The Imagistic Interface as a Possible Component of the Broad Language Faculty (FLB)

Author: Nishant Mulay

Email: nishantmulay@gmail.com

In 1880, the British scientist Francis Galton wrote a paper titled 'Statistics of Mental Imagery'. In the paper, Galton "desired to define the different degrees of vividness with which different persons have the faculty of recalling familiar scenes under the form of mental pictures, and the peculiarities of the mental visions of different persons." He asked various people some questions regarding various imagistic aspects of a recollected event (e.g., this morning's breakfast table), questions like 'Is the image dim or fairly clear?', etc., and recorded their judgments. To Galton, these answers "clearly show[ed] the great variety of natural powers of visual representation" in people.

Galton initially was surprised to find that the "men of science" to whom he asked about mental imagery protested that they didn't strictly "see" anything with the "mind's eye" but that ordinary laymen did not protest and in fact readily answered in the affirmative. One of Galton's correspondents (among the men of science) said, "I do not see it any more than a man sees the thousand lines of Sophocles which under due pressure he is ready to repeat."

Keeping aside the eugenic motivations of Galton for the moment, his question of mental imagery was not crazy, nor was his correspondent's protest crazy, and nor was the laymen's prompt affirmations about "seeing" images in the mind crazy. There is obviously a distinction between seeing with the mind's eye (mental imagery) and ordinary seeing, and I would like to, in this paper, describe the interrelation between these two, and, also, sketch a possible course for studying

the phenomenon of mental imagery with the tools available in contemporary cognitive science theory.

To go back a bit in time, the Indian cognitive scientists of the later Nyaya school distinguish between 'indeterminate perception' and 'determinate perception'. S. Radhakrishnan describes their position as such: "The determinate perception of an object as qualified by some properties presupposes an indeterminate perception of the properties, without which determinate perception is not possible." This school holds that while perceiving an object, e.g., a jar, we not only require contact of the sense-organ with the jar, but also previous knowledge of 'jarness' in our minds. The British Neo-Platonist philosopher Ralph Cudworth says something similar: "Knowledge is not a passion from anything without the mind, but an active exertion of the inward strength, vigour, and power of the mind, displaying itself from within." Cudworth likens the human mind to "a diaphanous and crystalline sphere, in which the ideas and images of all things existing in the real universe may be reflected or represented." Further, he says that these images aren't actual ideas but images from which the mind is able to frame intelligible ideas. In Nyaya terms, this means that these reflected ideas and images represented in the human mind constitute the stuff of indeterminate perception, i.e., constitute the computation carried out before the sense-organ coming in contact with the object.

To reinterpret the above ideas in mental-imagistic terms (our topic at hand), let us imagine a mother teaching her child the meaning of the word 'jar' without showing him an object or a picture. She describes the object by saying things like "The jar is used to hold milk", "The jar is transparent", "The jar breaks into pieces when thrown from above", "The jar is roughly yay big in size" and so on. Listening to his mother's description, the child forms in his mind a loose picture of what we call a jar. While doing this, he is indeterminately perceiving the jar, and when he actually sees a real jar, his full perception of the jar conforms to his

modes of cognition, i.e., conforms to this generated mental picture. In Nyaya terminology, this would mean that the child's perception of the jar becomes determinate when it conforms to an indeterminate mental image.

There was also a debate in Indian philosophy as to whether indeterminate knowledge logically precedes determinate knowledge in the act of perception or vice-versa, but we need not go there. We need only be satisfied with the atoms of indeterminate perception since we are studying mental imagery and not visual perception. Also, we need not look into Galton further, since what we are interested in is an internalist phenomenon and what he was interested in was basically psychometrics, i.e., grading people's mental capacities.

Now, the stuff that goes into generating mental imagery are the atoms of indeterminate perception contained in the mind. This stuff is like a visual toolkit that the child brings into this world, using which he perceives the objects he sees as a jar, a table, a chair, a rabbit, a tiger, and so on. What we are interested in is this toolkit that generates images in the mind to which visual perception later conforms, we are not interested in visual perception itself.

To paint a provisional metaphor, this toolkit that the child comes equipped with is like the toolkit a carpenter carries with him. This carpenter's toolkit comprises tools that do general things like cutting, sharpening, drilling, gluing, etc., using which the carpenter creates various artifacts. A carpenter without his toolkit only sees a block of wood, but a carpenter with his toolkit sees a chair, a table, a bed, etc.

In language-growth terms, this would mean that this visual toolkit is employed by the child's mind to attach pictorial attributes to the lexical item 'jar' – it having a hole to carry milk, its transparency, its brittleness, its size, etc. – just like how the carpenter would use his tools of a general nature to drill, sharpen, glue and cut a block of wood to make a chair, for example.

To come to the main hypothesis of this paper, the narrow language faculty (FLN) module, containing only the generative procedure, lends its powers to something we can provisionally call an 'Imagistic Interface', along with conceptual-intentional (C-I) and sensorimotor (SM) interfaces (together called the broad language faculty (FLB) in the literature). Since there is no question as to whether the phenomenon of mental imagery is real or not, and since its nature is obviously generative, i.e., we can generate novel mental images we haven't thought of before (stuff that fantasy novelists regularly do), we need to only wonder whether this Imagistic Interface is directly connected to FLN or goes through the C-I interface first.

To roughly analyse this, let's take some sentences –

    (1) Colourless green ideas sleep furiously
    (2) Revolutionary new ideas appear infrequently
    (3) Spherical weightless bricks rotate slowly
    (4) Smooth round balls roll easily

Note that all the four sentences have the same syntax, viz., "Adj + Adj + N + V + Adv", which is a representation in English, as opposed to the non-representation "Adj + V + Adv + N + Adj" (e.g., "smooth roll easily balls round" has no representation in English). Without going into the nature of the representations, we only need to understand for now that the infinite set of representations an I-language generates has psychological reality, and even though it technically is an infinite set, it still has limits, i.e., there will be a complement set that this I-language wouldn't be able to parse and hence will have null psychological reality in the mind. Therefore, all the above four sentences have psychological reality in an English speaker's mind, therefore we can proceed to talk about how the Imagistic Interface would parse these sentences.

Now, (1) is semantically deviant, i.e., the sentence just doesn't make any sense. There is no colourless green anything. Ideas don't sleep. And sleeping doesn't happen furiously. Though we can sufficiently talk about the linguistics of this sentence for hours, we can never ask the question of what it means (short of stipulations of what these words themselves mean, which is a trivial Saussurean arbitrariness matter). And since we can never ask what it means, we do not know the meaning of this sentence and do not have a complement mental image generated. In other words, (1) is conceptually and imagistically null, i.e., it has no psychological reality in C-I nor in the Imagistic Interface.

Sentence (2) is semantically non-deviant. Yes, ideas can be new, ideas can be revolutionary, ideas can appear, and appearance can happen infrequently. All these concepts make sense, and hence (2) has reality in C-I. The question is whether (2) has a mental image. If (2) has a mental image, what does it look like? And if it doesn't, why not? If one attributes more semantic structure to the words in (2), we can have a mental image. For example, the word 'idea' is associated with persons, i.e., persons have ideas and not, for example, a block of wood. Therefore, it is possible to interpret (2) to mean that revolutionary new ideas in the person X (in X's mind) appear infrequently, and then imagine how X's behaviour might look like when this happens, after which we could have a mental image of (2), but only that it would be a highly derivative one. Further computation is required to form a mental image of (2), though the main point is that it is not impossible to imagine (2), unlike (1) where it's impossible to.

The sentence (3) lies somewhere between (1) and (2), i.e., it is not completely deviant like (1) but still has some problems while interpreting it. You know that bricks are rectangular and they have weight, so what could spherical weightless bricks mean? You cannot imagine a spherical brick. You can imagine a spherical object made of the stuff bricks are made of, but that object would cease to be called as a 'brick' – 'brick' has certain features of shape attached to it and

spherical is not one of them. Though you can easily imagine a brick rotating slowly, you cannot imagine a spherical brick and hence cannot imagine a spherical brick rotating slowly.

Coming to 'weightless bricks', we know that bricks feel heavy when we hold it, obviously. But, for the purposes of our study of mental imagery, if you try to imagine 'weightless bricks rotating slowly' and 'bricks rotating slowly', they seem, in fact, to be identical mental images. Adding 'weightless' to 'bricks rotating slowly' doesn't stop us from imagining bricks rotating slowly, but adding 'spherical' does stop us. The property of 'brick' having mass doesn't lead us into problems while imagining a rotating brick, but the abstract properties of shape of 'brick' does in fact lead us into difficulties. Similarly, we can adequately imagine "balls rolling down frictionless planes" even though no such thing as frictionless planes exist, but we can't imagine, for example, "a spherical cube rolling down a staircase", because it runs into various difficulties associated with the pictorial form of these lexical items – a cube isn't spherical, and nothing can roll down a staircase because, strictly speaking, a thing can only descend or ascend from one step to the next.

We can distinguish between "weightless bricks rotating slowly" and "spherical bricks rotating slowly" by saying that the first one is imagistically non-deviant and the second one is imagistically deviant. To go back to later Nyaya terminology, the set of physical properties of an object is not incumbent on indeterminate perception, but its complement set is. Since indeterminate perception (what we have interpreted to mean as the generation of mental imagery) does not involve contact of the sense-organs with the object, there is no question of the properties of the object derived from this contact of the sense-organs with the object (i.e., the object's physical properties) being incumbent on the generation of mental imagery. To put it differently, mental imagery is a weightless matter but not a shapeless matter.

In (4), all the words fit together semantically and imagistically without any deviance. Balls can be smooth, they can be round, they do roll, and the rolling can happen easily – and all of this can be imagined perfectly, hence they are imagistically non-deviant.

To summarize our analysis of (1)-(4), (1) was semantically deviant. (2) was semantically non-deviant but imagistically highly derivative (but not deviant). (3) was semantically non-deviant (i.e., you could understand a 'spherical brick', unlike (say) 'spherical ideas') but imagistically deviant (something to do with 'spherical brick' and not 'weightless brick'). (4) was both semantically and imagistically non-deviant.

Our above analysis would plausibly suggest that the psychological reality in the Imagistic Interface of a representation (a linguistic expression) generated by a particular I-language is incumbent on, first, it having psychological reality in the C-I interface, and, second, on the pictorial features (e.g., shape) of the individual lexical items themselves. What this roughly means is that we can't talk about 'green ideas' the way we can talk about 'spherical bricks.' Since the lexeme 'brick' does have the property of shape, we can attach the property 'spherical' to 'brick' and talk about 'spherical bricks', but since 'idea' does not carry the property of shape the way 'brick' does, we cannot talk about 'spherical ideas', and we cannot talk about 'green ideas' for the same reason. 'Green ideas' and 'spherical ideas' are semantically deviant, but 'spherical bricks' and 'colourless roses' are semantically non-deviant.

To put the matter somewhat theoretically, the psychological reality of a representation generated by a particular I-language in the Imagistic Interface ultimately depends on the syntactic properties of the pictorial features of the lexical items involved. This is to say that 'green ideas' will never have a mental image because of its semantic deviance, and 'spherical brick' (though semantically non-deviant) will never have a mental image because of its imagistic

deviance due to syntactic mismatch between the pictorial features of 'spherical' and 'brick.'

What comes out of our rough analysis above is that some lexical items do carry pictorial features, and when these items are found in an expression, the generation of a complement mental image of that expression is incumbent on the syntactic properties of their pictorial features. Therefore, to study the generation of mental imagery of an I-language is to study the generation of a specific subset of the set of representations of that I-language, i.e., the subset which is sieved out of our posited Imagistic Interface.

References and Bibliography:

1. Francis Galton – 'Statistics of Mental Imagery' (1880): https://psychclassics.yorku.ca/Galton/imagery.htm
2. Sarvepalli Radhakrishnan – 'Indian Philosophy: Volume 2' – George Allen & Unwin Ltd: London.
3. Hutton, Sarah, "Ralph Cudworth", *The Stanford Encyclopedia of Philosophy* (Summer 2021 Edition), Edward N. Zalta (ed.), URL = https://plato.stanford.edu/archives/sum2021/entries/cudworth/.
4. Noam Chomsky – Syntactic Structures (1957)
5. Noam Chomsky – Rules and Representations (1980)
6. M. D. Hauser, N. Chomsky, W. T. Fitch, The faculty of language: What is it, who has it, and how did it evolve? *Science* 298, 1569–1579 (2002).
7. Noam Chomsky – The Girona Lectures (1992) forthcoming on Ling Buzz.
8. Nishant Mulay – 'The syntax of mental imagery' (2022) – URL = https://ling.auf.net/lingbuzz/006642
9. Nishant Mulay – 'A rough sketch of the architecture of our language faculty (2021) – URL = https://ling.auf.net/lingbuzz/006364

10. Nanay, Bence, "Mental Imagery", *The Stanford Encyclopedia of Philosophy* (Winter 2021 Edition), Edward N. Zalta (ed.), URL = https://plato.stanford.edu/archives/win2021/entries/mental-imagery/.

11. Barbara Landau and Lila Gleitman – 'Language and Experience: Evidence from the Blind Child' (1985): Harvard University Press

12. Bhartrihari – 'Vakyapadiya' – URL = https://archive.org/details/Vakyapadiya/page/n35/mode/2up