The Image Problem
Mystery and Debate

Arthur Auer

Mental *Picturing* or Mental *Imaging*?

In Lecture II of his seminal 1919 course for the first twelve Waldorf teachers, Rudolf Steiner's guidance was clear: We must help children develop *Vorstellen*, as well as feeling and willing. Steiner characterizes *Vorstellen* as "thought activity" in which there is "movement of mental images" (*Bewegung von Bildern*), an "imaging-activity" (*Bildtätigkeit*).[1] (In a German psychology dictionary, *Vorstellen* is described as: "making an image of something in thoughts (*sich in Gedanken ein Bild von etwas machen*)".

As a result of Steiner's recommendation, there is in Waldorf schools great emphasis on the development of thinking with mental *imag*-ery, mental "picturing" and *imag*-ination and this applies to children and teachers alike. But what about the significant number of children and teachers who mentally "picture" or visually imagine very little or nothing at all in their "mind's eye"? How do they become imaginative learners and teachers? And what exactly are "mental images" and "mental imaging" anyway? What is the difference between a mental image and a mental picture? This article explores aspects of these questions from the points of view of psychology and neuroscience.

The Multisensory Nature of Mental Images

Noted English Waldorf educator, Cecil Harwood, admits in his notes on translation of Steiner's *Study of Man* that although Steiner "does rather stress the **pictorial** nature of *Vorstellung* [the image produced by the activity of mental image-making or *Vorstellen*]… *Vorstellung* **does not intrinsically contain the suggestion of picture** [and Harwood, in revising the translation] toyed with the idea of rendering it as 'mental evocation' or even inventing the word 'mentalisation'."[2]

Indeed, elsewhere, in other lectures cycles, Steiner does refer to *images* from other sense experiences; for example, "mental images (*Vorstellungen*) fill themselves with a content derived from percepts conveyed by our eyes and ears and so on…"[3] This multisensory aspect of mental images becomes important for Waldorf education since its founder stresses the vital importance of 12 senses and of different ways of learning – visual, auditory, kinesthetic, linguistic, etc.

Consideration of the multisensory nature of images begins to address the question of the significant number of children and teachers who, to a significant degree, cannot conjure up visual images in the so-called "mind's eye." They become 'imaginative' learners and teachers because *Vorstellen*, mental imaging, does not have to be only mentally-*visually* accessible to waking consciousness. There are other ways to *vorstellen*, to re-*present* things mentally. The mind is an amazingly versatile configurer of different types of "images": sound-images in the mind's ear, taste-images in the mind's tongue, smell-images in the mind's nose, and kinesthetic-tactile images in the mind's hand. For those who are visual-mental-image-blind, the hands, for example, can compensate and make images appear externally in matter for the outer eyes to see rather than the inner "mind's eye." They are used to show and make seen. The art of making shapes makes visible that which is inwardly invisible.

Many researchers today point to the rich multisensory nature of mental images. For example, a leading neuroscientist, Antonio Damasio, characterizes images as

> mental patterns with a structure built with the tokens of each of the sensory modalities—visual, auditory, olfactory, gustatory, and somatosensory. … [The latter] includes varied forms of sense: touch, muscular, temperature, pain, visceral, and vestibular. The word image does not refer to 'visual' image alone and there is nothing static about images either… The process we come to know as mind … is a continuous flow of images… ***Thought* is an acceptable word to denote such a flow of images**.[4]

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1 Rudolf Steiner, *Study of Man: General Education Course* (Forest Row, UK: The Rudolf Steiner Press, 1966).

2 C. Harwood Note, "A Note on the Revised Translation", *Study of Man* (Forest Row, UK: The Rudolf Steiner Press, 1966), p. 7. Emphasis added.

3 Rudolf Steiner, *A Psychology of Body, Soul, and Spirit: Anthroposophy, Psychosophy, and Pneumatosophy* (New York: Anthroposophic Press, 1999), p. 196.

4 Antonio Damasio, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness* (New York: Harcourt Brace & Co., 1999), p. 318. Emphasis added.

Damasio's designation of *thought* as a "flow of images," I would argue, correlates with Steiner's *Vorstellen* as a "movement of images."

In a major and comprehensive study entitled *The Case for Mental Imagery* (2006), Harvard University Professor Emeritus (Psychology), and leading neuroscience researcher, Stephen Kosslyn, also describes how mental imagery is not limited to the "visual modality … and the experience of 'seeing with the mind's eye," but also includes "auditory imagery … accompanied by the experience of '**hearing with the mind's ear,**' tactile images … accompanied by the experience of '**feeling with the mind's skin**,' and so on… The modality-specific representations that underlie mental imagery are relatively prolonged and can be called up voluntarily."[5]

Another neuropsychologist, Ian Robertson, who documents the prevalence of visual mental- image-blindness, emphasizes that "imagery is not just about vision" but also "consists of mental … sounds, smells, tastes, touch and other bodily sensations that we can recreate with incredible vividness."[6] He discusses "kinesthetic imagery," used by athletes, and "complex mind-body state imagery" that can influence a person's wellbeing.[7] Robertson deems all mental images both concrete and abstract "mind sculptures," and he provides exercises to test and develop stronger inner imaging. Another recent study, to round up this sample of the many relevant studies and publications on mental imagery, is a rich collection of empirical and theoretical studies called *Multisensory Imagery*.[8]

These examples remind us that there are sound-music imagers with mind's ears, hands-on-kinesthetic imagers with mind's hands, taste imagers (such as wine experts) with mind's tongues, etc. And there are all kinds of complex "combiners," not to mention synesthetes such as Kandinsky who have color-sound imagery! In fact, while one modality may seem predominant in people, most of us are "combiners" of senses and sense-images without always being conscious of it. Steiner points out that in our complex mental life, we synthesize information from multiple senses in our discernment or judgment (*Urteil*) of reality: "The world you experience comes to you in twelve different ways and you reunite things through your judging (*Urteilen*)… Because we have twelve senses, we have a large number of combined relationships between the [twelve] senses."[9] With twelve senses, we create a variety of mental image-formations and their combinations.

The Debate on the Elusive Nature of Mental Images: Some History

Researchers of mental images and mental imagery have been investigating these images' multisided and elusive nature for decades. Moreover, what mental images and imagery actually are has been questioned for centuries and has in recent decades sparked in psychology a so-called 'imagery debate'. Stephen Kosslyn summarizes the challenge of investigating this phenomenon:

> **Mental images are fleeting, ethereal entities**; how should we conceptualize them in a way that explains not only how they represent information about the world but also how 'mental' images relate to the physical brain itself? This issue has plagued theorists at least since the time of Plato, who in his *Theatetus* likened **images to patterns etched on a block of wax** (individual differences in imagery were explained by differences in the hardness and purity of the wax).[10]

And Aristotle, the great philosopher and Plato's one-time pupil, held that "the soul never thinks without a mental image [*phantasma*]" (*On the Soul*, 431a 15-20).

Here are a few more historical examples from the long and fascinating quest to solve "the image problem" and its related debate:

1880: The First Mental Imaging Study

A pioneer, who set the stage for modern imaging research, was the Victorian Renaissance Man, Sir Francis Galton. He began questioning his friends in the Royal Society of London about their "faculty of visualizing" and "to [his] astonishment"

> found that the great majority of the men of science … **protested that mental imagery was unknown to them**. … On the other hand, when [he] spoke to persons … in general society, [he] found [that] many men and yet a larger number of women, and many boys and girls, declared that they habitually saw mental imagery… perfectly distinct to them and full of color… Many persons, especially

5 Stephen M. Kosslyn, William L. Thompson, and Giorgio Ganis, *The Case for Mental Imagery* (Oxford: Oxford University Press, 2006), p. 4. Emphasis added.

6 Ian Robertson, *Opening the Mind's Eye* (New York: St. Martin's Press, 2003), p. 3.

7 Robertson, *Opening the Mind's Eye*, p. 59.

8 Simon Lacey and Rebecca Lawson (eds.), *Multisensory Imagery* (New York: Springer-Verlag, 2013).

9 Rudolf Steiner, *The Foundations of Human Experience* (New York: Anthroposophic Press, 1996), Lecture 8, pp. 144-45.

10 Kosslyn, *The Case for Mental Imagery*, pp. 8-9. Emphasis added.

> women and intelligent children, take pleasure in introspection.[11]

Galton intensified his inquiry, introduced the use of the questionnaire and investigated the 'vividness' or 'deficiency' of people's imagery, specifically its degree of brightness, sharpness and coloring. In his groundbreaking study, the 'Statistics of Mental Imagery', first published in the journal *Mind*, in 1880, Galton concluded that

> [A]n over-readiness to perceive clear mental pictures is antagonistic to the acquirement of habits of highly generalized and abstract thought, and that if the faculty … was ever possessed by men who think hard, it is very **apt to be lost by disuse**. … However, … the missing faculty seems **to be replaced so serviceably by other modes of conception … chiefly… connected with the motor sense**… Men, who declare themselves entirely deficient in the power of seeing mental pictures, can nevertheless give life-like descriptions of what they have seen and can otherwise express themselves as if they were gifted with vivid visual imagination. They can also become painters of the rank of Royal Academicians.[12]

1978: Visualizers and Verbalizers

A century later, Robert Sommer, Professor of Psychology at UC Davis, characterized the dichotomy between visual thinkers and intellectual word thinkers:

> People who think in pictures often doubt that others do not. **People who lack imagery … are skeptical that anyone has it. Visualizers and verbalizers inhabit different worlds.** A good imager, whose memory is a vivid multisensory collage, can raise his blood pressure by imagining that he is running an exciting race or dilate the pupils of his eyes by imagining himself at the trail's end at dusk. The verbalizer can recall such scenes but only as nonsensory husks. No internal image can make his pulse race or his nostrils flare.[13]

Vivid mental imagers often cannot watch scary movies without risking insomnia and are much more vulnerable to strong, trauma-generating experiences.

1981/2005: Picture Thinker Minority

Child development researcher Linda Silverman, who coined the term '*visual/spatial learner*' in 1981, found that 45% of people use both visual/spatial thinking and thinking in words. But while 30% strongly use visual/spatial thinking, only 25% think only in words. Of the 30% even a smaller percentage are true 'picture thinkers' who use this mode of thinking to the exclusion of the others.[14]

2002: Opening the Mind's Eye

Neuroscientist and former Director of the Institute of Neuroscience at Trinity College, Dublin, Ian Robertson, calls attention to the dimming of mental imagery in our highly intellectualized, word-based culture:

> Western societies have largely lost the ability to think in images rather than words. … [M]odern neuroscience backs [this up] ... [I]t is the nature of words that they tend to transform experiences into a rather bloodless code that can starve our brains of the rich images that wordless imagining can evoke. [W]ords trigger images as well as other word-thoughts. Yet most of us, most of the time … don't think in images enough … Language is the great achievement of evolution — an essential ingredient in what makes human beings unique on the planet. But there are costs to the way we have grown dependent on the spoken and written word.
>
> Imagery consists of the mental **sights, sounds, smells, tastes, touch, and other bodily sensations** that we can re-create with incredible vividness in that private, infinite universe within our skulls. The human brain is the most complex object in the known universe and it has the most incredible abilities, some which — like imagery — are underused.
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> Imagery is important, but in Western culture, language is king. In school we steadily wrap our children's brains in the 'cool web of language.' It would be terrible if we didn't, but there is a cost to everything. By neglecting imagery we risk the withering of whole set of quite remarkable mental capacities … Children

11 Francis Galton, "Statistics of Mental Imagery", first published in *Mind*, 5, 301-318 (1880). Emphasis added.

12 Galton, "Statistics of Mental Imagery". Emphasis added

13 Robert Sommer, *The Mind's Eye: Imagery in Everyday Life* (New York: Delacorte Press, 1978), pp.1-2. Emphasis added. Sommer refers to individuals as being 'visile', 'audile', and even 'motile' imaginers, "better suited to … mentally performing a complicated dance step" (*The Mind's Eye*,1-2).

14 Linda Silverman, *Upside-Down Brilliance: The Visual-Spatial Learner* (Denver: Deleon Publishing, 2005).

> think mostly in images before word-dominated school clouds their mind's eye.[15]

Robertson goes on to describe what this one-sided intellectual emphasis means for adulthood and how art tries to be a cultural corrective:

> Most of the time we [as adults] see, hear, feel, taste, and smell what our brains expect rather than the sensations themselves. Much modern art tries to shock or surprise us out of these image-clouding mental habits into seeing more purely with the mind's eye, uncluttered by well-worn categories and labels. (p. 4)
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> The older we get, [it becomes] harder and harder to have an experience that's completely new … When you classify experiences like this, you begin to experience the class and not the event. In other words, your conscious experience becomes once removed from the immediate sensation.(p. 12)
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> The brain's predilection for prediction and categorization is not confined to the visual sense. It also anticipates what we see, hear, feel, taste, and smell … For much of our lives, we taste memories — what we expect — not the raw, fresh complexity of the sensations on our tongues… (p. 18)
>
> But the outside world can hijack our attention... It is … [at] rare moments that we are **closest to the unfettered, uncategorized seeing that we attribute to young children and to savants**. (p. 19, emphasis added)

2006: Depictive or Descriptive

Cognitive neuroscientist and Harvard Professor Emeritus of psychology, Stephen Kosslyn, has been in the forefront of the debate since the 1970's, when the validity of imagery as a fundamental part of cognition was significantly brought into question again. (It had been attacked previously as worthless by behaviorist psychology because there is no visible evidence of images in the brain.) In 2006, Kosslyn collaborated with several colleagues to issue *The Case for Mental Imagery*. With the aid of MRI and PET scanning, he and his colleagues revealed that Plato's mythical 'seal' is indeed making marks in our neural tissue 'wax.' In Kosslyn's and his colleagues' judgment, recent discoveries have 'resolved' the imagery issue: There is now convincing neuroscientific mapping evidence (brain scans) for depictive mental imaging activity in the visual cortex. Visual images are essentially spatial and are topographically mapped out physically on the cortex. Neurons interconnect to represent lines and surfaces. The fact that this activity has been found to occur in the same area that processes our visual perception of the outer world, Kosslyn claims, establishes that internal visual imagery is closely connected with visual perception and recognition.

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Kosslyn and his colleagues, however, have yet to account for and 'resolve' the mystery of how perceptions inscribe and map themselves in patterned neural formations and how these physical instruments lead to images in the mind. Furthermore, his 2006 study focuses primarily on a comparison of the two main modes of mentally 'representing' the world, the 'depictive' and the 'descriptive' (which are comparable to Sommer's 'visualizer' and 'verbalizer' described above):

(1) The 'depictive' mental imaging mode has traditionally been investigated from Plato to William James by using introspection. (Rudolf Steiner is part of that tradition; he represents his *Philosophy of Freedom* as the "Results of Introspective (*Seelische*) Observation according to Natural Scientific Methods."[16])

(2) The 'descriptive' mode uses symbolic language, that is, thinking in words and other symbols.

Significantly, Kosslyn disagrees with the latter view that mental processing is solely language-like and symbolic:

> Many computer scientists—perhaps because of their familiarity with list processing languages such as LISP—have the strong intuition that language-like formats are sufficient for representing all knowledge.
>
> (*The Case for Mental Imagery*, p. 20)

15 Ian Robertson, *Opening the Mind's Eye*, pp. 2-3. Emphasis added.

16 This is the original subtitle of Steiner's 1894 classic, *The Philosophy of Freedom*: "*Seelische Beobachtungsresultate nach naturwissenschaftlicher Methode.*"

> Squarely within this emerging new computer science-inspired perspective, Zenon Pylyshyn (1973) argued that "the picture metaphor underlying recent theoretical discussions [of visual mental imagery] is seriously misleading—especially as it suggests that an image is an entity to be perceived". (p. 1) Moreover, he claimed that "an adequate characterization of 'what we know' requires that we posit abstract mental structures to which we do not have conscious access and which are essentially conceptual and propositional [descriptive] rather than sensory or pictorial, in nature. Such representations are more accurately referred to as descriptions than as images in the usual sense." (p. 6)

Many years later, in spite of recent and remarkable neuroscientific mapping data, Pylyshyn, a Canadian cognitive scientist who initially played a major role in sparking the 'imagery debate' in 1973, still holds his position and assertion that current neuroscientific data cannot resolve the debate. (It would be interesting to know whether Pylyshyn can visualize mental images or is he 'image-blind' and/or completely a 'verbalizer'? And is Kosslyn a vivid visualizer?) Kosslyn remains firm in his objection to Pylyshyn's one dimensional view of the human mind. Brain scanning, he says, reveals that mental imagery is a physiological and psychological reality and that there are multiple systems of mental representation—depictive, descriptive (language), motoric, procedural, etc.—and that the versatile human being uses combinations of them.

What exactly are "mental images" and "mental imaging" anyway? What is the difference between a mental image and a mental picture?

2007: Mentalese

Evolutionary Psychologist and renown Harvard Professor, Steven Pinker, presented his position on mind and language in a series of popular books: *The Stuff of Thought* (2007), *How the Mind Works* (1996) and *The Language Instinct* (1994). Pinker holds that our minds work at an even deeper level than that of imagery or the language-like and symbolic. He comes up with his own term, "mentalese," for the mysterious silent medium of the brain that is the real ground substance of our thought and of the mind's activity. We can clothe "mentalese" activity in words, but words do not determine the meaning of thought at its root. Thinking, Pinker points out, does not depend on language and words.

Speculating about mentalese sounds interestingly like Harwood's previously cited attempt to find new terminology in such expressions as "mentalisations." At any rate, Pinker, joining Noam Chomsky as another genius of linguistic and cognitive theory, set off another interesting offshoot of the imagery debate.

2010: Mind's Eye Blindness

Physician and Professor of Neurology, the late Oliver Sacks, appreciated and built on Kosslyn's pioneering and decades-long research. Sacks stated that it

> revolutionized the study of imagery. … Where [the philosopher Ludwig] Wittgenstein writes of 'saying' and 'showing,' Kosslyn speaks of 'descriptive' and depictive' modes of representation. These modes are available to the normal brain, and they are complementary, so that one may sometimes use one mode or the other.[17]

In his book, *The Mind's Eye*, Sacks is still left with the mystery of how imagery really works in the human mind, even after surveying contemporary research into mental imagery in both the sighted and the blind. He uncovers an array of differing capacities, processing modes and unaccountable anomalies and contradictions. Furthermore, Sacks adds his own experience and admits that he is one of those who are "blind" when it comes to bringing depictive images to consciousness at will. He poses the question: "What, then, of people like me … **who cannot evoke any visual images voluntarily**? One must infer … that we have visual images that allow visual perception and recognition but are **below the threshold of consciousness**."[18]

Already early in life, around age 14, Sacks became uncomfortably self-conscious of his "deficiency." He learned that his mother, a surgeon and anatomist, was able to see and mentally move objects "in her mind as clearly and vividly as if she were looking at them." In comparison, he "felt bewildered, and very stupid. I could hardly see anything with my mind's eye—at most, faint, evanescent images over which I had no control."[19] Sacks adds to this account another example of a surgeon, who, like himself, cannot consciously conjure up visual images and yet is capable of designing solar

17 Oliver Sacks, *The Mind's Eye* (New York: Alfred A. Knopf, 2010), p. 46.

18 Sacks, The Mind's Eye, p. 231. Emphasis added.

19 Page 221.

panels. This colleague's theory is that "'there must be representations or models in the brain that get matched up with what I am seeing and doing. But they are not conscious. I cannot evoke them.'"[20]

This recalls Galton's 1880 account of scientists,

> who declare themselves entirely deficient in the power of seeing mental pictures, [but] can nevertheless give life-like descriptions of what they have seen and can otherwise express themselves as if they were gifted with vivid visual imagination … the missing faculty seems to be **replaced so serviceably by other modes of conception … chiefly … connected with the motor sense**.[21]

But what might these "other modes of conception" be? Like Pinker, Oliver Sacks thinks that they may lie deeper and more mysteriously than we might think:

> When I talk to people, blind or sighted, or when I try to think of my own internal representations, I find myself uncertain whether words, symbols, and images of various types are primary tools of thought or whether there are forms of thought antecedent to all of these, forms of thought essentially amodal. Psychologists have sometimes spoken of 'interlingua' or 'mentalese,' … the brain's own language. … Vygotsky … used to speak of 'thinking in pure meanings.'[22]

> There is increasing evidence for the extraordinarily rich interconnectedness and interactions of the sensory areas of the brain, and the difficulty, therefore, of saying that any thing is purely visual or purely auditory, or purely anything.[23]

Sacks describes particularly revealing case studies of the congenitally blind who "have rich and varied perceptual experiences, mediated by language and **imagery of a nonvisual sort**. Thus they may have a 'mind's ear' or a 'mind's nose.'" And how, he asks, does one account for the fact that "Helen Keller's writing … startles one with its brilliantly visual quality?"[24] Sacks leaves the reader with this riddle.

A New Conception of Imagining

Recent imagery-research and debate and the mystery characterized by Sacks and others indicate that we are perhaps approaching a new threshold, a new *consciousness of consciousness*. Such a situation calls for a new paradigm of cognition and for new perceptions and concepts for the workings of the mind. Some of the speculations and expressions cited above about "thinking in pure meanings" (Vygotsky), "mentalizations" (Harwood), the mind's hidden "mentalese" (Pinker) and the hidden "modes of conception connected chiefly with the motor sense" (Galton) have been attempts to reach out for new ways to understand and describe the complex and elusive nature of our mental processes and mental image-making. Vygotsky's expression, *thinking in pure meanings*, reminds one of what Rudolf Steiner calls "pure thinking." For Steiner, thinking and its many modalities (imaginal, logical, abstract, symbolic, etc.) range from being heavily brain-filtered and sense-bound to liberated, 'pure sense-free' capacities of cognition that lift away from a limiting neural apparatus. From his own direct observations and time-tested experience, Steiner held that the key to the next step in the evolution of consciousness lies in finding and exercising new ways of creating mental images and *imag*-ination. For him, our age since the Renaissance is one of the (self) consciousness soul (*Bewusstseinsseele*). In the future, Steiner predicted, this stage of the human soul will metamorphose into the "imagination soul" (*Imaginationsseele*). Steiner planted seeds in our times toward that evolution by creating Waldorf education.

Ian Robertson: "For much of our lives, we taste memories — what we expect — not the raw, fresh complexity of the sensations on our tongues."

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20 Page 222. Emphasis added.

21 Galton, "Statistics of Mental Imagery." Emphasis added.

22 Sacks, The Mind's Eye, p. 231. Emphasis added.

23 P. 238.

24 P. 239. Emphasis added.