fMRI meta-analyses II of II:

Marie Arsalidou

NUG seminar

19 February, 2018

NEUROPSY LAB

https://social.hse.ru/en/psy/brainresponses/about

https://social.hse.ru/en/psy/brainresponses/news

www.neuropsylab.com

Eligibility criteria

- fMRI research article
- Relevant task
- Stereotaxic coordinates in MNI or Talairach
- Whole brain analyses
- Random effects analyses
- Healthy participants
- Age range specifications
- Direct contracts/experiment

PRISMA

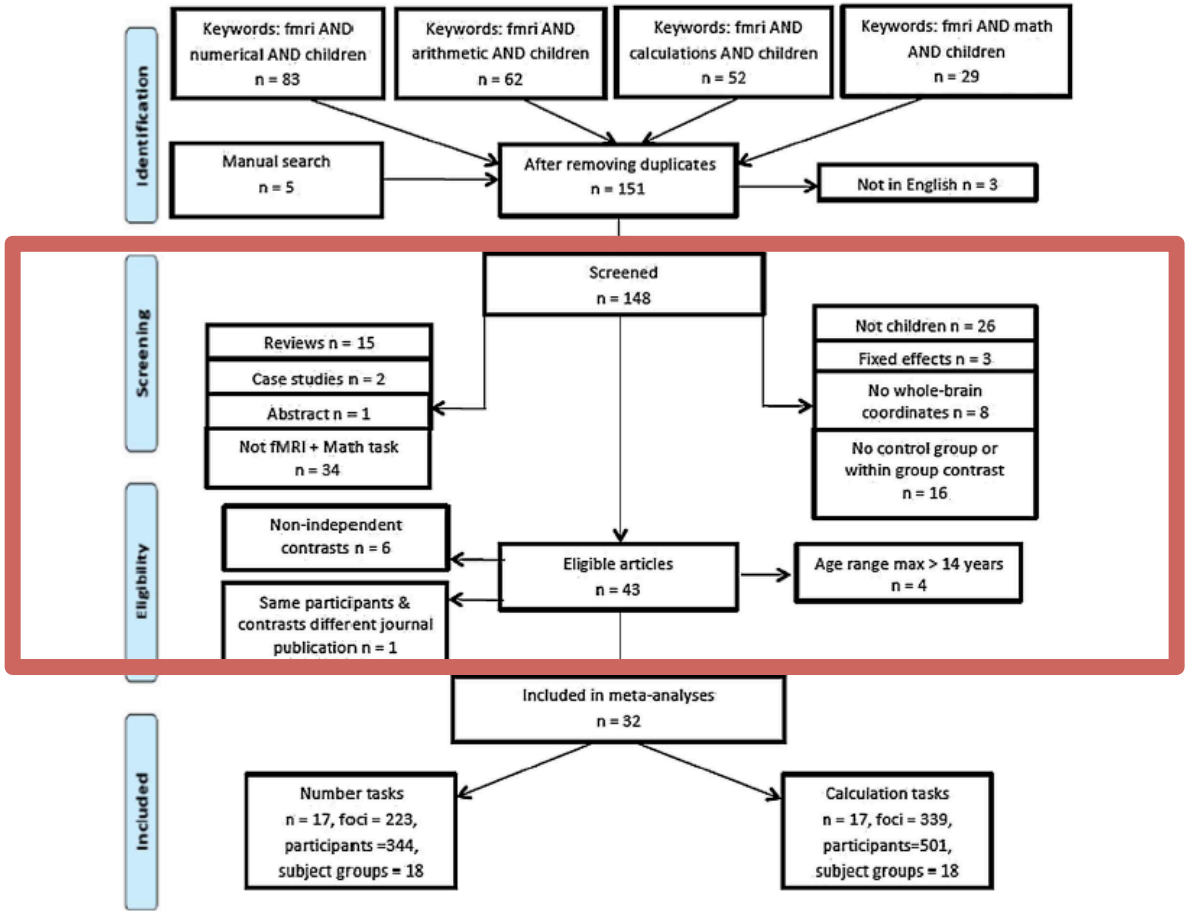


Fig. 1. PRISMA flowchart for identification and eligibility of articles (template by Moher et al., 2009). n = number of papers.

Arsalidou et al., in press

Contrasts or Experiments

- Turkeltaub, P. E., Eickhoff, S. B., Laird, A. R., Fox, M., Wiener, M., & Fox, P. (2012). Minimizing within-experiment and within-group effects in activation likelihood estimation meta-analyses. Human brain mapping, 33(1), 1-13.

Coordinates

- Tables in manuscript
- Text in manuscript
- Supplementary material ***

In text – Result section

- functional contrasts: A > B showed significant difference in V5/MT in the left (- 42, - 60, - 4) and right (45, - 57, 1) hemisphere, and superior temporal gyrus in the left (- 48, - 50, 12) and right (49, - 50, 10), and A > C in the fusiform gyri, left (- 43, - 57, - 17) and right (41, - 57, - 13) and the amygdalae, left (- 21, - 4, - 10) and right (23, - 4, - 10).

TABLE I. Areas of significant activation during recognition of all faces types minus baseline

Anatomical region	Brodmann area	Hemisphere	*x*	*y*	*z*	(*t*)-value
Own faces minus baseline						
Fusiform gyrus	BA 37	R	42	−48	−14	5.507
		L	−40	−47	−14	4.695
Inferior occipital gyrus	BA 19	R	43	−77	−4	5.184
		L	−34	−76	−4	4.678
Lingual gyrus	BA 18	R	17	−78	−3	3.641
		L	−5	−79	−3	3.837
Cuneus	BA 17/18	R	24	−86	13	4.640
		L	−22	−82	18	4.339
Precuneus	BA 7	R	20	−70	41	3.821
Partner's faces minus baseline						
Fusiform gyrus	BA 37	R	47	−45	−16	5.262
		L	−38	−46	−16	6.417
Lingual gyrus	BA 18	R	12	−76	−3	3.398
		L	−17	−76	−6	4.587
Cuneus	BA 18	R	19	−85	18	3.510
Parahippocampal gyrus	BA 36	R	14	42	−6	4.202
Middle temporal gyrus	BA 39	R	45	−64	20	5.209
Superior temporal gyrus	BA 13	R	45	−43	20	3.394
Precuneus	BA 7	L	−6	−58	37	3.589
Middle frontal gyrus	BA 9	L	−37	26	29	4.664
Parent faces minus baseline						
Fusiform gyrus	BA 37	R	40	−49	−16	4.933
		L	−38	−60	−11	3.970
Famous faces minus baseline						
Fusiform gyrus	BA 37	R	40	−55	−14	4.329
Unfamiliar faces minus baseline						
Anterior cingulate	BA 32	R	7	30	25	−4.217
		L	−3	33	24	−3.837
Cingulate gyrus	BA 24	R	6	−10	28	−3.772
		L	−5	13	30	−4.754

Taylor, Arsalidou et al., 2009

TABLE II. Areas of significant activation during recognition of personally familiar minus unfamiliar faces

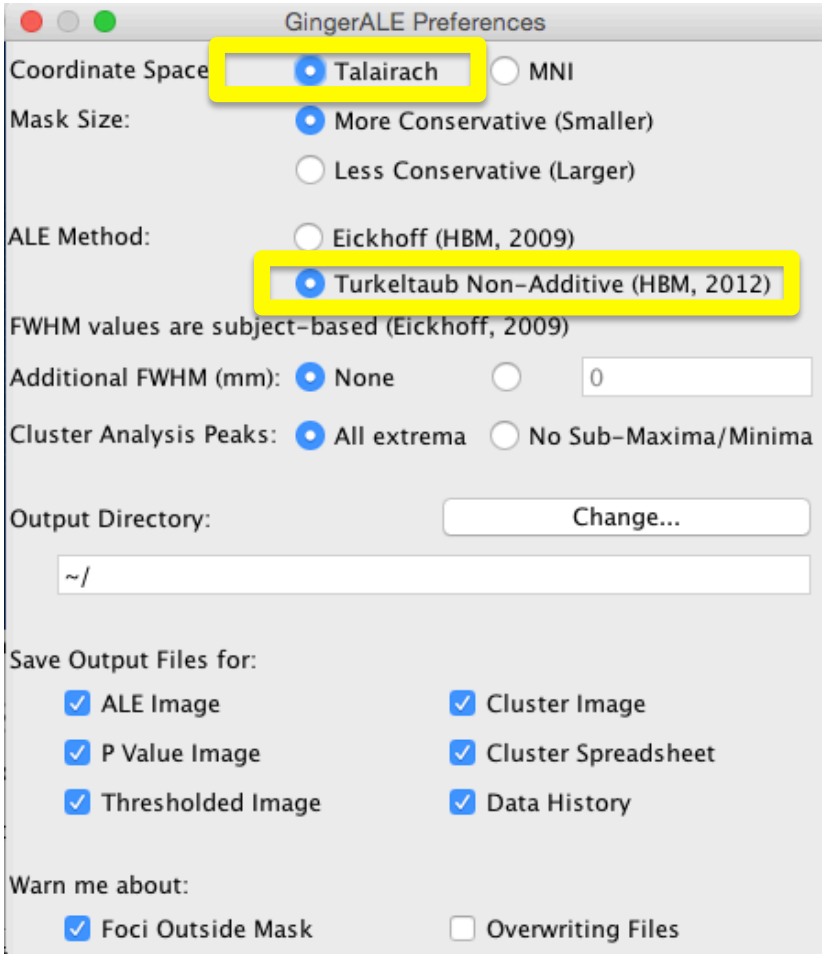
Anatomical region	Brodmann area	Hemisphere	*x*	*y*	*z*	(*t*)-value
Own faces minus unfamiliar faces						
Anterior cingulate	BA 32	R	3	35	20	3.930
		L	−1	36	20	3.857
Cingulate gyrus	BA 32/24	R	7	18	30	3.946
		L	−1	20	30	3.716
Medial frontal gyrus	BA 9	R	18	27	31	3.698
		L	−15	29	30	4.272
Middle frontal gyrus	BA 46	L	−38	36	17	3.342
Partner's faces minus unfamiliar faces						
Anterior cingulate	BA 32	R	5	33	24	4.133
		L	−3	31	24	3.377
Cingulate gyrus	BA 32	R	5	31	29	3.639
		L	−2	31	28	4.032
Medial frontal gyrus	BA 10	R	7	59	8	3.787
		L	−6	49	8	3.450
Middle frontal gyrus	BA 8	L	−23	36	38	4.279
Inferior frontal gyrus	BA 47	L	−22	17	−14	4.074
Middle temporal gyrus	BA 20/21	L	−49	−11	−14	3.322
Insula	BA 13	L	−28	15	−4	3.300
Amygdala	BA 34	L	−25	−2	−10	3.218
Thalamus		L	−20	−26	5	3.303
Parahippocampal gyrus	BA 34/28	L	−14	−9	−14	3.314
Precuneus	BA 7	L	−6	−56	41	3.375
Parent faces minus unfamiliar faces						
Cingulate gyrus	BA 32/24	R	5	26	30	3.659
		L	−1	21	30	3.901
Superior frontal gyrus	BA 6/8	R	6	22	56	3.831

Taylor, Arsalidou et al., 2009

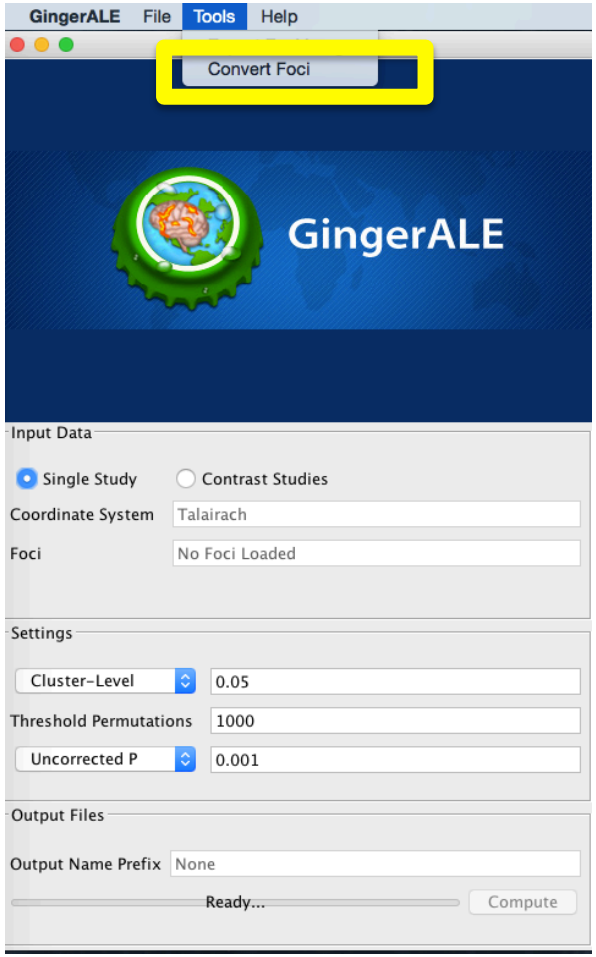
GingerALE2.3.6

Application - 161.6 MB
Created Tuesday, April 26, 2016 at 8:37 AM
Modified Tuesday, April 26, 2016 at 8:37 AM
Last opened Today, 1:46 AM
Version 2.3.6
Add Tags...

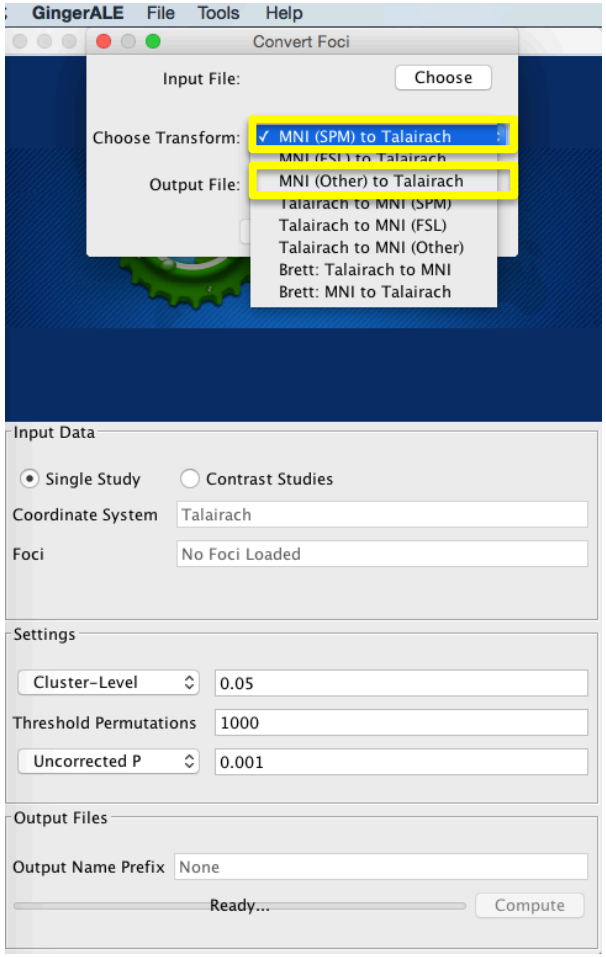
http://brainmap.org/ale/



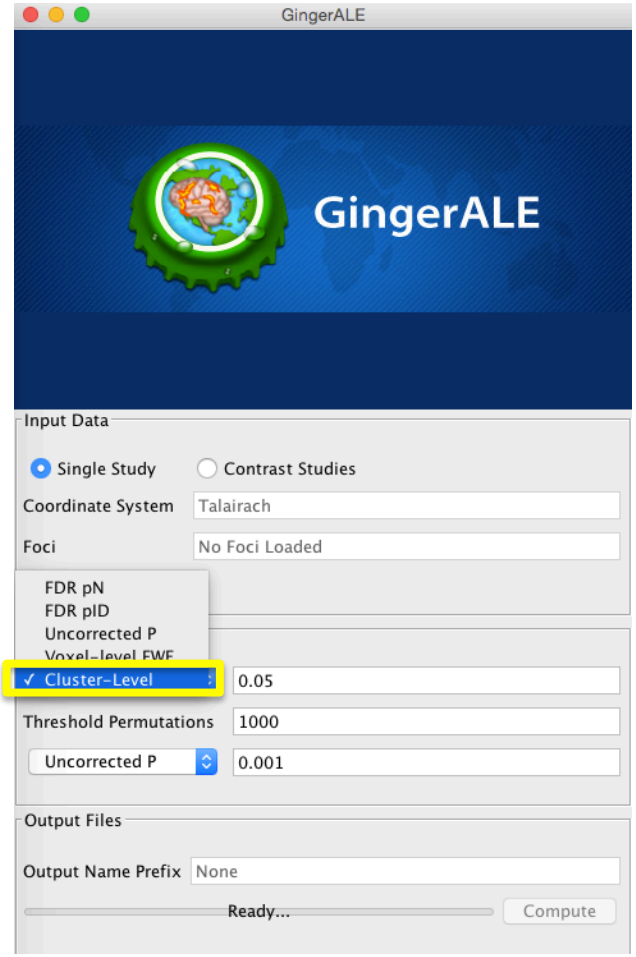
http://brainmap.org/ale/



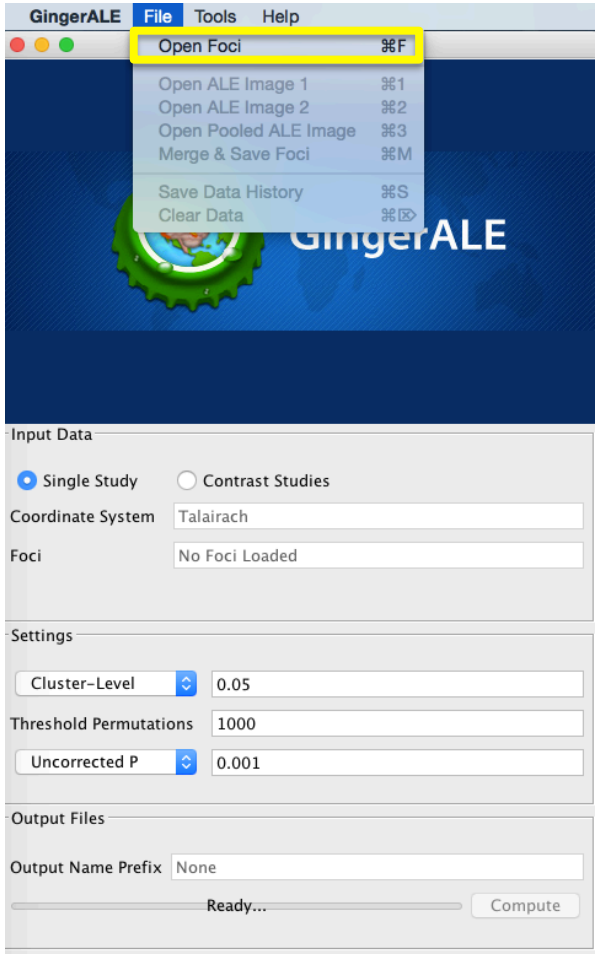
http://brainmap.org/ale/



http://brainmap.org/ale/



http://brainmap.org/ale/



http://brainmap.org/ale/

Foci files

//Madeup 2009 Age MNI A >B and A >C
//Subjects = 57
-42 - 60 - 4
45 - 57 1
-48 - 50 12
49 - 50 10
-43 - 57 - 17
41 - 57 - 13
-21 - 4 - 10
-23 - 4 – 10

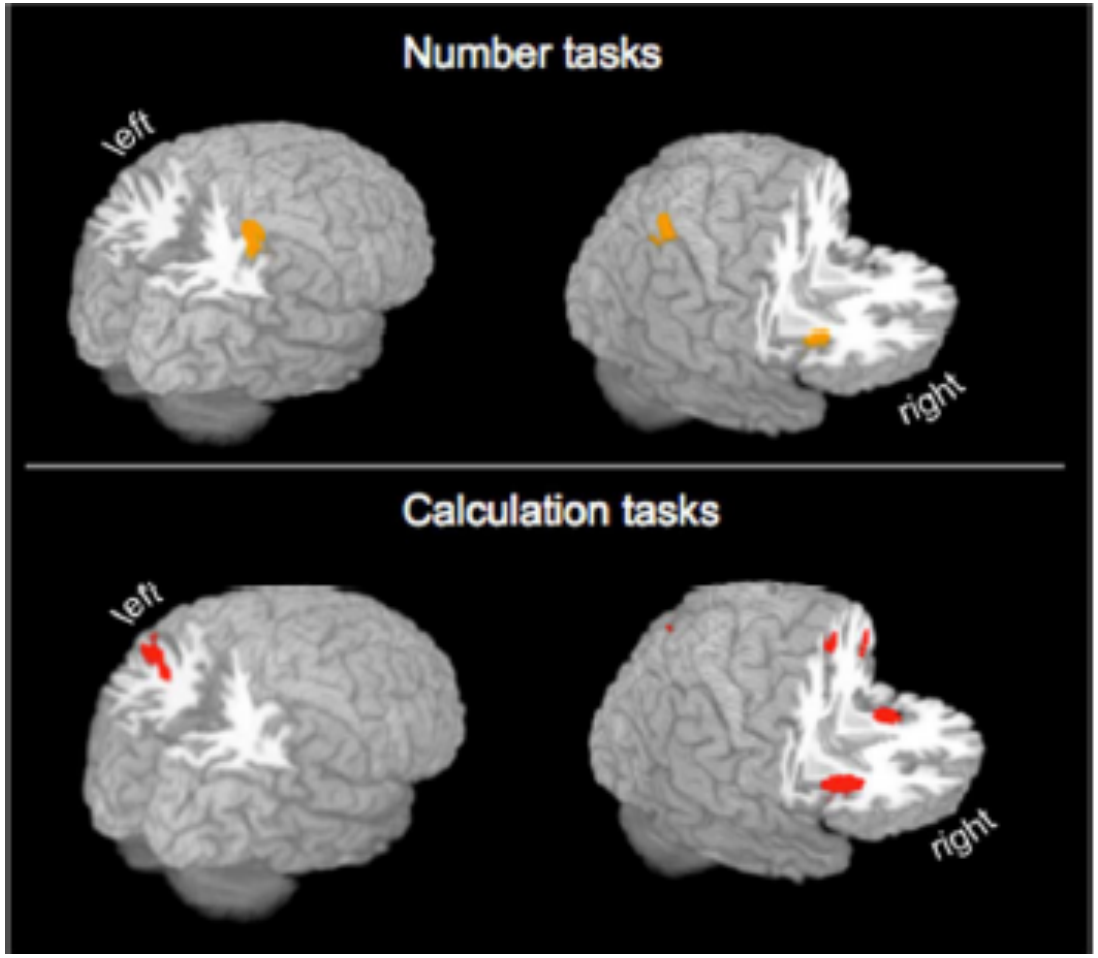
// Knotreal 2009 Age MNI A>Fixation and A>B
//Subjects = 24
5.33 -62.35 7.62
43.19 15.71 10.8
21.2 2.1 15.2
2.28 -68.35 12.11
49.1 14.2 13.1

http://brainmap.org/ale/manual.pdf

ALE output

N-TAL-child-merged-2017-06-17_ALE_C05_1k.nii
N-TAL-child-merged-2017-06-17_ALE.nii
N-TAL-child-merged-2017-06-17_clust.nii
N-TAL-child-merged-2017-06-17_clust.txt
N-TAL-child-merged-2017-06-17_clust.xls

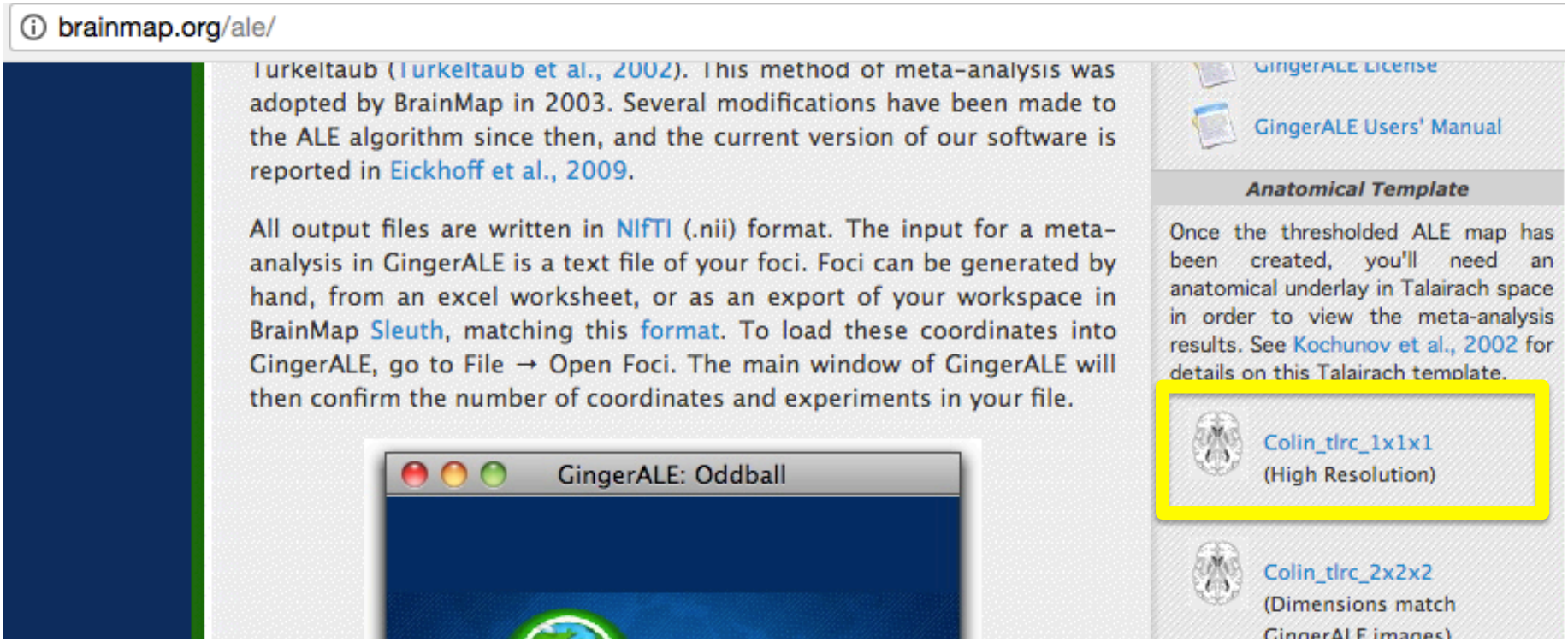
Cluster #	Volume (mm	Weighted Center (x,y,z)			Extrema Valu	x	y	z	Label
1	1736	38.1	-45.8	47.4	0.01876064	38	-48	54	Right Cerebrum.Parietal Lobe.Inferior Parietal Lobule.Gray Matter.Brodmann area 40
					0.01790206	38	-46	42	Right Cerebrum.Parietal Lobe.Inferior Parietal Lobule.Gray Matter.Brodmann area 40
					0.01184219	34	-34	48	Right Cerebrum.Parietal Lobe.Postcentral Gyrus.Gray Matter.Brodmann area 3
2	1072	32	18.2	3.4	0.01809398	30	18	8	Right Cerebrum.Sub-lobar.Claustrum.Gray Matter.*
					0.01465496	36	16	0	Right Cerebrum.Sub-lobar.Insula.Gray Matter.Brodmann area 13



Arsalidou et al., in press

Mango

- http://ric.uthscsa.edu/mango/

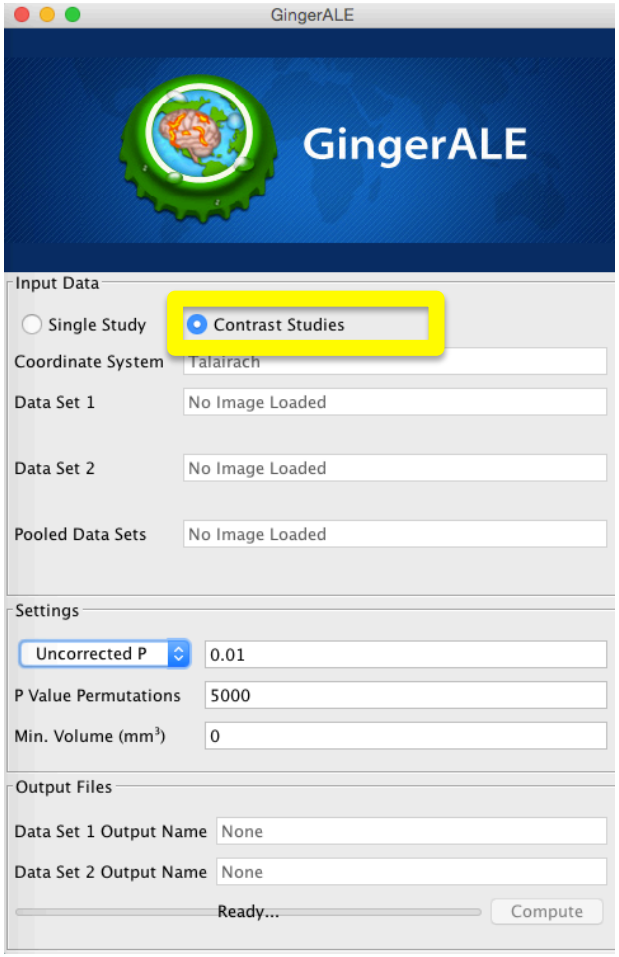


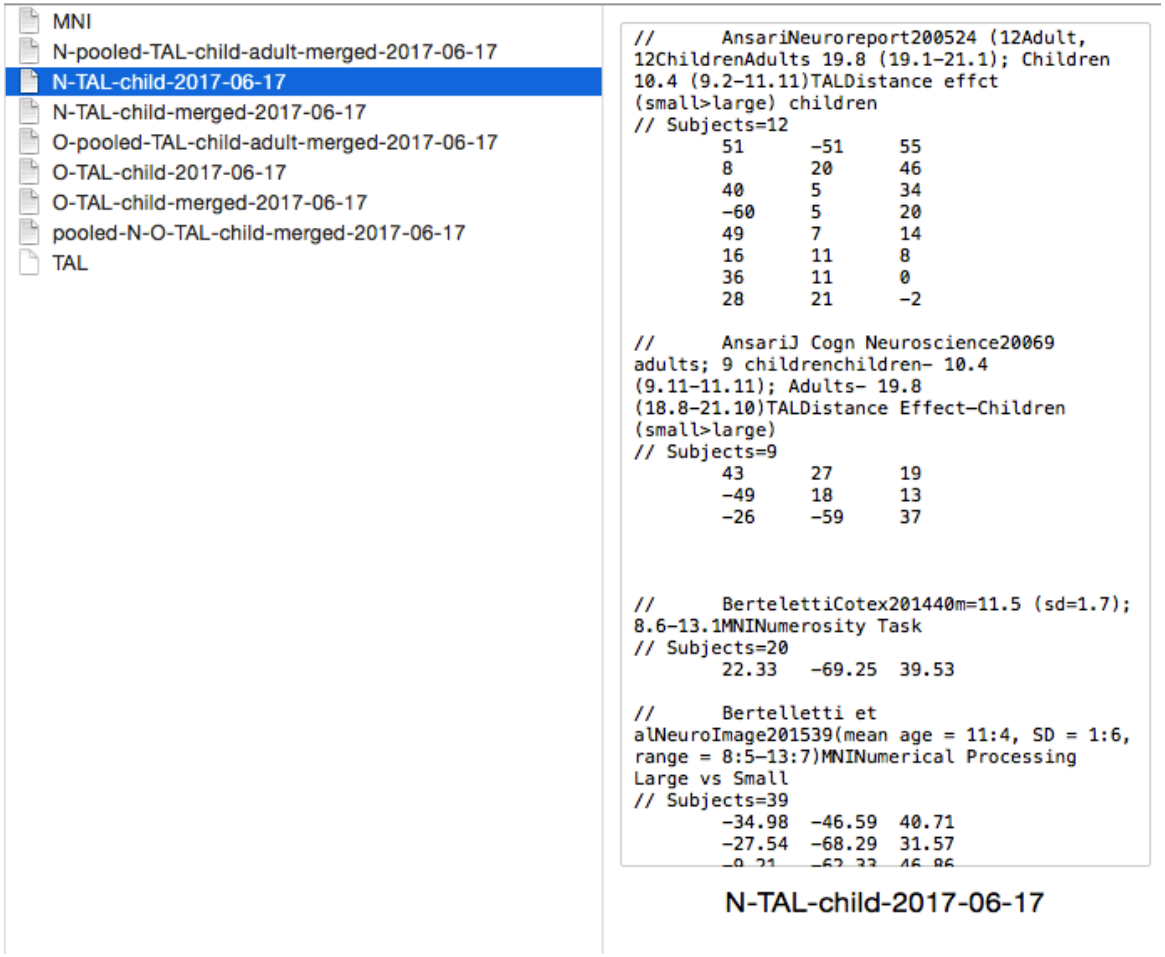
http://brainmap.org/ale/

```
Number of within-brain voxels = 198111
Mask Size                     = More Conservative (Smaller)

Foci:
Coordinate System             = Talairach
File of foci coordinates      = N-TAL-child-merged-2017-06-17.txt
Number of foci                = 223
Number of experiments         = 18
Total number of subjects      = 344

ALE - Random Effects, Turkeltaub Non-Additive (HBM, 2012):
File of ALE voxels            = N-TAL-child-merged-2017-06-17_ALE.nii
FWHM minimum value            = 8.846637917362688
FWHM median value             = 9.437333897527274
FWHM maximum value            = 10.362276299774612
Minimum ALE score             = 1.6017328E-36
Maximum ALE score             = 0.018760642

P Values: Eickhoff (HBM, 2009)
File of P values              = N-TAL-child-merged-2017-06-17_P.nii
Minimum P value               = 3.5308071E-6

Thresholding:
Threshold Method              = Cluster-level Inference
Thresholding Value            = 0.05
Thresholding Permutations     = 1000
Cluster-Forming Method        = Uncorrected P value
Cluster-Forming Value         = 0.001
Volume > Threshold            = 2808 mm^3
Chosen min. cluster size      = 616 mm^3
Thresholded ALE image         = N-TAL-child-merged-2017-06-17_ALE_C05_1k.nii

Cluster Analysis:
 #1: 1736 mm^3 from (32,-54,38) to (44,-30,58) centered at (38.1,-45.8,47.4)
   Extrema: (Labels are within +/-5mm)
     0.018760642 at (38,-48,54) Right Cerebrum.Parietal Lobe.Inferior Parietal Lobule.Gray
Matter.Brodmann area 40
     0.017902056 at (38,-46,42) Right Cerebrum.Parietal Lobe.Inferior Parietal Lobule.Gray
Matter.Brodmann area 40
```

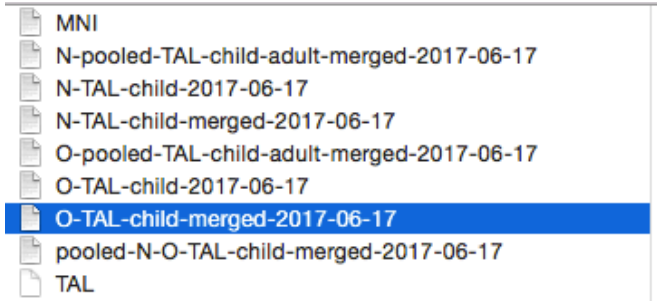
N-TAL-child-merged-2017-06-17_clust.txt

Contrasts


GingerALE
GingerALE
Input Data
Single Study
Contrast Studies
Coordinate System
Talairach
Data Set 1
No Image Loaded
Data Set 2
No Image Loaded
Pooled Data Sets
No Image Loaded
Settings
Uncorrected P
0.01
P Value Permutations
5000
Min. Volume (mm³)
0
Output Files
Data Set 1 Output Name
None
Data Set 2 Output Name
None
Ready...
Compute



N-TAL-child-2017-06-17




```
//      AshkenaziDevCogNeurosci201217
controls8.12 (SD=6.59 months)MNIControls;
Complex > Simple Addition
// Subjects=17
        -23.99  -82.22  39.32
        -20.3   -84.11  39.21
        -27.69  -71.2   42.11
        0.01    -70     48.09
        -5.4    -67.07  37.47
        31.46   -64.75  50.92
        38.89   -53.61  52.11
        -21.39  -87.66  -20.61
        -21.09  93.71   9.2
        -34.39  -86.08  -17.07
        45.01   21.81   30.53
        23.23   54.35   6.22
        5.94    24.17   46.31
        48.46   5.32    45.24
        -51.32  16.2    33.77
        -43.51  46.55   11.55
        -34.28  37.18   10.82
        -27.64  -5      57.39
        -30.61  14.98   6.98
        0.4     -14.05  33.58
        -3.32   -32.49  29.97
        2.34    1.19    31.46
        -0.96   -14.11  -4.28



//      Bertelletti et al NeuroImage 2015 39
17 22 0 (mean age = 11:4, SD = 1:6, range =
8:5–13:7) 0 Visual 0 MNI Event 8 Whole brain
and ROI random 0 0 Whole brain subtraction
large vs small
// Subjects=39
        -53     -53.84  0.08
        1.84    -68.32  50.08
        -19.5   -16.05  -2.98
```

Спасибо за внимание
Thank you for your attention

NEUROPSY LAB

marie.arsalidou@gmail.com