Exploring Consciousness

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Cognitive phenomenology: a projective view

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Why is Cognitive Phenomenology a hot topic for cognition theorists?

- **Because there are new ideas available to boost its study**

  - **phenomenological observations: see contributions in** Bayne & Montague (2011), Chudnoff (2015)
  - **Experimental evidence and theorizing from behavioral, neuroscientific and comparative studies**
  - **Naturalistic philosophical theorizing about metacognition**

An interdisciplinary approach might explain why there is still no consensus on its fundamental nature:

- **Proprietary (an experience that is unique to thinking)**
- **Sensory (an experience that also occurs in emotional or perceptual episodes)**

Our first goal is to try accounting for this dissensus.
Our second goal is to explain why CP is felt as related to current cognitive activity

Outline

1. **Definition and types of cognitive phenomenology: an exhaustivity claim**
2. **Two scientific insights about cognitive phenomenology**
3. **Internal imagery has an indexing function**
4. **Why are goal-indexings and noetic feelings phenomenally experienced as task features: Projectivism**
5. **Conclusion**

CP is sensory but the sensory information is organized in a proprietary way

1. Definition and types of cognitive phenomenology

An exhaustivity claim

Defining thought p-awareness

Thought p-awareness = Df the conscious experience that is specifically elicited when agents are "thinking", i.e. when they are engaged in first-order cognitive activities such as reasoning, discriminating or interpreting.

Forms of phenomenology triggered by perception of external or bodily events (present, simulated, remembered) or by emotions do not qualify as "cognitive" as meant in the philosophical literature **[although they belong to cognition in the scientific sense]**

This commonly accepted definition aims to contrast

- the *causal effects* of a thought (including the phenomenology elicited *when* a given thought occurs – in causal association to it)

- the phenomenology as a *constitutive* ingredient in the ability to think.

Examples of CP

1. Strawson (2011, p. 294) We have "the experience of consciously entertaining and understanding specific and expressly propositional contents as a result of hearing certain sounds or seeing certain marks."
2. Bayne & Montague (2011): "We deliberate about what to have for lunch, we remember forgotten intentions, we consider how best to begin a letter or end a lecture, and we puzzle over the meaning of a friend's remark and the implications of a newspaper headline."

3. William James (1890, p. 251) "Suppose we try to recall a forgotten name. The state of our consciousness is peculiar. There is a gap therein; but no mere gap. It is a gap that is intensely active. A sort of wraith of the name is in it, beckoning us in a given direction, making us at moments tingle with the sense of our closeness and then letting it sink back without the longed-for term. "

4. Robinson (2011), p. 202: "One may suddenly realize what someone else is talking about, after having been puzzled for a few moments. Many jokes depend on suddenly realizing what a scene implies."

5. Chudnoff (2015, p.1) "In a book you read, “If $a < 1$, then $2 - 2a > 0$,” and you wonder whether this is true. Then you “see” how a’s being less than 1 makes 2a smaller than 2 and so 2 - 2a greater than 0."

Exhaustivity Claim: Thought p-awareness comes in <u>only two</u> varieties

- Examples 1 and 2 : 'Hearing one's own thought in internal speech', having visual imagery (thereby accessing what one thinks about')
- Examples 3 to 5 describe noetic feelings (feedback < cognitive content)
  - Seeming to understand a sentence
  - Finding a distinction clear/obscure
  - Finding a proposal coherent/incoherent, relevant/irrelevant
  - Finding a cognitive task demanding/easy
  - Having the impression of having sufficiently studied a given item.
  - Having a name on the tip of one's tongue.

Claims that are presupposed in this presentation

- The agentive, controlled nature of thinking
- The exhaustivity claim
- The existence of cp (against eliminativism)

2. Two scientific insights about cognitive phenomenology

2.1. Asher Koriat's "cross-over principle"

Koriat (2000)

Noetic feelings have either a predictive or a retrospective evaluation function

- **Finding a perceptual or memory task demanding/easy.**
- **Having a feeling of familiarity**
- **Having a word on the tip of the tongue**
- **Feeling of knowing the answer to a question**

Prediction of epistemic success (effort & persistence regulation)

- **Seeming to understand a sentence**
- **Finding a proposal coherent/incoherent, relevant/irrelevant etc.**
- **Having the impression of having sufficiently studied a given item.**

Retrospective evaluation of epistemic value, based on the specific normative goal of the cognitive action.

- Predictive noetic **feelings** reliably assess likely success in current cognitive task **and** motivate a conscious, reportable, rational decision)
- Retrospective noetic **feelings** reliably assess likely correction of task outcome **and** motivate a conscious, reportable, rational decision

Why noetic feelings are (and need to be) conscious

"Cross-over principle"

"Although metacognitive feelings **appear to be** an integral part of conscious, explicit metacognition, **they are actually two-sided:** They serve to interface between implicit-unconscious-automatic processes on the one hand, and explicit-conscious-controlled processes on the other" (Koriat, 2000, p. 152).

CROSS-OVER PRINCIPLE

- **Unconscious vehicle cues** (and associated implicit heuristics), carry **predictive**/evaluative information

- **Conscious subjective feelings** express the **likely success of** a task

Implicit antecedents

Explicit consequences

Cross-over principle:

- states that noetic feelings are consciously experienced **because** their property of being conscious **suspends the automatic influence of implicit learning over decision.**
- The word "because" here, is **teleological**; it is the **function** of these feelings to make agents sensitive to what is actually known, or only guessed, and more generally to the degree of confidence to credit to thought outcomes.

Conscious awareness **integrates information**

- What is, then, the additional information that noetic feelings carry, and that is not included in their subpersonal antecedents?
- This information is seen as resulting from a **"mass effect",** i.e. from the **integration** of the antecedents with present goals and background information. (Koriat, 2000, p. 163)
- All the unconscious antecedents predict opportunities, but each from a different standpoint: for example, from a time, resource, or incentive standpoint. Koriat & Levy-Sadot (2000), p. 193.

- "IMPLICIT ANTECEDENTS" refer to unconscious heuristics that extract **activity-dependent information**, i.e., **information about the vehicle** that processes the first-order task

- NOETIC FEELINGS ARE **NOT** BASED ON conscious or unconscious access to the **content of thought** (metacognitive experiences are not "metarepresentations" of first order contents)

Examples of implicit antecedents: "Traditional" unconscious heuristics

- Cue familiarity: elicited by the terms of the question (Reder, 1987)
- Overall accessibility of pertinent information regarding the target: elicited by the activity triggered by the question (Koriat, 1993)
- Fluency heuristic: responses that come to mind quickly are deemed correct. (see priming experiments as a source of confidence enhancement: Kelley & Lindsay, 1993)

Recently discovered activity-dependent heuristics

- Predictive neural dynamics: Kepecs & Mainen (2012).

- Predictive interoceptive cues from the respiratory, circulatory, digestive, and endocrine systems: Barrett & Symons (2015), Park & Tallon-Baudry (2014).

- Proprioceptive (postural, facial) cue-based heuristics: possible interpretation from Stepper & Strack (1993)

"EXPLICIT in their CONSEQUENCES"

- Predictive noetic **feelings** reliably assess likely success in current cognitive task **and** motivate a conscious, reportable, rational decision)
- Retrospective noetic **feelings** reliably assess likely correction of task outcome **and** motivate a conscious, reportable, rational decision
- Noetic feelings are sometimes illusory, but
  - When warned about a potential source of illusion, participants can **adjust** their decision accordingly.

A problem

- Granting that the noetic experience of thinking depends on **vehicular properties** of our thoughts, but is not intrinsically related to their meaning, how is it that thinkers feel that they understand *an argument*, rather than *find a thinking episode pleasant or convenient*?
- In other words: Why are noetic feelings consciously felt *as being about an ongoing task*? There must be a specific mind/brain process that explains this feeling

What the cross-over principle does not mean to explain

- **Are there conscious** cues **identifying the type of ongoing cognitive task at a given time t?**

- **Unconscious predictive vehicle cues** (and associated implicit heuristics),

- **Subjective feelings** expressing the **predicted likely success of** a task

Question unaddressed

Cross-over principle

What the cross-over principle does not mean to explain

- **Are there conscious** cues identifying **the ongoing cognitive task at a given time t?**

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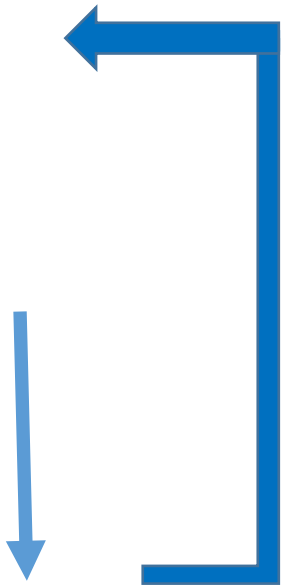


Unexplained: How are conscious noetic feelings **felt as being about the ongoing task?**

2.2. Ray Jackendoff's view on consciousness

(Jackendoff, 1987)

Jackendoff's insights

- Consciousness is constituted by computational mechanisms, which themselves are realized by physical brain structures and their processing relations

- Thought awareness presents itself as a sequence of linguistic and other perceptual images.

- What he means is *not* that thought *consists in* a succession of images, but rather that it *is* ***experienced in an imagistic format*.**

- Concepts, quantifiers, etc. work outside consciousness within a specialized structure – **the conceptual structure**.

- This structure controls and monitors deductive/inferential activity according to various semantic and pragmatic constraints.

- All this activity only becomes conscious t**hrough phonological (or other perceptual) imagery.**

- Intermediate levels provide to awareness **its form,**
- higher levels provide to awareness **its content,**
- and the affects provide its **"feel".**

Jackendoff's speculation

Conceptual awareness of our thoughts occurs as a consequence of "*projections*"

- from unconscious higher-level computational structures
- to consciously available phonological structures and distinctions.

- Jackendoff, however, does not study the essential connection between conscious imagery and cognitive control.
- His theory proposes a descriptive architectural scheme of the computational mind, rather than a causal explanation

Combining 2 important insights:

- Koriat's noetic feelings: an interface structure, characteristic of consciousness in general, holds together
  - "implicit antecedents" (heuristics)
  - "explicit consequences" (control of thoughts)

- Jackendoff's perceptual (verbal) imagery as a basis of cognitive phenomenology

Modifying Jackendoff's proposal

- The contents of thought are **indexed** by sensory markers as part of occurrent cognitive actions

- Sensory awareness does the indexing, but index-**understanding** is performed in non-sensory structures.

- New **philosophical** concepts in the CP debate:
    - Goal-indexing
    - Functional projection

3. Consciously identifying what one thinks about

Goal indexing

Phenomenological experiences for goal-indexing: examples

- Strawson (2011, p. 294) We have "the experience of consciously **entertaining** and understanding specific and expressly propositional contents as a result of hearing certain sounds or seeing certain marks."

- Bayne & Montague (2011): "We **deliberate about** what to have for lunch, we **remember forgotten intentions**, we consider how best to **begin a letter or end a lecture**, and we **puzzle over the meaning** of a friend's remark and the implications of a newspaper headline."

Indexing a cognitive goal: examples

Sensory imagery associated with a goal

- phonological-auditory experiences,
- visual imagery
- proprioceptive imagery
- Visuo-motor imagery

Enabling conscious execution of

- Conceptual reasoning tasks, planning
- Mathematical tasks, spatial reasoning
- Meditation
- Sport training, drawing

Phonological indexes point to contents

- Because **they have a pointing-to-goal function,** indexes ***do not themselves contain*** the information they point to.
- Because they are the feedback of a prior action, they are delivered in feedback mode, i.e. **in the mode corresponding to the proximal repertory of the output of a specific action.**

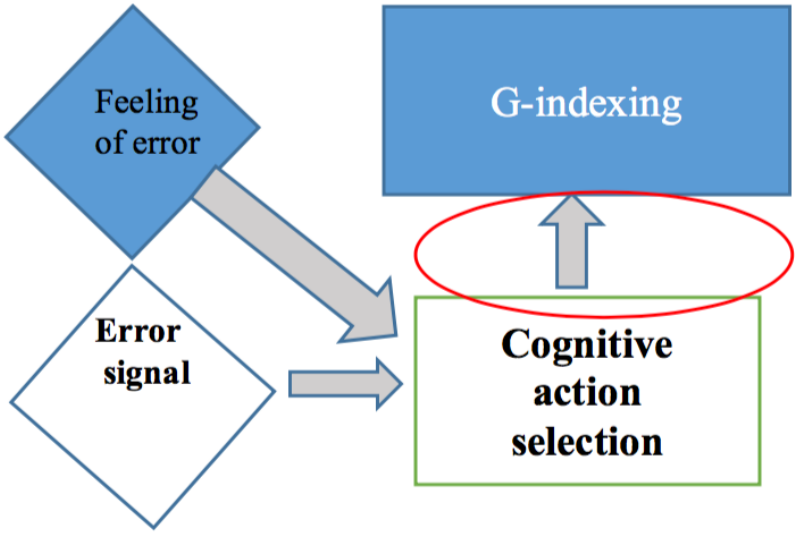
→ Internal speech is "**heard in the head**" as a phonological sequence.

→Deaf signing cognizers should rather "**see in their head**" a hand sign sequence

In summary

Current cognitive task is indexed by sensory feedback acquired in monitoring tasks of the same kind.

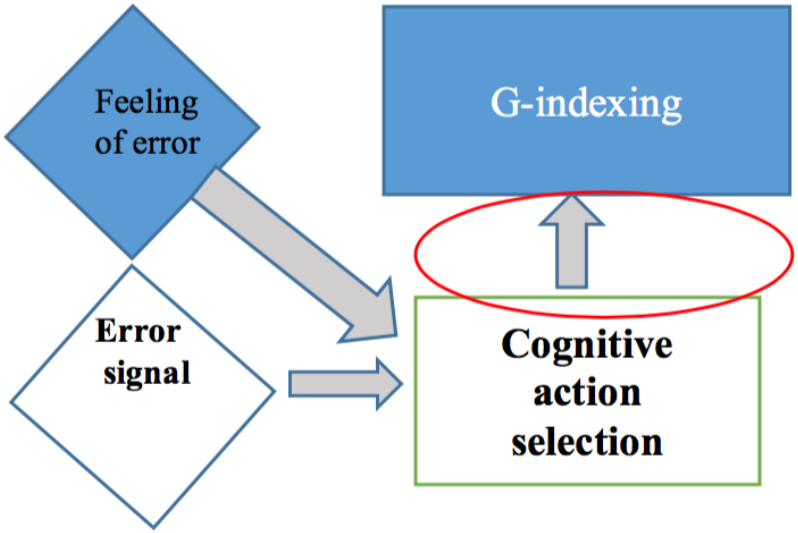
- Ex: talking to oneself while planning.
- Mental imagery in mathematical reasoning



5 questions and responses about G-Indexing

1. What is the "**implicit antecedent**" of G-indexing?

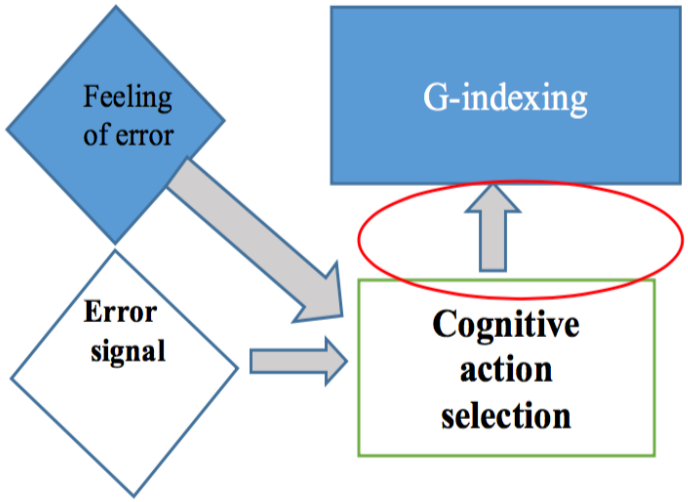
G-indexing results from unconscious action-selection.



5 questions and responses about G-Indexing

2. How is action-selection itself caused?

- **Selecting an action requires a sensitivity to "affordances":**
  -
  - opportunities & risks in the environment: **world affordances**
  - Opportunities & risks in information acquisition/retrieval: **cognitive affordances : ex= an error signal** (Proust, **2015**)



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2. How is action-selection itself caused?

- As the word "affordance" suggests, such an attitude has the double function of **detecting opportunities and acting on them.**

- An AS is a conscious, non-propositional attitude registering the opportunities and risks present in an agent's current environment.

- On these attitudes: see philosophers Bermúdez (2003), Campbell (1993), Cussins (1992), Dreyfus & Kelly (2007), Gendler (2008), Griffiths & Scarantino (2009), B.C. Smith (1996), Strawson (1959), and psychologists Gawronski & Bodenhausen (2006).

Differentiating the two kinds of affordances

- Evaluating likely reward (sensing a **world affordance**)
- Evaluating likely cognitive success (sensing a **cognitive affordance**)

Depend on **different sources of information** and are processed by **distinct brain structures**. (Kepecs & Mainen,2012).

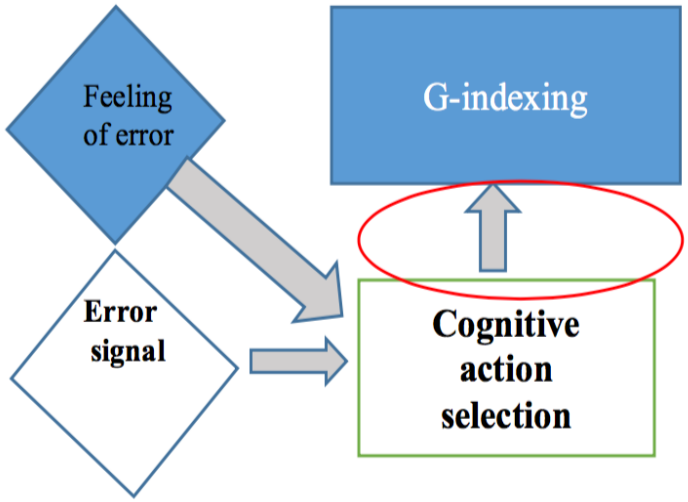
A single decision to act has to be made, however, **integrating** subjective cognitive uncertainty and objective world uncertainty

5 questions and responses about G-Indexing

3. What does a G-index index?

A goal:

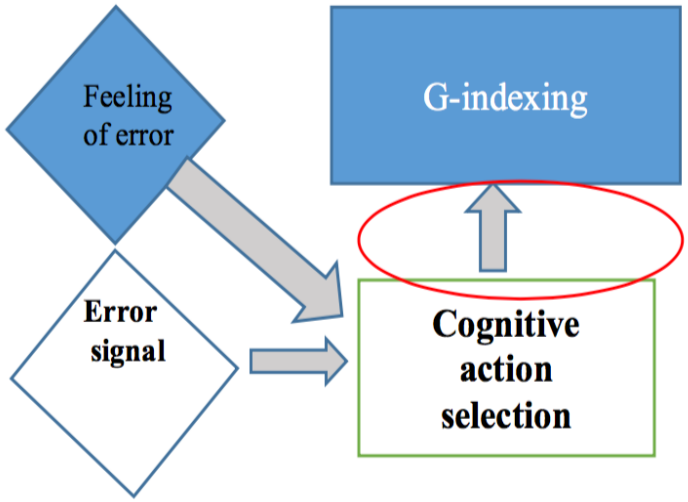
Its function is to channel attention onto **a given goal "executive" representation** until completed.



5 questions and responses about G-Indexing

4. Why does imagery of one's own thought content have an indexical structure?

Conscious imagery allows control of thoughts



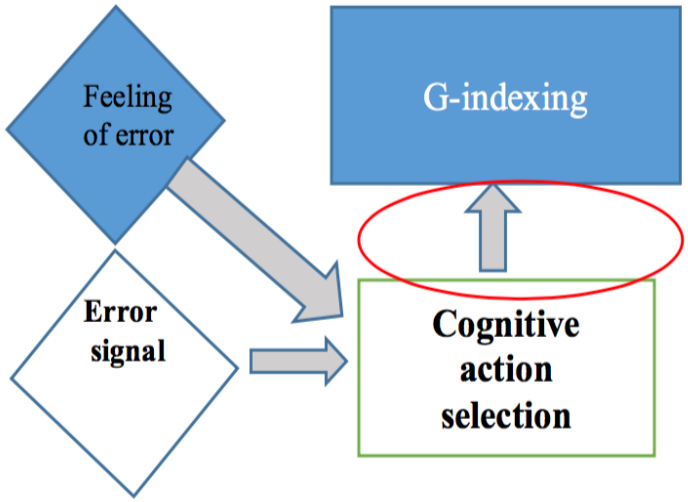
5 questions and responses about G-Indexing

5. Is imagery a *vehicle* for thinking (e.g. problem solving)?

NO:

G-indexing merely **flags** tasks to be performed outside awareness.

This flagging, however, makes thinkers sustain their attention to what their thinking is about.



3 - Goal-indexing: character

- An indexical is a linguistic expression whose reference can shift from context to context.
- The character of G-indexing is a function on contexts whose value at any context is the action selected in this context by the agent experiencing it.
  - If the action consists in trying to remember the name of O, the value of the goal index is this action itself (e.g. a piece of inner speech "What's her name?")

Goal indexing as a precursor & component of other kinds of indexicals

1. Linguistic indexing is based on a token-reflexive *rule* common to people in a linguistic group.
2. Conventional iconic indexing is based on a mutually recognized rule for behaviour coordination (traffic lights).
3. Goal-indexing is a phenomenal marker that idiosyncratically refers to the action to be performed, thus motivating it, eliciting it, and controlling its execution.

- In contrast with 1 and 2: conceptualization of G-Indexing is uneasy and interferes with performance. (tennis service)
- 3 is involved in all forms of ostensive signals.

4. Why are goal-indexes and noetic feelings phenomenally experienced in connection with one and the same task ?

Projectivism revisited

- One way of coming to terms with the intentionality of the subjective experience of colour or taste is to claim that it is *projected* by the perceptual system onto the object.

- Colours or taste arguably belong to a perceiver's experience, not to the object perceived.

- *Projection* is a mechanism that automatically associates a given subjective experience with an external, world difference.

Literal projectivism

- Is the view that our secondary qualitative experiences **are projected to what causes them**: for example redness onto the object experienced as red

- Unattractive consequence: much of our perceptual experience is a category-mistake, because the secondary quality that is projected actually only belongs to the experience, not to the object.

Shoemaker (1996)

Functional projectivism: definition

A given colour experience is functionally projectable to an external object iff such projection

- enhances the ability to detect primary object properties such as shape and volume,
- generates a phenomenally unified representation of a scene;
- guides and motivates proper action selection.

Functional projectivism

Applied to noetic feelings:

A given noetic feeling is functionally projectable to the content of a cognitive task iff:

- It allows an agent to reliably predict and evaluate the actual outcomes of the action being monitored.
- It generates a phenomenally unified normative representation of a task .
- It guides and motivates further action selection.

A remarkable contrast in CP projection

- **In a goal index,** a sensory feature (phonological or imagistic marker)
  - Is part of – phenomenally represents -- **the action model that has been nonconsciously selected**,
  - is **perceived as one's upcoming goal**.
  - Direction of fit: **world to mind**
- **In noetic feelings**, sensory embodied features
  - are based on **nonconscious feedback and heuristics**
  - Are **perceived** as observed progress to goal (i.e. cognitive affordances)
  - Direction of fit: **mind-to-world**

This contrast offers a functional account of projection to goal

- Indexing points to a conceptual structure related to goal.
- This executive phenomenology controls both execution and feedback interpretation "as being about" goal progress.

- Agents take their feeling to actually reflect contents, not merely vehicle properties.

In summary

Goal phenomenology and evaluative phenomenology are made **continuous with each other** by goal selection

Phenomenology is what links together control and monitoring of current cognitive actions.

6 - Conclusion

Cross-over principle defended on new grounds

- Indexing and noetic feelings are phenomenally conscious **because**
- cognitive affordance-sensings require conscious indicators
  - for grading opportunities (noetic feelings).
  - for maintaining attention focused on the opportunity currently evaluated

→ Consciousness is required for its motivational, integrative and evaluative subjective value.

A common function for indexing and noetic feelings

Securing

- **Flexible (revisable) control of cognitive action**
- Dominance of **internally generated sensory cues** over **perceptually generated cues** (environmental affordances) in the control of decision.

IS CP Proprietary or non-proprietary ?

- CP is called "proprietary" if it is only activated by thinking, and irreducible to sensory experiences.
- CP is "non-proprietary" if it consists in sensory and affective experiences.
- The status of CP now appears to be more complicated than this contrast makes it appear.

IS CP Proprietary or non-proprietary ?

- Goal indexing involves sensory imagery, i.e. non-proprietary phenomenology
- But goal indexing is **not felt as a sensory form of experience**: it indexes thought contents

- Similarly: noetic feelings involve somatic markers, i.e. non-proprietary phenomenology
- But noetic feelings are not **felt as a somatic form of experience**: they are felt as epistemic properties

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