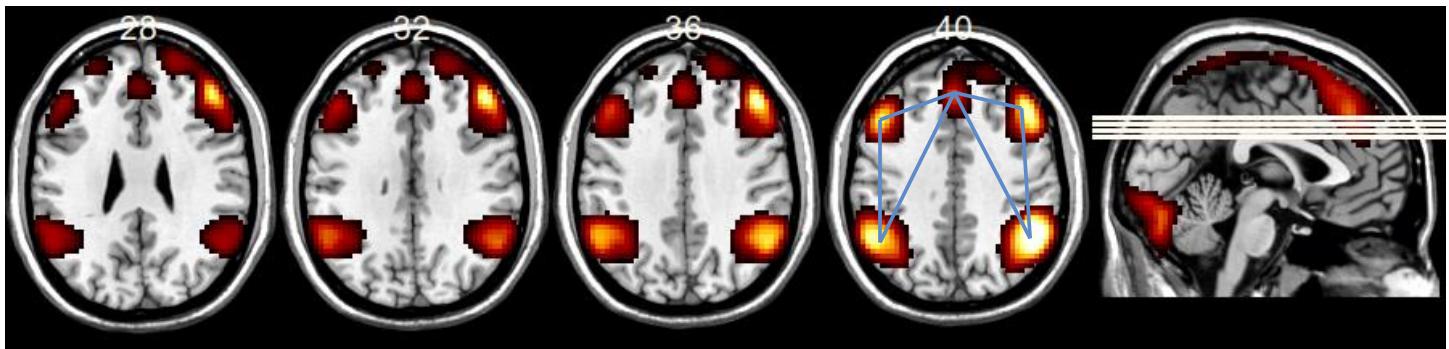


### Other Networks:

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#### *Re-Evaluation*

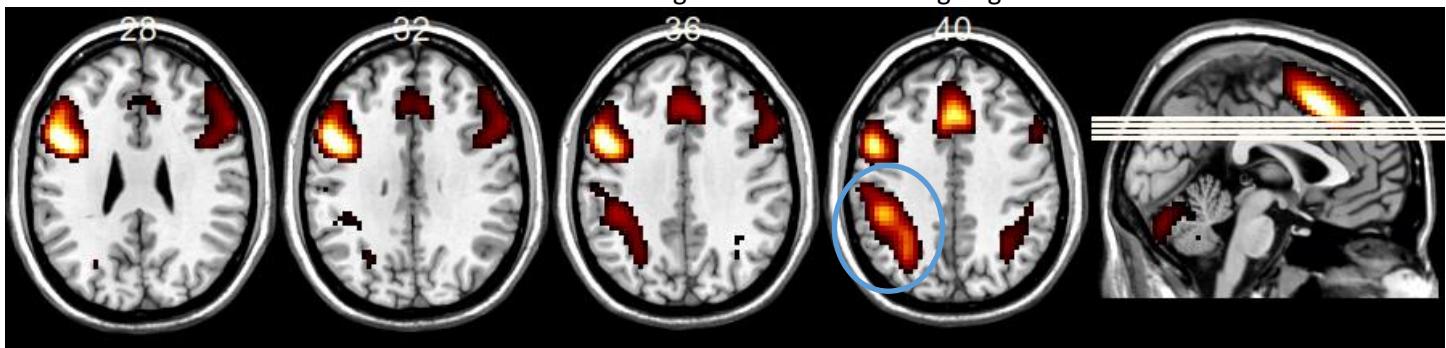
Bilateral larger triangles.




---

#### *Language*

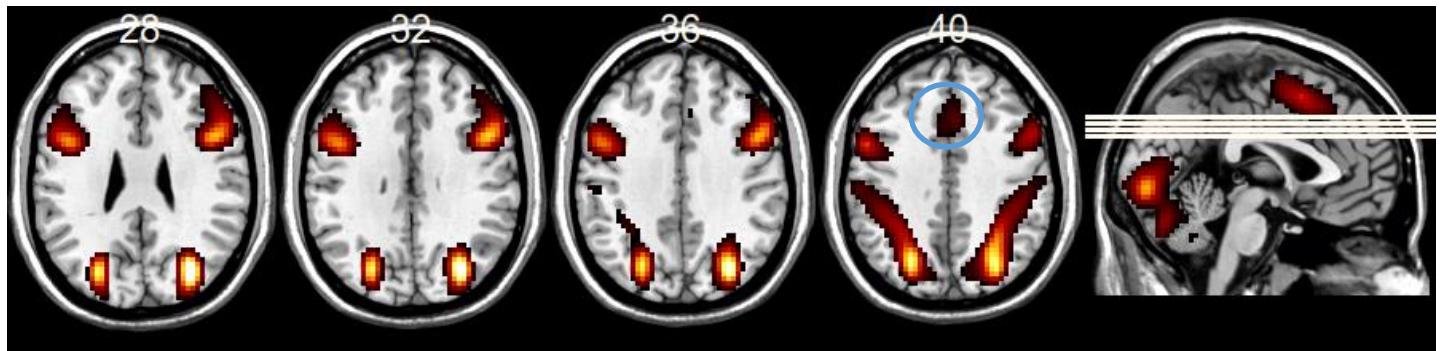
Similar to Internal Attention but bottom of triangle extends more along edge.



---

*Multiple Demand*

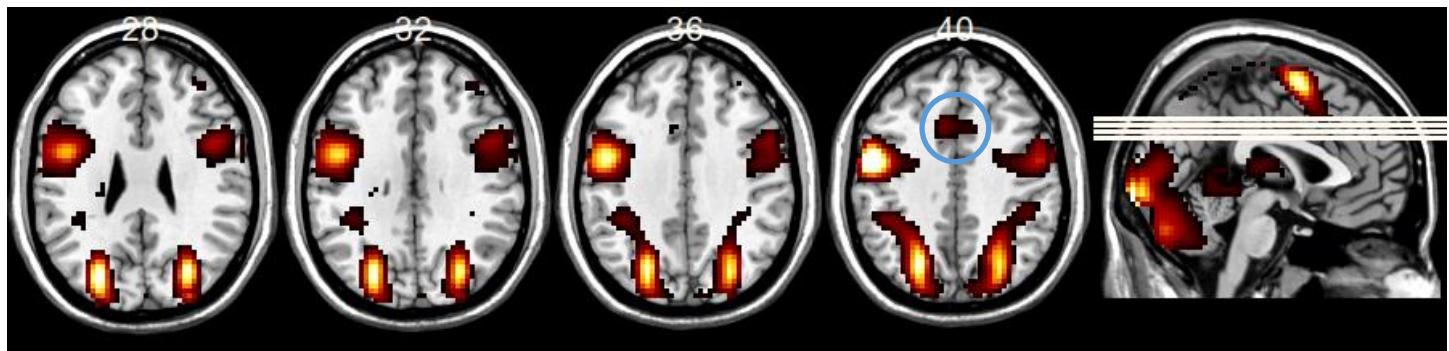
Bilateral and muted centre point of triangle. Activity extends along bottom edge of triangle.



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*Initiation*

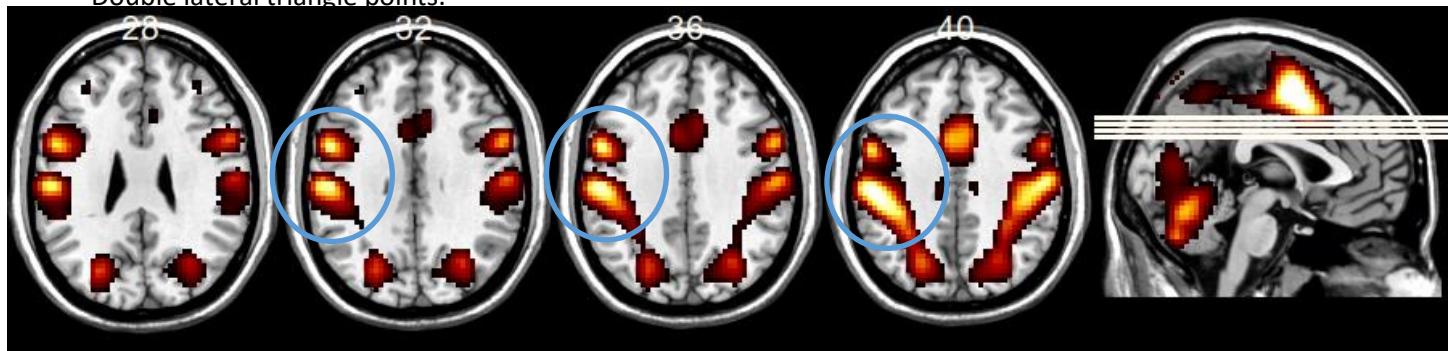
Bilateral and muted centre point of triangle. Activity extends along bottom edge of triangle.



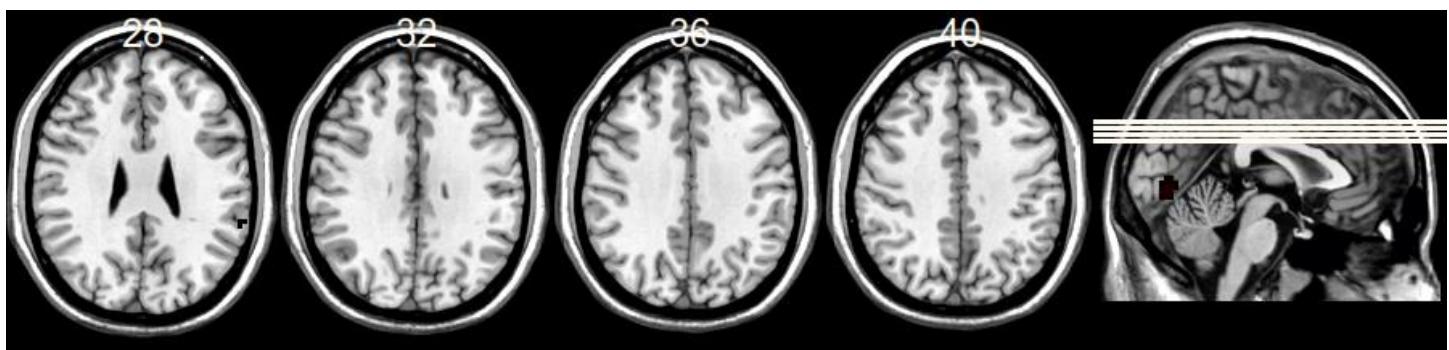
---

*Response*

Double lateral triangle points.



---

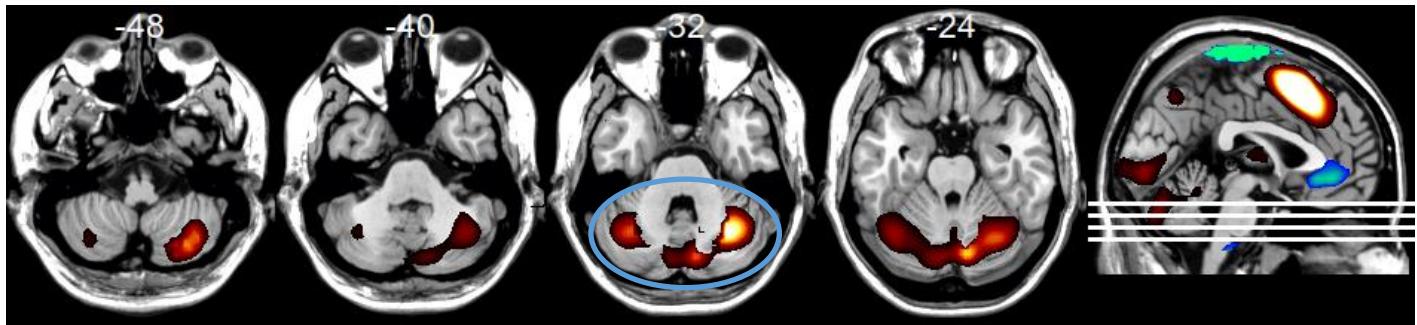
*Auditory Perception*

**Maintaining Internal Attention (MAIN)**  
 Previous Names: Access to Internally Stored Information (AISI)  
 Internal Attention (INT)



3. Right-Handed Crab Claw: 24, 32, 40, 48

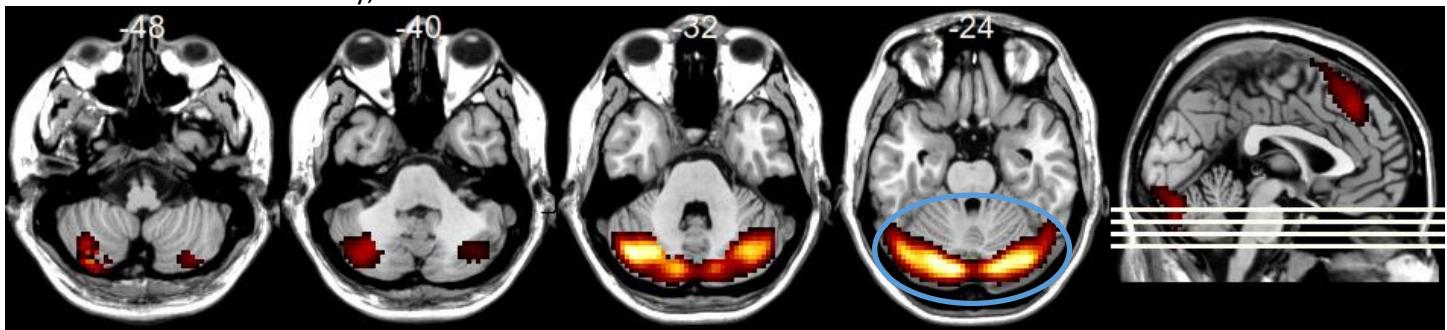
Right-dominant activity in crab claw formation, most apparent in slice -32.



Other Networks:

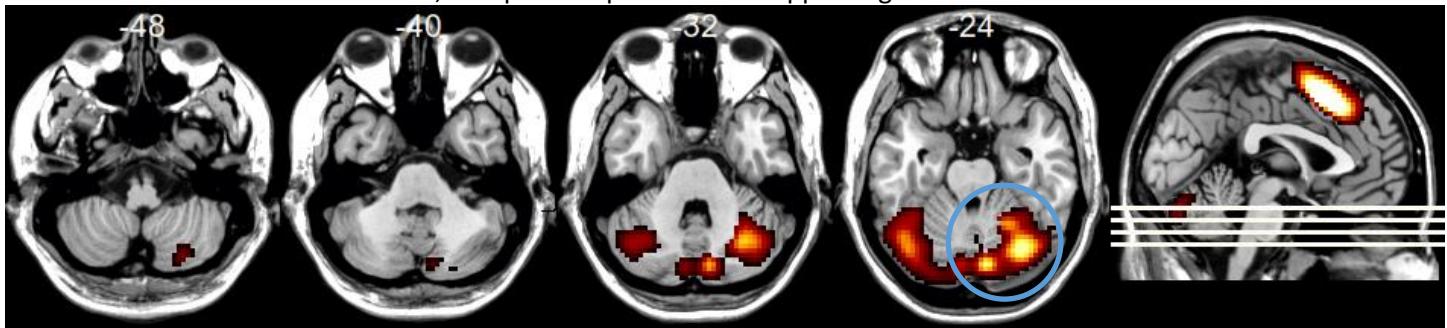
*Re-Evaluation*

Bilateral wider activity, different on slice -24.



*Language*

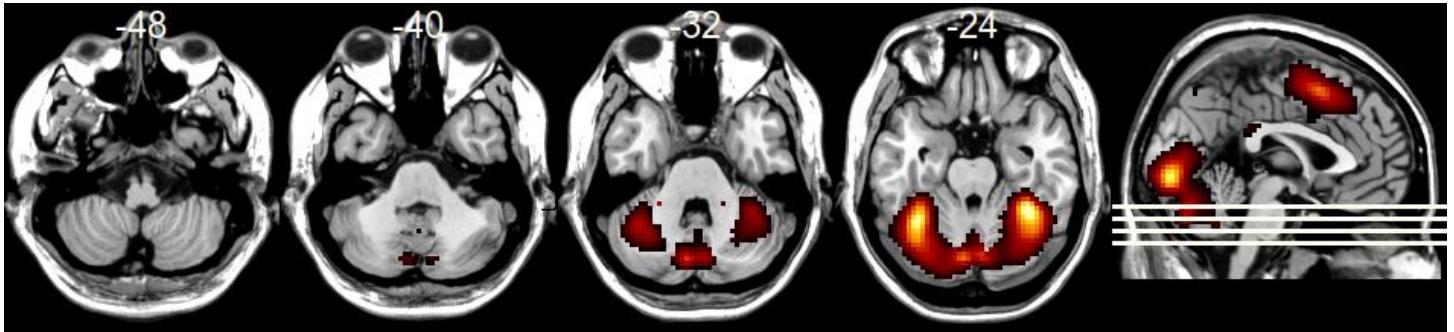
Similar to Internal Attention, except more prominent disappearing face on slice -24.



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*Multiple Demand*

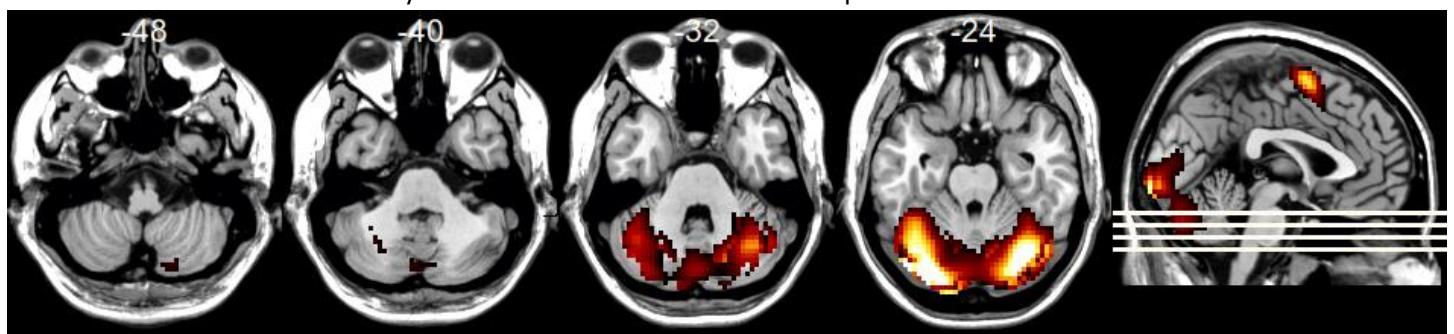
Bilateral and more activity on slice -24 than -32 which is more anterior than Initiation.




---

*Initiation*

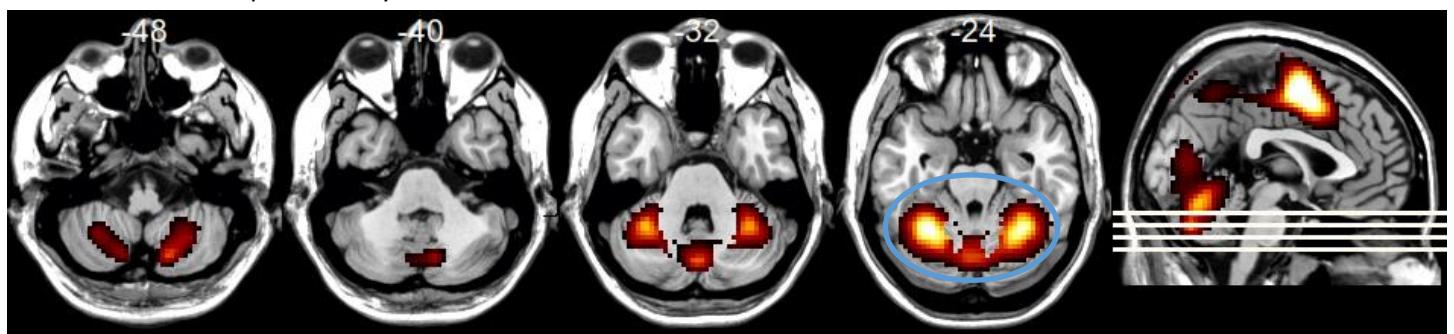
Bilateral and more activity on slice -24 than -32 which is more posterior than External Attention.



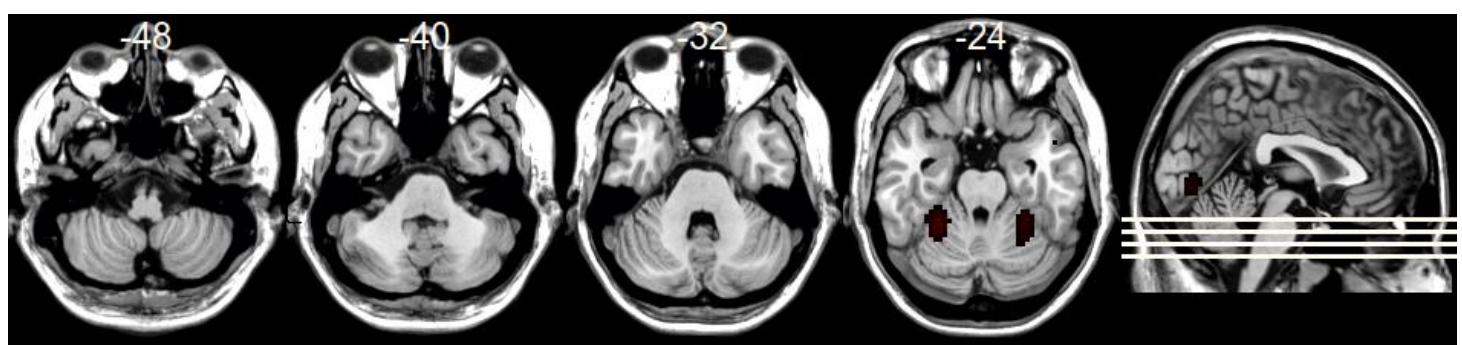

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*Response*

Bilateral compact activity more medial in slice -24.




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*Auditory Perception*


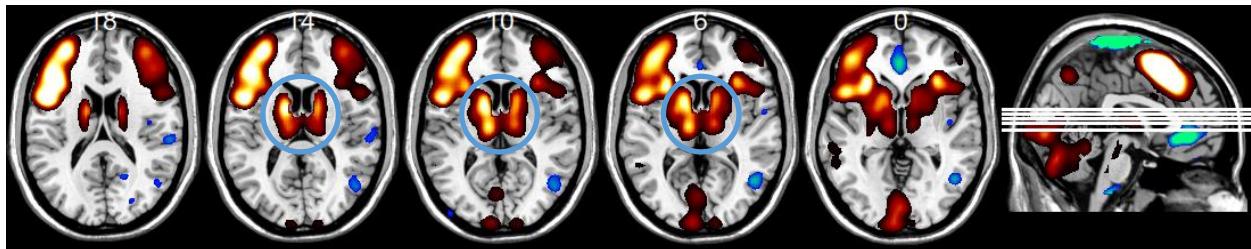
## Maintaining Internal Attention (MAIN)

Previous Names: Access to Internally Stored Information (AISI)  
Internal Attention (INT)



4. Found a Peanut: 90, 86, 82, 78, 72

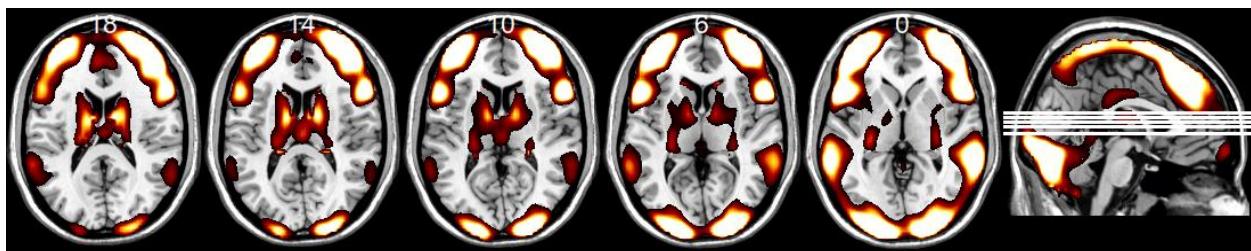
Two peanuts, slightly left-dominant.



### Other Networks:

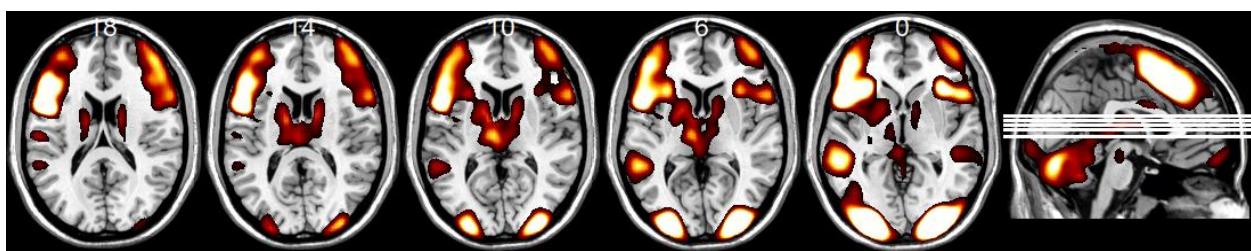
#### *Re-Evaluation*

Activity more prominent on slice 14 than 6, and less peanut shape.



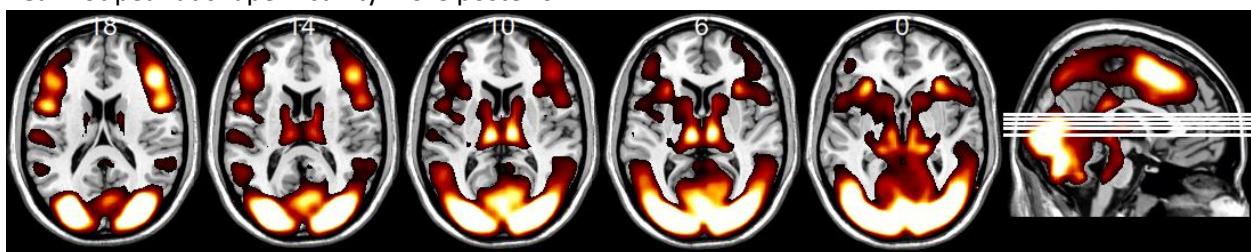
#### *Language*

Muted peanut activity, more left-posterior.



#### *Multiple Demand*

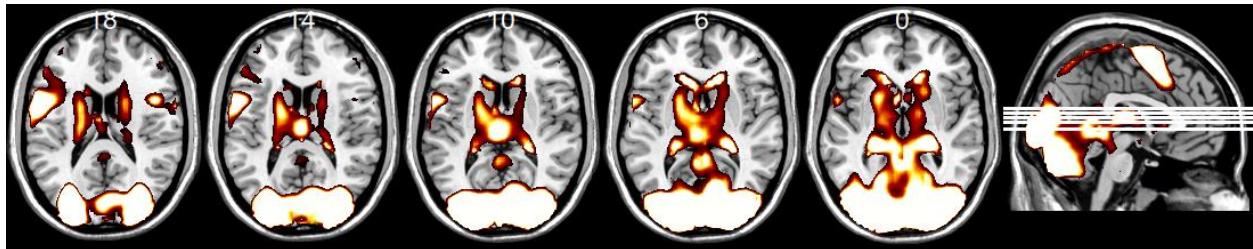
Pear not peanut shape. Activity more posterior.



---

*Initiation*

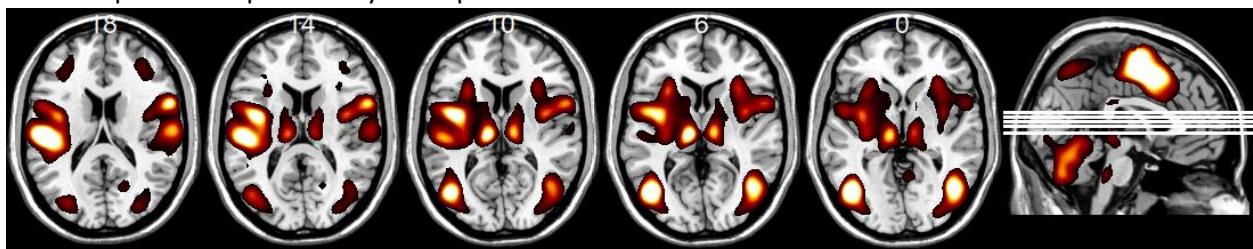
No distinct peanut shape, activity left-lateralized and more medial.



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*One-Handed Response*

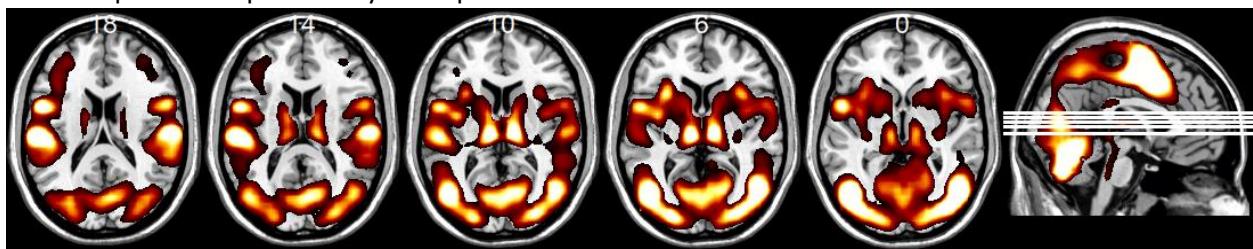
Pear not peanut shape. Activity more posterior.



---

*Two-Handed Response*

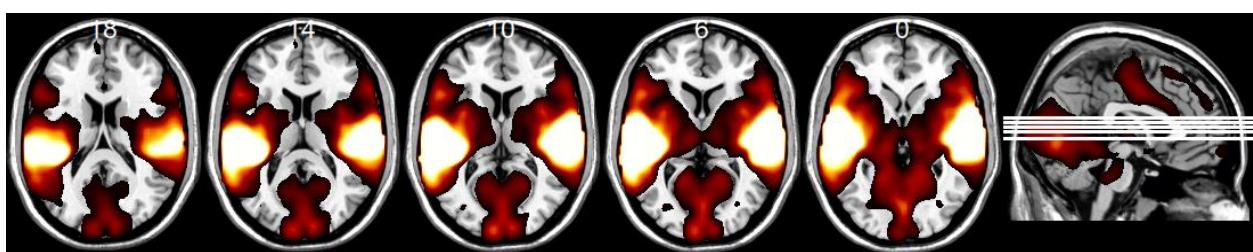
Pear not peanut shape. Activity more posterior.



---

*Auditory Perception*

No peanut activity.



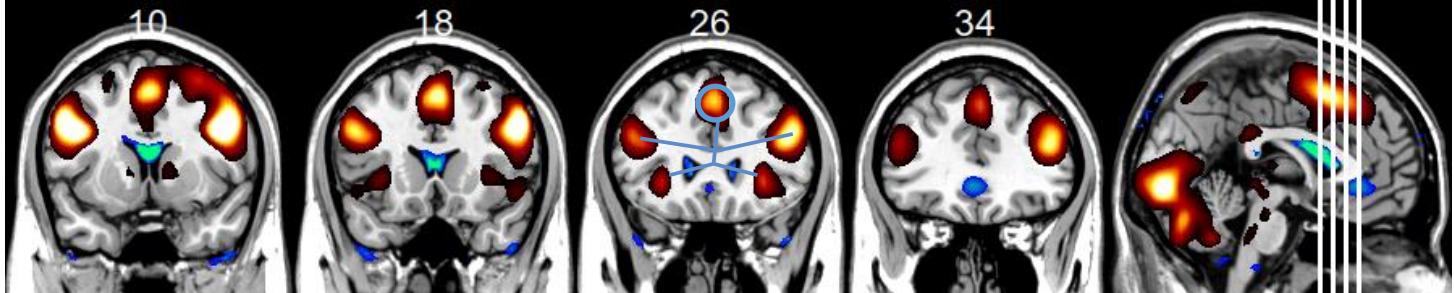
## Multiple Demand (MD)

Previous Names: Sustained Attention (SATT),  
External Attention (EXT)



### 1. Jumping Jack Flash: 136,144,152,160

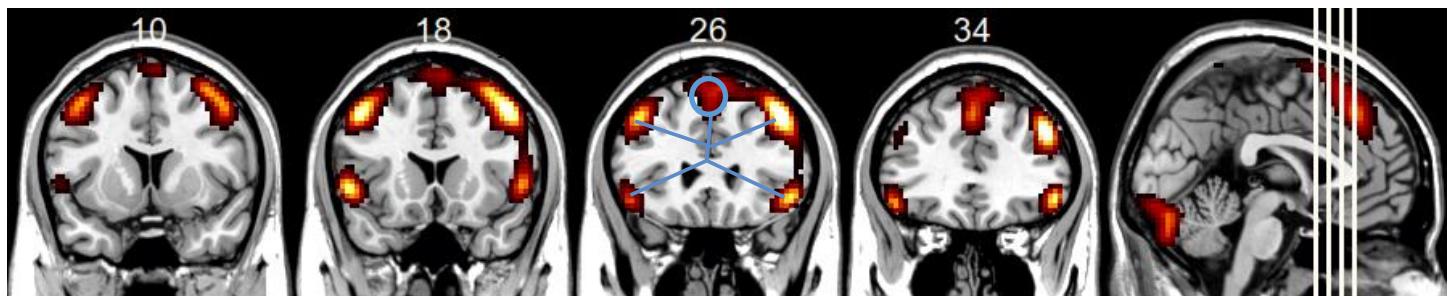
Bilateral activity in head, hands and feet, prominent on slice 18 and/or 26.



### Other Networks:

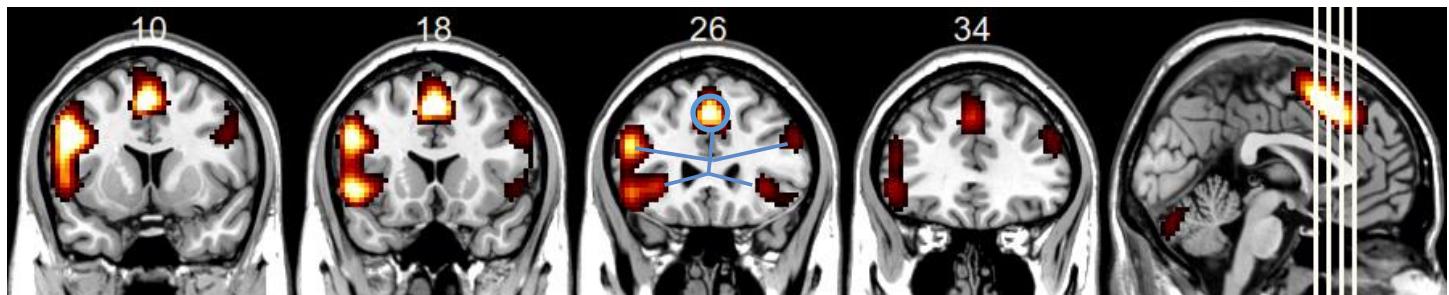
#### *Re-Evaluation*

Hands and feet more spread out. Head less prominent.



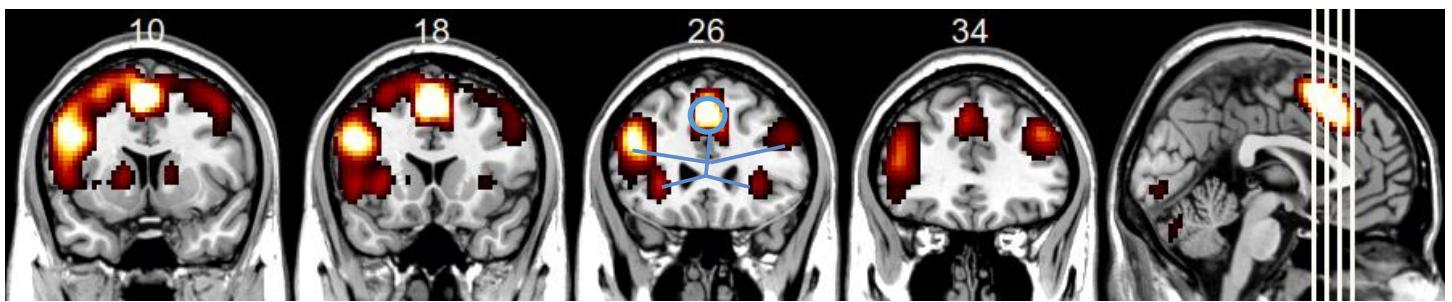
#### *Language*

Left-dominant activity. Left foot more lateral.



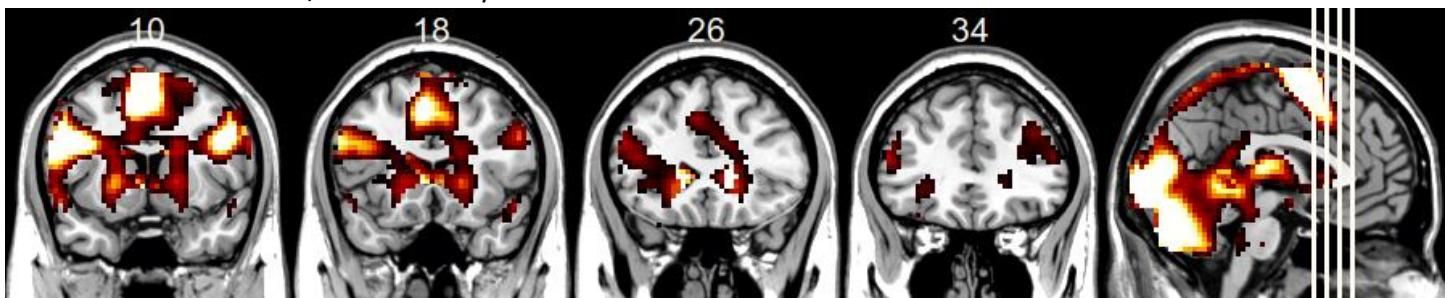
#### *Maintaining Internal Attention*

Left hand prominent.



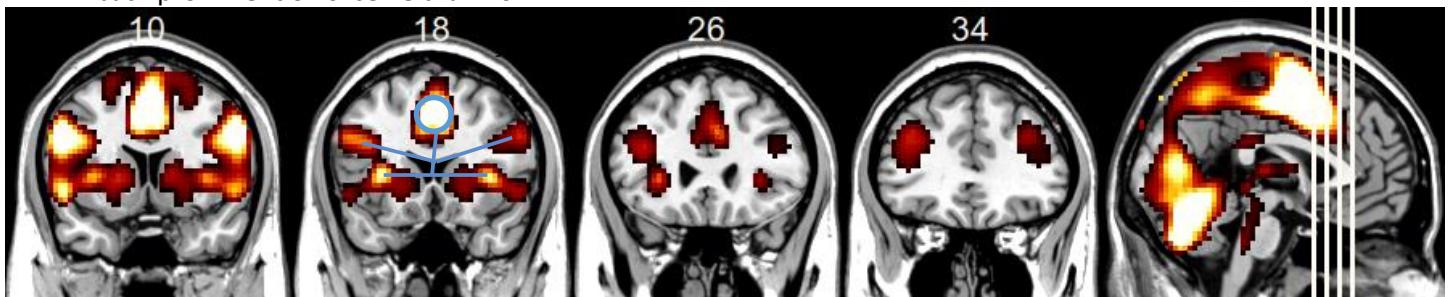
*Initiation*

No distinct hands/feet. Feet very medial.

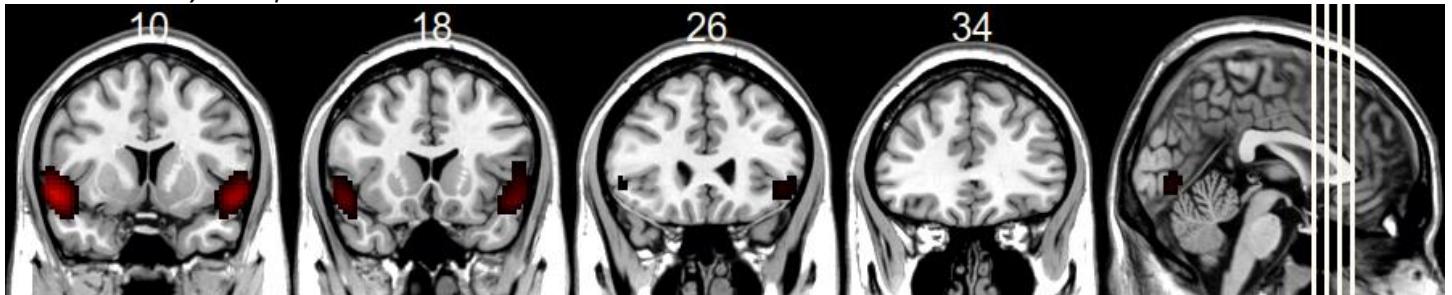


*Response*

Jack prominent on slice 18 than 26.



*Auditory Perception*



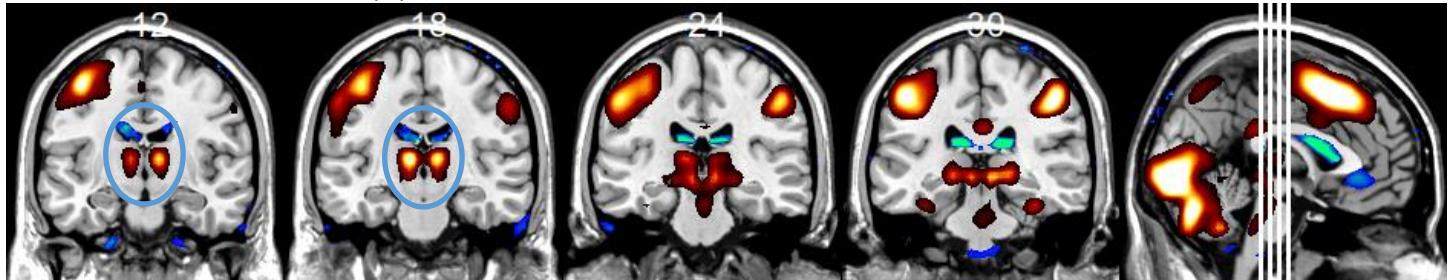


## Multiple Demand (MD)

Previous Names: Sustained Attention (SATT),  
External Attention (EXT)

### 2. Ape Nostrils: 114, 108, 102, 96

Bilateral central activity, prominent on slices -12 or -18.

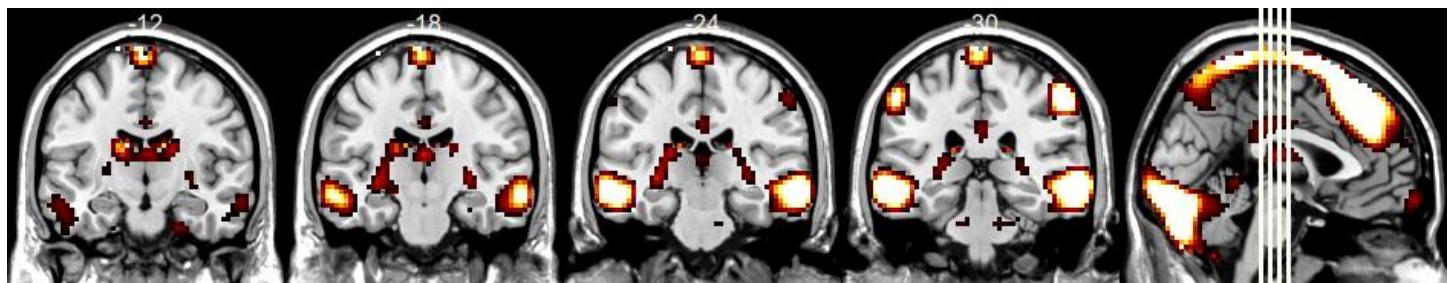


### Other Networks:

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#### *Re-Evaluation*

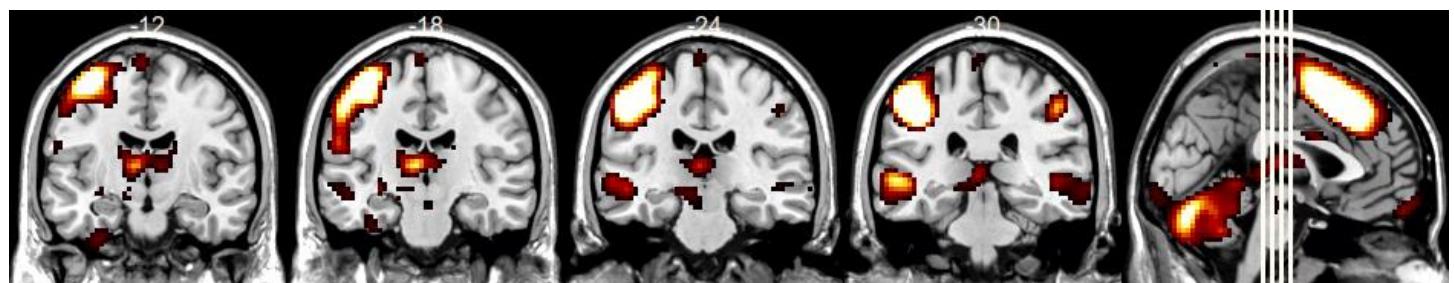
No distinct nostrils and activity more lateral and superior.




---

#### *Language*

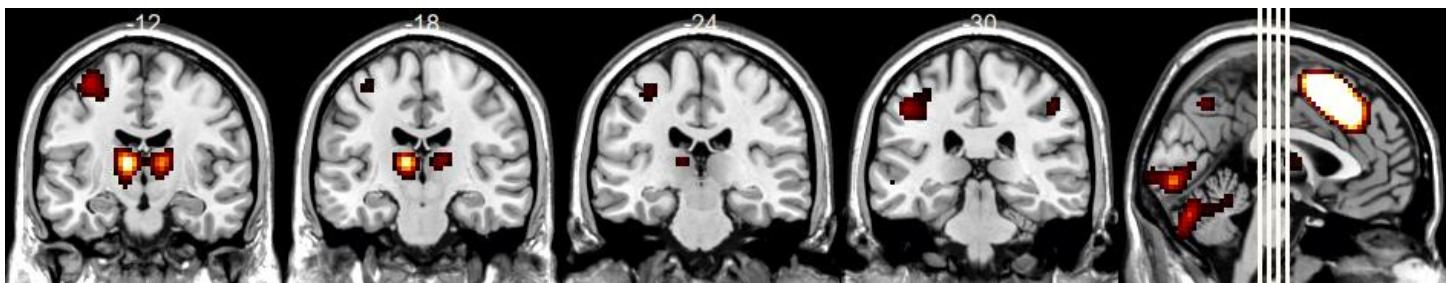
Not distinct and left-dominant activity.




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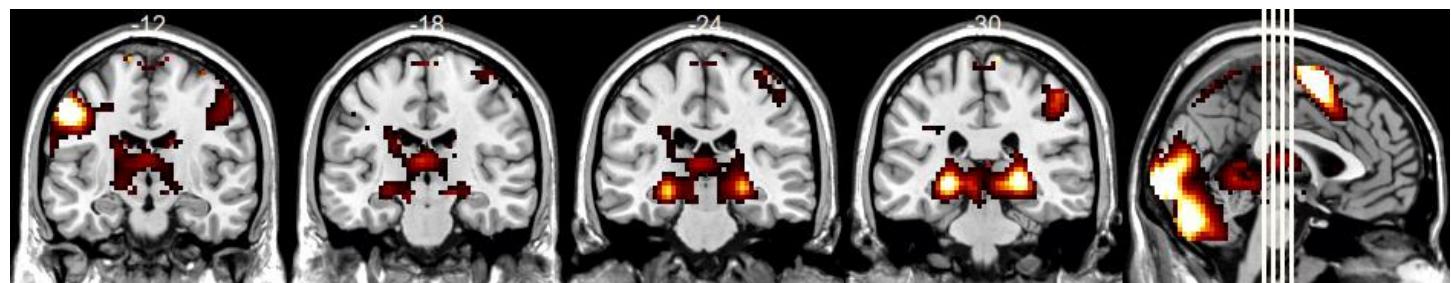
#### *Maintaining Internal Attention*

Left-dominant nostrils.



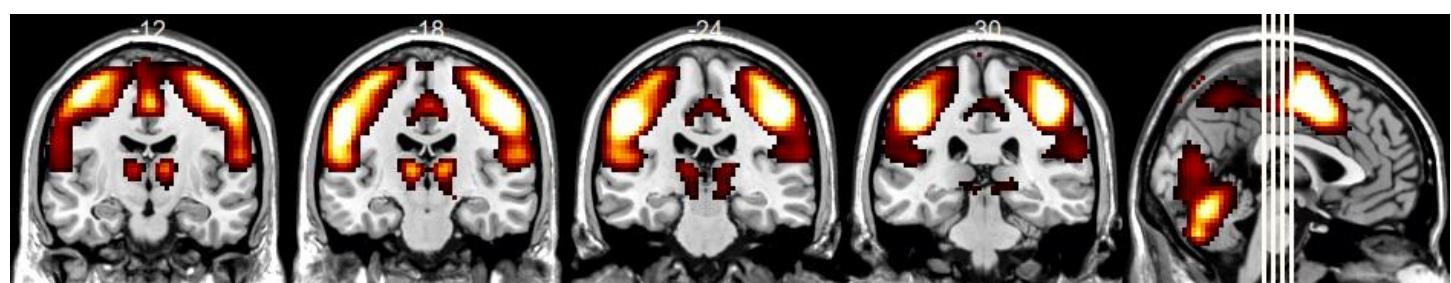
*Initiation*

No distinct nostrils.



*Response*

Nostrils with ape hair.



*Auditory Perception*

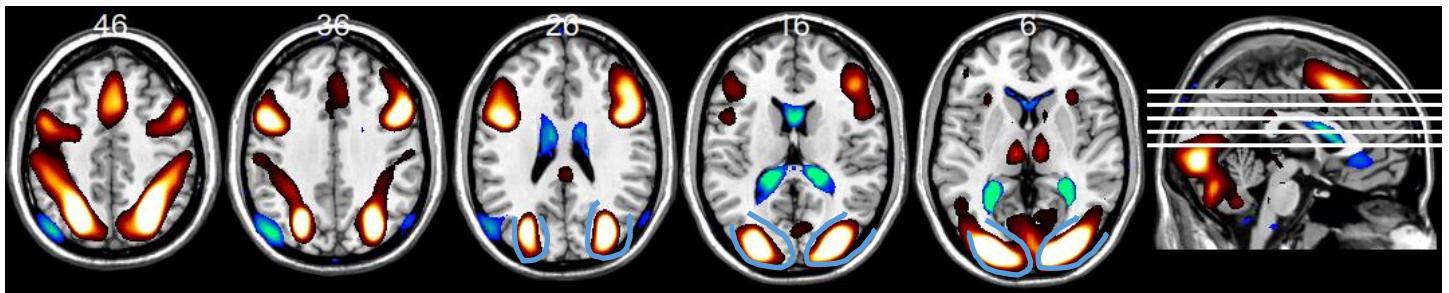


**Multiple Demand (MD)**  
 Previous Names: Sustained Attention (SATT),  
 External Attention (EXT)



**3. Flexing Hands: 118, 108, 98, 88, 78**

Bilateral activation on posterior border of slices, hands in slice 26 that begin flexing when moving to slice 6

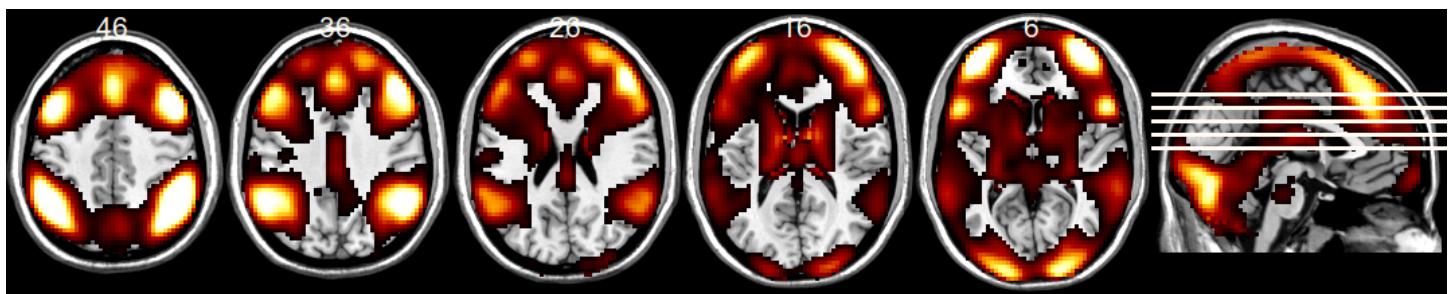


Other Networks:

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*Re-Evaluation*

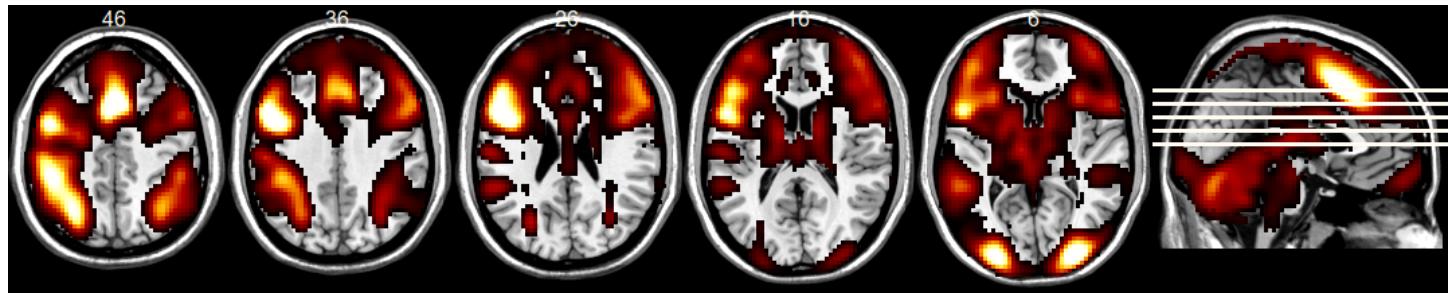
No hands on slices 26 and 16.




---

*Language*

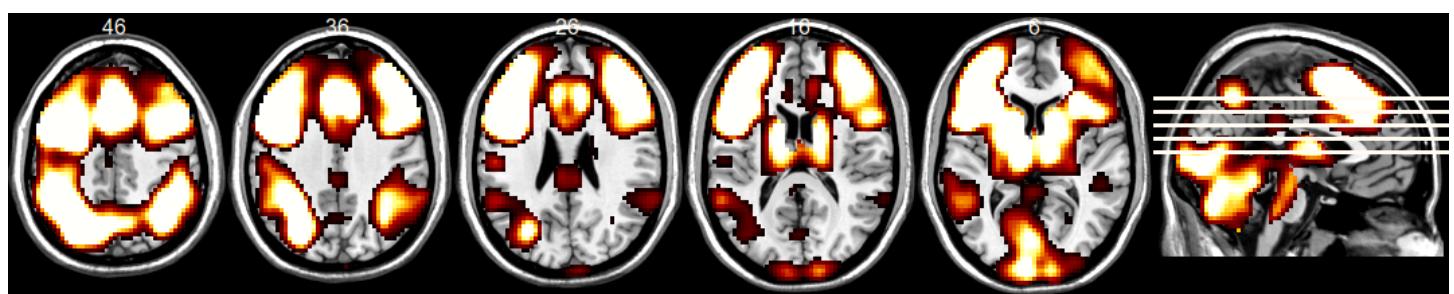
No hands on slices 26 and 16.




---

*Maintaining Internal Attention*

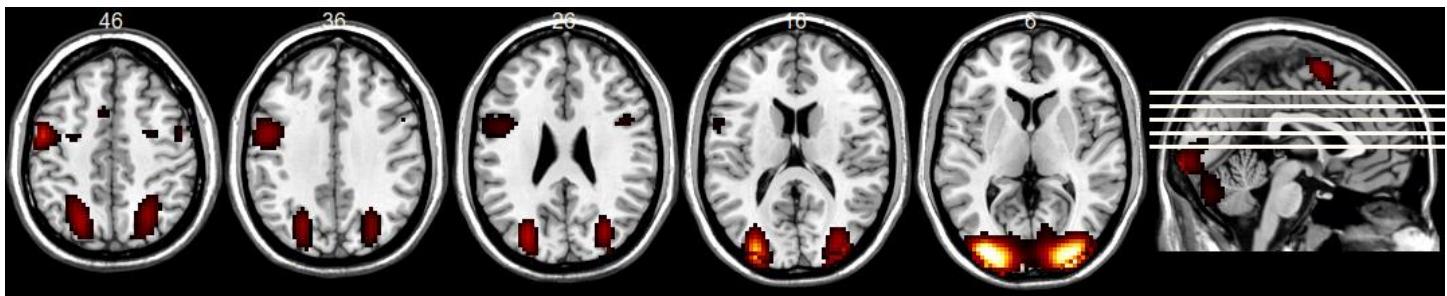
No distinct hands.



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*Initiation*

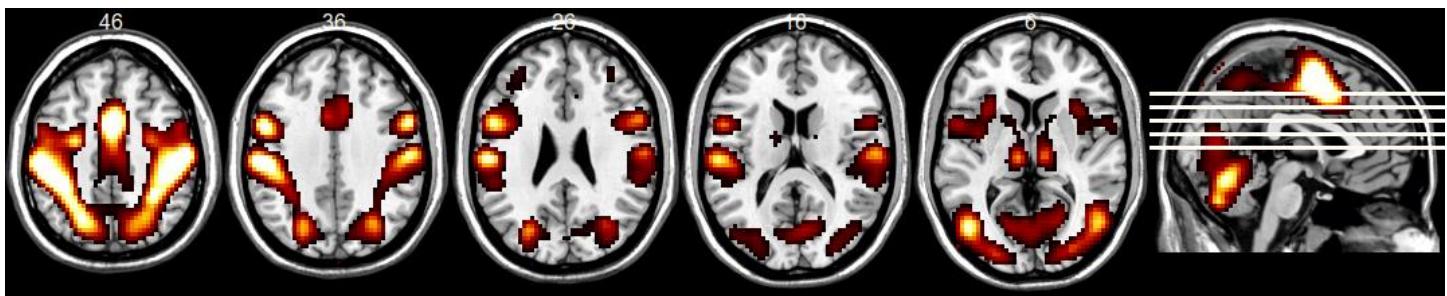
Hands much more prominent on 6 than 26, and left-dominant on slice 16.



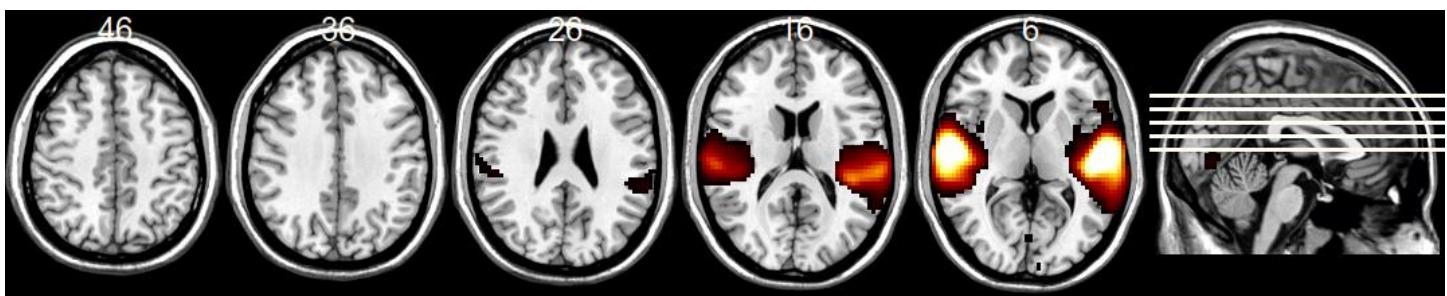
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*Response*

Hands less distinct activity and more anterior and lateral on slice 6.



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*Auditory Perception*

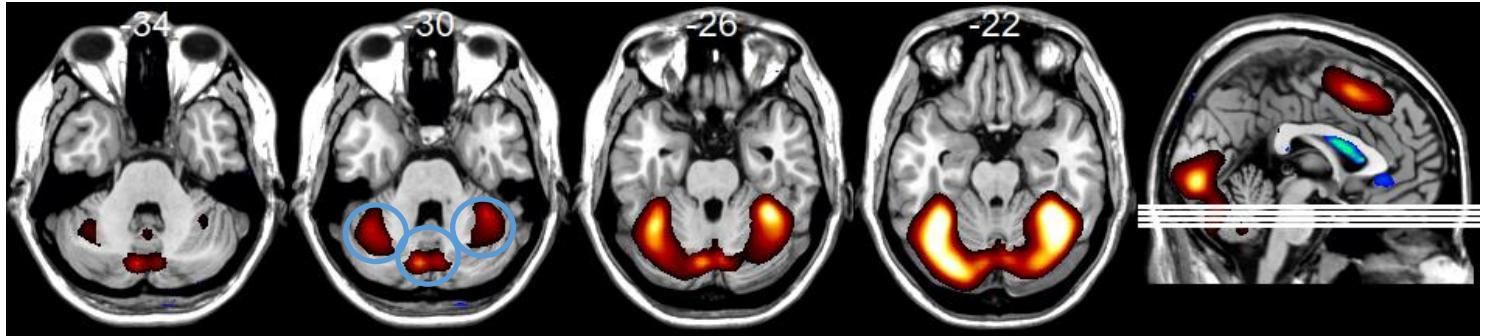
## Multiple Demand (MD)

Previous Names: Sustained Attention (SATT),  
External Attention (EXT)



### 4. Wipe Your Mouth Bear Triple Jam: 38, 42, 46, 50

High jam corners on slice -30.

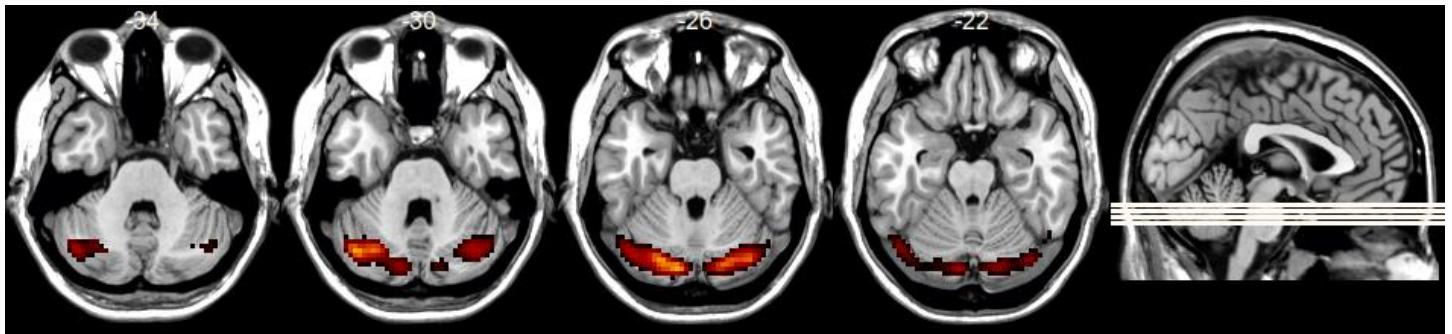


#### Other Networks:

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#### *Re-Evaluation*

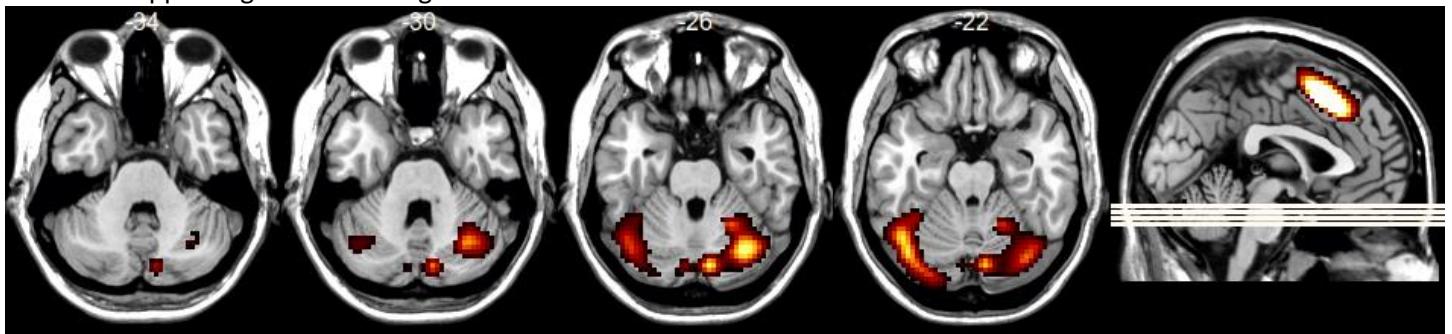
Low jam corners and moustache on slice -26.




---

#### *Language*

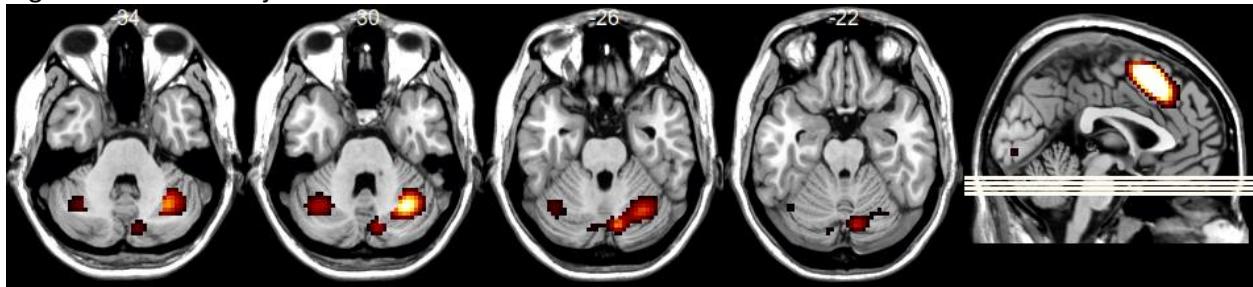
Right-dominated low jam corners on slice -30. Prominent left lateral activity on slice -22, with disappearing face on the right.



---

*Maintaining Internal Attention*

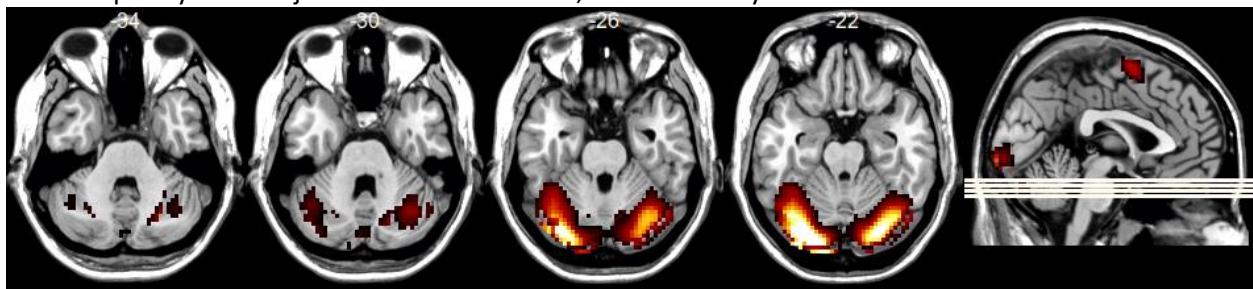
Right-dominated low jam corners on slice -30.



---

*Initiation*

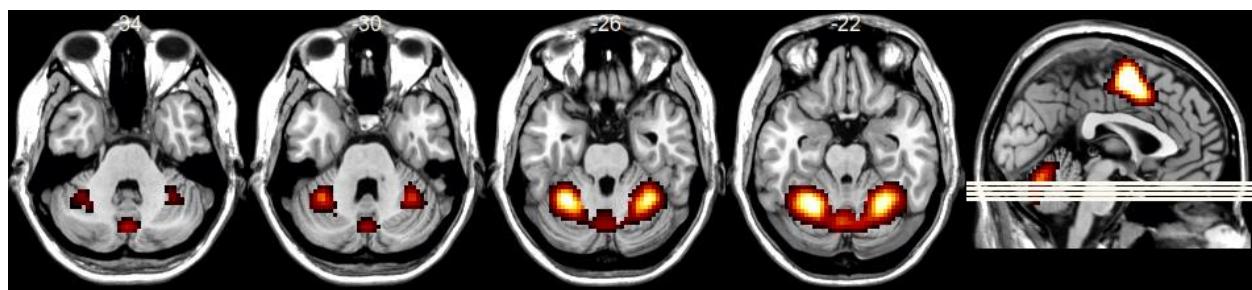
Low and poorly defined jam corners on slice -30, with not really crab on slice -26.



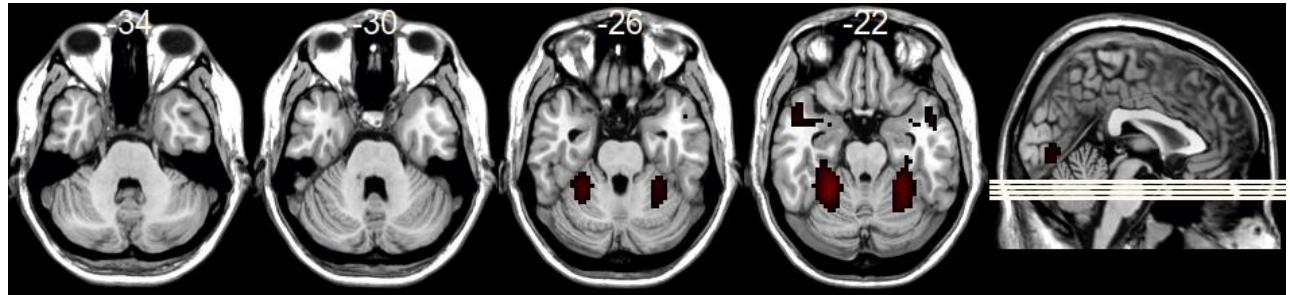
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*Response*

High jam corners on slice -30 with compact crab on slice -26.



---

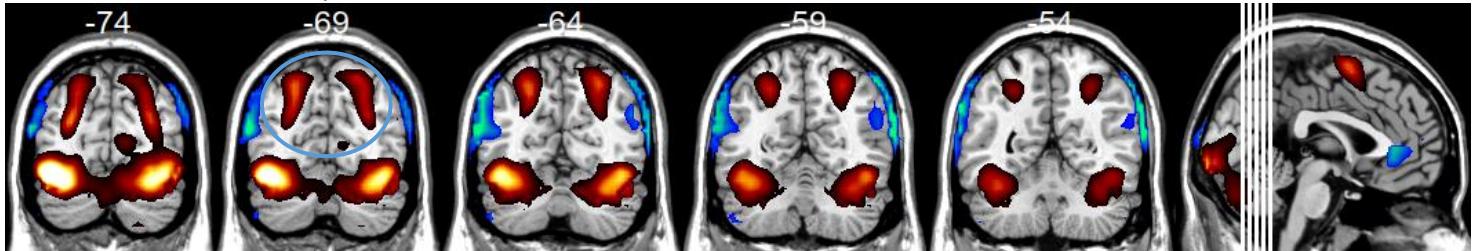
*Auditory Perception*

## Initiation (INIT)

### 1. Raised Eyebrows: 52, 57, 62, 67, 72



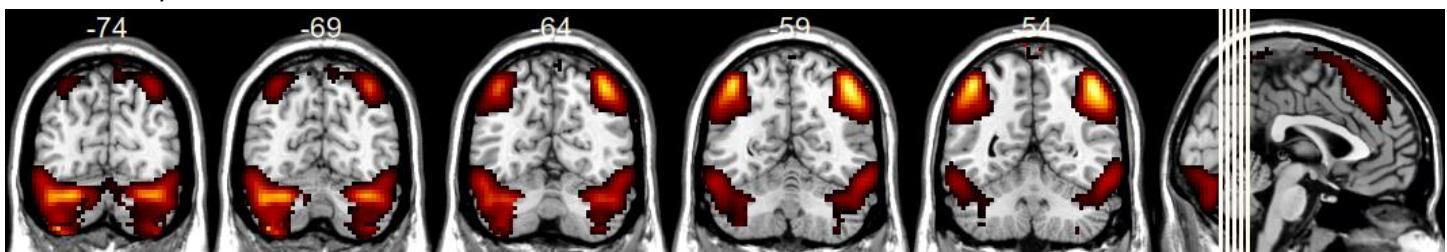
Raised bilateral eyebrows in slices -74 and -69.



### Other Networks:

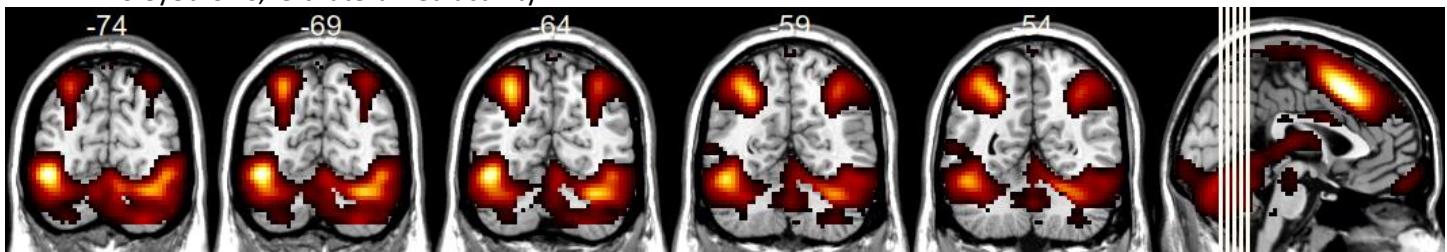
#### *Re-Evaluation*

No eyebrows.



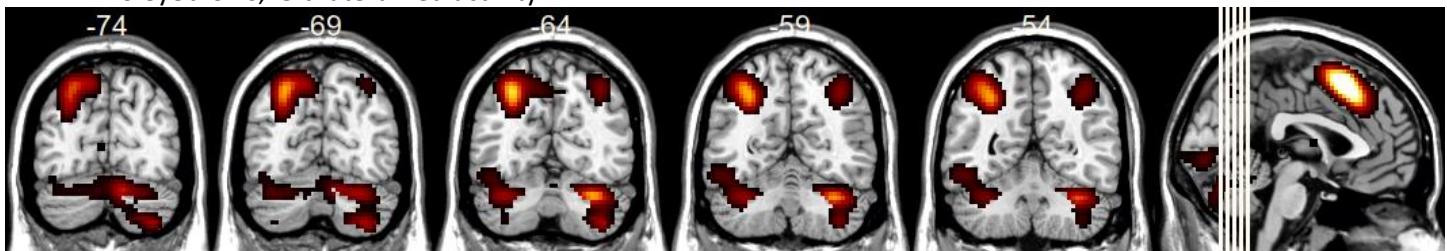
#### *Language*

No eyebrows, left-lateralized activity.



#### *Maintaining Internal Attention*

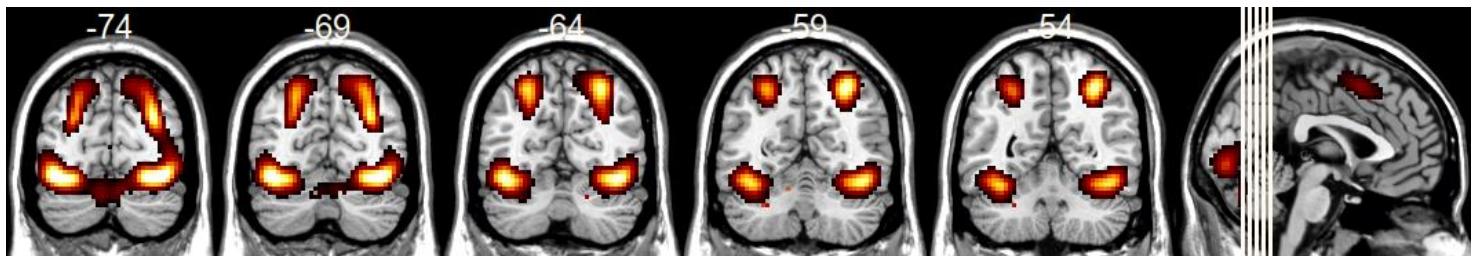
No eyebrows, left-lateralized activity.



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*Multiple Demand*

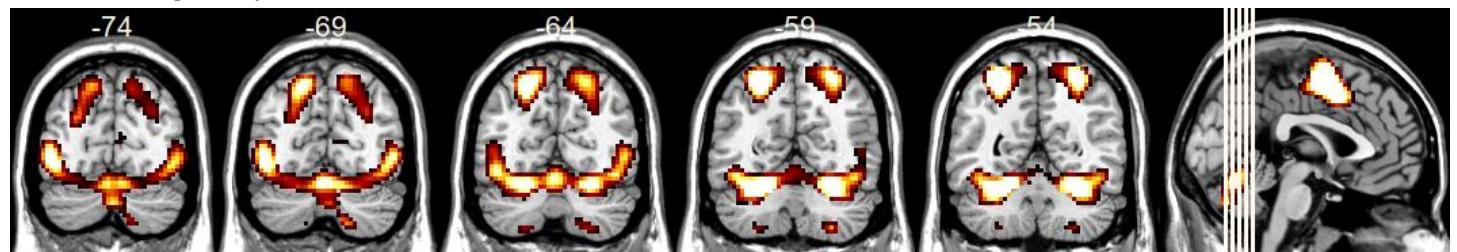
Similar to Initiation.



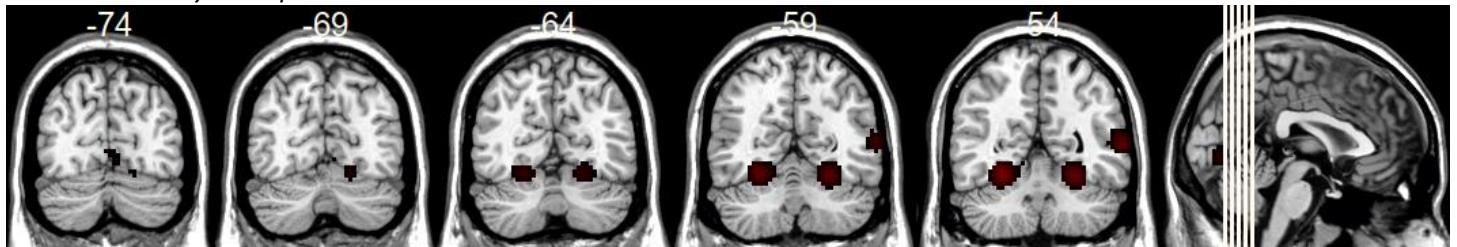
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*Response*

Strong left eyebrow with moustache underneath

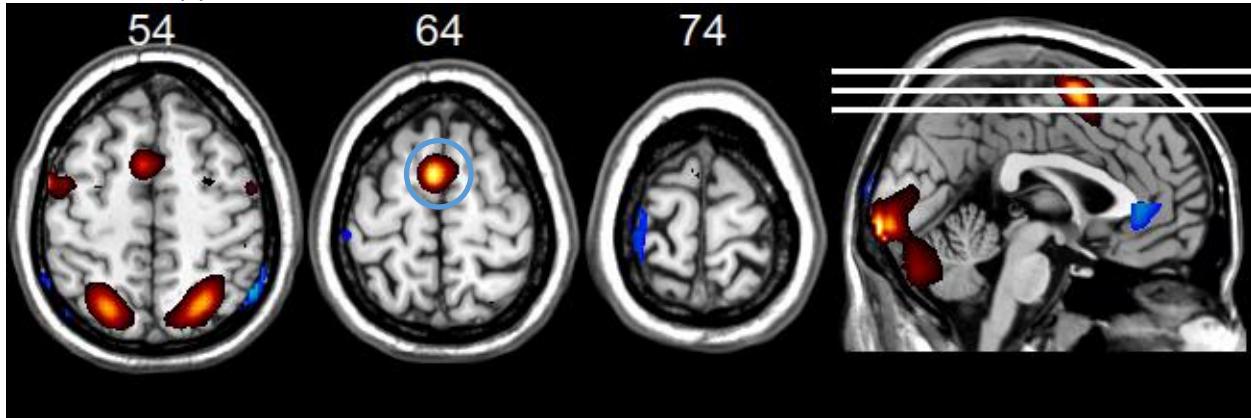


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*Auditory Perception*

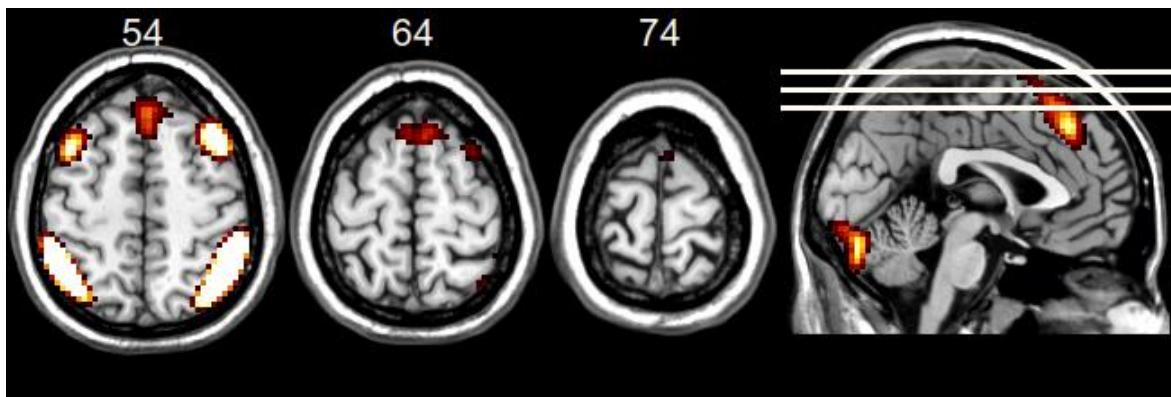
**Initiation (INIT)****64****2. When I'm 64: 126, 136, 146**

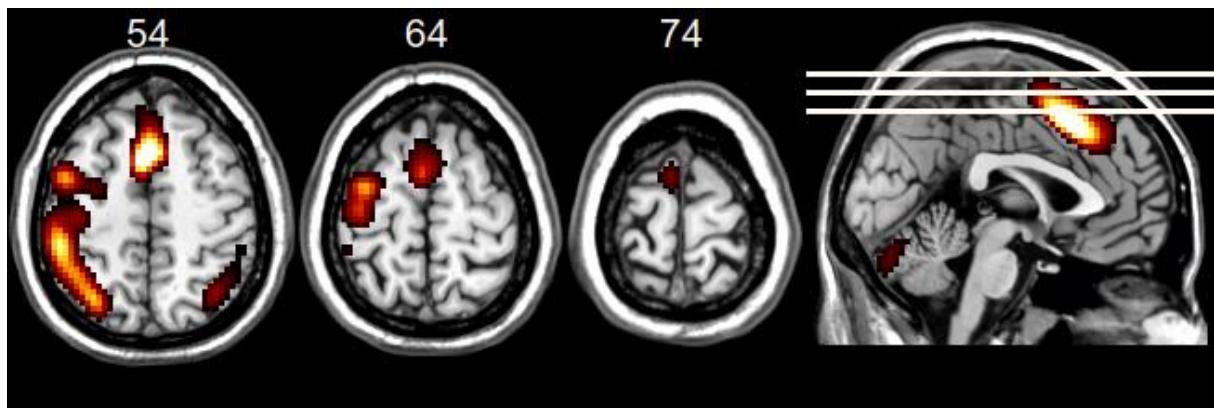
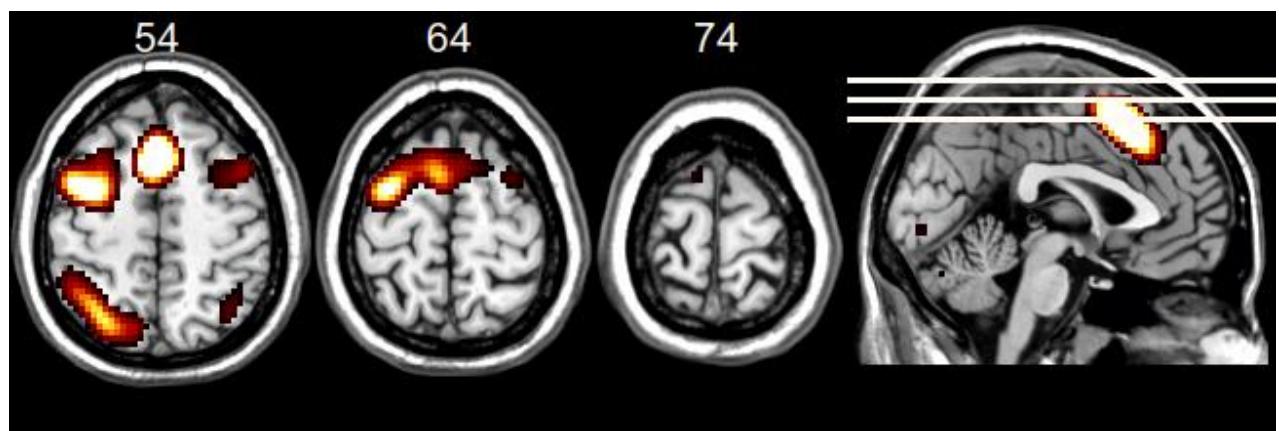
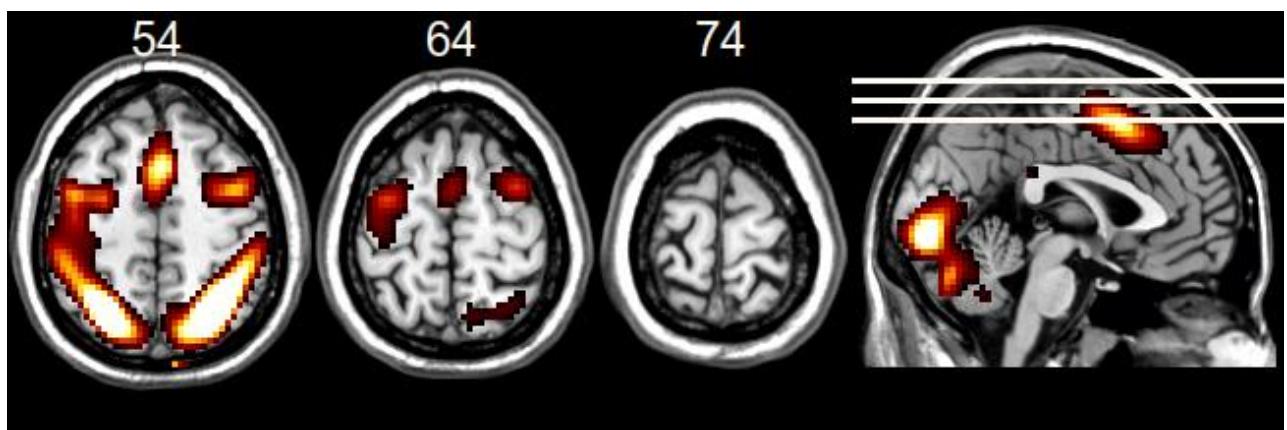
Activity peaks on slice 64 not 54.

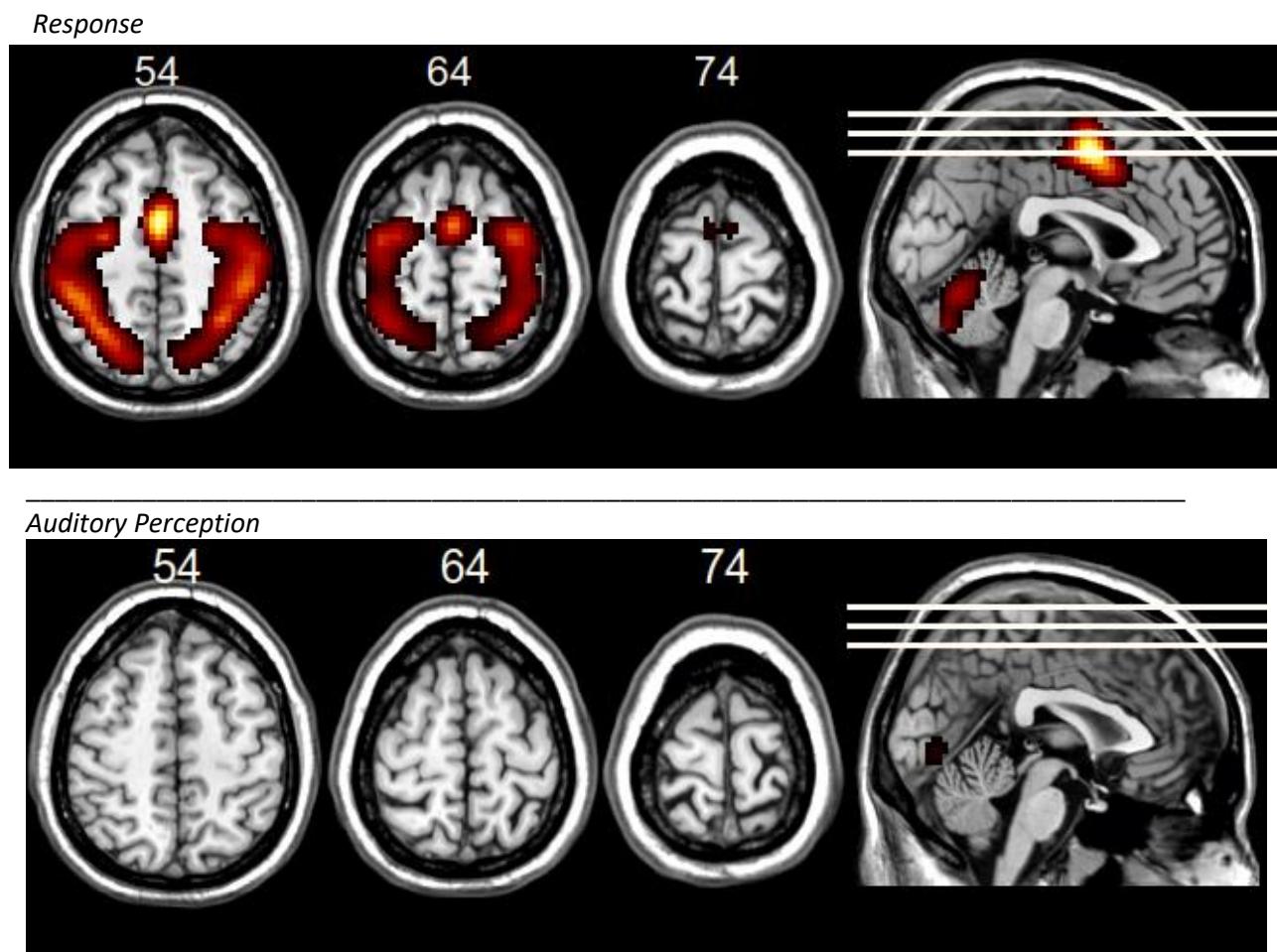
**Other Networks:**

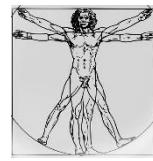
All peak on slice 54 not 64.

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*Re-Evaluation*

*Language**Maintaining Internal Attention**Multiple Demand*

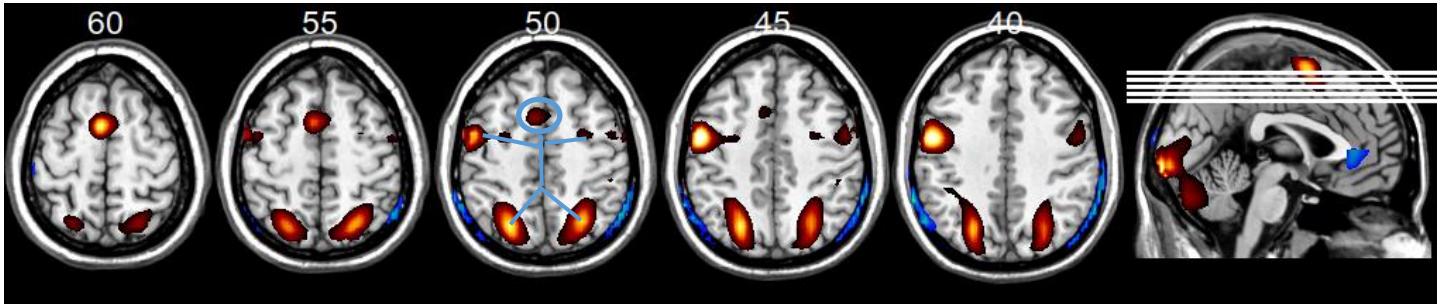




## Initiation (INIT)

### 3. De Divina Proportione Front Guy: 132, 127, 122, 117, 112

More prominent on slices 55 and 50. Left hand becomes more prominent in slices 45 through 55.

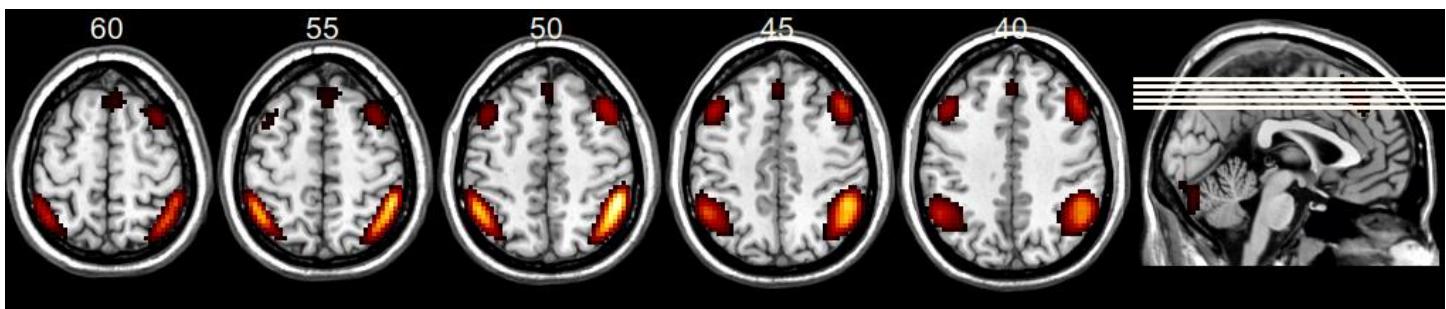


### Other Networks:

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#### *Re-Evaluation*

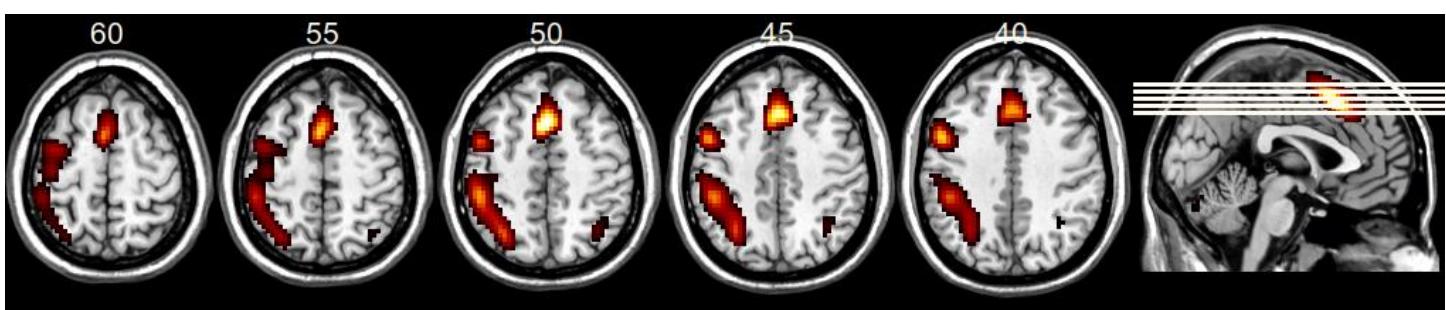
Wide and prominent feet.




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#### *Language*

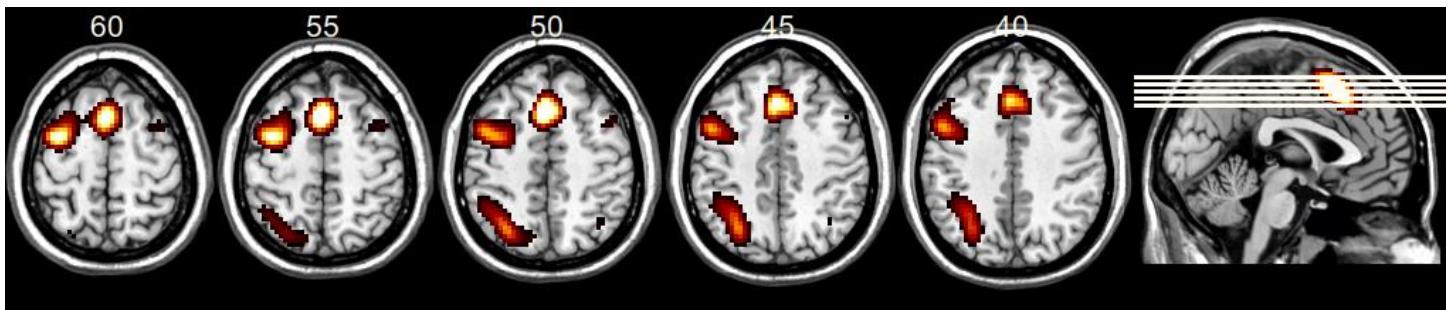
Left-lateralized, no distinct lower foot.



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*Maintaining Internal Attention*

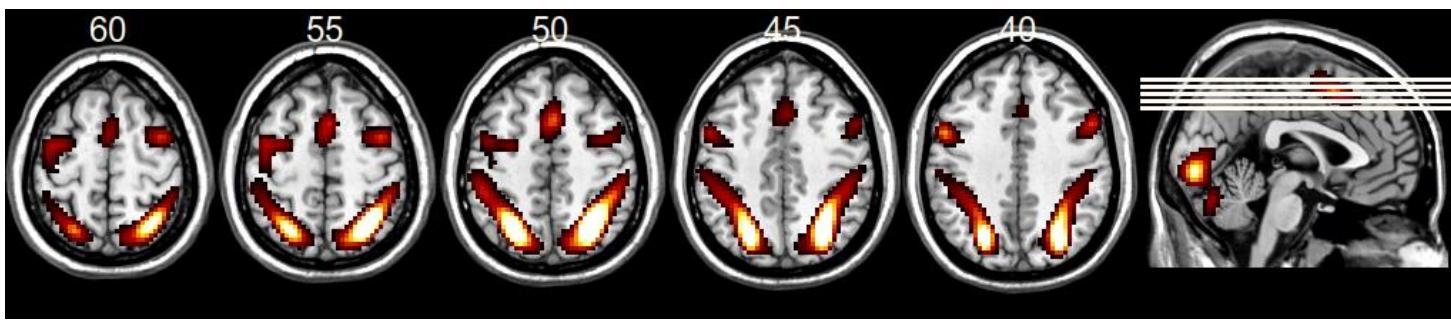
Left-lateralized.




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*Multiple Demand*

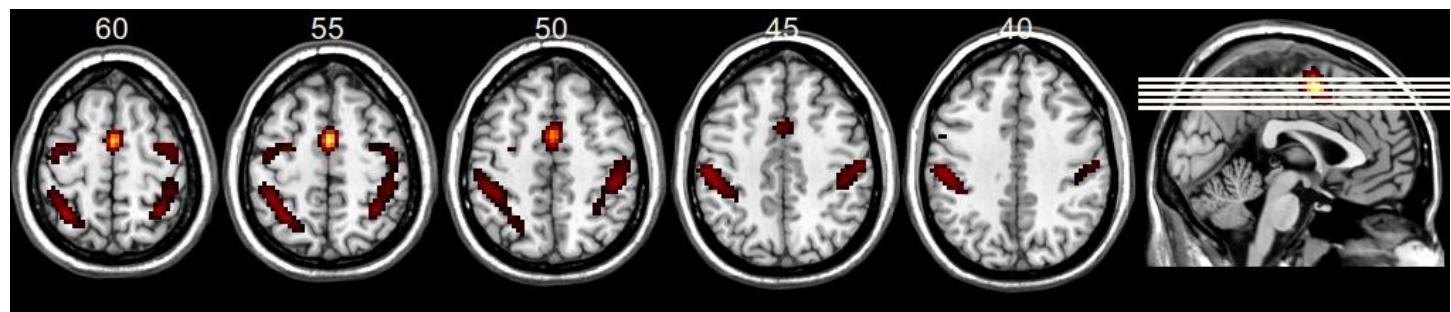
Prominent and smeared feet.




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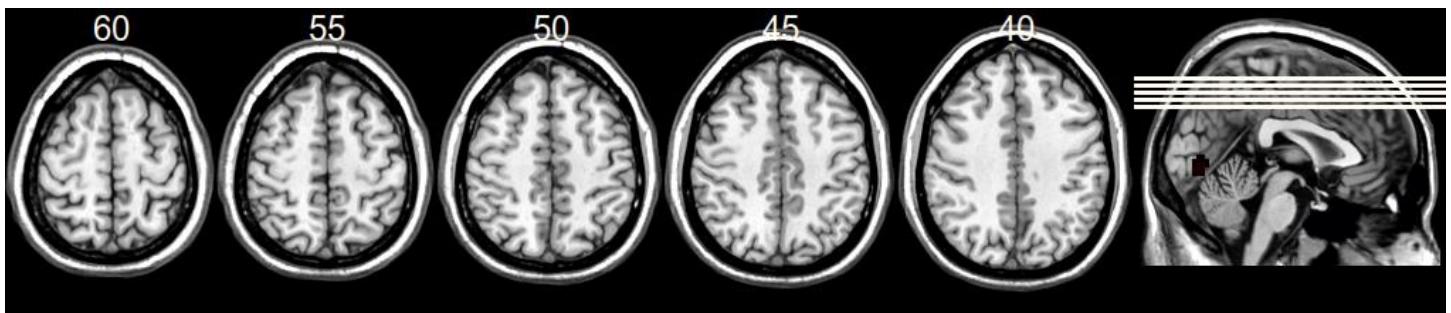
*Response*

Muted wide legs and low head on slice 60.

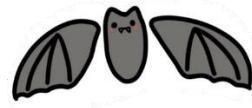



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*Auditory Perception*



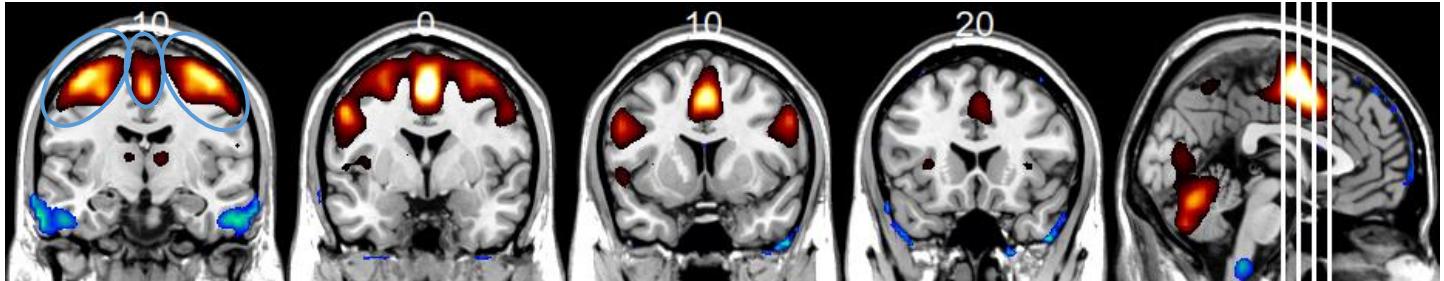
## Response (RESP)



1. Bat (One Sided if One-Handed Response): 116,126,136,146

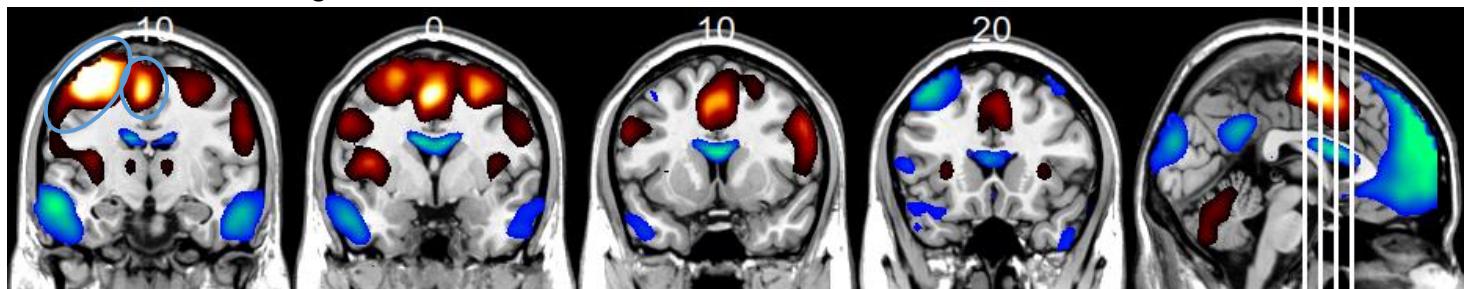
### Two-Handed (2RESP)

Bilateral.



### Right-Handed (1RESP)

Bat with left wing.

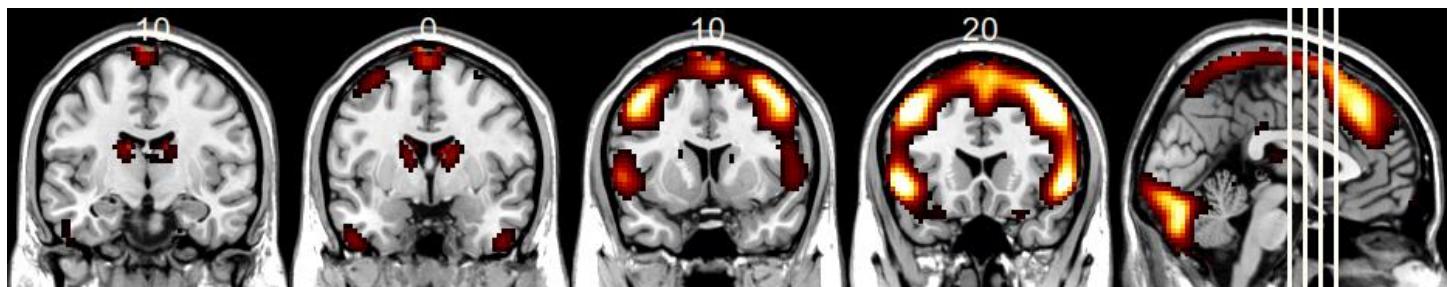


### Other Networks:

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#### *Re-Evaluation*

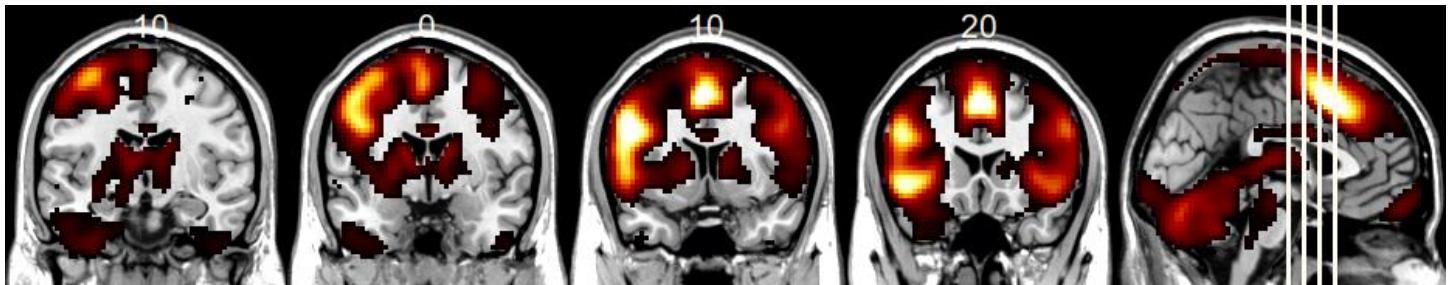
No bat on slices 10 and 0. Wide winged bat appears on slices 10 and 20.




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#### *Language*

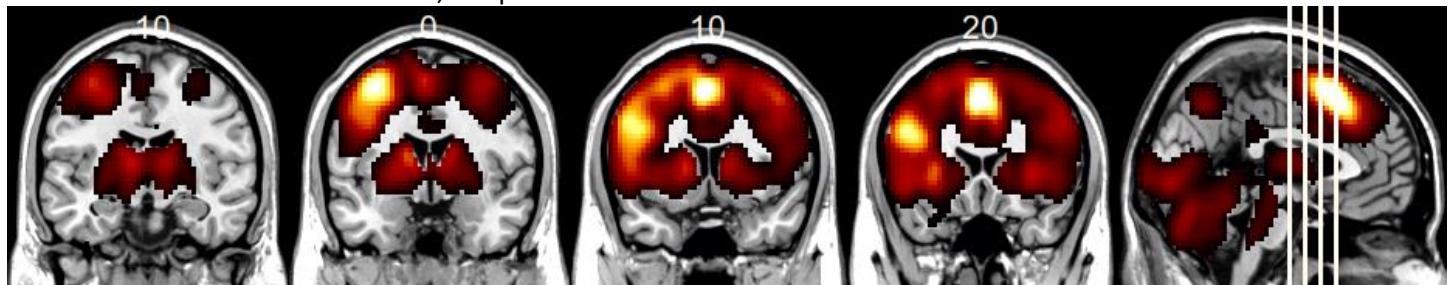
Left-dominated winged bat with drooping wings.




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*Maintaining Internal Attention*

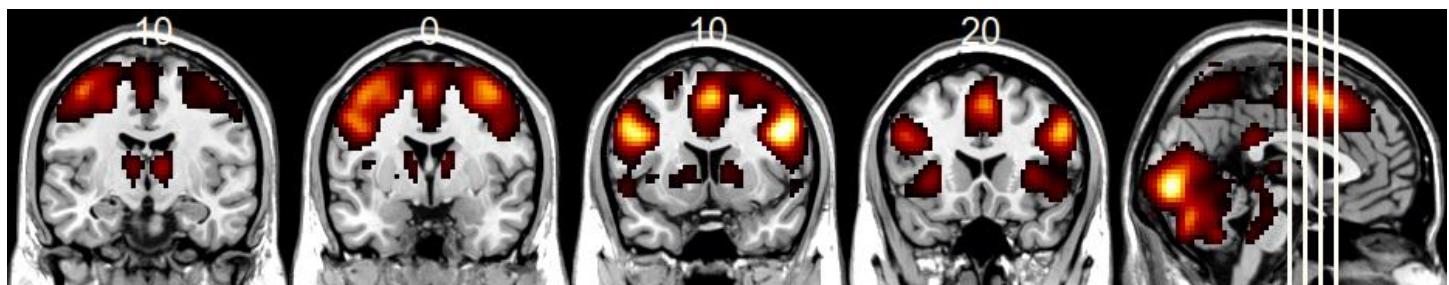
Left-dominant bat on slice 0, not prominent on slice 10.




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*Multiple Demand*

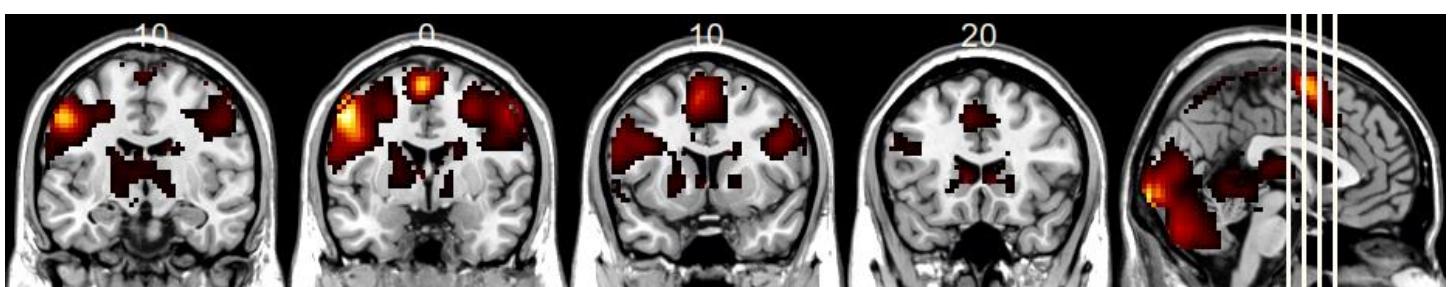
Bat with droopy wings.




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*Initiation*

Wings not really connected to bat body.



*Auditory Perception*



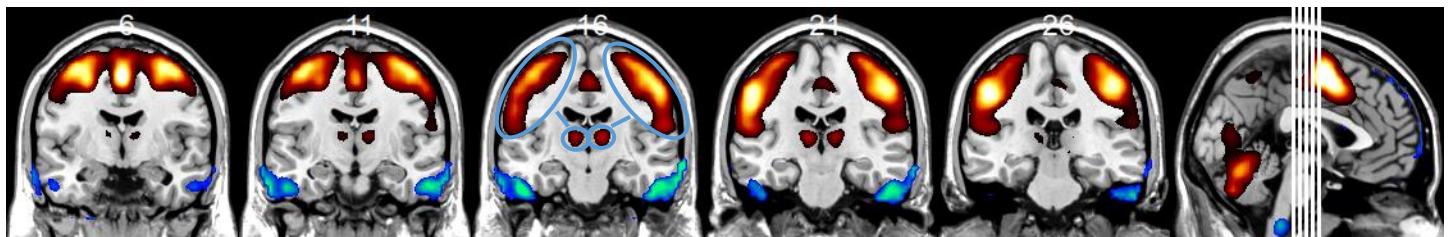
### Response (RESP)

#### 2. Thalamus Kite Surfer: 120, 115, 110, 105, 100

On slice 16. Kite becomes more prominent moving from 16 to 26. Kite is more prominent than thalamus activity.

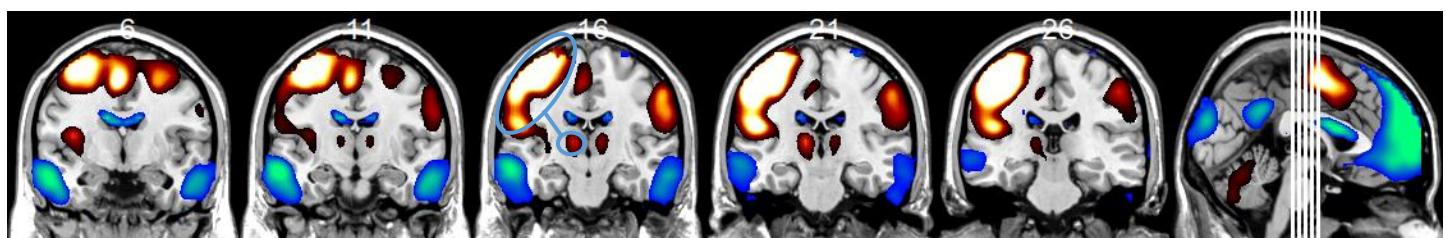
### Two-Handed (2RESP)

Bilateral.



### Right-Handed (1RESP)

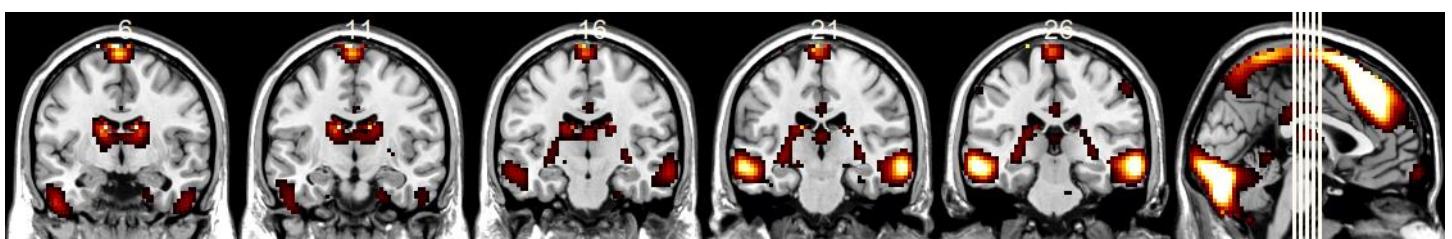
Left-lateralized.



### Other Networks:

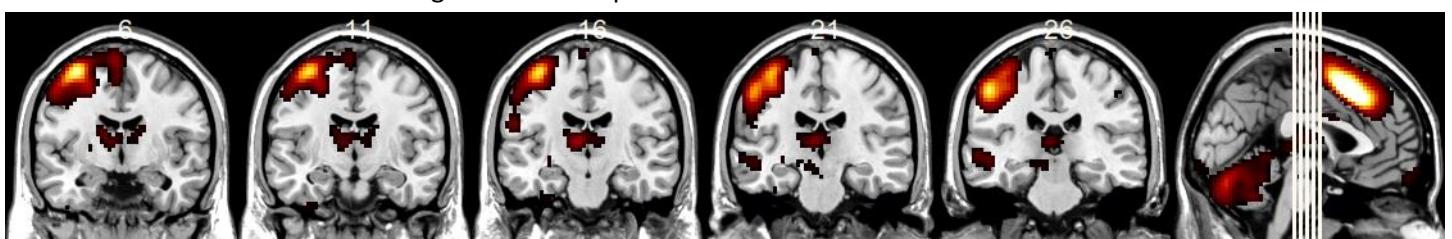
#### *Re-Evaluation*

No kite.



#### *Language*

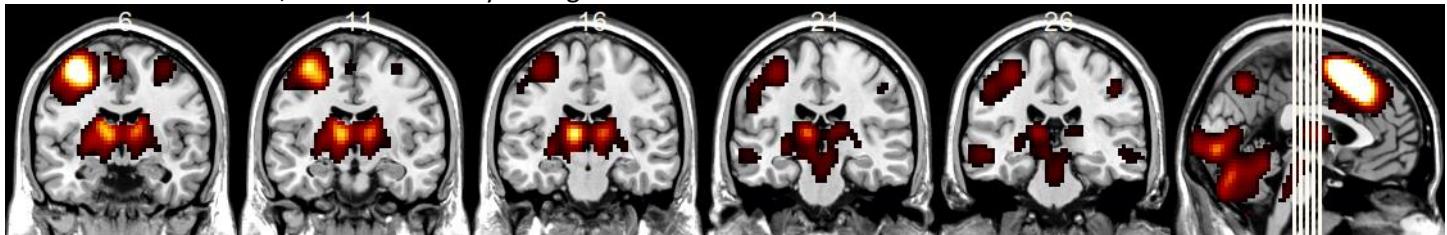
Left-lateralized. Similar to right-handed response.



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*Maintaining Internal Attention*

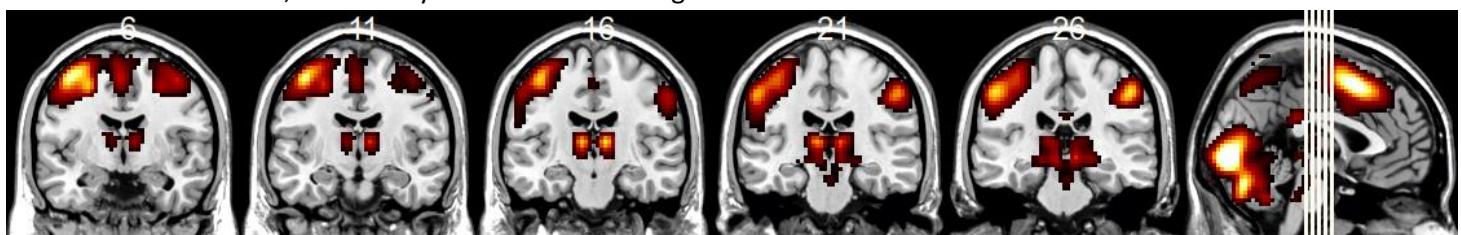
Left-lateralized, thalamus activity stronger than kite.



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*Multiple Demand*

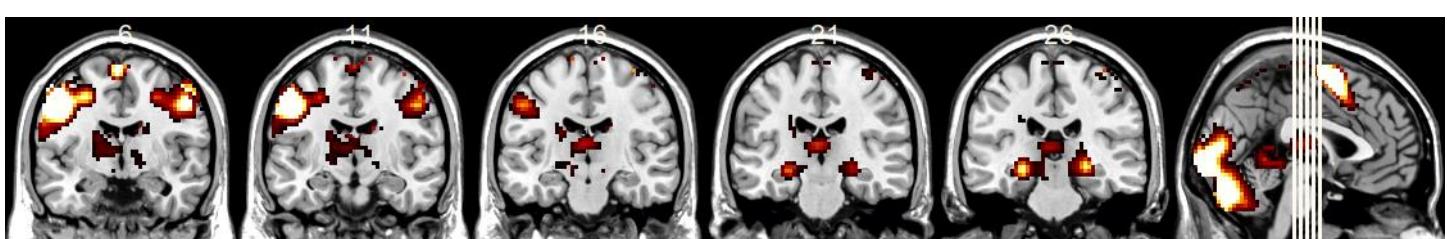
Similar slice 16, but activity in thalamus is stronger.



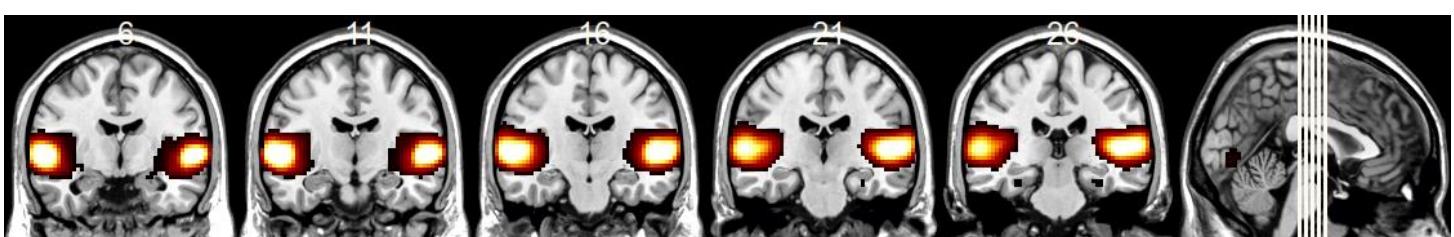
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*Initiation*

No defined kite or thalamus on slice 16.



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*Auditory Perception*

## Response (RESP)

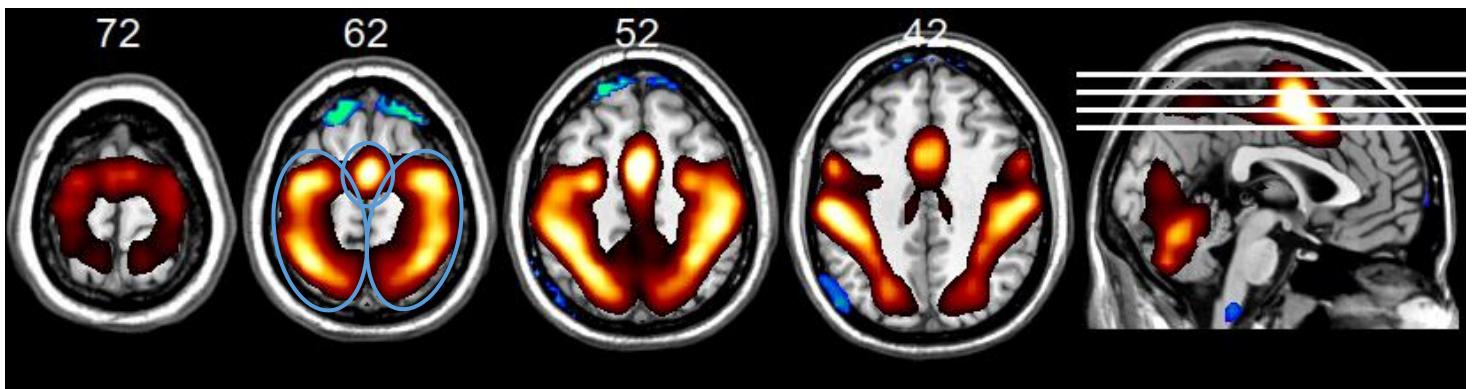
3. Butterfly (One Sided if One-Handed Response): 144, 134, 124, 114



Mainly on slices 62 and 52.

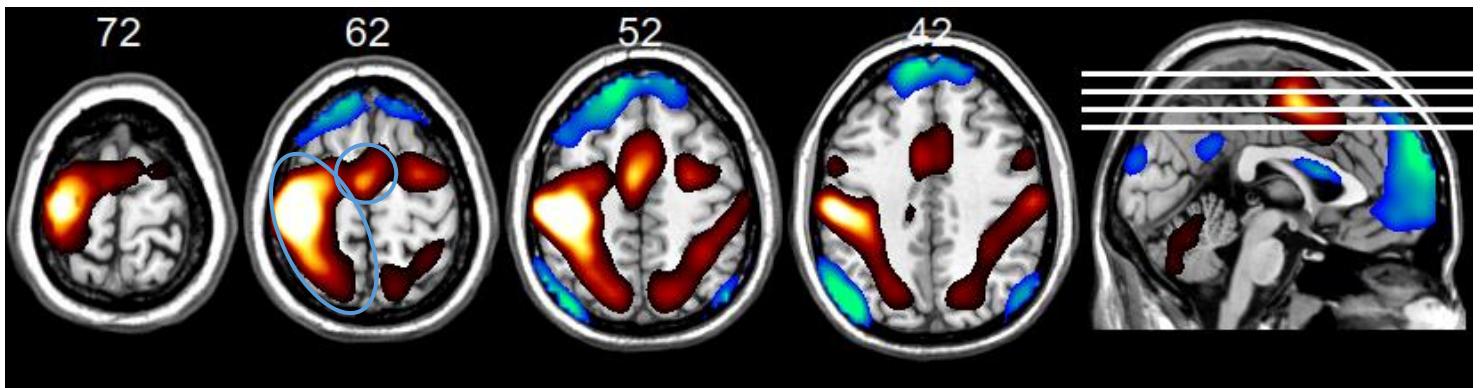
### Two-Handed (2RESP)

Bilateral.



### Right-Handed (1RESP)

Left-dominant.

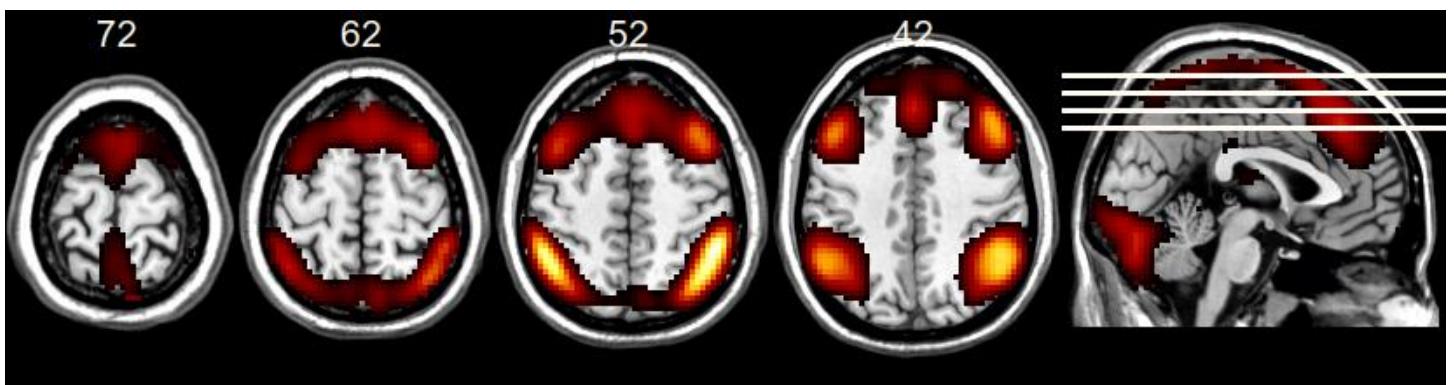


Other Networks:

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*Re-Evaluation*

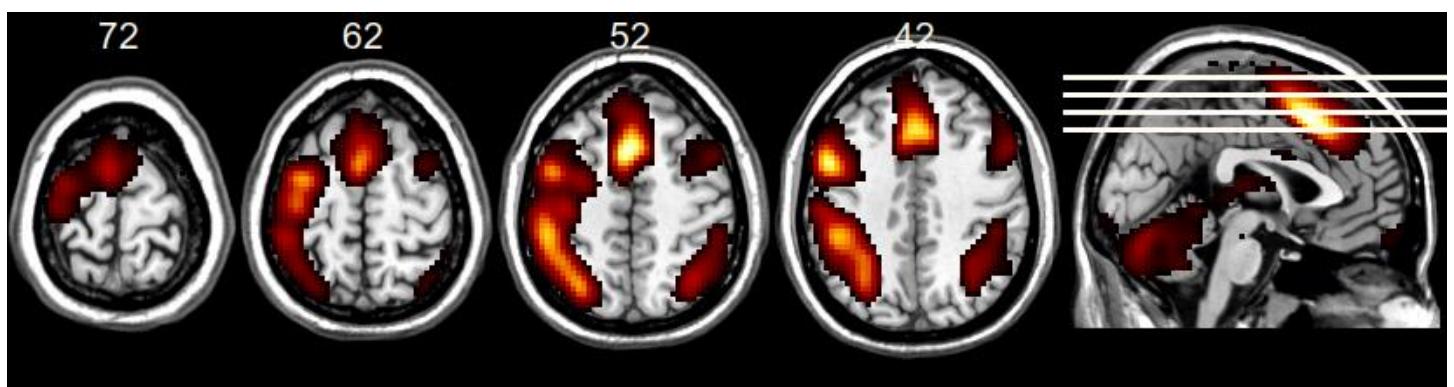
Lateral activation.



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*Language*

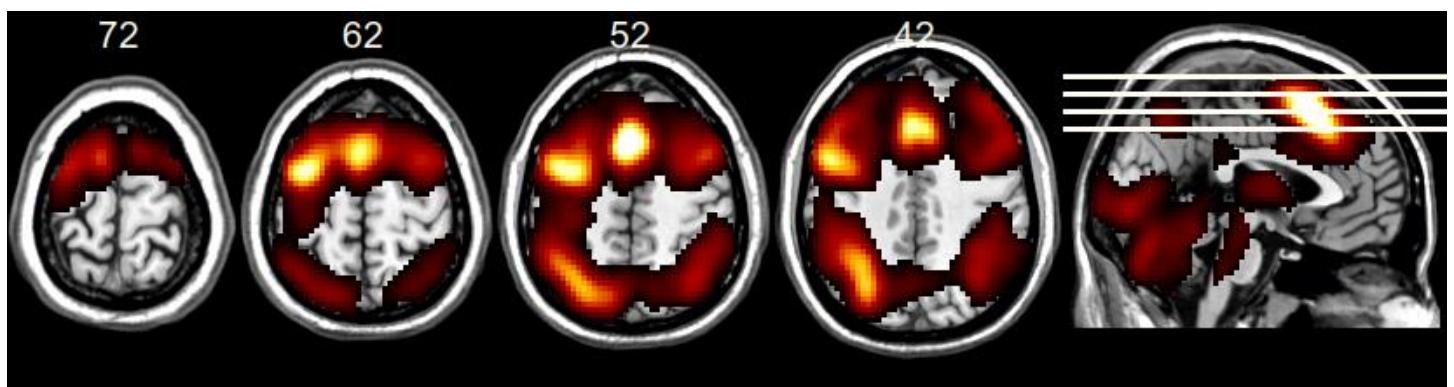
Left dominant and activity more lateral.



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*Maintaining Internal Attention*

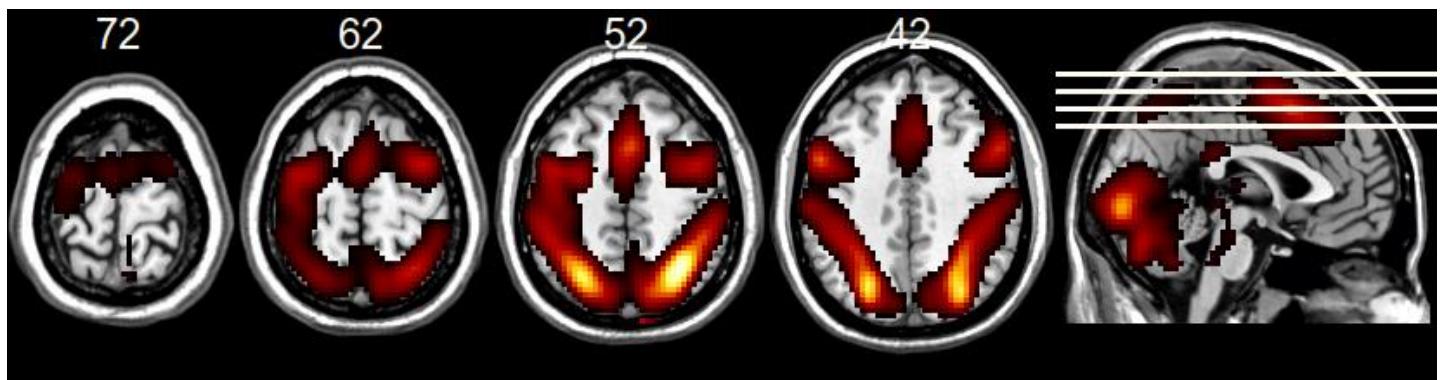
Left-dominated and wings less defined.



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*Multiple Demand*

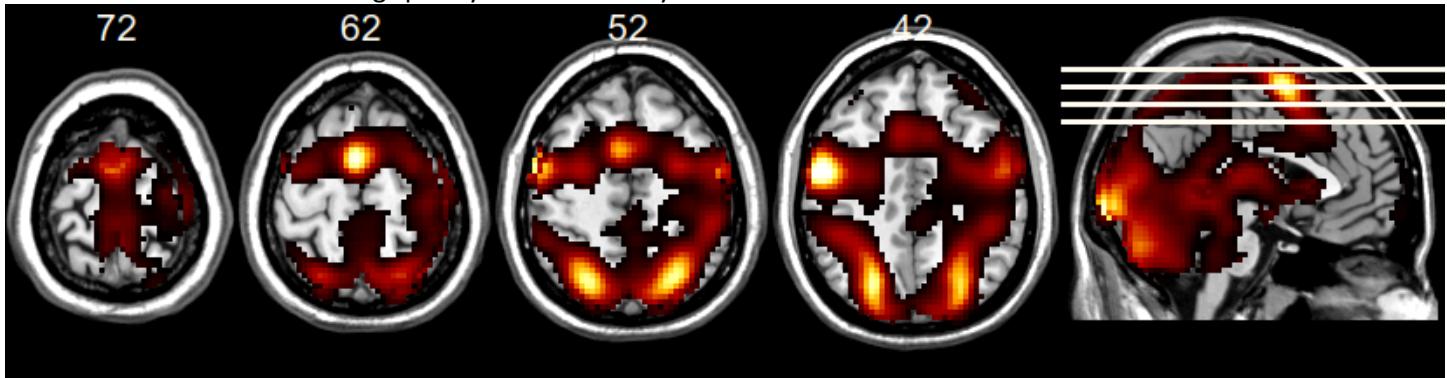
Activity more posterior.



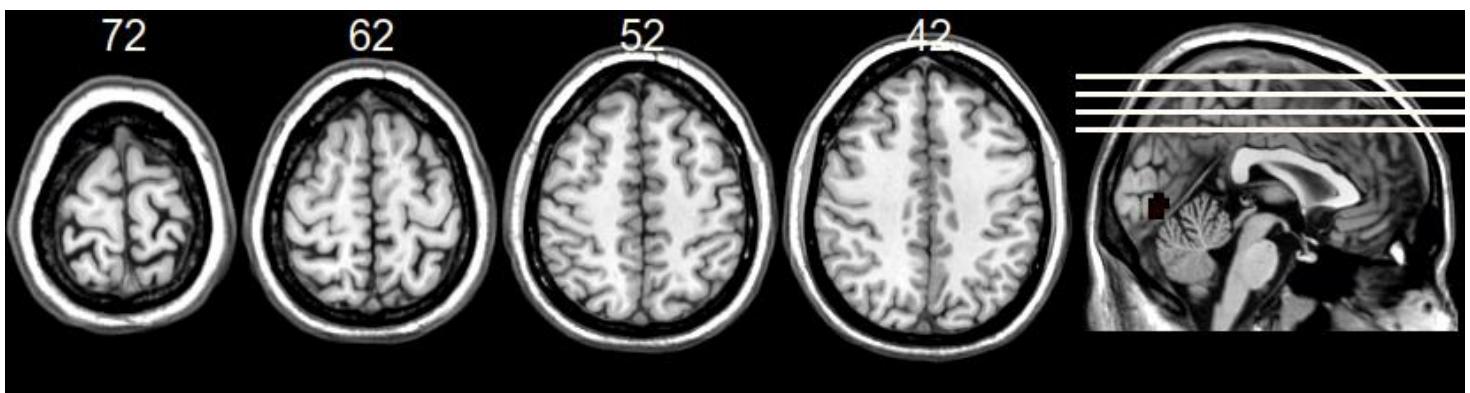
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*Initiation*

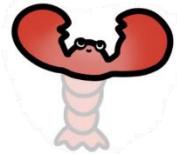
Left-dominant and wings poorly defined activity.



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*Auditory Perception*

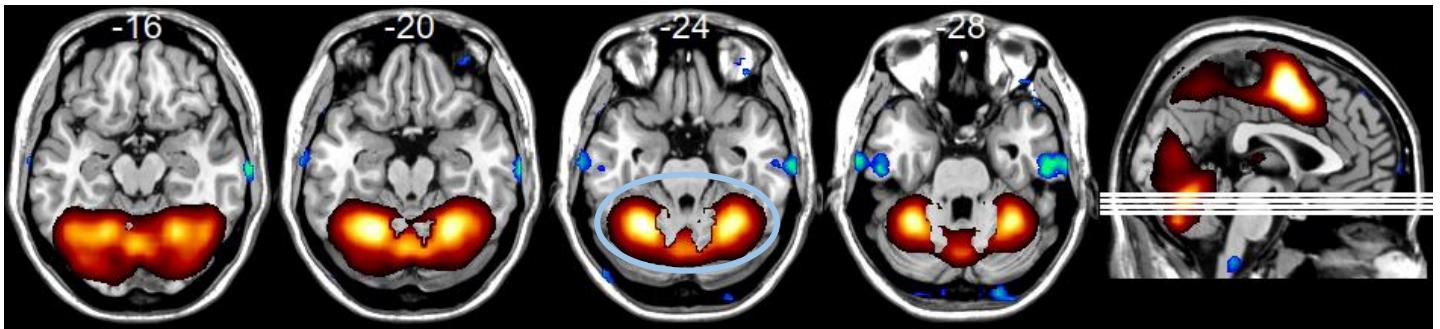
## Response (RESP)



4. Lobster Claw: 56, 52, 48, 44

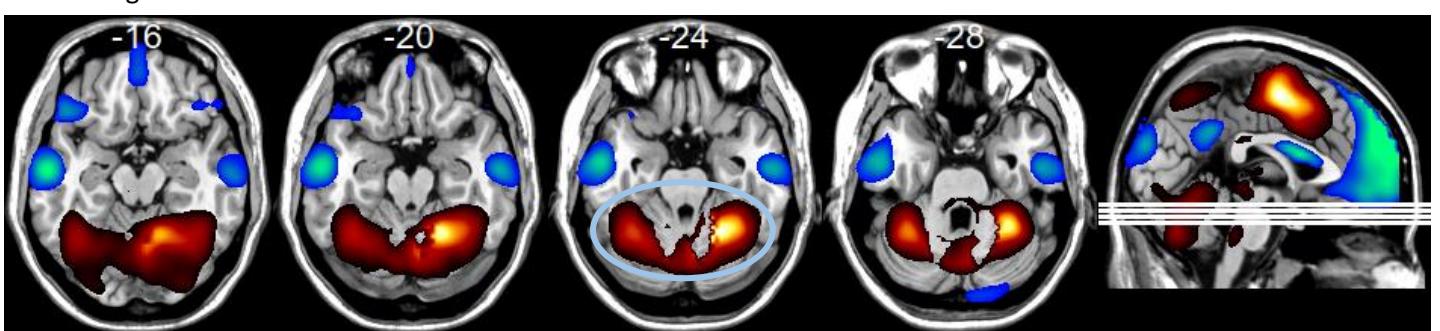
### Two-Handed (2RESP)

Bilateral.



### Right-Handed (1RESP)

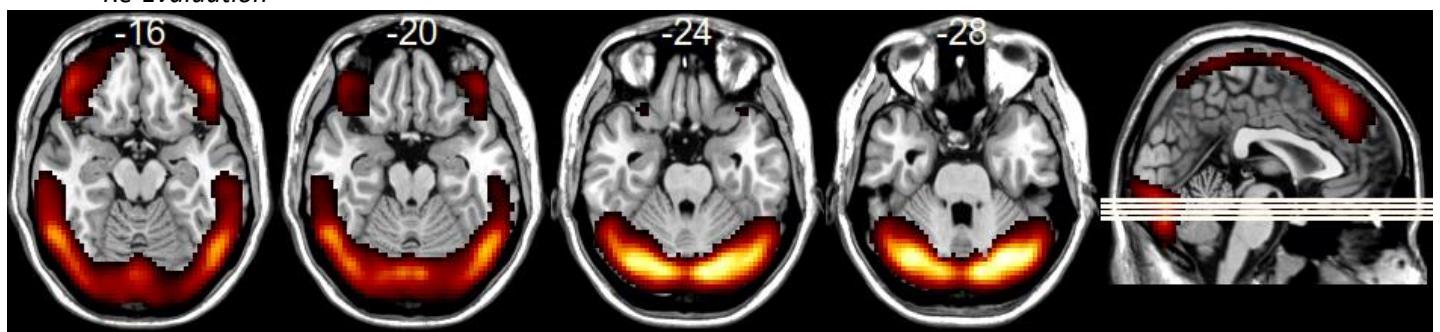
Right-dominant.



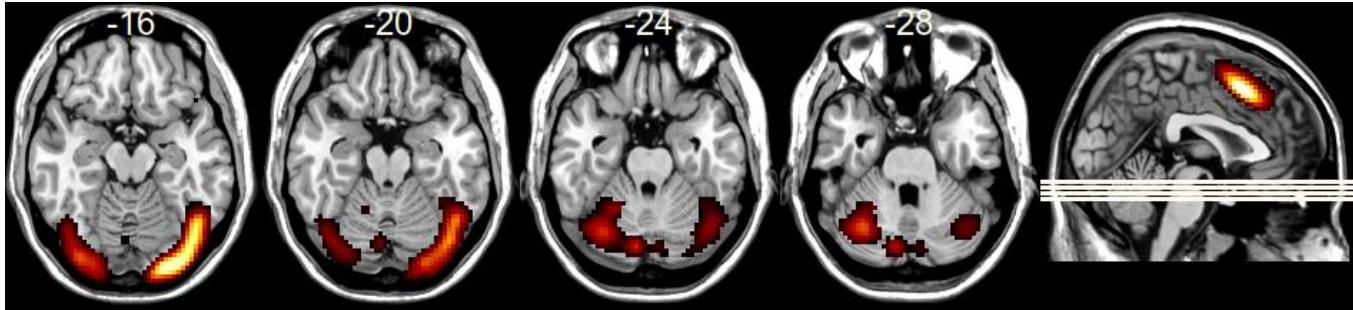
Other Networks:

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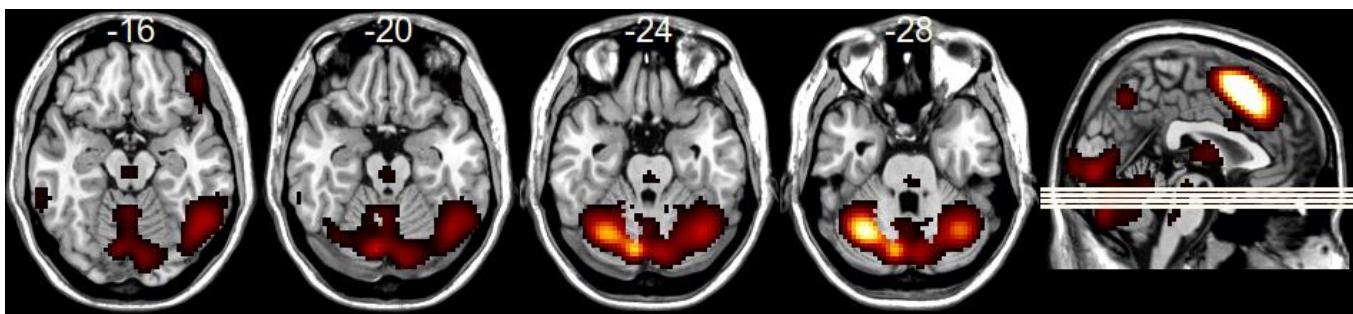
#### *Re-Evaluation*



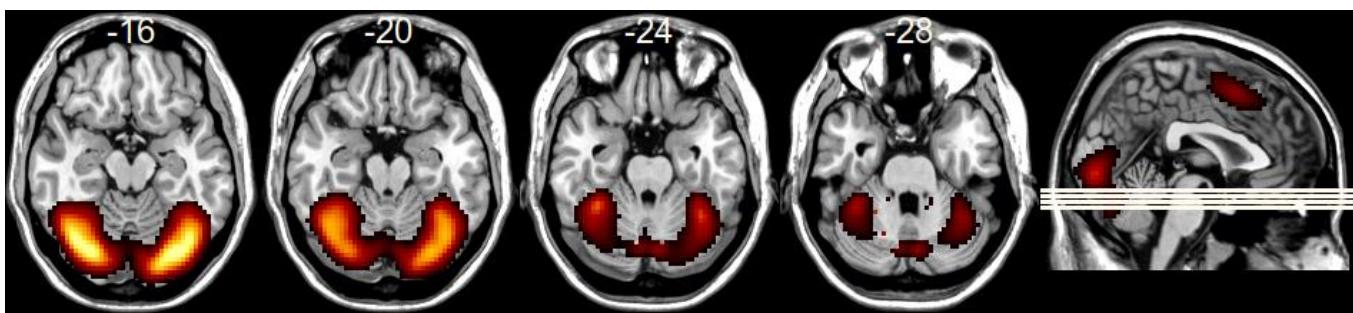
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*Language*

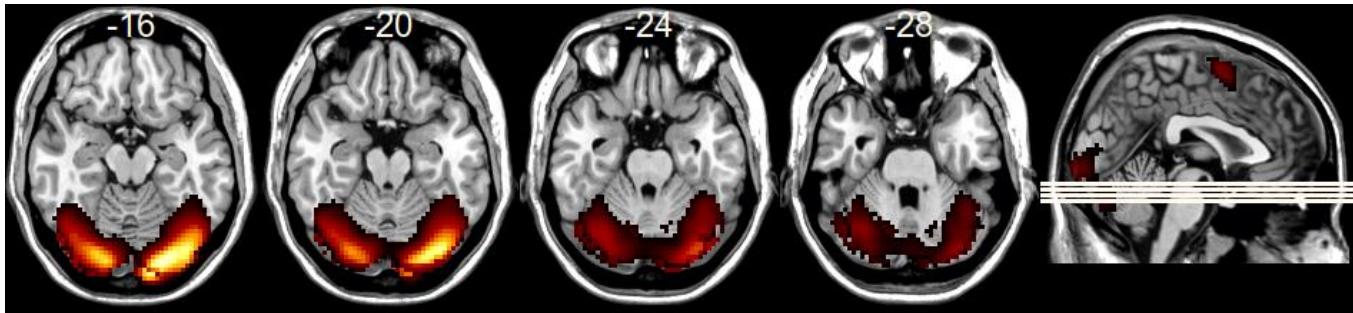
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*Maintaining Internal Attention*

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*Multiple Demand*

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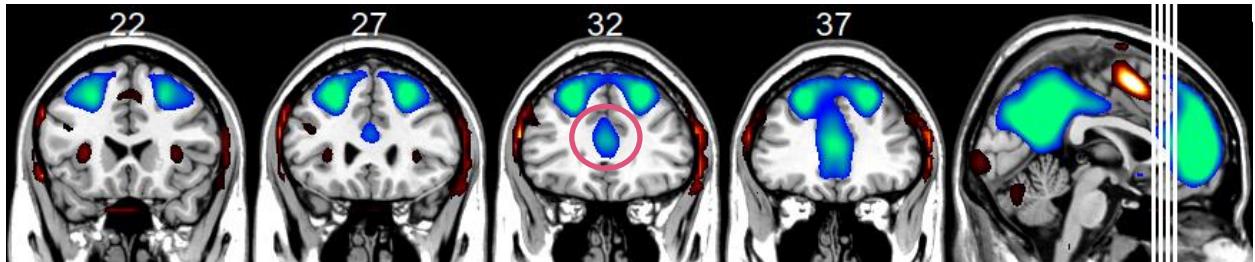
*Initiation*

## Default Mode (DM)

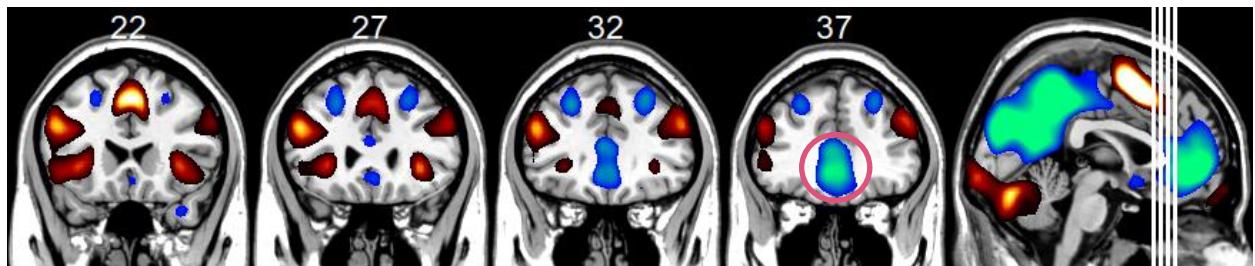
1. Snowman Nose vs. Mouth: 148,153,158,163

### DMB Nose

Mainly slices 32 and 37.



### DMA Mouth

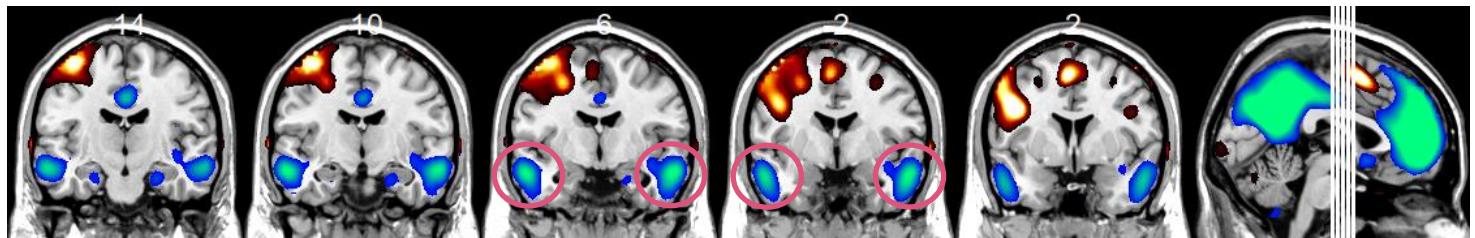


## Default Mode (DM)

### 2. Medial Temporal Dots- Prominent vs Muted: 112,116,120,124,128

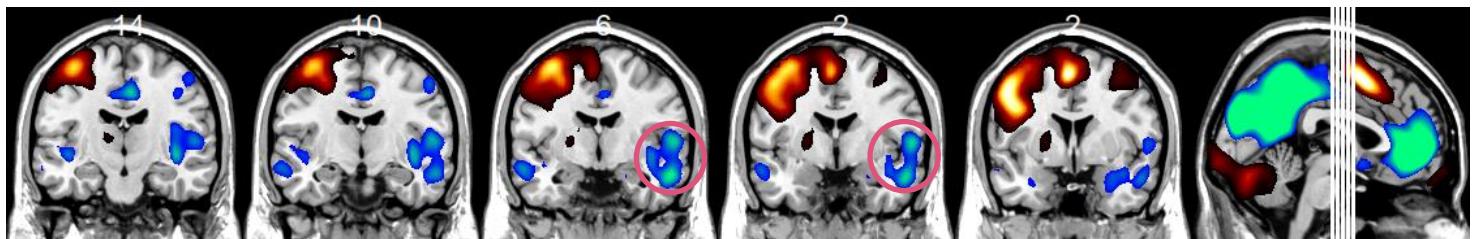
#### Prominent DMB

Prominent bilateral medial temporal dots.



#### Muted DMA

Muted right-dominant medial temporal dots.

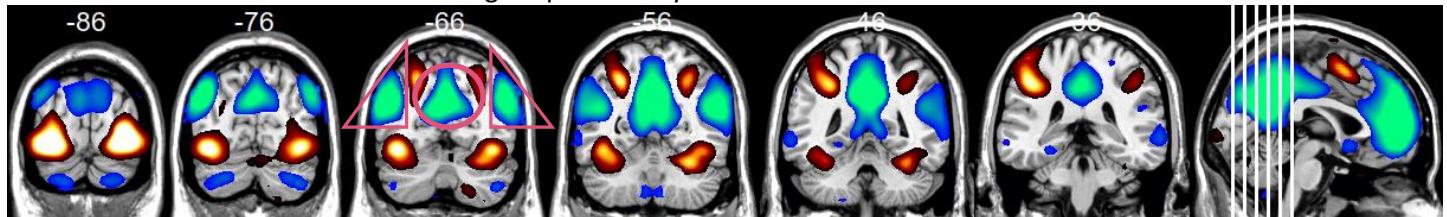


## Default Mode (DM)

### 3. In Flight vs. Penguin: 40,50,60,70,80,90

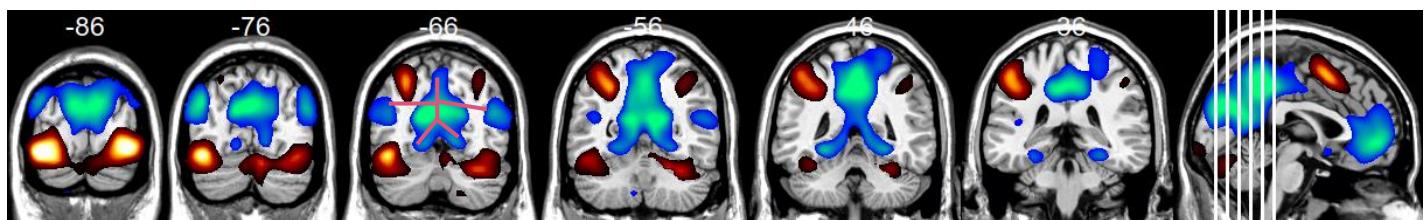
#### In Flight DMNB

Prominent bilateral wing shaped activity.



#### Penguin DMNA

Low shoulders and chest on slice -66. More prominent chest than arms.



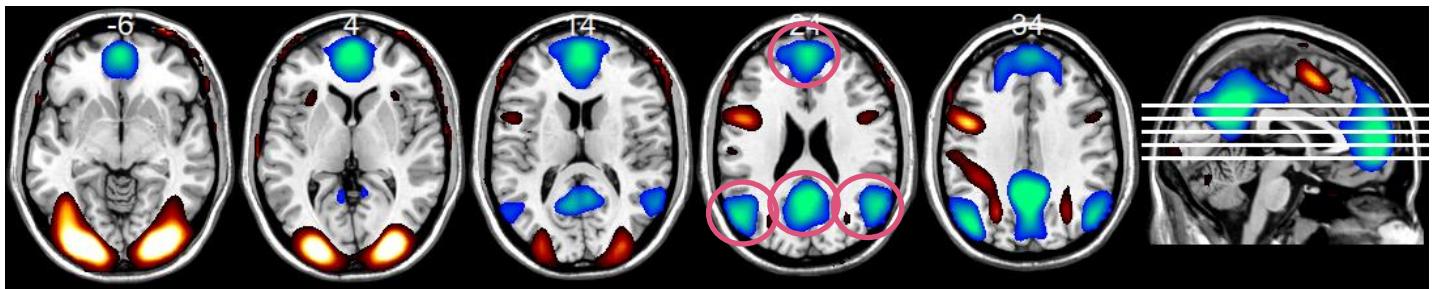
## Default Mode (DM)

4. Tripod vs. Kitten: 66,76,86,96,106



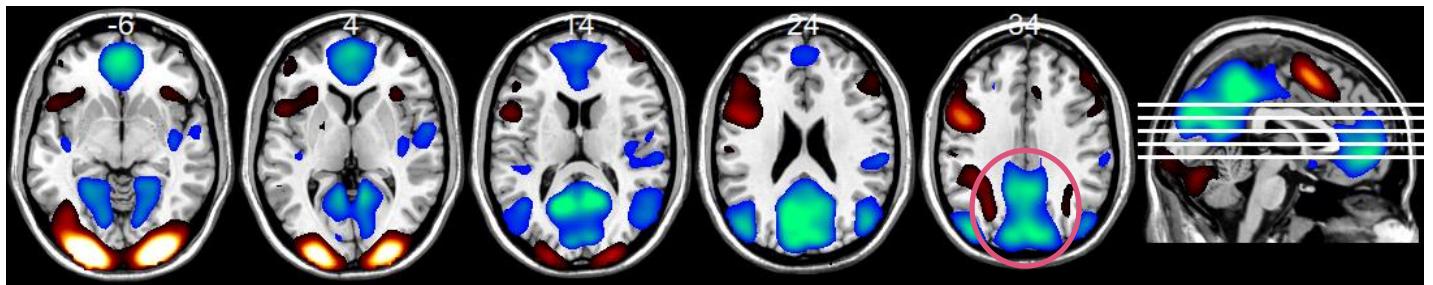
### Tripod DMNB

Mostly on slices 24 and 34.



### Kitten DMNA

The kitten is sitting facing into the screen.



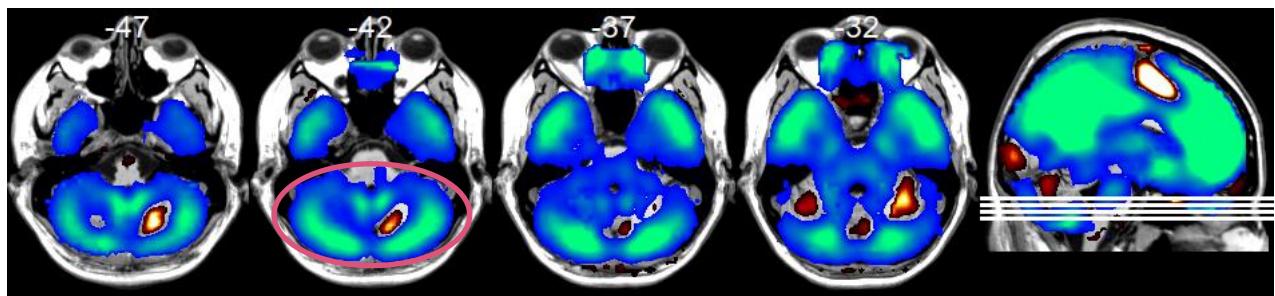
## Default Mode (DM)

### 5. Mandibles vs. Laughing Clown: 25,30,35,40

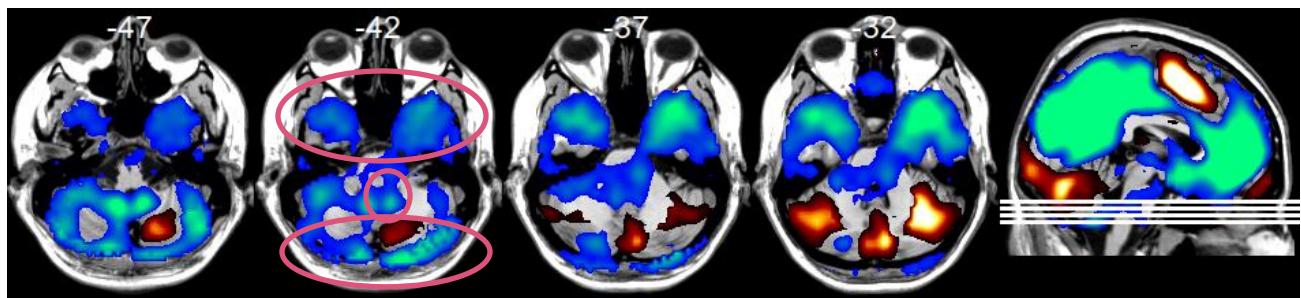


#### Mandibles DMB

Take threshold right down to -.1 and -.01.



#### Laughing Clown DMA

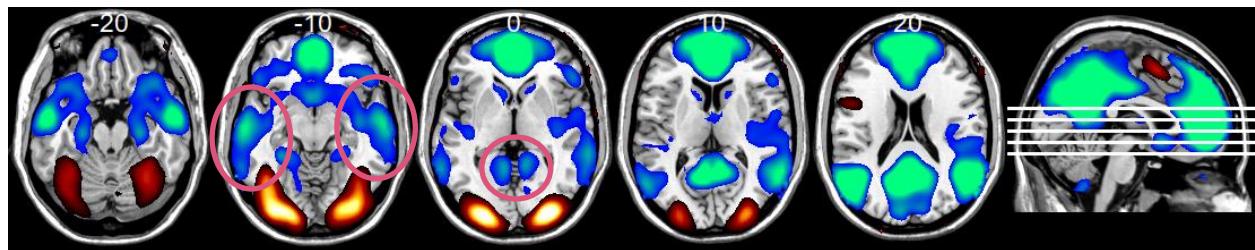


## Default Mode (DM)

### 6. Angel Wings vs You're In Trouble: 52,62,72,82,92

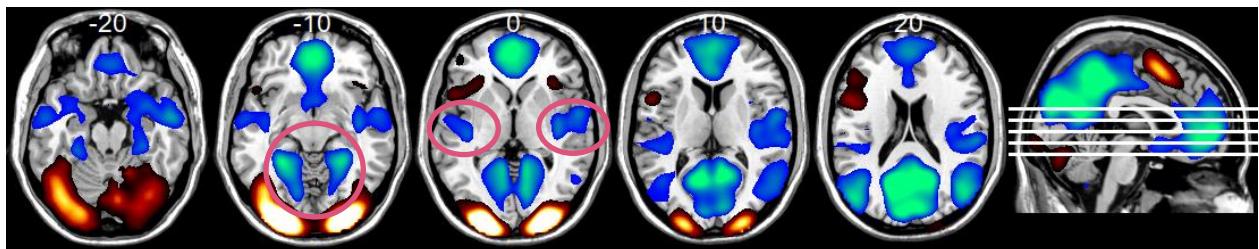
#### Angel Wings DMB

Feet less prominent in slices -10 and 0. Wingtips more posterior and lateral, particular in slice 0.



#### You're In Trouble DMA

Prominent feet in slices -10 and 0. Basal ganglia arms. Forearms and elbows more anterior and medial, particularly in slice 0.



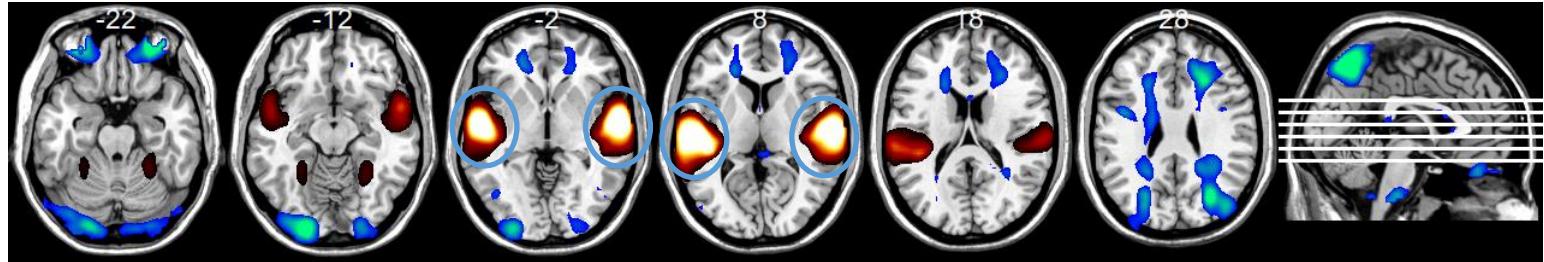
## Auditory Perception (AUD)

Previous Name: Primary Auditory (AUD)



### 1. Headphones: 50,60,70,80,90,100

Prominent bilateral temporal lobe activity in slices -2 and 8.



### Other Networks:

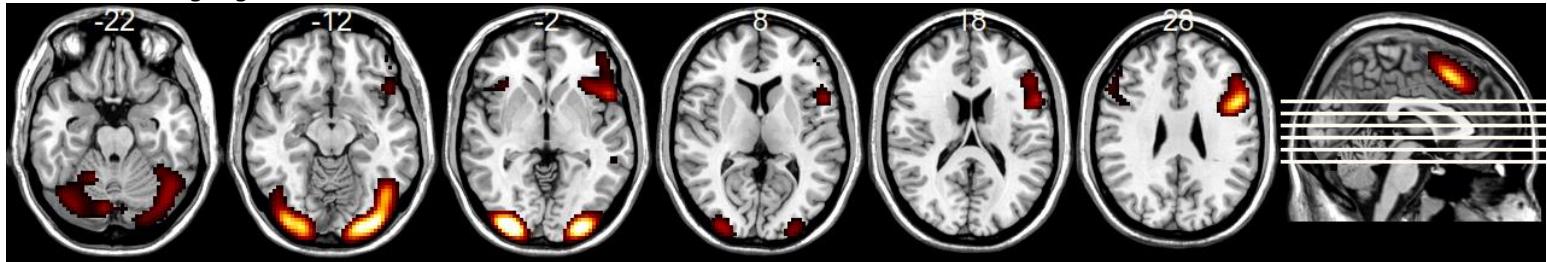
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#### Re-Evaluation



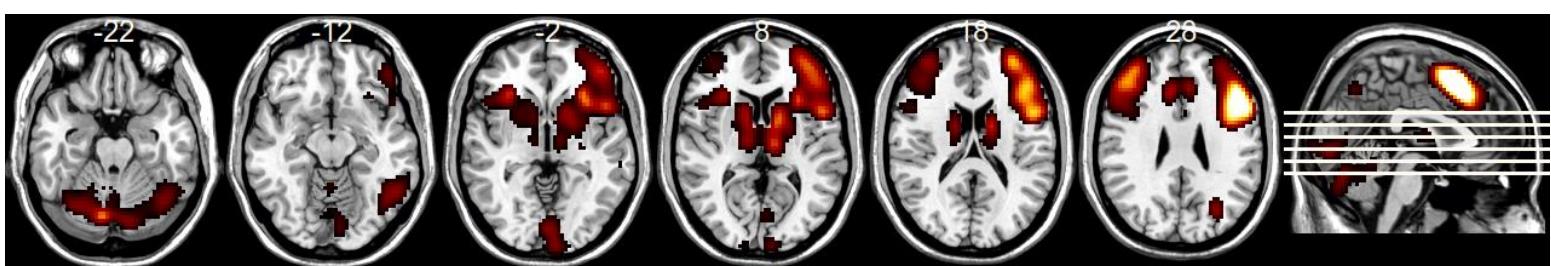

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#### Language

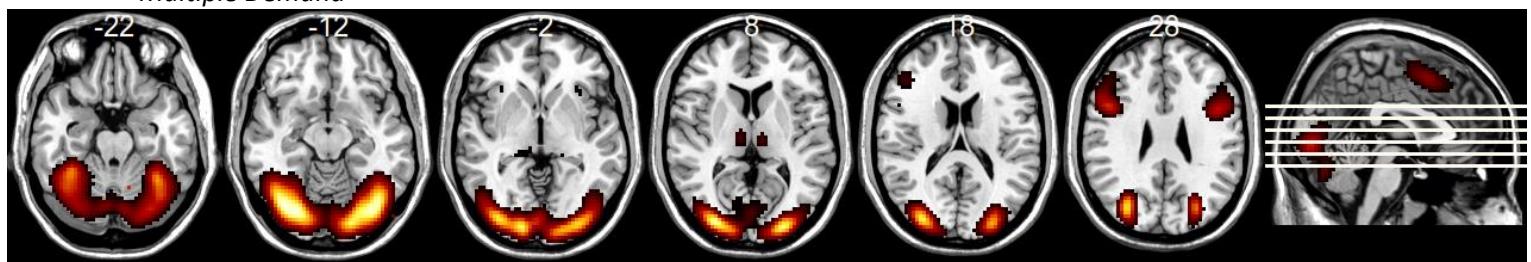



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#### Maintaining Internal Attention



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*Multiple Demand*

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*Initiation*

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*Two-Handed Response*

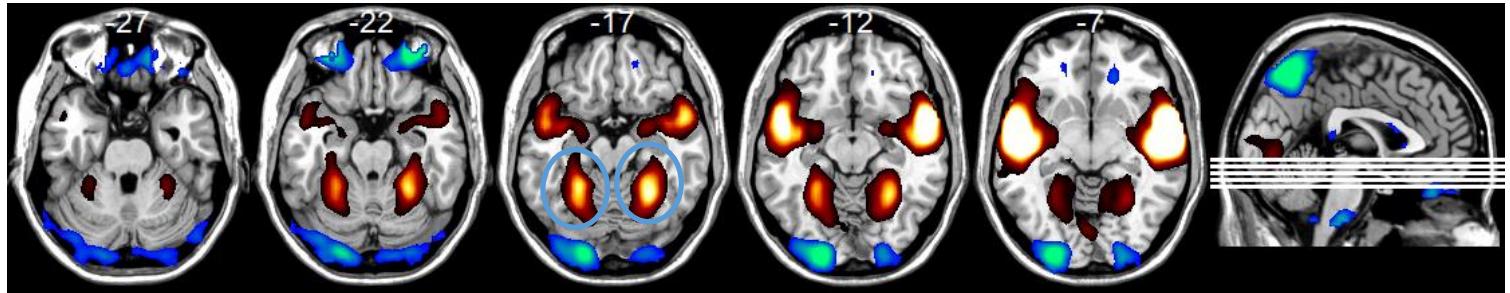
## Auditory Perception (AUD)

Previous Name: Primary Auditory (AUD)



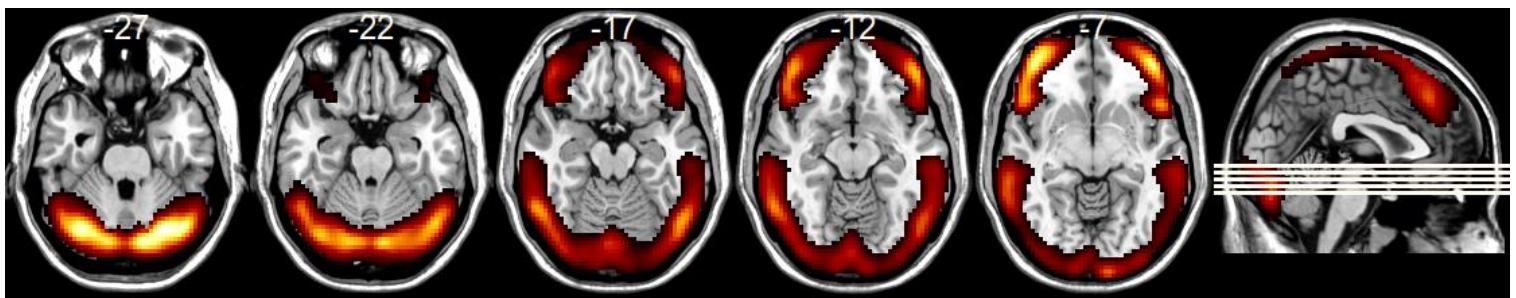
### 2. Angry Dragon: 45, 50, 55, 60, 65

Bilateral occipitotemporal area activation in slice -17.

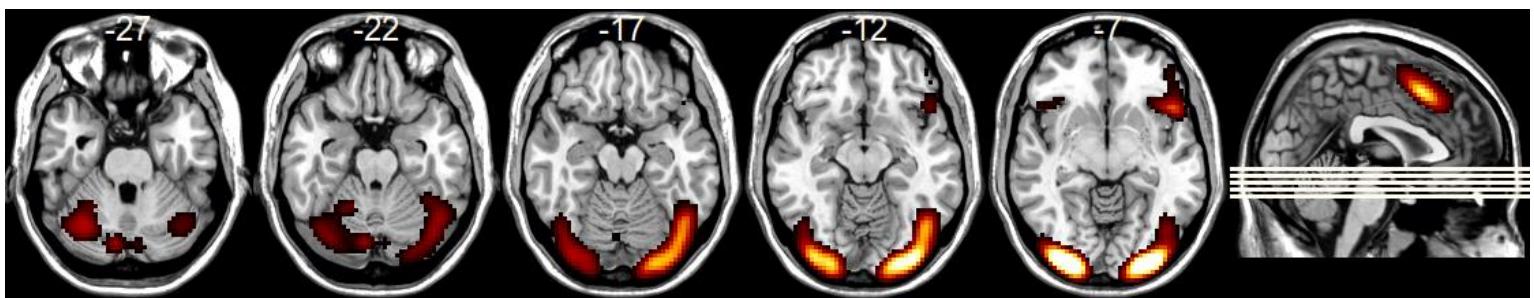


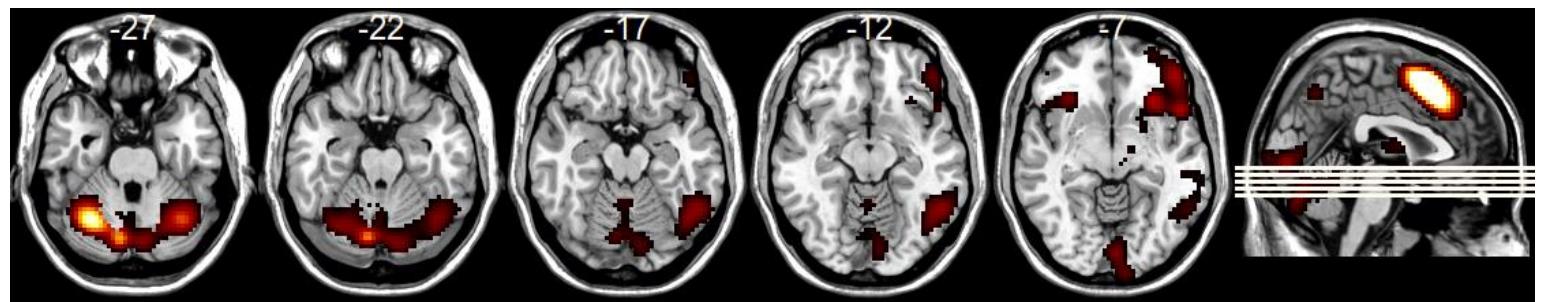
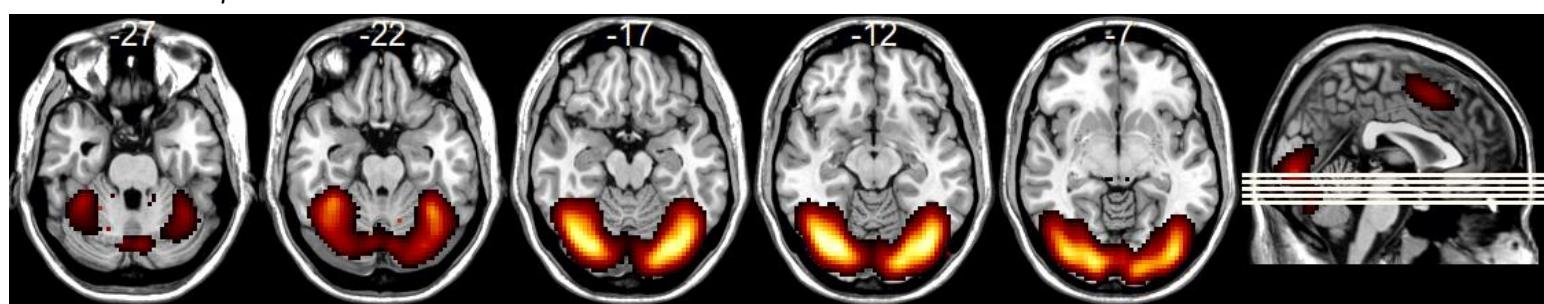
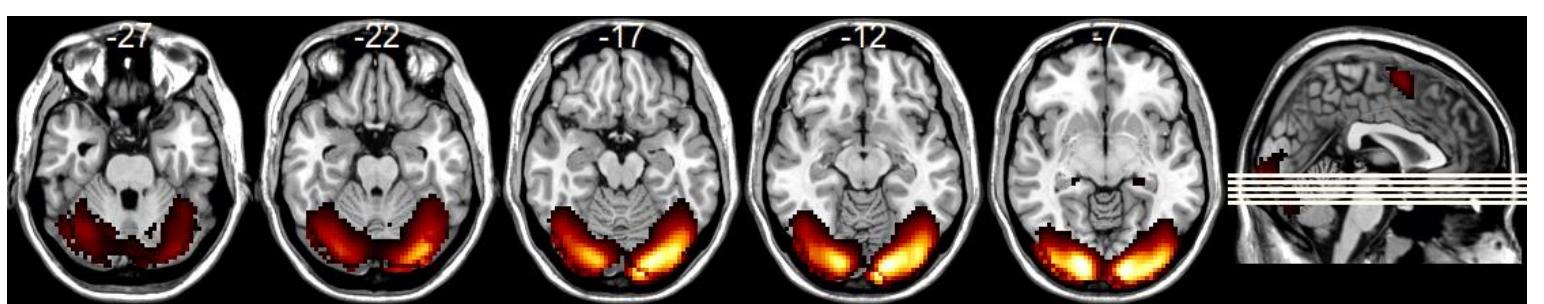
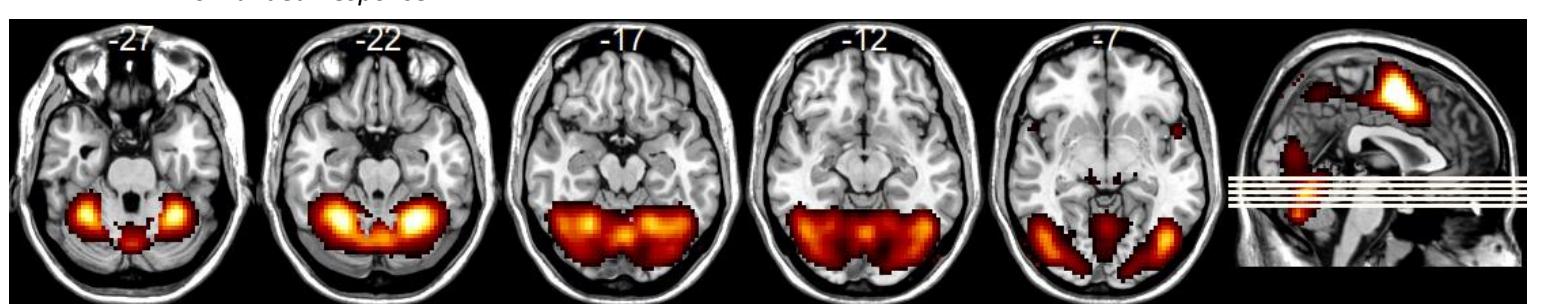
Other Networks:

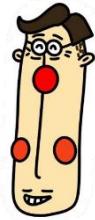
*Re-Evaluation*



*Language*



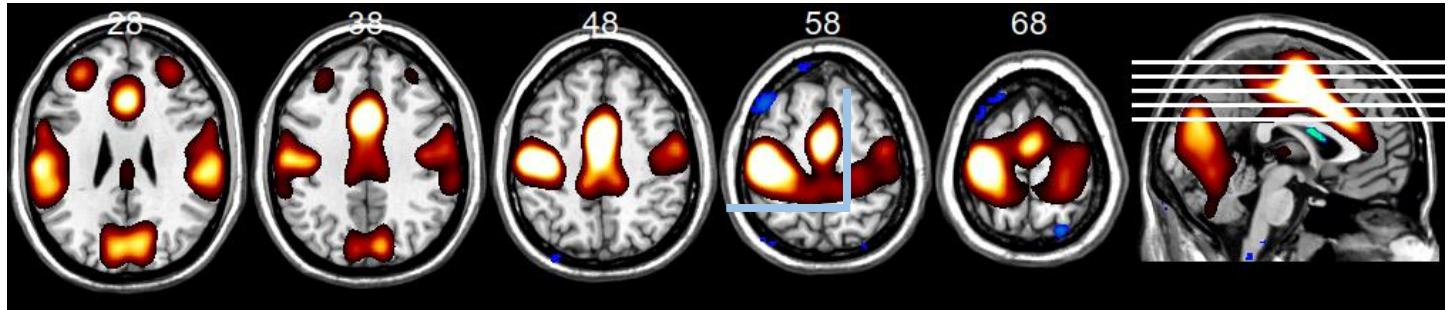
*Maintaining Internal Attention**Multiple Demand**Initiation**Two-Handed Response*



### Auditory Attention for Response (AAR)

#### 1. Happy 28<sup>th</sup> Birthday Long Face/Right Angle: 100, 110, 120, 130, 140

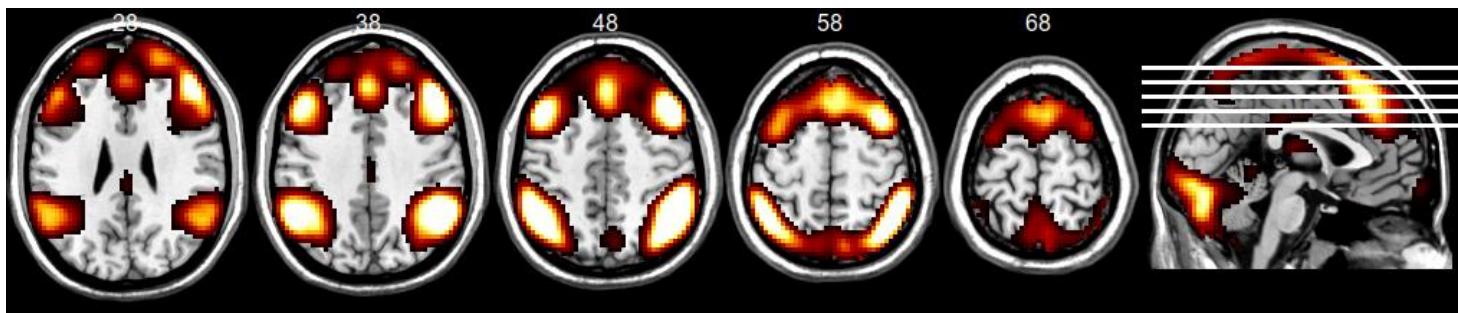
Slice 28 has long face with cheeks. Right angle on slice 58.



Other Networks:

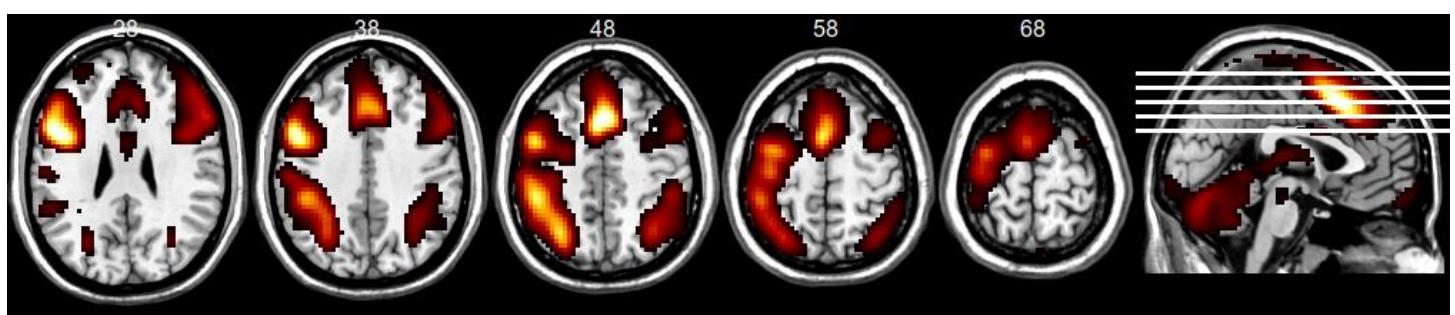
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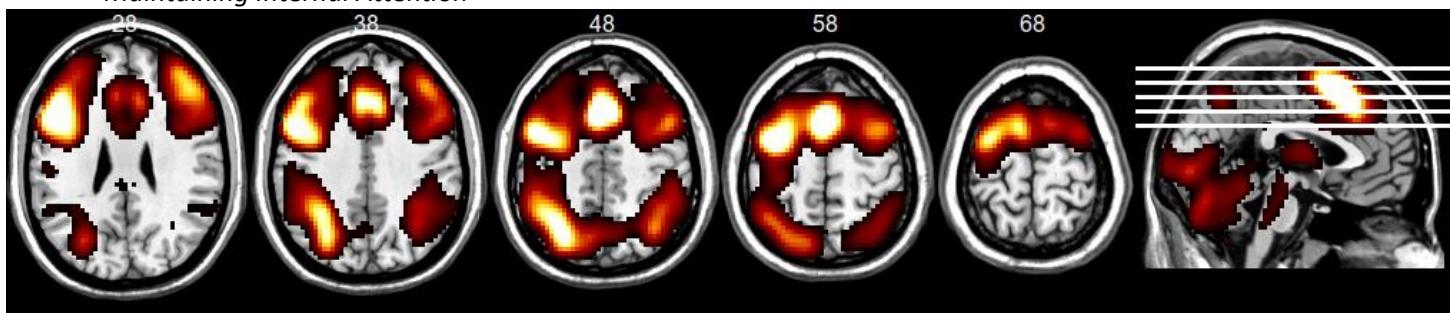
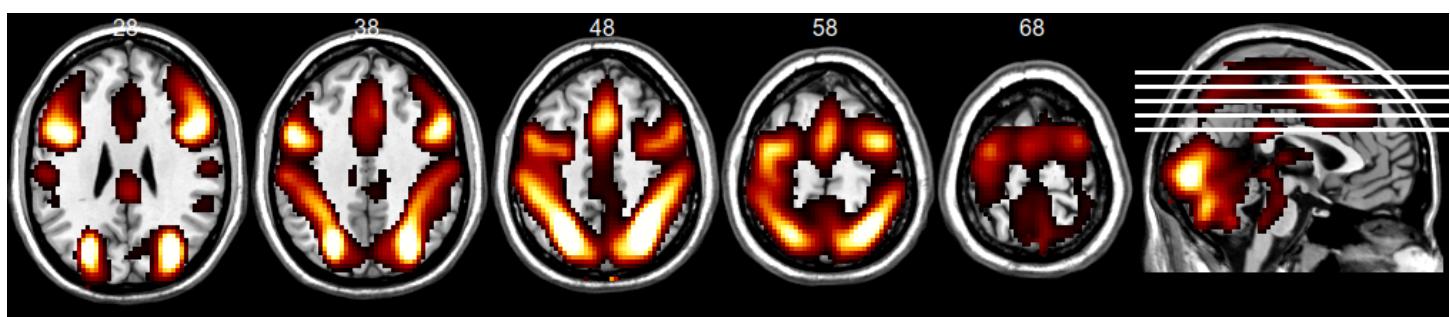
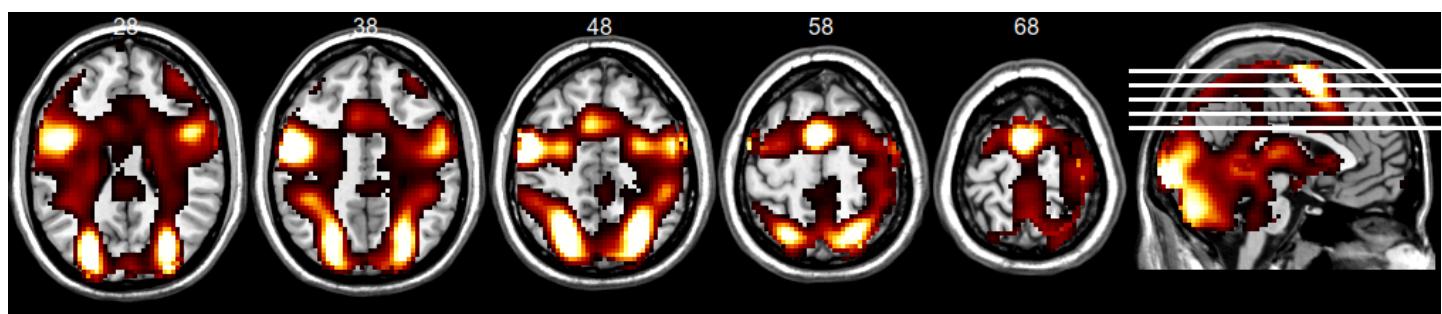
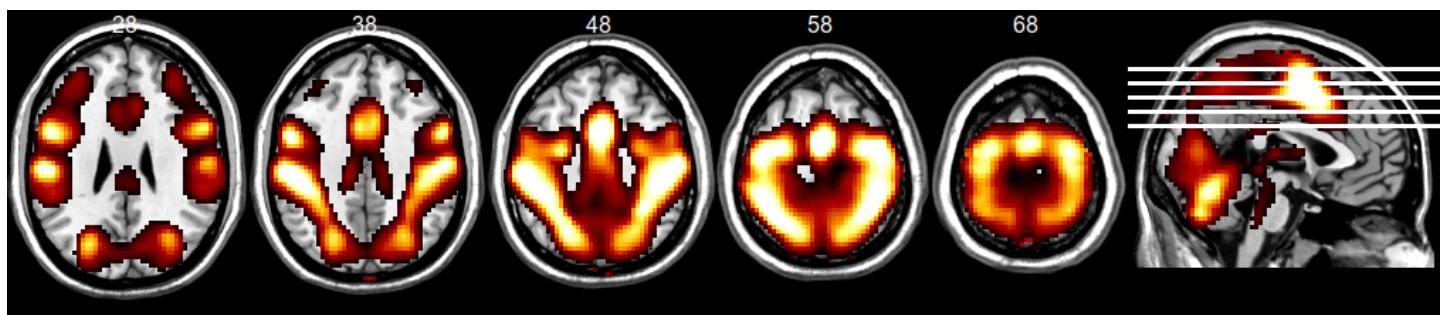
#### *Re-Evaluation*




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#### *Language*



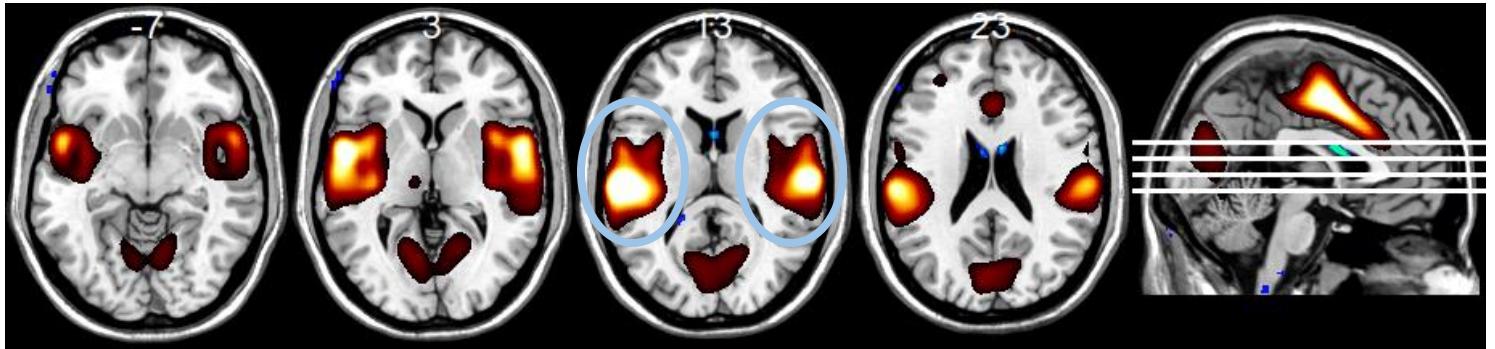
*Maintaining Internal Attention**Multiple Demand**Initiation**Two-Handed Response*

## Auditory Attention for Response (AAR)



### 2. On Fire: 65, 75, 85, 95

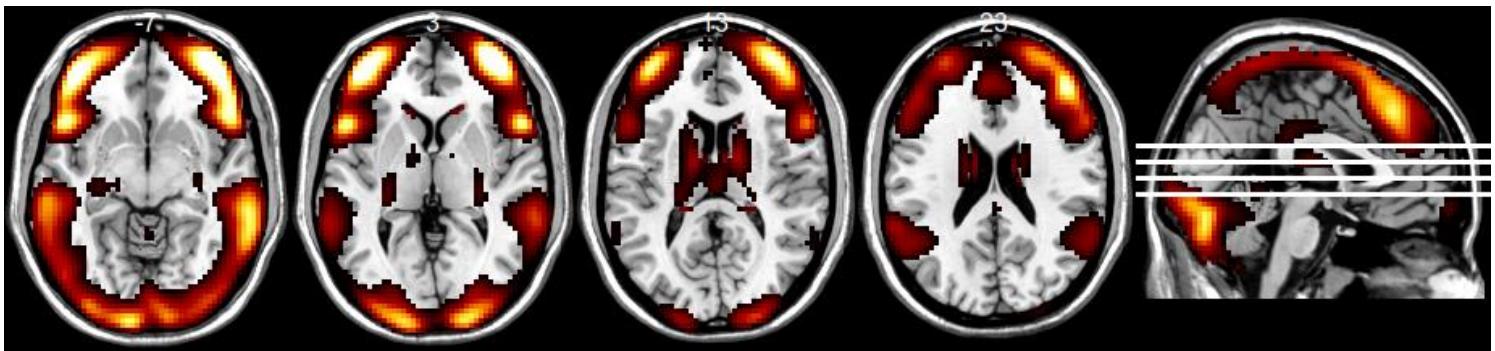
Flame shapes on slice 13 bilaterally in the temporal lobes.



### Other Networks:

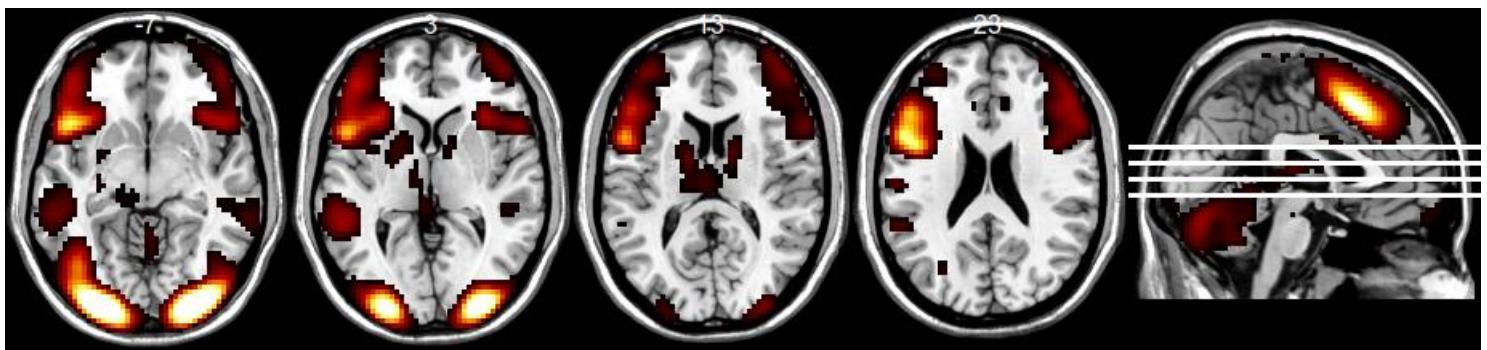
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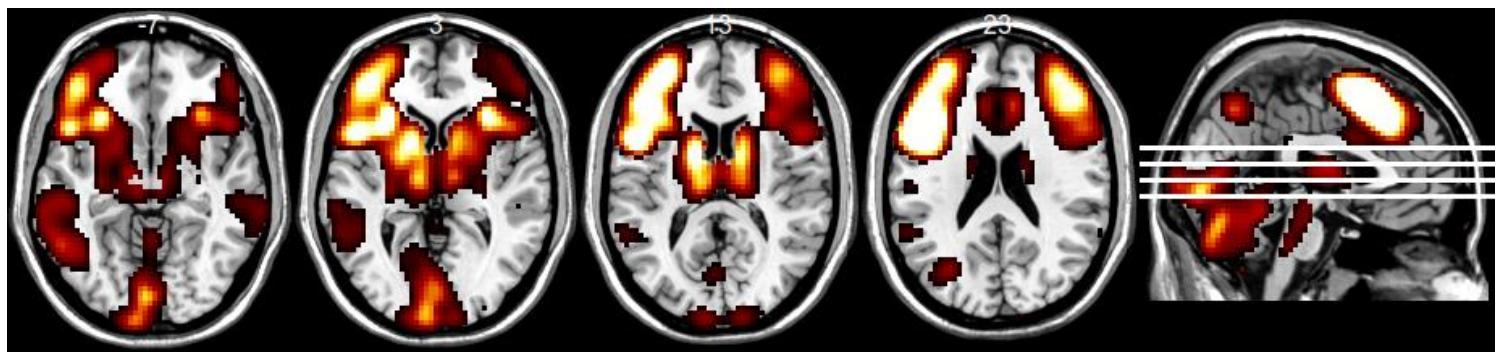
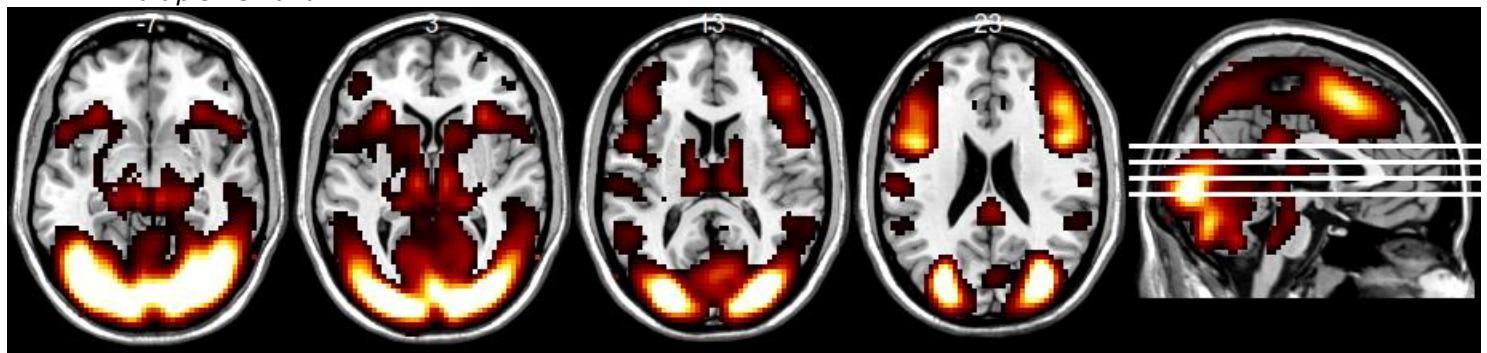
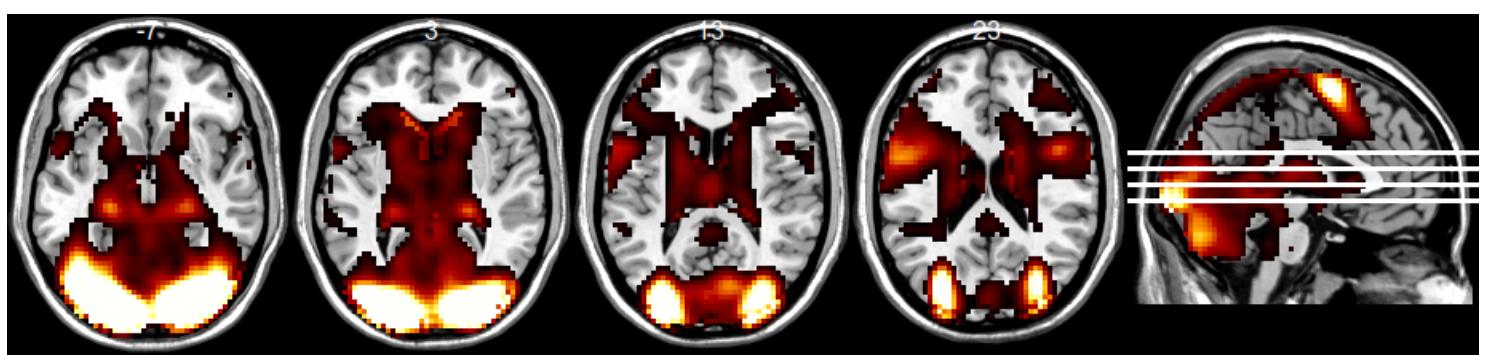
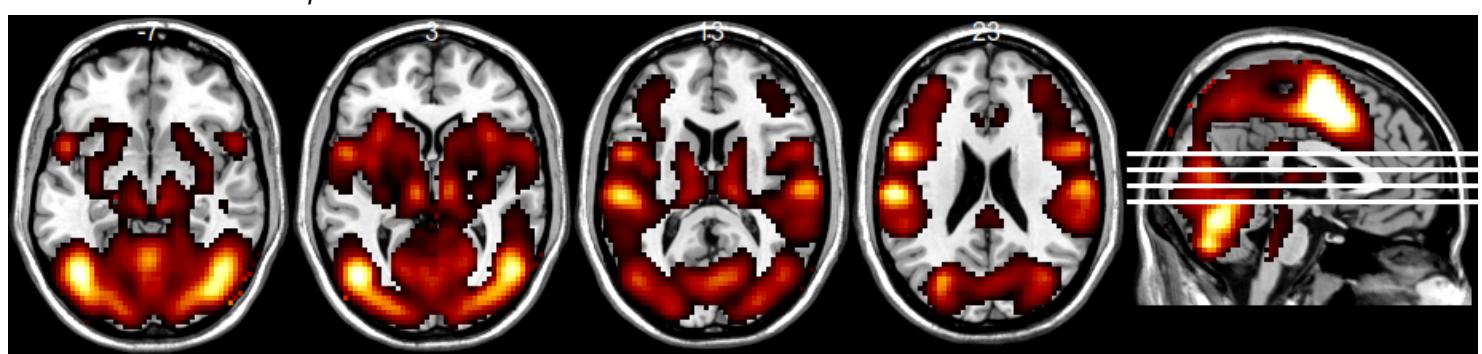
#### *Re-Evaluation*




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#### *Language*



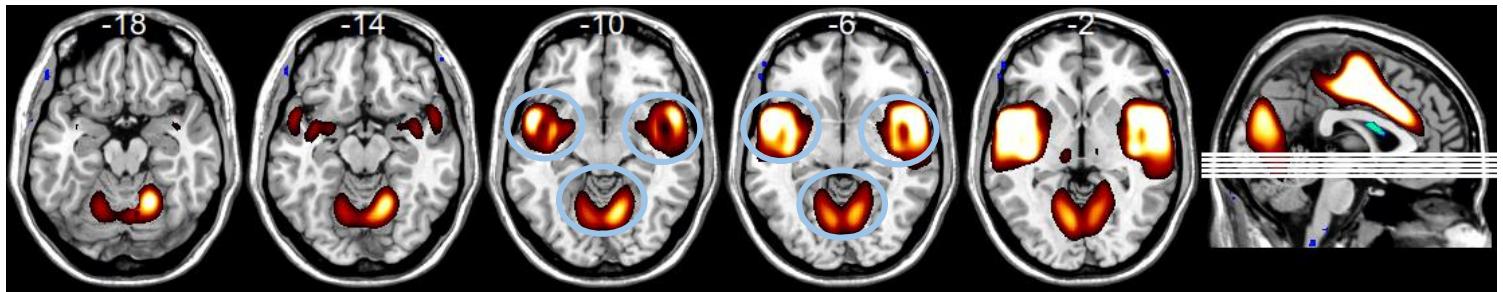
*Maintaining Internal Attention**Multiple Demand**Initiation**Two-Handed Response*

### Auditory Attention for Response (AAR)



#### 3. Small Smile: 54, 58, 62, 66, 70

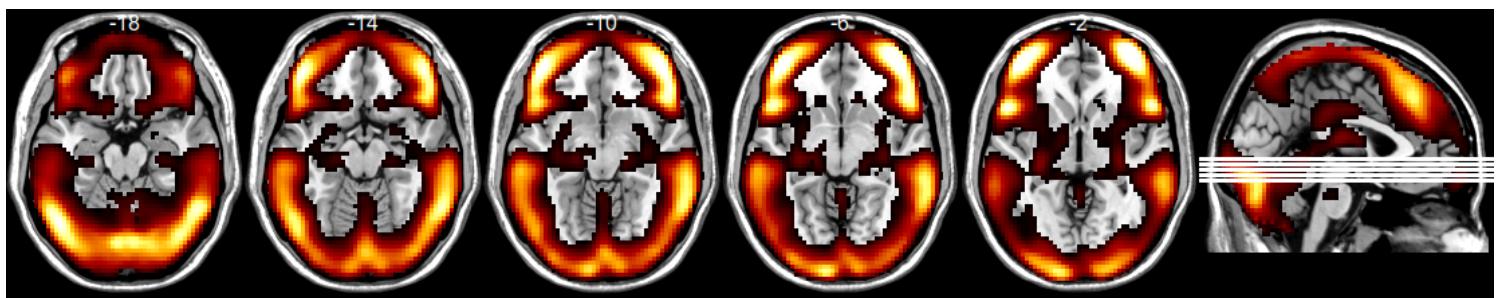
Small eyes and smile dominant on slices -10, -6.



#### Other Networks:

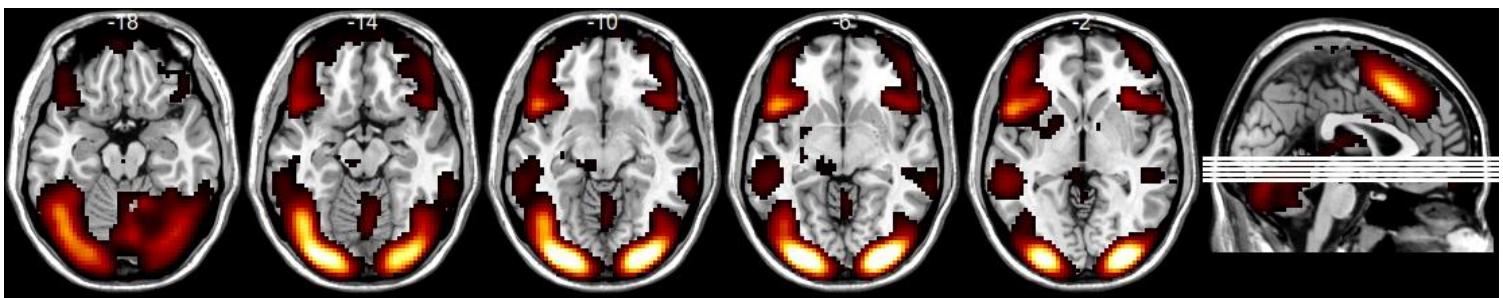
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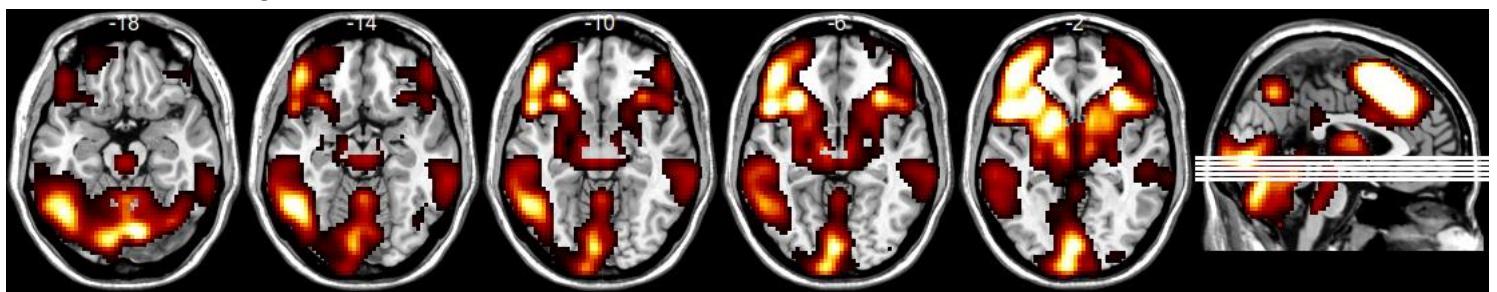
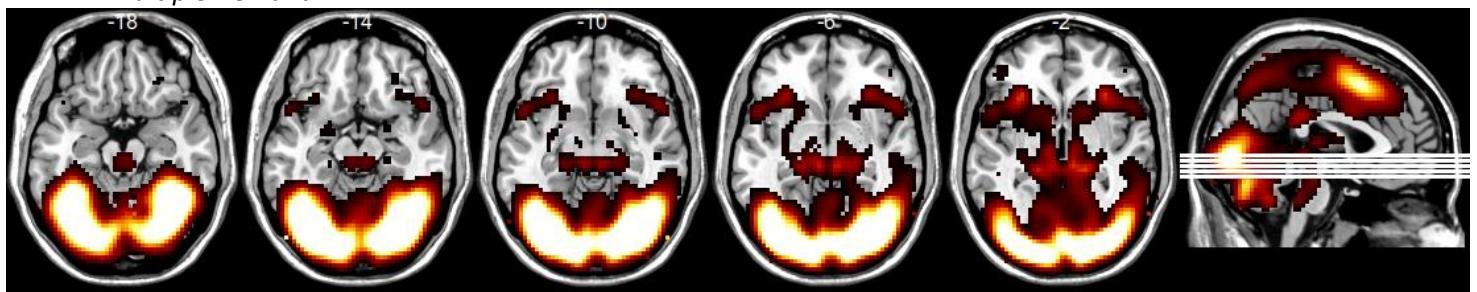
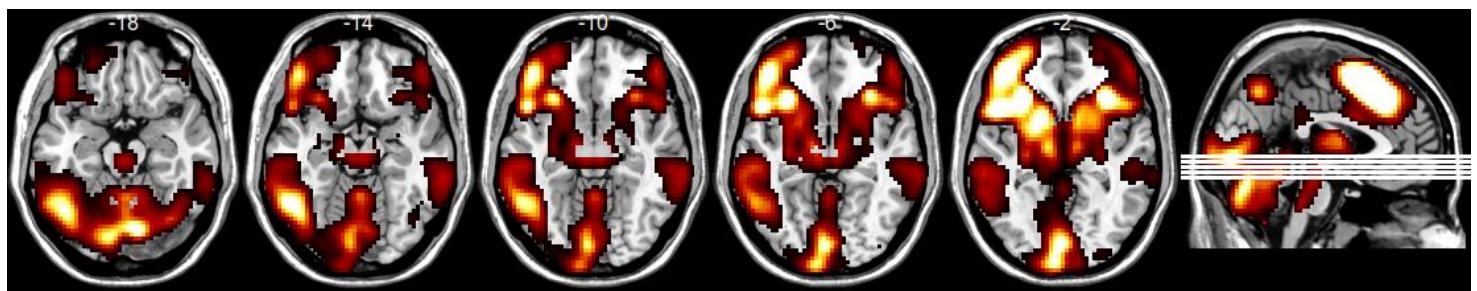
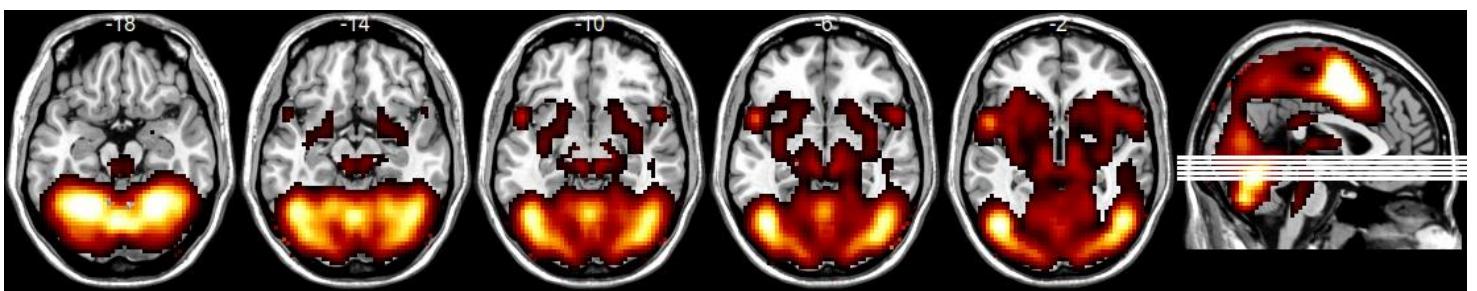
#### *Re-Evaluation*




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#### *Language*



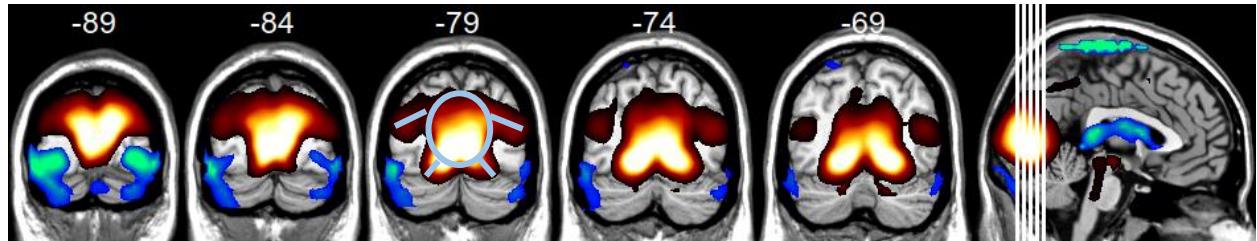
*Maintaining Internal Attention**Multiple Demand**Initiation**Two-Handed Response*



**Focus on Visual Features (FoVF)**  
Previous Name: Focus on Visual Features (FVF)

1. Stay Puft: 37, 42, 47, 52, 57

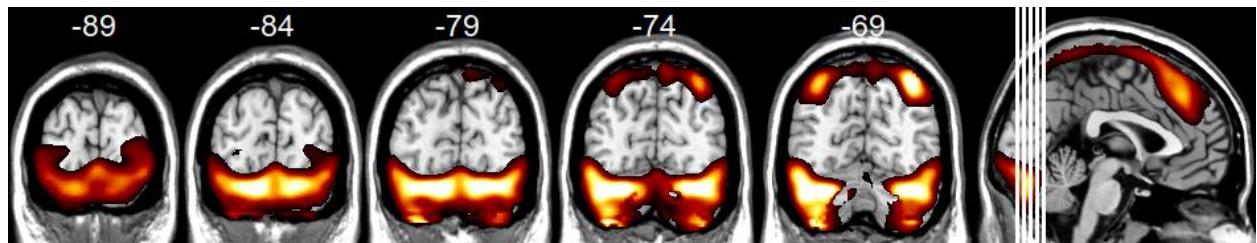
Body of the Marshmallow Man on slice -79.



Other Networks:

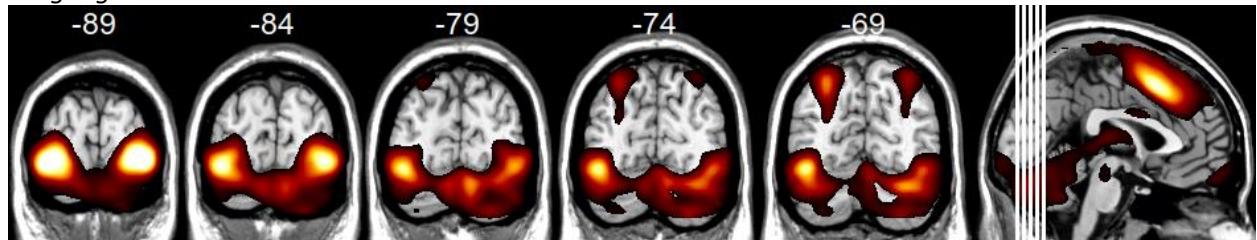
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*Re-Evaluation*



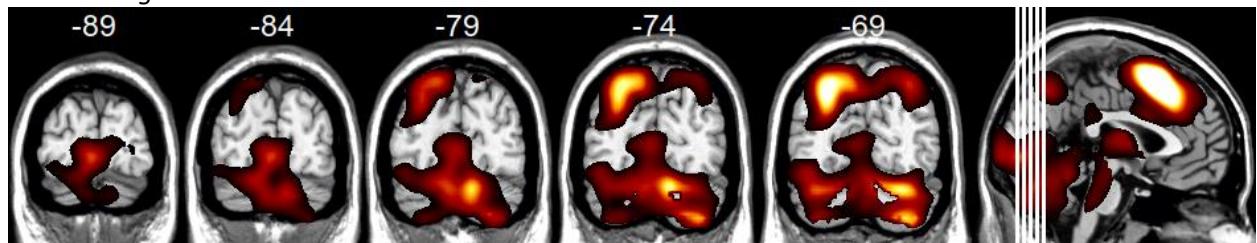

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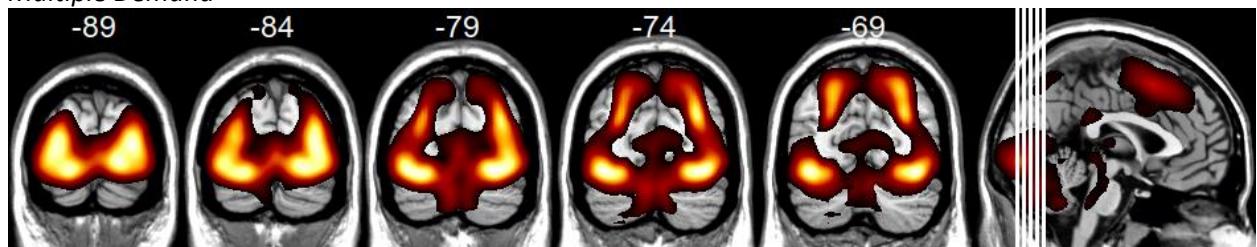
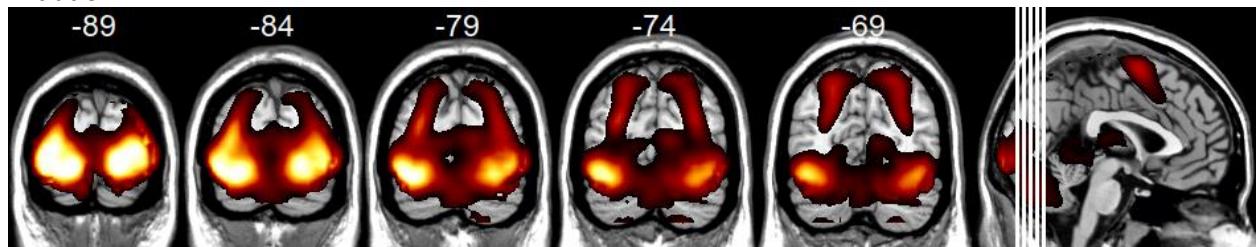
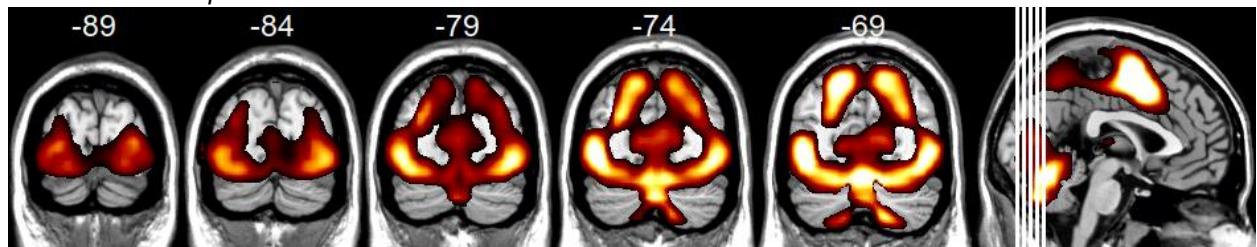
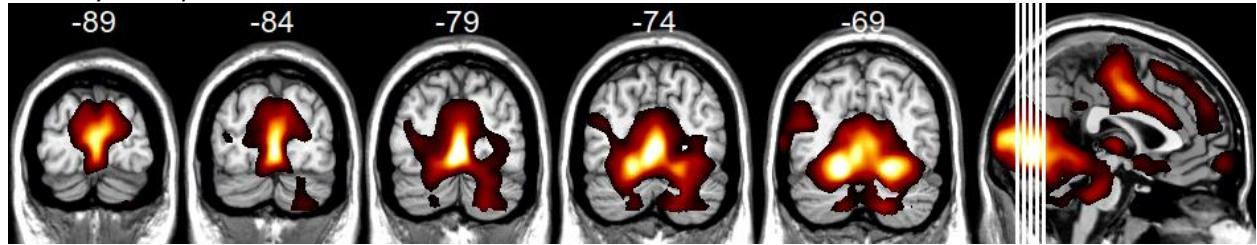
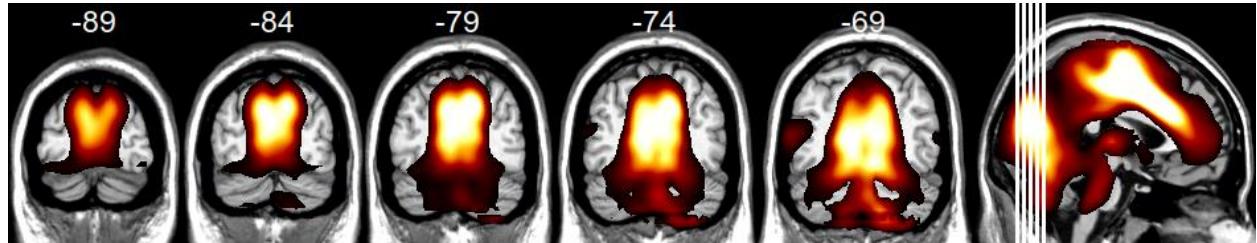
*Language*




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*Maintaining Internal Attention*



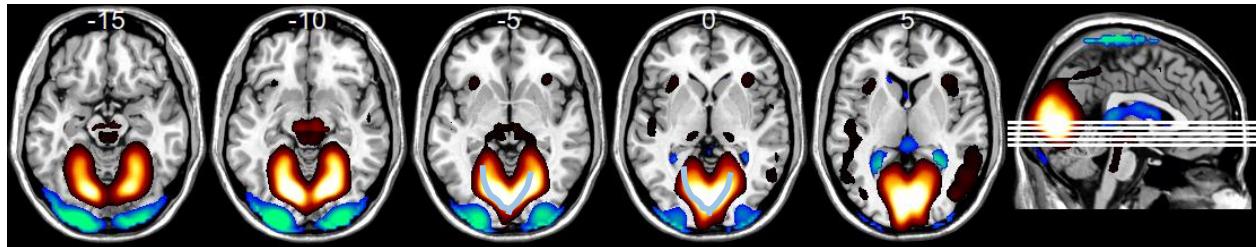
*Multiple Demand**Initiation**Two-Handed Response**Auditory Perception**Auditory Attention for Response*

**Focus on Visual Features (FoVF)**  
 Previous Name: Focus on Visual Features (FVF)



2. **Wishbone: 57, 62, 67, 72, 77**

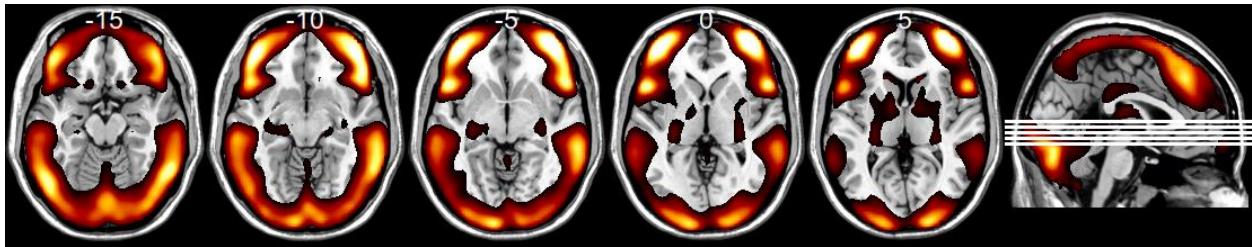
Wishbone on slice -5 and 0.



Other Networks:

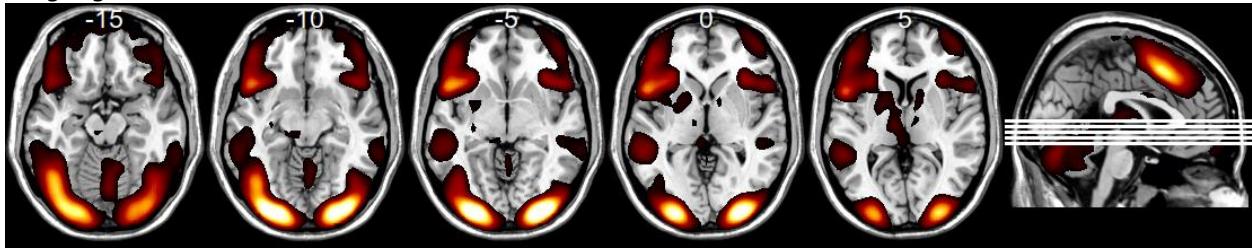
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*Re-Evaluation*



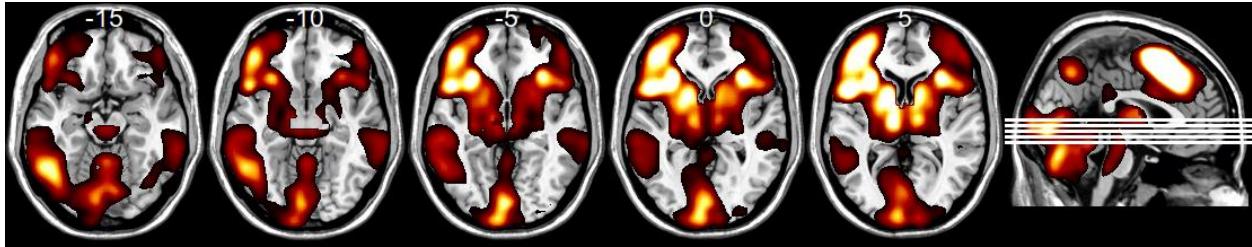

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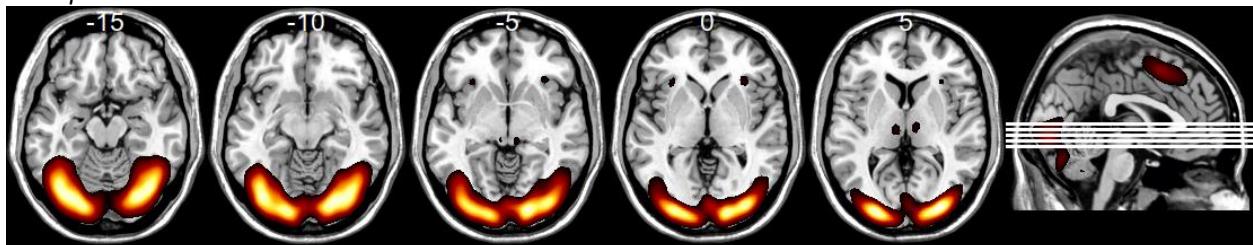
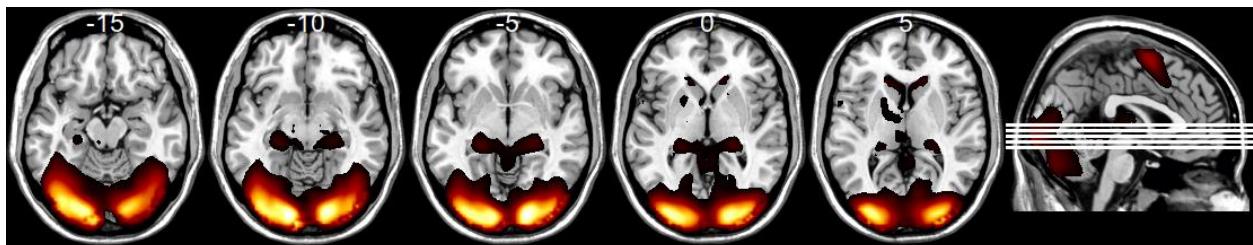
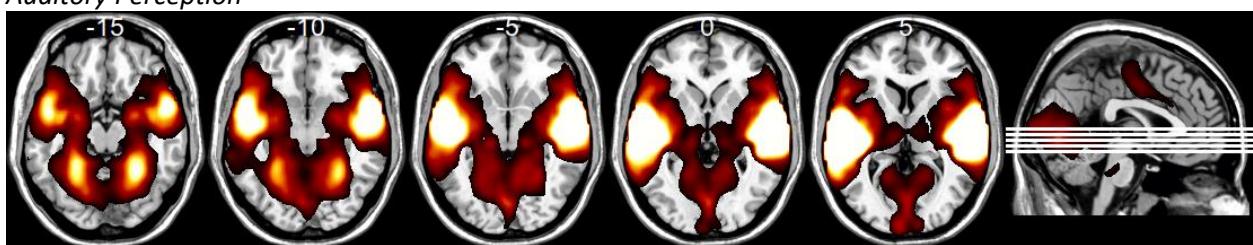
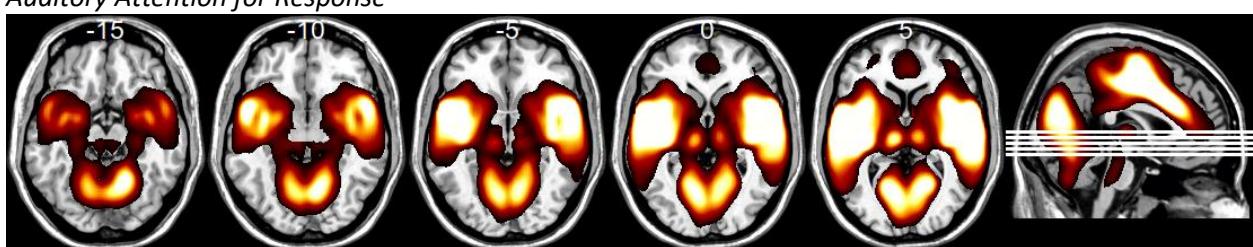
*Language*




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*Maintaining Internal Attention*



*Multiple Demand**Initiation**Two-Handed Response**Auditory Perception**Auditory Attention for Response*

# Appendix

## 1. Re-Evaluation (RE-EV)

- Lavigne, K.M., Menon, M., & Woodward, T.S. (2019). Functional Brain Networks Underlying Evidence Integration and Delusions in Schizophrenia. *Schizophrenia Bulletin*, doi:10.1093/schbul/sbz032.
- Lavigne, K.M., Metzak, P.D., & Woodward, T.S. (2015). Functional brain networks underlying detection and integration of disconfirmatory evidence. *NeuroImage* 112(2015): 138-151.
- Zurrin R, Wong STS, Roes MM, et al. Functional brain networks involved in the Raven's standard progressive matrices task and their relation to theories of fluid intelligence. *Intelligence* 2024;103.

## 2. Language (LAN)

- Wong, S.T.S., Goghari, V.M., Sanford, N., Lim, R., Clark, C., Metzak, P.D., Rossell, S.L., Menon, M., & Woodward, T.S. (2020). Functional brain networks involved in lexical decision. *Brain and Cognition*, 138, doi: 10.1016/j.bandc.2019.103631.
- Besso, L., Larivière, S., Roes, M., Sanford, N., Percival, C., Damascelli, M., Momeni, A., Lavigne, K., Menon, M., Aleman, A., Ćurčić-Blake, B. & Woodward, T. S. (2024) Hypoactivation of a Linguistic Processing Brain Network During Auditory Imagery Contributes to Hallucinations in Schizophrenia. *Psychiatry Research: Neuroimaging*.  
<https://doi.org/10.1016/j.pscychresns.2024.111824>

## 3. Maintaining Internal Attention (MAIN)

- Sanford, N., Whitman, J.C. & Woodward, T.S. (2020). Task-Merging for finer separation of functional brain networks in working memory. *Cortex*, 125, 246-271.doi: 10.1016/j.cortex.2019.12.014.
- Momeni, A., Addis, D., Feredoes, E., Klepel, F., Rasheed, M., Chinchani, A. M., & Woodward, T. S. (2024). Functional Brain Networks Underlying Autobiographical Event Simulation: An Update. *PsyArXiv*, June 3, <https://doi.006Frg/10.31219/osf.io/3s69b>.

## 4. Multiple Demand (MD)

- Goghari, V.M., Sanford, N., Spilka, M.J., & Woodward, T.S. (2017). Task-Related Functional Connectivity Analysis of Emotion Discrimination in a Family Study of Schizophrenia. *Schizophrenia Bulletin*, 43(6):1348–1362
- Lavigne, K.M., Menon, M., & Woodward, T.S. (2019). Functional Brain Networks Underlying Evidence Integration and Delusions in Schizophrenia. *Schizophrenia Bulletin*, doi:10.1093/schbul/sbz032
- Lavigne, K.M., Metzak, P.D., & Woodward, T.S. (2015). Functional brain networks underlying detection and integration of disconfirmatory evidence. *NeuroImage* 112(2015): 138-151.
- Zurrin R, Wong STS, Roes MM, et al. Functional brain networks involved in the Raven's standard progressive matrices task and their relation to theories of fluid intelligence. *Intelligence* 2024;103.

## 5. Initiation (INIT)

- Metzak, P.D., Riley, J., Wang, L., Whitman, J.C., Ngan, E.T.C. & Woodward, T.S. (2012). Decreased efficiency of task-positive and task-negative networks during working memory in schizophrenia. *Schizophrenia Bulletin*, 38(4): 803-813.
- Sanford, N., Whitman, J.C. & Woodward, T.S. (2020). Task-Merging for finer separation of functional brain networks in working memory. *Cortex*, 125, 246-271.doi: 10.1016/j.cortex.2019.12.014.
- Woodward, T.S., Feredoes, E., Metzak, P.D., Takane, Y., & Manoach, D.S. (2013). Epoch-specific functional networks involved in working memory. *NeuroImage*, 65: 529-539

## 6. Right-Handed Response (1RESP)

- Lavigne, K.M., Metzak, P.D., & Woodward, T.S. (2015). Functional brain networks underlying detection and integration of disconfirmatory evidence. *NeuroImage* 112(2015): 138-151.
- Sanford, N., Whitman, J.C. & Woodward, T.S. (2020). Task-Merging for finer separation of functional brain networks in working memory. *Cortex*, 125, 246-271.doi: 10.1016/j.cortex.2019.12.014.

## 7. Two-Handed Response (2RESP)

- Goghari, V.M., Sanford, N., Spilka, M.J., & Woodward, T.S. (2017). Task-Related Functional Connectivity Analysis of Emotion Discrimination in a Family Study of Schizophrenia. *Schizophrenia Bulletin*, 43(6):1348–1362.
- Sanford, N. A. (2019). Functional brain networks underlying working memory performance in schizophrenia: a multi-experiment approach (T). University of British Columbia. Retrieved from <https://open.library.ubc.ca/collections/ubctheses/24/items/1.0387449>

## 8. Default Mode B (DMB)

- Goghari, V.M., Sanford, N., Spilka, M.J., & Woodward, T.S. (2017). Task-Related Functional Connectivity Analysis of Emotion Discrimination in a Family Study of Schizophrenia. *Schizophrenia Bulletin*, 43(6):1348–1362
- Lavigne, K.M., Menon, M., & Woodward, T.S. (2019). Functional Brain Networks Underlying Evidence Integration and Delusions in Schizophrenia. *Schizophrenia Bulletin*, doi:10.1093/schbul/sbz032.
- Lavigne, K.M. & Woodward, T.S. (2018). Hallucination and speech-specific hypercoupling in frontotemporal auditory and Languages in schizophrenia using combined task-based fMRI data: An fBIRN study. *Human Brain Mapping*, 2018(39):1582–1595.
- Sanford, N., Whitman, J.C. & Woodward, T.S. (2020). Task-Merging for finer separation of functional brain networks in working memory. *Cortex*, 125, 246-271.doi: 10.1016/j.cortex.2019.12.014.
- Whitman, J.C., Metzak, P.D., Lavigne, K.M., & Woodward, T.S. (2013). Functional connectivity in a frontoparietal network involving the dorsal anterior cingulate cortex underlies decisions to accept a hypothesis. *Neuropsychologia*, 51(2013):1132–1141.

Wong, S.T.S., Goghari, V.M., Sanford, N., Lim, R., Clark, C., Metzak, P.D., Rossell, S.L., Menon, M., & Woodward, T.S. (2020). Functional brain networks involved in lexical decision. *Brain and Cognition*, 138, doi: 10.1016/j.bandc.2019.103631.

### **9. Default Mode A (DMA)**

Besso, L., Larivière, S., Roes, M., Sanford, N., Percival, C., Damascelli, M., Momeni, A., Lavigne, K., Menon, M., Aleman, A., Ćurčić-Blake, B. & Woodward, T. S. (2024) Hypoactivation of a Linguistic Processing Brain Network During Auditory Imagery Contributes to Hallucinations in Schizophrenia. *Psychiatry Research: Neuroimaging*.  
<https://doi.org/10.1016/j.psychresns.2024.111824>

### **10. Auditory Perception (AUD)**

Sanford, N., Whitman, J.C. & Woodward, T.S. (2020). Task-Merging for finer separation of functional brain networks in working memory. *Cortex*, 125, 246-271.doi: 10.1016/j.cortex.2019.12.014.  
 Gill K, Percival C, Roes M, et al. Real-Time Symptom Capture of Hallucinations in Schizophrenia with fMRI: Absence of Duration-Dependent Activity. *Schizophrenia Bulletin Open* 2022;3(1).

### **11. Auditory Attention for Response (AAR)**

Lavigne, K.M. & Woodward, T.S. (2018). Hallucination and speech-specific hypercoupling in frontotemporal auditory and language in schizophrenia using combined task-based fMRI data: An fBIRN study. *Human Brain Mapping*, 2018(39):1582-1595.  
 Sanford, N. A. (2019). Functional brain networks underlying working memory performance in schizophrenia : a multi-experiment approach (T). University of British Columbia. Retrieved from <https://open.library.ubc.ca/collections/ubctheses/24/items/1.0387449>

### **12. Focus on Visual Features (FoVF)**

Sanford, N. A. (2019). Functional brain networks underlying working memory performance in schizophrenia : a multi-experiment approach (T). University of British Columbia. Retrieved from <https://open.library.ubc.ca/collections/ubctheses/24/items/1.0387449>  
 Woodward, T.S., Feredoes, E., Metzak, P.D., Takane, Y., & Manoach, D.S. (2013). Epoch-specific functional networks involved in working memory. *NeuroImage*, 65: 529-539