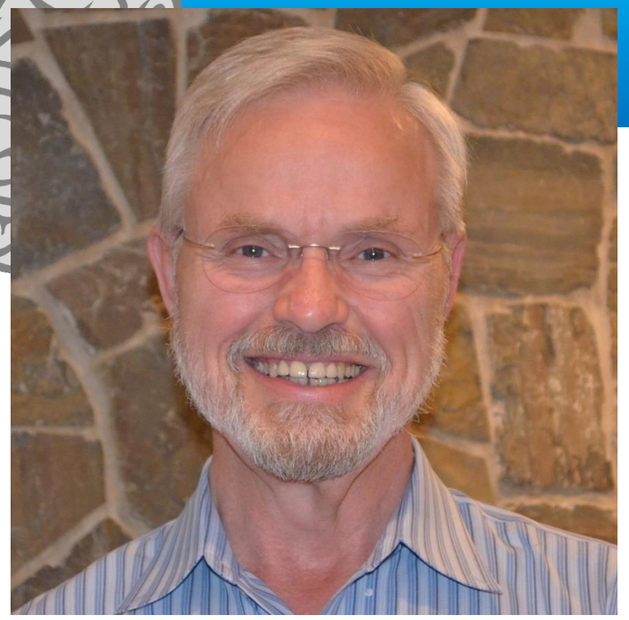
A Scientific Model of Consciousness that Explains Spirituality and Enlightened States



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Outline

<u>Part 1</u>: Agents & the Three Agent Model of the Brain

<u>Part 2</u>: Cluster of Conscious Neurons

<u>Part 3</u>: Spirituality & Spiritual Enlightenment

<u>Part 4</u>: Combining these ideas:

Three Agent Model + Cluster Of Conscious Neurons
<u>To Explain</u> Spirituality & Spiritual Enlightenment

<u>Part 5</u>: Predictions

Part 1: Agents & the Three Agent Model of the Brain

- An **Agent** has goals, a way of sensing the world, and a way to make changes to the world to achieve its goals.
- A theorem[(1)] from control theory says "**Any good agent must contain a model of the system**"
  - If the agent is part of the system, then the agent must also contain a **model of itself**.
- Therefore, a conscious agent must contain a **model of the world** and a model of the agent itself (a **self-model**)

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(1) Conant & Ashby, Int. J. Systems Sci., 1970, vol. 1, No. 2, 89-97

The Three Agent Model of the Brain

- The three different, but integrated, functional agents are:
  - **The Thinker** – the executive function which uses language, symbols, concepts and images to **solve problems**.
  - **The Doer** – controls the body and has emotions.
  - **The Experiencer** – constructs the sensory and language (or conceptual) model of the world and the body.
- The most compelling evidence for the Thinker and Doer agents is **Dual Process Theory**[(1)] (DPT) in psychology.
  - DPT System 1 (the "Fast" subconscious system) is the **Doer**
  - DPT System 2 (the "Slow" conscious system) is the **Thinker**

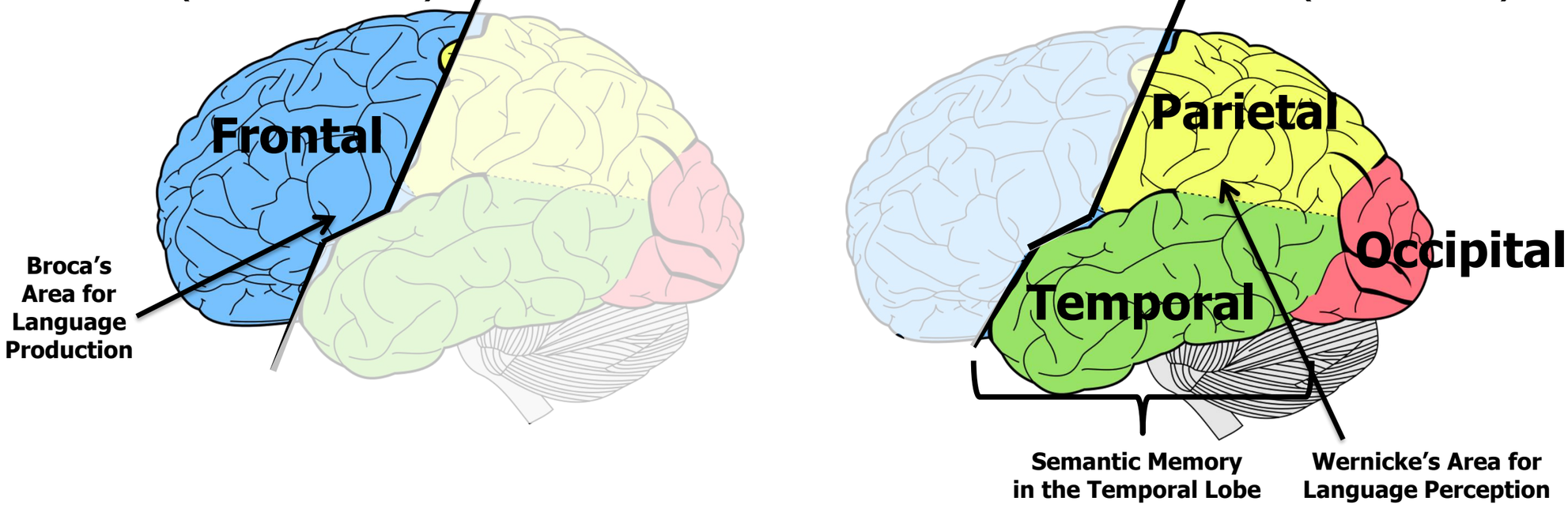
[(1)] Nobel Laureate **Daniel Kahnemann** popularized **Dual Process Theory** in his 2011 book**, "Thinking, Fast and Slow."**

The "Core"[1] Locations of the Three Agents in the Brain

The Thinker & The Doer
(Share 1 Lobe)

Each Agent could also use some neural circuits in the other parts of the brain

The Experiencer
(In 3 Lobes)



The Thinker & The Doer may **share ~ 40%** of brain

The Experiencer may be **~ 60%** of the brain

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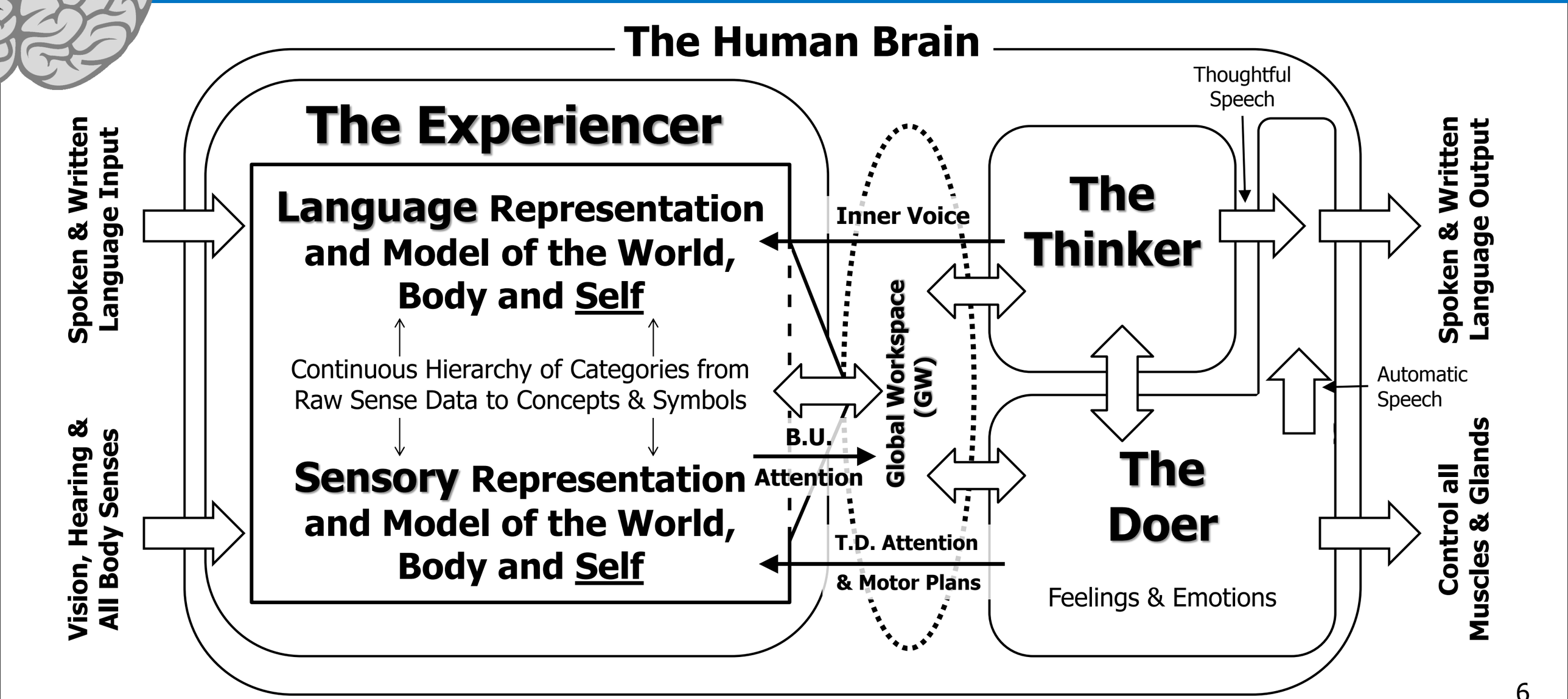
[1] "Core" based on lobes containing the primary sensory and language input areas (Experiencer) versus the lobe containing the primary motor and language output areas (Thinker and Doer).

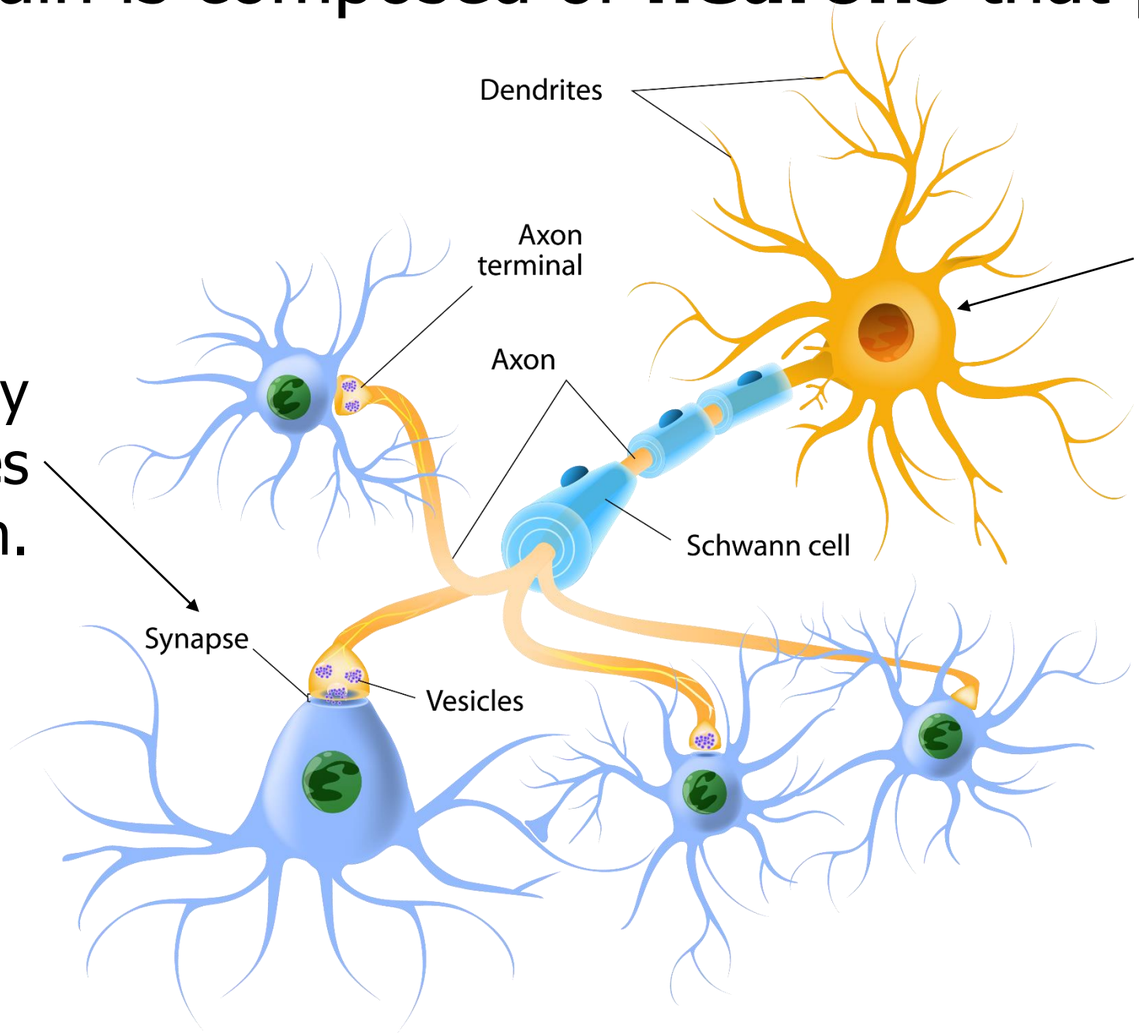
The Three Agents & Their Interfaces:



Part 2: Cluster of Conscious Neurons

- The brain is composed of **neurons** that process signals:

There are roughly 100 trillion synapses in the human brain.



There are almost 100 billion neurons in the human brain.

Conscious vs. Subconscious Neurons

- We can be **conscious** of many different kinds of things:
  - Sensory inputs, thoughts, emotions, feelings, and our actions.
- The brain performs **significant subconscious** processing.
- Which neurons do **conscious** vs. **subconscious** processing?
- **Neural Correlates of Consciousness (NCC)**[(1)]: the neural events & mechanisms sufficient for consciousness.
- The set of neurons needed by the NCC, at a given time, could be called the:

Cluster of Conscious Neurons (CCN)

[(1)] Crick F. and Koch C. (1990) Towards a neurobiological theory of consciousness.

Cluster of Conscious Neurons (CCN)

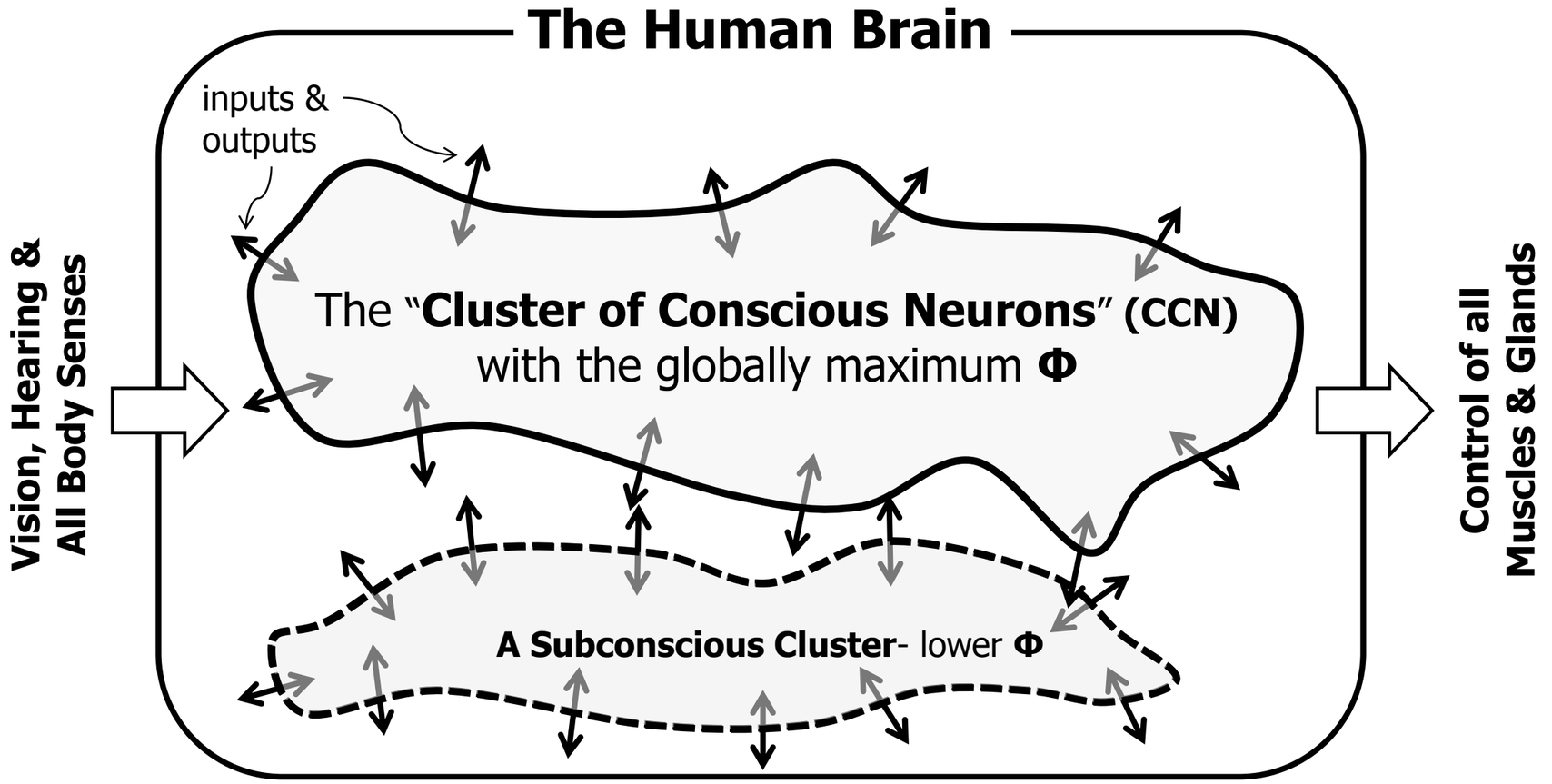
- Can the CCN be determined **experimentally**?
- Is there a **theory** that could determine the CCN?
- Is the CCN **static** or **dynamic**?
  - Does the CCN depend on the **activity** and the **connectivity** of the neurons?
- To explain enlightenment this consciousness model **needs**:
  - The CCN to be **dynamic** and to **depend** on the **activity** and **connectivity** of the neurons.
  - **Integrated Information Theory (IIT)** is a neuroscientific theory that satisfies both these needs.
    - Other theories could satisfy both these needs – e.g. if the CCN is the cluster of neurons firing synchronously in Gamma EEG band.

Integrated Information Theory (IIT)

- **IIT[(1)]** is a neuroscientific theory that can determine the **Cluster of Conscious Neurons (CCN)**

The symbol **Φ** represents the amount of integrated information in any given neuron cluster.

For a given system, the neuron cluster with the globally maximum **Φ** value will be the CCN.



(1) Tononi, Giulio, (2008) V1.0, (2012) V2.0, (2014) V3.0

Part 3: Spirituality & Spiritual Enlightenment

- What is the "problem" that Spirituality solves?
- What is Enlightenment?

- What are some of the properties of Enlightenment?

What is the "problem" that Spirituality and Spiritual Enlightenment Solve?

The problem is the Thinker!

- The Thinker is **ideal** for developing civilization, science and technology; and to help us achieve goals…
  - But it is **not good** at living a happy life.
- The Thinker **finds** problems everywhere
  - This can lead to a negative critical attitude towards life.
- If there is **no** problem, then that is a problem!
  - So the Thinker will find an old problem or invent a new problem.
- The Thinker argues with reality: **"This should not happen." or "This is bad and wrong." or "I should not have done that!"**
  - ⇨ An Experiencer model of the world filled with contradictions.

More about The Thinker "problem"

- **Negative emotions** are a problem for the Thinker to solve:
  - "How do I prevent this from happening again?"
- **Positive emotions** can also be a problem for the Thinker:
  - "How do I make sure this happens all the time?"
  - Or turns Positive to Negative – worrying about the Positive ending
- Problems can be in the **past** – often called a **resentment**;
- Problems can be in the **future** – usually triggering **fears**.
- Thus, the Thinker is an **emotion amplifier** and an **emotion echo chamber**!
  - Buddhism: the cause of Suffering is Attachments and Aversions.
  - The Thinker also amplifies Attachments and Aversions.

Enlightenment (AKA Nonduality)

- What is **Enlightenment**?
  - Enlightenment is **not** about any sort of **perfection**…
    - See Daniel Ingram's discussion of models of enlightenment.[(1)]
  - Enlightenment is a different kind of perception of the world, **and** it requires a fundamental change in the self-model of the human.
- There are **multiple** kinds of enlightenment
  - Bernadette Roberts reports having two different kinds of enlightenment, many years apart.[(2)]
  - Daniel Ingram documents that various sects of Buddhism claim between two and ten different stages or paths of enlightenment.

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(1) Daniel L Ingram, "**Mastering the Core Teachings of the Buddha**" (2008) see the 31 models of enlightenment in the "Models of the Stages of Enlightenment" chapter.

(2) Bernadette Roberts, "**What Is Self**" (2005)

Some Commonly Reported Properties of Enlightenment

This is **not** a universally accepted list!

- Nonduality is the most important property
- Non-agency – no sense that "they" are "doing" actions
- Simultaneous awareness of the whole visual field
- Continuous awareness of the entire body
- Substantially decreased thoughts
  - Especially "self" centered thoughts
- Substantially decreased emotions
  - Especially "negative" emotions; leaving mostly "positive" ones

Part 4: Combining Ideas:

Combining IIT and the Three Agent Model can explain:

- The purpose of spiritual practices and spiritual awakening,
- Multiple different kinds of enlightenment or nonduality, &
- The properties of different enlightened or nondual states.

These are explained by the way the **CCN** is distributed among the **Three Agents.**

The **CCN** distribution among the **Three Agents**

- The normal modern human would have a **CCN mostly in the Thinker and the Experiencer**.
- The spiritually enlightened or nondual states would have a **CCN mostly in the Doer and/or Experiencer**.
  - In other words, **NO CCN** in the **Thinker**!
- The most nondual enlightened state would have a **CCN confined to the Experiencer only**.

The Three Agent's Self-models:

- **Thinker =** "I" or "me"; the autobiographical narrative history of "me"; "my" goals; "my" body; "my" emotions and feelings. (By the way, "I" am aware of the world; "I" make all the decisions; and "I" am in total control of "my" body.)
- **Doer =** the body, emotions, feelings and goals. (And is capable of controlling the body and perceiving the world.)
- **Experiencer =** "presence awareness"
  - Presence – the sense of existence or "beingness"
  - Awareness – perception of the body, world, thoughts & feelings

When the CCN contains most of an agent, the self-model of the CCN will match the self-model of the agent.

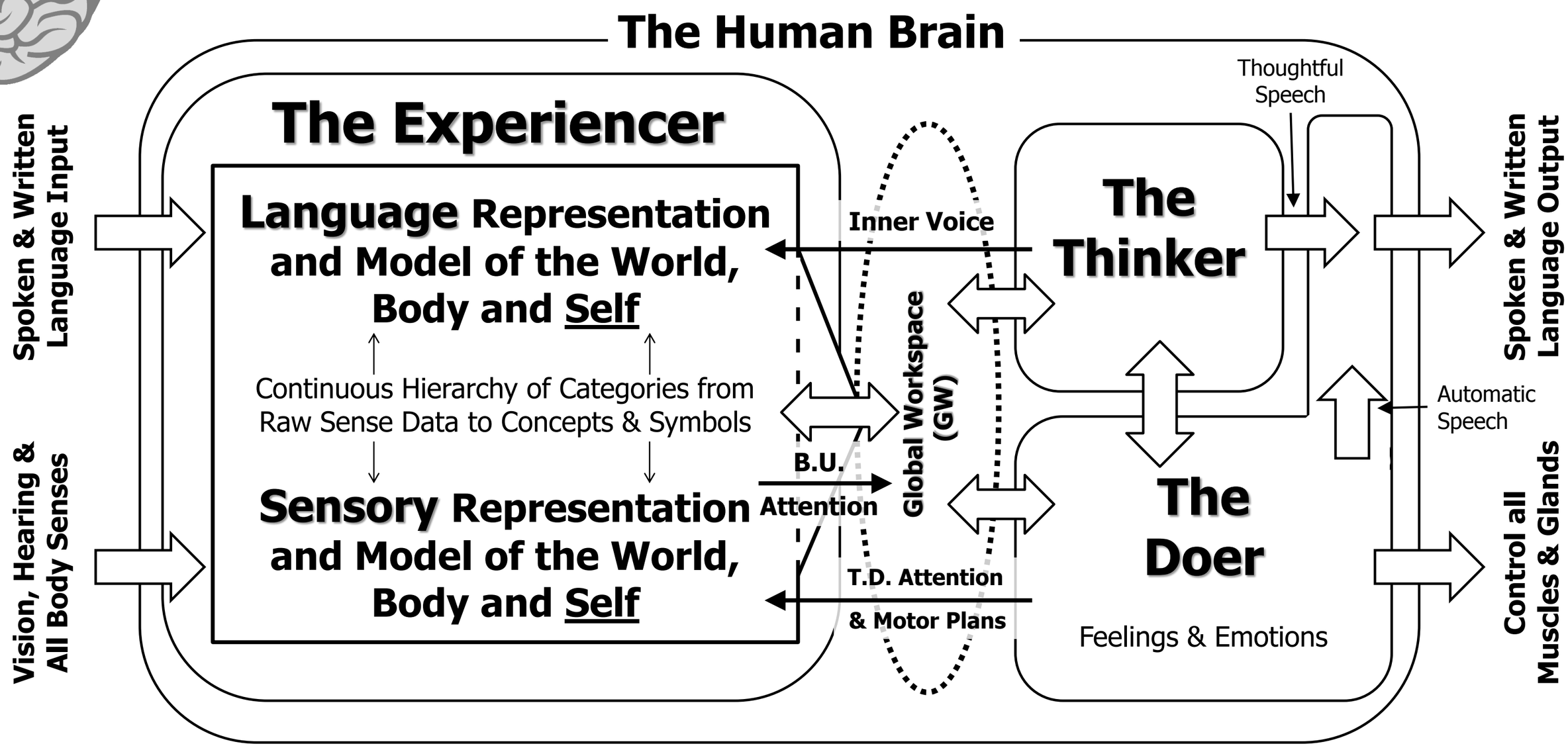
How Does **Spirituality** Help Solve the Thinker "Problem"?

- Spiritual practices can give insight that we are **more** than just the **Thinker**
  - The Doer or Experiencer can be recognized as "the **soul**" or as our connection to a "**God.**"
    - When the Thinker first became the CCN, the Thinker may have misidentified the subconscious Doer and Experiencer as the "God" agent!
    - Some spiritual paths recommend trusting intuition as being God's communication to us – intuition comes from the Doer and Experiencer.
- **Forgiveness & acceptance** can mitigate resentments caused by the Thinker trying to solve problems in the past.
- **Trusting God** or a Higher Power can mitigate fear caused by the Thinker trying to solve problems in the future.

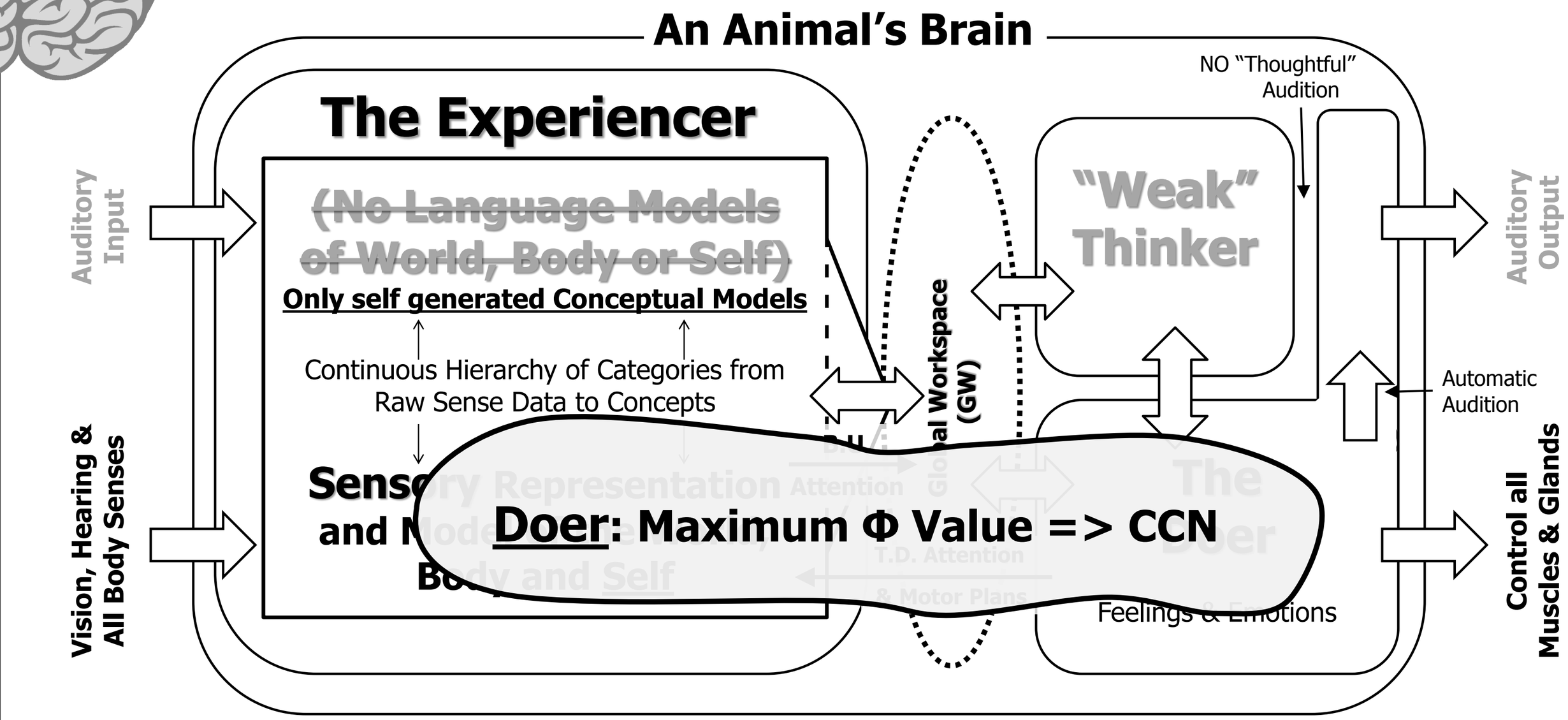
How Does **Enlightenment** Help Solve the Thinker "Problem"?

- Before Enlightenment, the CCN includes most of the Thinker.
  - Therefore, the CCN self-model **is** the Thinker's self-model,
  - All these "problem solving" thoughts **are** "our" thoughts,
  - And all these problems to solve **are** "our" problems.
- After Enlightenment, the CCN does **NOT** include the Thinker.
  - Therefore, the Thinker's self-model can be seen to **not** be "me,"
  - The Thinker's thoughts are **not** "my" thoughts,
  - All these problems the Thinker is solving are **not** "my" problems.
  - The Thinker may still have attachments and aversions, but they are **not** "my" attachments and aversions.

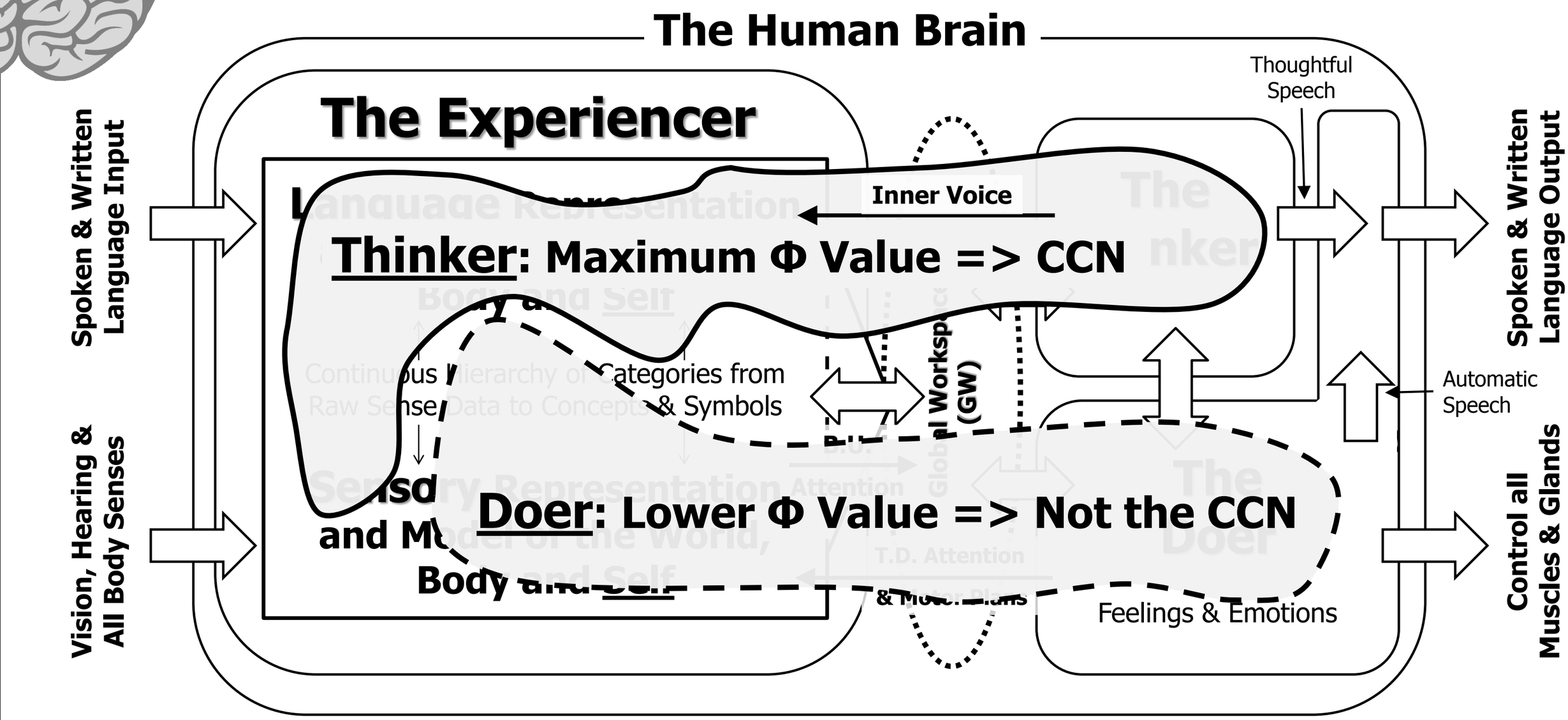
Three Agent Diagram to Graphically Indicate How the CCN is distributed:



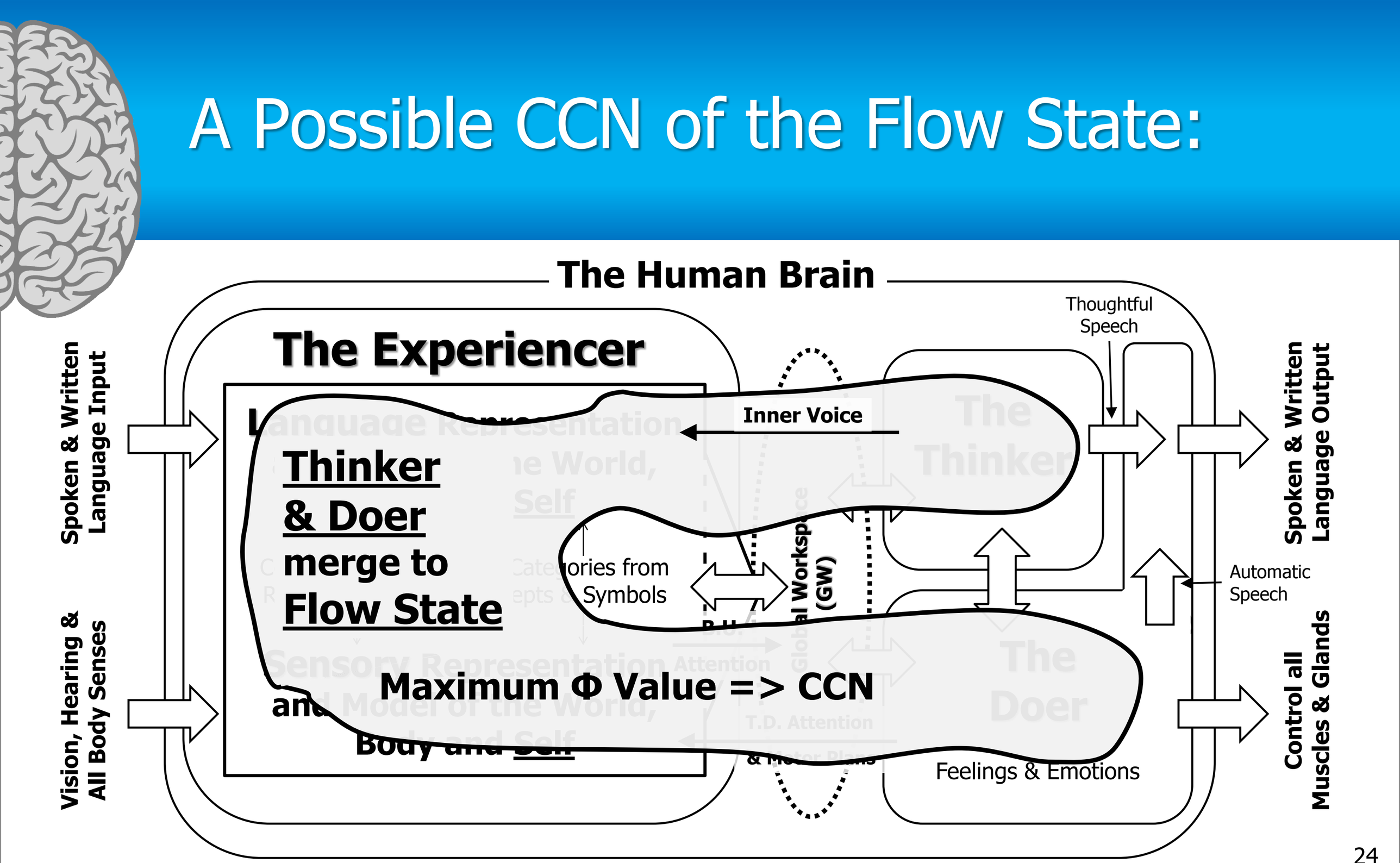
Animal's CCN State:



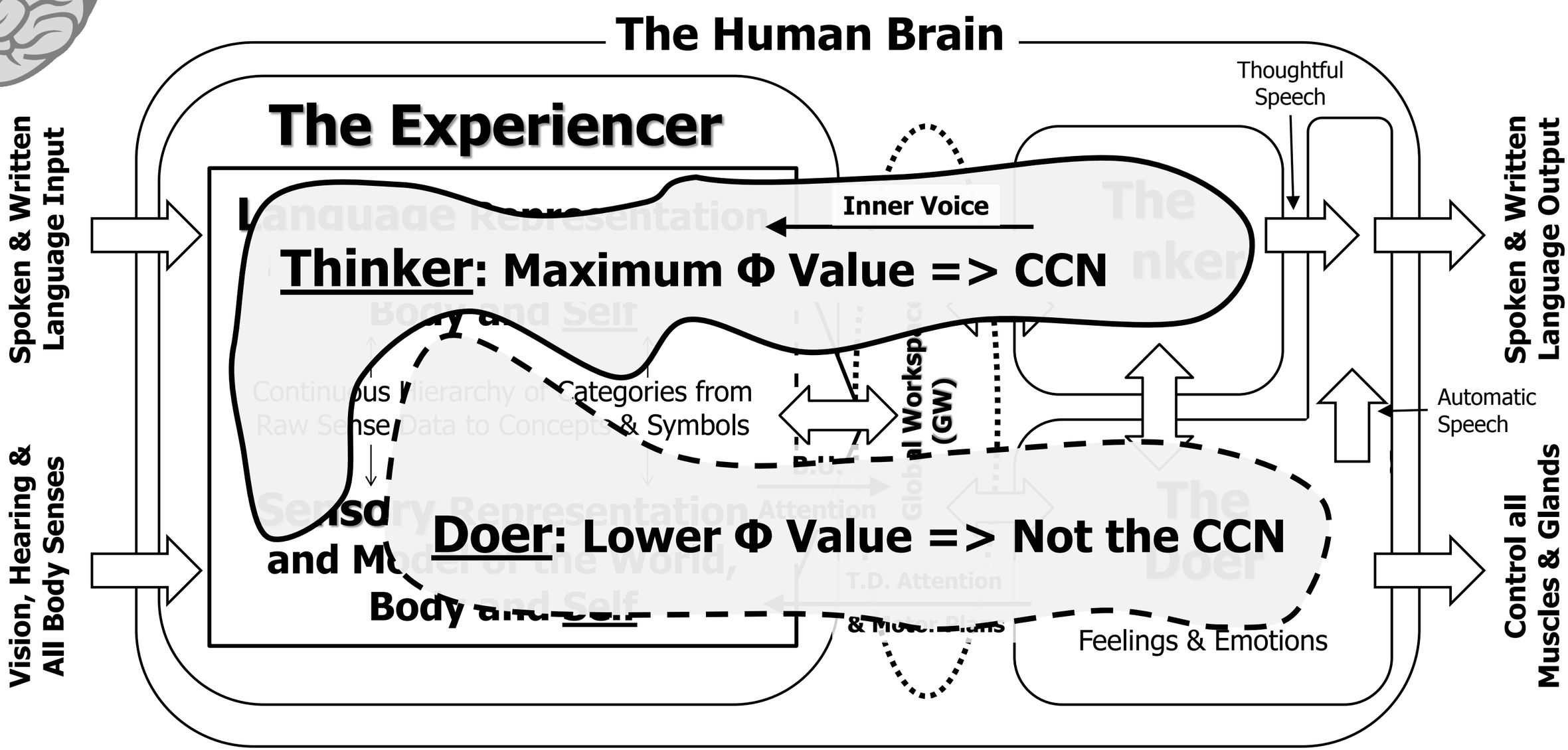
Modern Human CCN State:



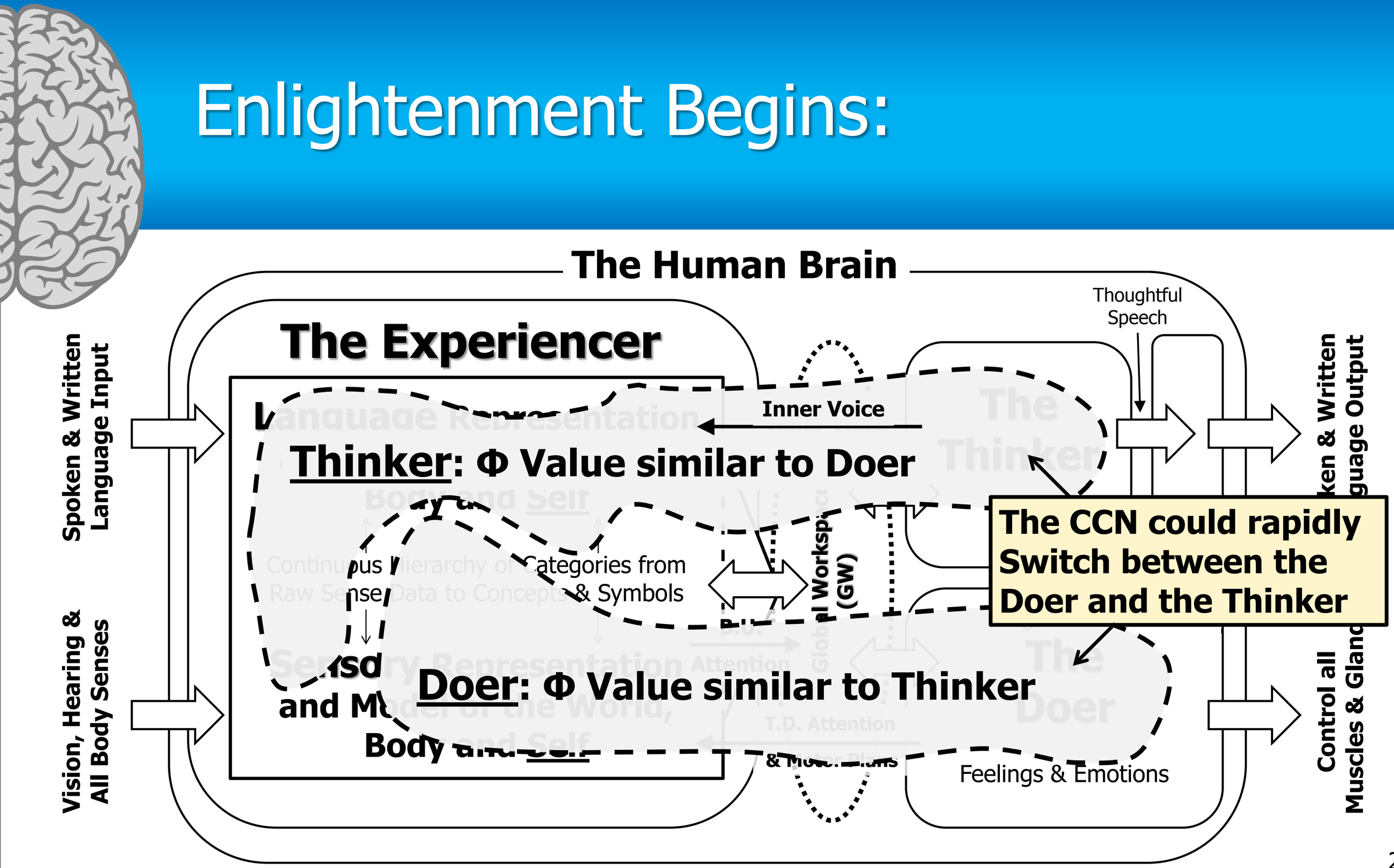
A Possible CCN of the Flow State:



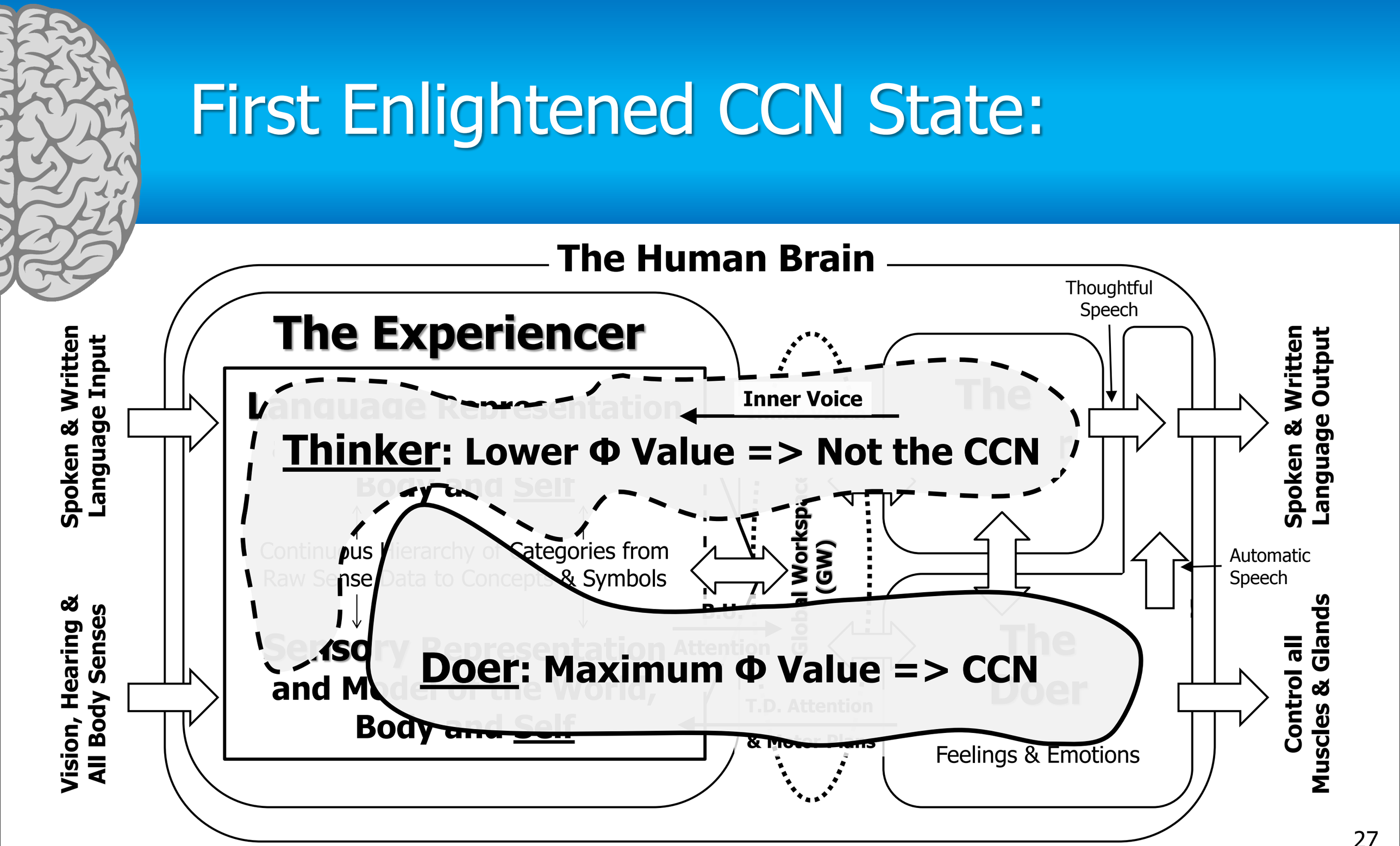
Back to the Modern Human CCN State:



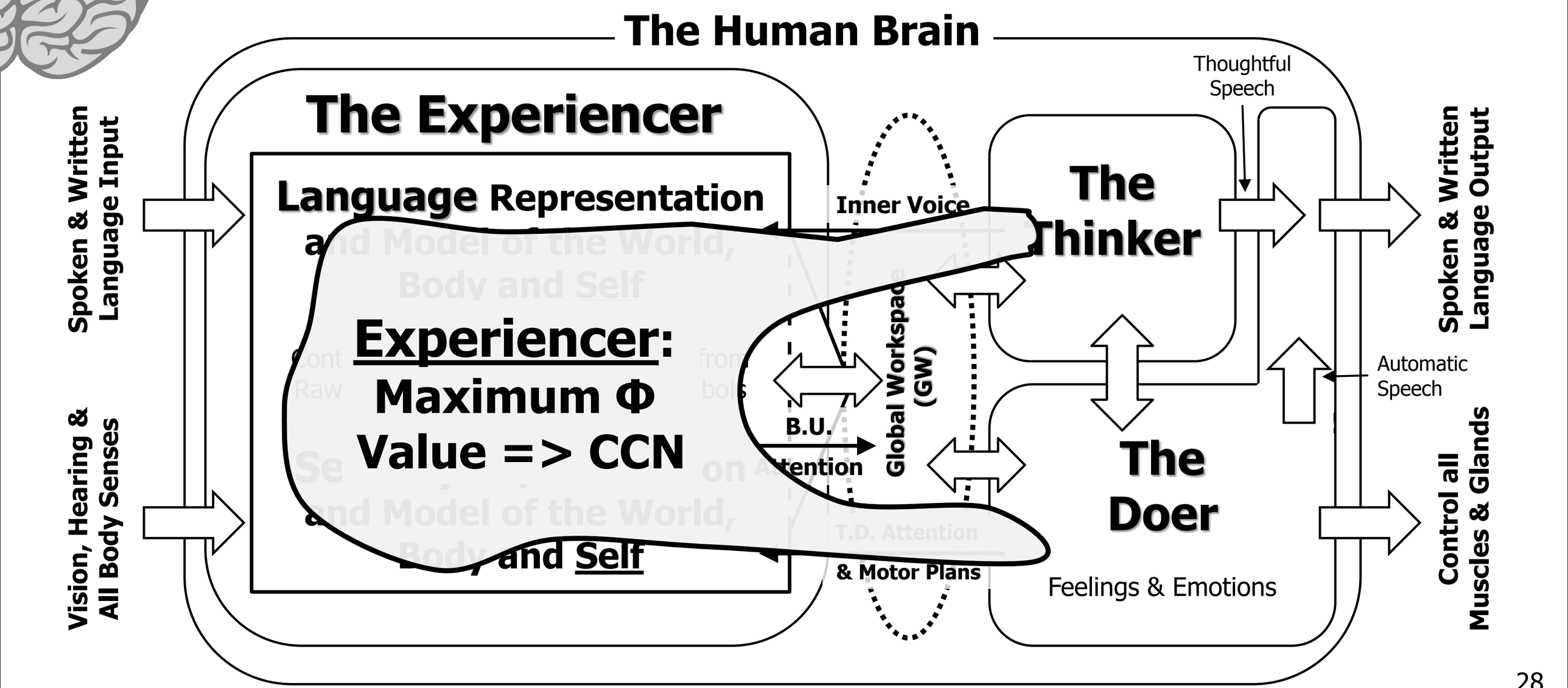
Enlightenment Begins:



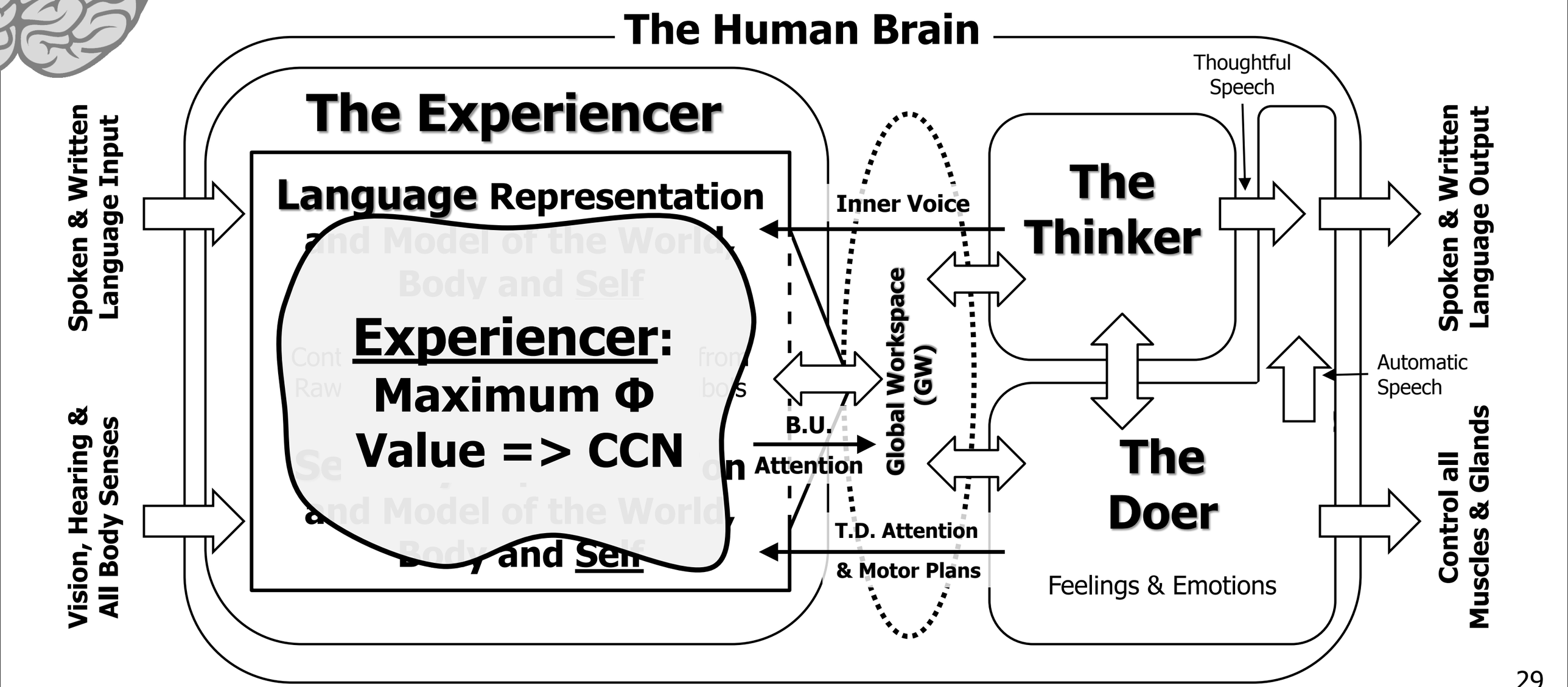
First Enlightened CCN State:



Early Nondual CCN State:
(Note some similarity to the Flow State CCN)



Fully Nondual CCN State:



Explaining Enlightenment Properties in the Fully Nondual CCN State

- Nonduality: Experiencer self-model = model of the world.
- Non-agency: The Experiencer does not "do" any actions
- The bottleneck of the Global Workspace explains:
  - Increased awareness of the whole visual field and body
- Substantially decreased thoughts: Experiencer isn't the Thinker
- Substantially decreased emotions: Experiencer isn't the Doer
  - Since the Experiencer does not argue with reality, it will accept the world exactly the way it is.
  - The Experiencer can achieve its goal of modeling the world, and that makes it a "Happy" agent.

Part 5: Predictions

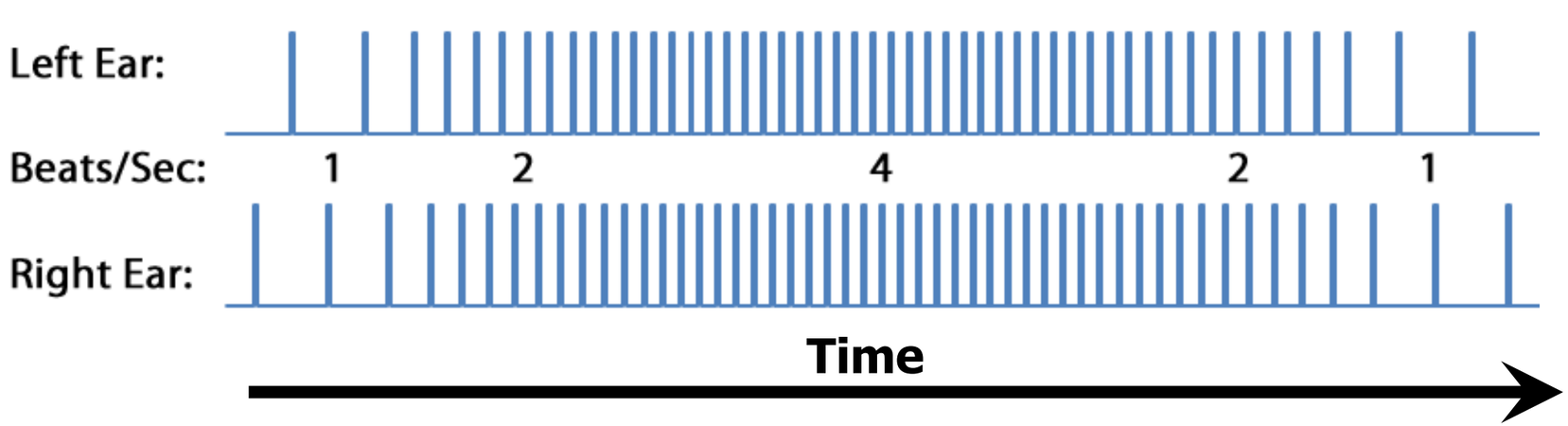
- **Prediction #1:** Fully nondual humans should be able to consciously detect masked images presented too fast for normal humans.

- **Explains:** Why Open Monitoring (OM) meditation practices are more effective at producing enlightenment than Focused Attention (FA) meditation.

  - Doing OM quickly should also increase effectiveness.

Predictions

- **Prediction #2:** A new kind of bottom up attention "meditation," triggered by technology generated alternating sensations, should be effective for achieving enlightenment.



(Example of left/right tick/tocks - from 1 bps to 4 bps to 1 bps)

Instruction: **When you hear the tick or tock in the left or right ear, …direct somatosensory attention to the corresponding left or right hand.**

Alternatively**, …direct peripheral visual attention to the corresponding left or right visual field while keeping focal visual attention fixed straight ahead.**

The End

- I would very much appreciate any and all thoughts and feedback. Thank you!
  - Please send a comment or question in an email to:

consciousness@frankheile.com

- Also, let me know if you would like an occasional email when new kinds of content (talks, videos, articles or my book) are available.