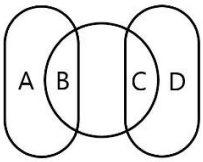
Neuresthetics
Jason T Burns
22MAY2020

Ambidexterity

Let's say A & B represent one hemisphere, while C & D represent the other.

Let's say B & C represent corticocortical neurons, while A & D are local.



The center section between B & C represents the Corpus Callosum, consisting of 200–300 million *axonal projections*[1], compared to the 100 billion[2] *neurons*, interconnected via the number of synapses they share between hemisphere. That is to say, that the number of cells which make axonal projections across hemispheres is relatively small compared to the number which those cells themselves communicate with, and generally serve higher functions.

The relative higher importance of corticocortical neurons can be gestured towards by calculating the global maximum connection count for a set given those relationships, which is all the neurons of A, times all the neurons of B, times all the neurons of C, times all the neurons of D. Learning to use both hands equally can increase the CC by as much as 10%[3], effectively raising throughput across a bottleneck. This is why putting the effort in to learn to engage fine motor skills and linguistics with both hands is valuable for time spent doing so.

Granted, these proportions and relationships are rudimentary and need to be completely refitted and scaled, but the general idea is that although a 10% increase from B1 and C1 (10 to 11) represents the same global increase as a 10% increase in A2 and D2 (50 to 55), the proportional growth is less in terms of neurons by count it took to make the increase, which means higher return for cost of growth, theoretically.

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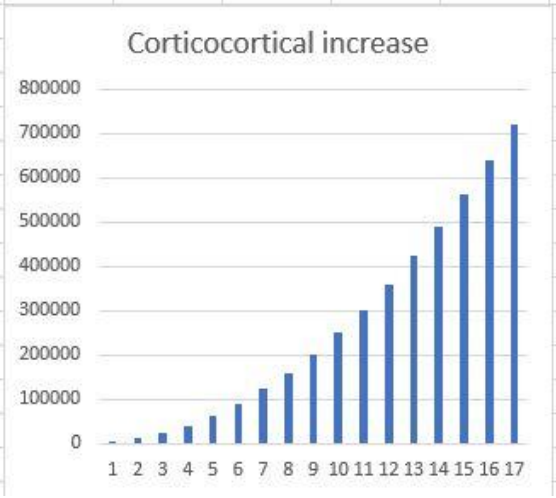
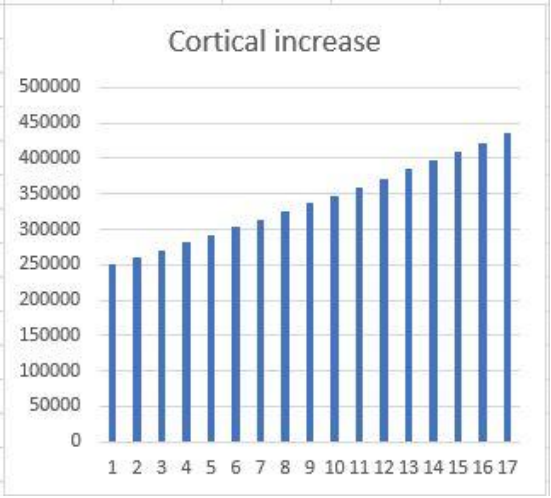
A1	B1	C1	D1	T1
50	1	1	50	2500
50	2	2	50	10000
50	3	3	50	22500
50	4	4	50	40000
50	5	5	50	62500
50	6	6	50	90000
50	7	7	50	122500
50	8	8	50	160000
50	9	9	50	202500
50	10	10	50	250000
50	11	11	50	302500
50	12	12	50	360000
50	13	13	50	422500
50	14	14	50	490000
50	15	15	50	562500
50	16	16	50	640000
50	17	17	50	722500

A2	B2	C2	D2	T2
50	10	10	50	250000
51	10	10	51	260100
52	10	10	52	270400
53	10	10	53	280900
54	10	10	54	291600
55	10	10	55	302500
56	10	10	56	313600
57	10	10	57	324900
58	10	10	58	336400
59	10	10	59	348100
60	10	10	60	360000
61	10	10	61	372100
62	10	10	62	384400
63	10	10	63	396900
64	10	10	64	409600
65	10	10	65	422500
66	10	10	66	435600





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1. https://en.wikipedia.org/wiki/Corpus_callosum
2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2776484/
3. https://pubmed.ncbi.nlm.nAih.gov/4023705/

09MAR2024 EDIT:

Perhaps being ambidextrous isn't as important as forcing the corpus callosum to be used by using motor control to express what originates from the other hemisphere, regardless of side. This combines the advantage of hand specialization with gains in corpus callosum.

Consider the split-brain studies of the 1960s. These studies were based on patients who had undergone section of corpus callosum and in some cases other forebrain commissures, for the relief of intractable epilepsy. The operation was largely successful in reducing seizures, but effectively disconnected the two sides of the brain, at least with respect to cognitive function. This enabled researchers to test the mental capacities of each side of the brain more or less independently of activity in the other side. The results quickly confirmed that the left side of the brain in these patients was indeed dominant for speech, while in most cases the right side of the brain was essentially mute.

As a Bilateria species, the human brain is a balance of symmetrical and asymmetrical functions.

There really are no left or right brained people, really, we all use both hemispheres for their unique and shared functions, their lateral and bilateral ones respectively. Asymmetry in handedness can increase efficiency by reducing duplication of functions and increasing specialization. There are certainly advantages to being single handed, it's less redundant, reduces training time, and min maxes training time to a single recipient.

It is true that Broca's area isn't always on the left side of the brain, but usually it is. It's also true, that like Ambidextrous people left handers also have a CC expanded by ten percent. Could the reason why left-handed people have a 10% larger CC on average than right-handed people, be because of the majority of people, weather left or right-handed, having language vocalization localized to the left hemisphere, which requires transmission across hemispheres to the right for motor control of the left hand at the same time? Or in short on opposites sides which forces relatively higher transhemispheric activity. If Broca's area was on the right, would right handers using the left motor cortex have a ten percent larger cc because of it, where lefties would have the disadvantage in that case?
