Theoria, 2026, 41(3), 378-395
https://doi.org/10.1387/theoria.27706

THEORIA
ISSN 0495-4548 – eISSN 2171-679X

Metacognitive feelings as mental affordances

(Sentimientos metacognitivos como affordances mentales)

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Keywords

Metacognitive feelings
Mental affordances
Mental action
Remembering
Reasoning
Attention

ABSTRACT: This paper explores the role of metacognitive feelings as mental affordances. Drawing on McClelland's Mental Affordance Hypothesis (MAH), we argue that metacognitive feelings are mental affordances because they motivate agents from within and guide their mental behavior. More specifically, we claim that metacognitive feelings satisfy McClelland's sensitivity and potentiation requirements: they make agents sensitive to their own cognitive states and potentiate specific mental actions. After presenting and assessing the MAH, we examine the motivational features of metacognitive feelings, focusing especially on valence and intensity. We then analyze metacognitive feelings related to remembering, reasoning, and attention. Finally, we argue that the MAH should be expanded to incorporate these feelings, since they function as internal affective signals that potentiate and modulate mental actions in ways consistent with the hypothesis.

Palabras clave

Sentimientos metacognitivos
Affordances mentales
Acción mental
Recordar
Razonar
Atención

RESUMEN: Este artículo explora el papel de los sentimientos metacognitivos como *affordances* mentales. Basándonos en la Hipótesis de las *Affordances* Mentales (Mental Affordance Hypothesis, MAH) de McClelland, sostenemos que los sentimientos metacognitivos constituyen *affordances* mentales porque motivan a los agentes desde el interior y orientan su conducta mental. Más específicamente, argumentamos que los sentimientos metacognitivos satisfacen los requisitos de sensibilidad y potenciación propuestos por McClelland: hacen que los agentes sean sensibles a sus propios estados cognitivos y potencian acciones mentales específicas. Tras presentar y evaluar la MAH, exponemos las características motivacionales de los sentimientos metacognitivos, centrándonos especialmente en su valencia e intensidad. A continuación, analizamos los sentimientos metacognitivos relacionados con la memoria, el razonamiento y la atención. Finalmente, sostenemos que la MAH debería ampliarse para incorporar estos sentimientos, ya que funcionan como señales afectivas internas que potencian y modulan las acciones mentales de un modo coherente con dicha hipótesis.

Gako-hitzak

Sentimendu metakognitiboak
Affordance mentalak
Ekintza mentala
Gogoratzea
Arrazoitzea
Arreta

LABURPENA: Artikulu honetan sentimendu metakognitiboek *affordance* mental gisa duten eginkizuna aztertzen da. McClelland-en *affordance* mentalen hipotesia (Mental Affordance Hypothesis, MAH) oinarritzat hartuta, sentimendu metakognitiboak *affordance* mentalak direla argudiatzen dugu, agenteak barrutik motibatu eta haien portaera mentala gidatzen dutelako. Zehatzago esanda, baieztatzen dugu sentimendu metakognitiboek McClellandek proposatutako sentikortasun- eta potentziazio-baldintzak betetzen dituztela: agenteak beren egoera kognitiboekiko sentikor bihurtzen dituzte eta ekintza mental espezifikoak potentziatzen dituzte. MAHa aurkeztu eta ebaluatu ondoren, sentimendu metakognitiboen motibaziozko ezaugarriak aztertzen ditugu, bereziki balentzian eta intentsitatean arreta jarriz. Ondoren, gogoratzearekin, arrazoitzearekin eta arretarekin lotutako sentimendu metakognitiboak aztertzen ditugu. Azkenik, argudiatzen dugu MAHa zabaldu behar litzatekeela sentimendu horiek barne hartzeko; izan ere, ekintza mentalak hipotesiarekin bat datozen moduetan potentziatzen eta modulatzen dituzten barne-seinale afektibo gisa funtzionatzen dute sentimenduok.

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How to cite: Arango-Muñoz, Santiago; Mejía-Rendón, Sebastián (2026). «Metacognitive feelings as mental affordances»; *Theoria. An International Journal for Theory, History and Foundations of Science,* 41(3), 378-395. (https://doi.org/10.1387/theoria.27706).

Received: 14 July, 2025; Final version: 13 July, 2026.
ISSN 0495-4548 - eISSN 2171-679X / © 2026 UPV/EHU Press

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Introduction

McClelland recently put forward the Mental Affordance Hypothesis (henceforth MAH), which posits the existence of mental affordances. According to McClelland, mental affordances are perceptions of external stimuli that invite certain mental actions such as attending, imagining, or calculating (McClelland, 2020). An amplified voice invites us to pay attention, a fantasy novel presents the opportunity to imagine fictional characters, and a jar full of marbles affords the act of counting them.

While we endorse McClelland's MAH, we argue that it should be expanded to include other types of stimuli that afford mental action. Based on Proust (2013, 2015a, 2015b, 2024), we claim that metacognitive feelings and epistemic emotions are mental affordances because they motivate us to engage in mental action. Metacognitive feelings are first-order affective experiences related to cognitive processes, dispositions, and mental states. Paradigmatic examples of metacognitive feelings are the tip-of-the-tongue phenomenon, the feeling of knowing, the feeling of error, the feeling of forgetting, among others. For instance, the feeling of knowing and the tip-of-the-tongue phenomenon afford the mental action of memory retrieval. The feeling of error affords the revision of the outcome of the mental process, while the feeling of forgetting affords the deployment of alternative mnemonic strategies when memory retrieval is not possible.

Recently, Proust (2024) analyzed how metacognitive feelings can be understood as mental affordances—a significant contribution to the literature on mental agency. While our perspective aligns with Proust's earlier work (2013, 2015a, 2015b, 2024), we diverge at a key point. Proust proposes an "informational model" in which metacognitive feelings serve to detect cognitive affordances (opportunities for mental action), treating the two as distinct entities. In contrast, we argue that metacognitive feelings are not merely detectors of affordances—they *are* mental affordances themselves. This proposal avoids ontological duplication: there is no need to posit both a detector and a detected affordance. Metacognitive feelings are already experienced as opportunities for action; hence, they fulfill the role of affordances directly.[1] To support this claim, we propose an expanded definition of the Mental Affordance Hypothesis (MAH) that explicitly includes such metacognitive states. We offer two key reasons for this extension.

First, adopting an account of affordances that incorporates feelings and phenomenal states provides a richer understanding of how mental affordances are experienced. By acknowledging this experiential dimension, we can better explain why certain mental affordances are more compelling than others and how metacognitive feelings, such as curiosity, the feeling of error, or cognitive effort, shape the way we engage in mental action. Second, incorporating internal mental states into the MAH allows us to account for additional dimensions of mental action that have been largely overlooked in the literature: namely, the internal modulation of mental action, including shifts in strategy, revision of outcomes, and even the decision to disengage from a mental process altogether.

The paper proceeds as follows. In section 1, we present the MAH. In section 2, we assess the MAH. In section 3, we outline the motivational dimension of metacognitive feelings. In section 4, we analyze metacognitive feelings related to remembering, reasoning, and attention. Finally, we defend the proposed extension of the MAH.

1. The Mental Affordance Hypothesis

The term "affordance" was coined by Gibson in the 20th century, and it has since led to an enormous literature that employs it in various ways. The fields of neuroscience, the arts, ecological psychology, and tool-use studies have all made

[1] Before proceeding, it is important to clarify that identifying metacognitive feelings with mental affordances does not require attributing rich representational content to those feelings. Metacognitive feelings are non-conceptual, first-order affective experiences (see §3.1). The cognitive sophistication lies in the underlying cognitive system (memory, reasoning, attention mechanisms); the feeling is the subjective manifestation of the relational property between that system and the task. Thus, we avoid both over-intellectualizing the feeling and thinning the affordance.

use of this concept.[2] Gibson introduced this concept to emphasize that the environment provides opportunities for action relative to an animal's bodily and sensory capacities (Gibson, 1979). For example, a stick is useful for a chimpanzee in hunting termites, but not for a dolphin. In this case, the affordance is animal-relative, meaning that affordances are relative to an individual's potential for action:[3]

> The *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill. The verb to *afford* is found in the dictionary, but the noun affordance is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does (Gibson, 1979, p. 127; emphasis in the original).

For decades, the term "affordance" has been used across a wide range of disciplines and has consequently become conceptually diffuse. Given the variety of applications of the term, it is often difficult to determine its precise reference when used in different contexts (Osiurak & Badets, 2017). Nevertheless, despite the diversity of uses of this term, an affordance can simply be defined as an opportunity for action in a situation in which it is possible for a subject to deploy some ability she possesses. In a nutshell, affordances can be understood as possibilities for action that arise from the relation between an agent and her environment. According to McClelland, an affordance can be defined as follows:

AFFORDANCE: x affords ϕ-ing for S if and only if x offers an opportunity for S to ϕ (McClelland, 2020, p. 405).

The concept of affordance has been introduced in the literature to explain agency. Gibson introduced the concept to explain how perceived environmental features guide bodily action (Zipoli Caiani, 2014). In his original proposal, Gibson mainly focused on bodily affordances and how the perception of an object offers, solicits or motivates[4] some bodily actions of an agent, such as grasping a glass or climbing a tree. We perceive affordances directly without the mediation of any other mental representation; that is, we do not infer them from the perceptual content, but we perceive opportunities for action directly in the environment. Building on Gibson's proposal—while adapting it to his representational framework—, McClelland argues that we are perceptually sensitive to both bodily and mental affordances. He distinguishes between these two types of affordances as follows. On the one hand, a bodily affordance is characterized by the perception of a stimulus that presents the possibility of performing a bodily action. For example, seeing a chair affords the action of sitting; seeing a glass of water affords the actions of grasping it and drinking the water. On the other hand, mental affordances are perceptions of external stimuli that present an opportunity to perform a mental action. A mental action is a mental event that is under our control, so that one can initiate, modulate or stop it (Peacocke, 2021; Proust, 2001), and does not necessarily involve any bodily movement for achieving its goal.[5] McClelland illustrates this idea with the case of a jar of marbles that affords the mental action of counting (McClelland, 2020, p. 422). In this case,

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2 In theory of action, affordances have been understood as (1) action opportunities, (2) links between visual attributes and motor knowledge, (3) online motor control, (4) sensorimotor knowledge, or (5) semantic knowledge. In tool-use reflection, affordances have been understood as (1) familiar tool use, (2) unfamiliar tool use, (3) novel tool use, or (4) non-tool use actions. In neuroscience, affordances can be associated with (1) a hand-centered, (2) a tool-centered frame of reference, or (3) both. Or, affordances can be regarded as relying on (1) the dorso-dorsal system, (2) the dorsal system, (3) the ventrodorsal system or (4) the ventral system (Osiurak & Badets, 2017).

3 Here we endorse Rietveld and Kiverstein's (2014) view on affordances. According to these authors, and against the traditional Gibsonian view of affordances, to perceive an affordance is animal-relative (not species-relative) and depends on the skills and abilities of the agent. Thus, an agent can only perceive an external stimulus as affording an action if the agent has the ability to perform such an action.

4 It is important to note that while a given affordance invites a particular action, it does not necessarily motivate it. For example, one might perceive a door as openable but feel no inclination to do so after reading a sign that says, "Keep the door closed." However, when an affordance is perceived and the corresponding action follows, we can consider that the affordance played a role—among other factors—in motivating the action. In this paper, we focus on cases where affordances contribute to motivation, as these are crucial for explaining agency. However, this does not mean that individuals are always compelled to act on affordances; resisting their pull is also possible. The phenomenon of resisting affordances will be the subject of another project.

5 This does not mean that mental actions cannot be accompanied by or realized through bodily movements and external interventions, as Clark and Chalmers (1998) have shown.

we perceive an object that potentiates the arithmetical action of counting. McClelland, in turn, introduced the concept of *mental affordance* to enrich Gibson's concept so that it can also explain our capacity to mentally act, that is, our mental agency.

Bodily and mental affordances share two key requirements: sensitivity and potentiation. The first requirement means that the agent is sensitive to affordances. For example, the agent sees a cake *as edible*, a bike *as rideable*, etc. The second feature, potentiation, refers to the automatic preparation of motor patterns responsible for performing the afforded action. The same can be said for mental affordances. In McClelland's example concerning stepping stones across a river, we perceive the situation as sometimes affording a bodily action, such as the next step in the easy cases, or affording the mental action of imagining. According to McClelland, in the difficult cases, that is, when it is not evident where one should step, the act of imagining a viable route for the next step is afforded. Thus, the stepping stone case shows how the bodily affordances (those that motivate a bodily action, e.g., executing the next step) and the mental affordances (those that motivate a mental action, e.g., imagining a possible way through the stones) are intertwined and are both triggered by the perception of environmental stimuli.

However, our point is that human mental agency is more complex than the Gibsonian view suggests, and it is not always bound to the perception of external stimuli. Unlike other animals, whose actions are tightly coupled with their immediate environment, humans are representational agents that can entertain thoughts about distal objects and properties (e.g., the center of the Earth, the Andromeda galaxy, etc.), non-existent beings (e.g., Sherlock Holmes, the fountain of youth, unicorns, etc.), and even about their own mental states and affective experiences (e.g., my trust in science, my feeling of anxiety, and my desire to formulate a strong argument). Furthermore, mental actions cannot be reduced merely to mental affordances associated with external stimuli. In contrast, Metzinger (2017) and Jorba (2020) have proposed accounts of mental agency that recognize the existence of mental affordances while allowing them to be triggered by elements internal to the mind. Thus, we argue that it is important to broaden the concept to encompass other types of affording elements, namely metacognitive feelings and emotions.

2. *Assessing the MAH*

The MAH posits the existence of mental affordances, understood as perceptions of external stimuli that invite certain mental actions such as attending, imagining, or calculating (McClelland, 2020). In this view, mental affordances are not merely triggered by external stimuli; rather, the perception of these stimuli potentiates particular mental actions. While McClelland's framework is informed by ecological psychology, which emphasizes a direct relationship between organisms and their environment, he adopts a representational view of affordances. That is, perceiving an affordance involves forming a perceptual representation of its object. This contrasts with the non-representational view in ecological psychology, which holds that affordance perception does not require a mental representation as intermediary. Our main critique of McClelland's approach is that he does not sufficiently distance himself from the core principles of ecological psychology. Even though McClelland claims to endorse a representational view of affordances in line with Siegel (2014), his emphasis on the perception of external stimuli ties affordances too narrowly to external stimuli and the environment, overlooking other potential sources of affordance—particularly internal mental states. In contrast to this way of thinking about agency, Metzinger (2017) and Jorba (2020) have proposed two related accounts of mental agency that acknowledge the existence of mental affordances, but also allow them to be triggered by internal elements of our mental environment. We will describe both views in the next paragraphs.

On the one hand, Metzinger puts forward an account of mental action in relation to predictive processing. According to his view, the brain generates a range of potential mental actions beyond what the external environment offers to us as possibilities of bodily action. These possible actions compete with each other until one of them becomes available in the stream of consciousness. Metzinger describes this as "a constant flow of possible mental ac-

tions, a dynamic inner environment constituted by non-sensory events which need to be predicted and controlled" (Metzinger, 2017, p. 11). This constant flow creates a rich inner repertoire of possible mental actions that are referred to as "affordances for cognitive agency". Therefore, according to Metzinger, our inner world is not made up of static mental objects, but rather a dynamic competition of affordances for potential cognitive actions (Metzinger, 2017, p. 12).

On the other hand, Jorba (2020) returns to Husserl's notion of "horizon" understood as an implicit feature of experience, and suggests that experience goes beyond the perceptual domain, namely, to thinking. Based on Husserl's work, she distinguishes between the perceptual horizon and the cognitive horizon. While the perceptual horizon consists of a set of possibilities opened by the experience of external objects, the cognitive horizon can be understood as a rational dimension of the cognitive experiences that can be motivating reasons for action (Jorba, 2020, p. 859). According to her, the cognitive horizon is an inner experience that involves a free play dimension of inferential relations and associations. Thus, the cognitive horizon shapes the experience of thinking which consists in "seeing" what you can do with your thoughts; that is, some thoughts in your stream of conscious thought might lead to physical or mental actions. This sense of the possibility of a mental action is what Jorba calls "cognitive affordance" (Jorba, 2020, p. 856).[6]

Despite the evident differences between the two accounts, Metzinger's "inner environment" and Jorba's "cognitive horizon" both underscore a key point we have emphasized: many of our mental actions are initiated, guided, and motivated by interactions among internal mental states. For Metzinger, this involves a dynamic competition of potential cognitive actions, of which the subject is aware as "cognitive affordances". In Jorba's view, our cognitive experience presents us with associative and inferential relations that motivate different courses of action or thought. However, in both cases it remains unclear how the subject becomes aware of these affordances or the relational dynamics that drive action and thinking.

Although we endorse McClelland's Mental Affordance Hypothesis to a certain extent, following Metzinger (2017) and Jorba's (2020) suggestions, we argue that the MAH should be expanded to encompass metacognitive feelings and emotions. Two considerations motivate this extension. First, mental affordances are experienced, not just perceived: incorporating feelings and phenomenal states into the concept of affordance provides a richer understanding of how mental affordances are felt. Mental activity is often accompanied by affective tones—such as ease, difficulty, urgency, or reluctance— that shape our mental actions. For example, the urges to focus on a thought, recall a memory, or entertain an imaginative scenario are influenced by how those thoughts feel to us. A more comprehensive theory of mental affordances should include these experiential dimensions. Second, mental affordances are not exclusively triggered by external stimuli. More specifically, not all invitations to think, imagine, or attend originate from the external environment; some are generated by internal mental states. In this sense, some philosophers of mind have introduced the 'mental environment' metaphor to characterize thought as a dynamic, self-sustaining space where a continuous flow of mental content shapes potential mental actions. Within this rich cognitive landscape, affordances emerge from our own thoughts, doubts, memories, or emotions. For example, an idea we have may afford reflection (Jorba, 2020; Metzinger, 2017), a doubt may afford the suspension of judgment, an imagined scenario may motivate daydreaming, and a sudden memory may afford reminiscing –much like the famous madeleine episode in *In Search of Lost Time* by Marcel Proust. Thus, a complete account of mental agency must recognize that mental affordances have an affective dimension that guides mental action, and they can arise from both external stimuli and internal mental states.

In the following section, we propose that metacognitive feelings play a crucial role in this awareness and guide mental actions. These experiences provide guidance for selecting and regulating mental actions, bridging the gap between internal mental affordances and conscious mental agency.

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[6] For present purposes, we treat Jorba's notion of cognitive affordance as broadly equivalent to what we call a mental affordance.

3. Motivational properties and mental agency: Metacognitive feelings as mental affordances

As argued in the previous section, McClelland's framework provides a valuable starting point but remains limited in two respects. First, it ties mental affordances primarily to external stimuli (e.g., perceiving a jar of marbles invites counting). Second, even if he acknowledges that there can be internal triggers (e.g., thoughts, emotions, memories), he does not explain how we can be sensitive to internal mental affordances. To elaborate on this final point, we propose that a first step in this direction is to identify specific instances of mental states that function as mental affordances, but are not necessarily tied to the perception of external stimuli. Among such mental states, we suggest that metacognitive feelings are particularly good candidates for fulfilling this role. Paradigmatic examples of metacognitive feelings are the tip-of-the-tongue phenomenon, the feeling of knowing, the feeling of error, the feeling of forgetting, among others.

3.1. Metacognitive feelings

We acknowledge that broadening the notion of affordance to encompass all forms of mental experience may be problematic and risks diluting the concept. Nonetheless, a natural first step is to explore the motivational role of metacognitive feelings. Although various terms have been proposed to describe these experiences —such as cognitive feelings, epistemic feelings (Arango-Muñoz, 2014; de Sousa, 2009), noetic feelings (Dokic, 2012), and metacognitive feelings (Norman *et al.,* 2010; Arango-Muñoz, 2019)— they share common features. Despite terminological differences, these notions largely belong to the same family of experiences. Metacognitive feelings are first-order, conscious, affective (Loev, 2022), non-conceptual experiences (Proust, 2015a) that emerge during cognitive activity (Koriat, 2000), functioning as embodied evaluations of one's own mental processes (Dorsch, 2025), including memory retrieval, reasoning, and decision-making (Arango-Muñoz, 2014). We examine each of these features below.

As Proust (2015a, 2015b) theorizes, these feelings function as affordance sensings—implicit detections of mental-action opportunities that bypass conceptual inference: "Affordances are neither perceived nor inferred; they are 'sensed'" (Proust, 2015b, p. 1). Their conscious character is evident in phenomena like the tip-of-the-tongue (TOT) state, where the subject is acutely aware of the temporary inability to recall a word (Koriat, 2000). The non-conceptual character of metacognitive feelings means that they do not represent propositions, procedures, or complex structures. They signal "recallability" or "error" in a direct, affectively laden manner, much like a bodily sensation signals "loss of balance" without describing the physics of falling. This non-conceptual character is precisely what allows them to function as affordances: they present opportunities for action without specifying the means, leaving the cognitive system to supply the detailed procedure.

Metacognitive feelings are constituted by transient, context-specific positive or negative valence, that is, the felt positive or negative affects attached to certain experiences (Teroni, 2018). These affective experiences are commonly understood either hedonically, as sensations of pleasantness or unpleasantness, or evaluatively, as conveying a sense of worth or lack thereof. Importantly, valence is not merely a descriptive feature but is closely tied to the motivational role of emotional experiences. That is, emotional and metacognitive experiences exert a motivational force that can prompt specific behaviors or guide cognitive actions (Carruthers, 2018; Corns, 2014). This motivational power is not binary but gradable —some feelings may drive immediate action or revision, while others exert weaker influence, allowing for sustained deliberation or disengagement (Kozuch, 2020). In this way, the valenced character of metacognitive feelings not only registers internal evaluations but also helps shape the direction and intensity of subsequent thought and behavior (Loev, 2022).

As embodied evaluations (Dorsch, 2025), metacognitive feelings bridge cognition and emotion by translating mental uncertainty into action-guiding signals (Fernández Velasco & Loev, 2025). According to Dorsch (2025), these feelings arise from interoceptive awareness of bodily changes, particularly cardiovascular signals, which encode and convey metacognitive information. Experimental evidence suggests that bodily afferents not only correlate with but causally influence the intensity and valence of noetic feelings. This supports a "strong embodied" view: bodily states do not merely

accompany cognition but actively shape it by translating cognitive processing fluency into affective signals that guide thought. Thus, these findings suggest that metacognitive processes depend in part on extracerebral bodily processes.

Finally, metacognitive feelings are non-conceptual (Proust, 2015a): they register bodily and contextual cues through affect without representing explicit causal relations. As Proust notes, "Epistemic feelings express affordances in a nonconceptual way" (Proust, 2013, p. 269). Their non-conceptual character distinguishes them from explicit metacognitive judgments: they encode bodily dynamics and predictive expectations (e.g., a feeling of knowing as a "sensed" opportunity to recall) rather than conceptual content (Proust, 2015b, p. 2). In a recent paper, Proust (2024) develops an informational model according to which metacognitive experiences detect cognitive affordances, inform agents about the viability of cognitive tasks, and guide action through three control stages: detection, adjustment, and evaluation. She argues that cognitive affordances are informational opportunities sensed through specialized affective appraisals. Accordingly, affordance sensitivity occurs at control junctures involving the detection of an opportunity, the adjustment of ongoing behavior, and the assessment of the final outcome (Goupil & Proust, 2023). On this account, metacognitive feelings and cognitive affordances are distinct entities: the former function as detectors of the latter. By contrast, we argue that metacognitive feelings are themselves cognitive affordances. Rather than detecting independently existing affordances, they constitute the very opportunities for mental action that they make available to the agent. This proposal avoids an unnecessary multiplication of entities while preserving the explanatory role that Proust assigns to metacognitive feelings.

A potential concern is that identifying metacognitive feelings with affordances either over-intellectualizes the feeling or thins the affordance. We do not claim that a feeling, such as the feeling of familiarity, must represent the entire structural complexity of the memory system. Rather, the feeling is the relational manifestation through which the latent capacities of the cognitive system become available to the agent. In this view, the feeling is the non-conceptual signal that translates sub-personal complexity into an action-guiding opportunity. By identifying the two, we avoid the ontological duplication of a 'detector' and a 'detected' entity, acknowledging that the affordance's functional role is only realized through the feeling's motivational presence. Thus, our approach differs slightly from Proust's, insofar as we avoid positing a duplication of entities. As a result, our account of metacognitive feelings is more parsimonious.

3.2. Metacognitive feelings as affordances

In this section, we propose that metacognitive feelings should be understood as affordances because they internally motivate the agent to act in a certain way and thus guide her mental behavior. In this sense, they function as internal motivation, not by representing possibilities from a detached standpoint, but by guiding cognitive activity. When we say that a metacognitive feeling is a mental affordance, we mean that the feeling itself constitutes the affordance for mental action – not a signal that detects an independent affordance. As such, it (a) presents a possible mental action (e.g., "try to recall"), (b) motivates initiating or sustaining it, and (c) dynamically structures its execution by enabling online adjustments (shifting strategy, persisting, disengaging) as the cognitive process unfolds (see the three stages in this section). These three functions are not additional features of the feeling; they constitute its affordance character. Taken together, these considerations support the inclusion of metacognitive feelings among mental affordance experiences, given that they meet both the sensitivity to internal cognitive states and the potentiation of action requirements outlined by McClelland. To establish this claim, we examine each requirement in turn. We first argue that metacognitive feelings satisfy the sensitivity requirement because they make agents aware of features of their own cognitive activity. We then show that they satisfy the potentiation requirement because they motivate and regulate mental action.

Concerning the sensitivity requirement, metacognitive feelings are felt experiences and thus have qualitative properties. Although they are not directly caused by perception of external stimuli, as in McClelland's examples, there is something it is like to undergo a feeling of knowing different from what it is like to have a feeling of error or a feeling of forgetting. That is why Proust claims: "an affordance is neither directly perceived nor inferred. It is directly sensed, which requires a different kind of ability" (Proust, 2015b, p. 3). This phenomenological accessibility is precisely what allows metacog-

nitive feelings to satisfy the sensitivity requirement. However, merely making an agent aware of a cognitive situation is not sufficient for something to count as a mental affordance. Mental affordances must also motivate or facilitate action. We must therefore examine whether metacognitive feelings satisfy McClelland's potentiation requirement.

Concerning the potentiation requirement, it seems that metacognitive feelings also potentiate certain mental actions. Metacognitive feelings, as argued by de Sousa (2009), not only shape our beliefs and decisions, but also play a crucial role in guiding our cognition. This role is displayed thanks to the involvement of valence. Metacognitive feelings can have either positive or negative affect (Arango-Muñoz, 2014). The feeling of knowing seems to be in part constituted by a positive valence concerning the possibility of retrieving a given piece of information, whereas the feeling of forgetting seems to be constituted by a negative valence. The same applies to curiosity and boredom. Moreover, it has also been highlighted that metacognitive feelings have intensity: "[they] can be felt as weak or strong, according to the activity in their dedicated somatic markers" (Proust, 2013, p. 136). Accordingly, some researchers have suggested that metacognitive feelings are embodied experiences that the agent can use to monitor and control her own mental dispositions (Arango-Muñoz, 2019; Dokic, 2012; Dorsch, 2025). In this respect, metacognitive feelings resemble paradigmatic affordances: they do not merely reveal possibilities for action but actively invite their realization.

Moreover, the potentiation of certain cognitive processes is explained by the functional characterization of the origin of feelings and the different stages in cognition where they take place. Metacognitive monitoring involves three stages where metacognition assesses the mental processes and triggers metacognitive feelings accordingly: *self-prediction, intermediate assessment, and post-evaluation* (Arango-Muñoz, 2014; Goupil & Proust, 2023; Proust, 2024). Each stage is associated with characteristic metacognitive feelings that guide mental action in different ways. Goal-related *self-prediction* assesses whether a potential or future cognitive process can attain a particular goal: for example, whether by trying to remember one can retrieve a particular piece of information, or whether by mentally calculating one can solve a math problem. In the *intermediate assessment*, metacognition evaluates the unfolding of the mental process and whether it is leading to the attainment of the desired goal, so that the subject can adjust her cognitive strategy online. For example, during a philosophy exam about Hegel's *Phenomenology*, the subject may try to report the main ideas of the book. In trying to remember Hegel's ideas, the subject may notice that she is only barely able to retrieve some words and concepts, but not to reconstruct his main ideas or arguments. Finally, in the *post-evaluation*, metacognition evaluates the outcome of the cognitive process and determines whether the cognitive process was successful. For example, after calculating a sum, the subject may feel that she has committed an error in the procedure. All these assessments generate positive or negative metacognitive feelings that inform the subject about the dynamics of her mental processing and thus motivate her to carry out certain actions such as selecting a mental strategy, changing the strategy, and/or accepting the result. The feeling of knowing potentiates remembering, the feeling of forgetting potentiates using mnemonic tools to remember, and the feeling of rightness potentiates accepting a conclusion of a reasoning process.

While sensitivity ensures that the subject has access to her own cognitive states through felt experiences, potentiation refers to their action-guiding character (shaped by valenced experiences), which we identify as essentially motivational features. It is important to distinguish between a property being merely 'accessible' and it becoming 'operative.' While an informational model might suggest that an affordance exists independently and is simply sensed, we argue that for an affordance to be truly mental, it must be operative—meaning it must function as the mechanism of online control. This is precisely where our view departs from informational models that treat metacognitive feelings merely as detectors of independently existing affordances. By "operative" we mean three interrelated functions that go beyond mere access: (a) the feeling presents the agent with a possible mental action Y (e.g., "try to recall"), (b) it motivates the initiation or continuation of Y, and (c) it dynamically structures the execution of Y by enabling online adjustments—such as persisting, shifting strategy, or disengaging—depending on the unfolding of the cognitive process. These adjustments correspond to the three stages of metacognitive monitoring—self-prediction, intermediate assessment, and post-evaluation—through which metacognitive feelings regulate ongoing cognition. A feeling of knowing does more than provide access to the fact that a memory exists; it provides the bridge that motivates the agent to initiate the reconstruction

process and guides the deployment of mnemonic resources. What makes a feeling "operative," then, is not merely that it makes an affordance available, but that it participates in its temporal unfolding as a guide for action.

Taken together, these features suggest that metacognitive feelings are not just feedback signals, but constitutive components of mental agency. They motivate the initiation, suspension, or revision of cognitive processes in a sensitive manner. By identifying metacognitive feelings (MFs) with the affordances that emerge in these stages, we avoid the ontological duplication of a separate 'detector' and 'detected' entity. The feeling does not need to 'represent' the entire structural complexity of the memory system to be an affordance; rather, it is the relational signal through which the system's latent capacities become available to the agentive self. Therefore, their role cannot be reduced to the detection of affordances—as in Proust's model—but should be understood as affordances themselves: they motivate mental action.

To conclude this section, we must address the concern that identifying metacognitive feelings with affordances overlooks the procedural and structural differences compared to physical affordances. We contend that these disanalogies—procedural, structural, and feedback-related—stem from an over-reliance on visual models of action. Metacognitive feelings present procedures in a non-conceptual, affective format. Furthermore, our three-stage model—self-prediction, intermediate assessment, and post-evaluation—demonstrates that these feelings are not static outputs but dynamic, online signals that provide the feedback and structure necessary for mental control. By identifying the feeling as the affordance itself, we avoid the ontological duplication inherent in the Proustian model, acknowledging that a mental affordance only becomes operative for the agent when it is felt as a motivating opportunity for action.

One might object that metacognitive feelings cannot themselves structure cognitive activity because the detailed procedures involved in remembering, reasoning, or attending are implemented by subpersonal mechanisms.[7] We agree that metacognitive feelings do not encode or execute these procedures. However, this objection assumes that affordances must contain procedural information. Bodily affordances do not always specify detailed motor instructions; rather, they make certain actions available and guide their ongoing regulation. Similarly, metacognitive feelings need not determine the specific cognitive operations involved in retrieval, inference, or attention. Their role is to present these activities as available courses of action and to regulate their continuation, modification, or termination through ongoing affective feedback. In this sense, they function as affordances without duplicating the underlying cognitive mechanisms.

In the following section, we examine how these general claims apply to particular cognitive domains. We focus on remembering, reasoning, and attention, arguing that metacognitive feelings guide and regulate mental action in each of these cases.

4. The analysis of three cases

4.1. Metacognitive feelings related to remembering

Remembering can sometimes be considered as a mental action in the sense that the agent controls her mnemic construction (Arango-Muñoz & Bermúdez, 2018), and the process can be improved with practice and the agent's performance can be assessed for excellence (Goldwasser, 2023). Remembering is especially relevant for our purposes because it provides one of the clearest cases in which metacognitive feelings both disclose cognitive possibilities and guide subsequent mental action. Remembering is not just the passive process of encountering some mental contents that one has stored in memory, but the active reconstruction of a past episode (in the case of episodic memory) or some data one has learned (in the case of semantic memory) (De Brigard, 2014; Michaelian, 2016).

This active reconstruction of past episodes is monitored and controlled by metacognition throughout the three stages that we have presented in the previous subsection: *self-prediction, intermediate assessment, and post-evaluation* (Arango-Muñoz

[7] We are grateful to an anonymous reviewer for raising this concern, which helped us refine our account of how metacognitive feelings function as mental affordances.

& Bermúdez, 2018). There are some metacognitive feelings related to these stages in remembering. In particular, the feeling of knowing precedes some instances of remembering (*self-prediction*). Psychologists have found that often, when someone is confronted with a question that requires memory retrieval, the subject experiences a feeling of knowing. This feeling precedes memory retrieval or reconstruction and often predicts the subject's ability to succeed in this mental action (Koriat, 2000; Reder, 1996; Reder & Ritter, 1992). For instance, after being asked about the name of the capital of Peru, the subject may undergo a feeling of knowing that affords remembering the name (Dokic, 2012). Importantly, the feeling of knowing does not merely predict successful retrieval. By presenting the memory task as potentially solvable, it motivates the agent to initiate or persist in the retrieval attempt. In this sense, it functions as an affordance for remembering. Thus, the feeling of knowing potentiates the mental action of trying to reconstruct a past episode.

In the *intermediate assessment*, that is, during the attempt to reconstruct a piece of information, the subject may feel that the remembering process is easier or harder. For example, when trying to remember a poem (say, Borge's "*Labyrinth"*), the subject may have an experience of ease of retrieval of each verse that affords attempting to remember the verses and the whole poem.[8] According to Koriat's accessibility model (1993, 2000), the accessibility of partial or contextual information relevant to the memory target gives rise to this feeling. In contrast, one may also have the feeling of difficulty when the information needed for the reconstruction is not easily accessible. These feelings are more apparent when the reconstruction involves reconstructing longer or more complex bits of information, such as trying to remember a poem or all the places visited on a road trip, and not just a specific name. These feelings afford mental actions related to the process of remembering: the feeling of the ease of retrieval affords trying to remember, whereas the feeling of difficulty in retrieval affords looking for alternative mnemonic strategies.

In the tip-of-the-tongue (TOT) phenomenon, the subject feels that she can retrieve a piece of information that she cannot actually retrieve at present. This experience is puzzling because the prediction of the possibility of memory reconstruction (*self-prediction*) and the actual reconstruction *(intermediate and post-evaluation*) come apart. In other words, the metacognitive system predicts, by a feeling of knowing, that the subject can reconstruct a piece of information but, then, she realizes that she cannot, "demonstrating that the processes of retrieval are not identical to the processes that elicit the TOTs" (Schwartz, 2002, p. 17). From our perspective, the significance of TOT experiences lies in their motivational profile. Even when retrieval fails, the feeling continues to present the information as accessible and thereby motivates continued search. The affordance remains operative despite the temporary failure of retrieval.

Another feeling that we often encounter in our daily life, during the *intermediate and post-evaluations*, is the feeling of forgetting. Consider the case in which one is leaving one's house: in this context, one often has the feeling that one is forgetting something. This feeling affords the revision of one's memory (what am I forgetting?). Ordinary experience suggests that this feeling is often worth heeding, given that one does not want to forget something important (say the keys or the credit card). Moreover, there is some empirical evidence that this feeling is reliable (Halamish *et al.*, 2011). In other contexts, such as when I'm writing a paper and need to remember a reference, the feeling of forgetting affords the use of external mnemonic tools such as a notebook, a reminder list, or just the internet (Arango-Muñoz, 2013).

Across the different stages of remembering, metacognitive feelings play a central role in structuring mental action. Feelings of knowing characterize self-prediction by presenting a memory task as potentially solvable and motivating retrieval attempts. Feelings of ease and difficulty regulate the ongoing process of reconstruction, guiding persistence or strategic adjustment during intermediate assessment. Feelings of forgetting, in turn, often contribute to post-evaluation by motivating the revision of the retrieval process and the deployment of alternative mnemonic resources. These experiences do more than provide information about memory performance: they present possibilities for mental action, motivate the selection

[8] "No habrá nunca una puerta. Estás adentro / y el alcázar abarca el universo / y no tiene anverso ni reverso / ni externo muro ni secreto centro..." ("There'll never be a door. You are inside / and the fortress contains the universe / and has no other side nor any back / nor any outer wall nor secret core...").

of mnemonic strategies, and regulate ongoing retrieval attempts. In this respect, they satisfy both the sensitivity and potentiation requirements of the MAH and therefore constitute genuine affordances for cognitive agency.

4.2. Metacognitive feelings related to reasoning

The notion of inference has been widely discussed in recent decades. According to the classical literature, inferences are rule-based transitions between thoughts. For example, my perception that the street is wet moves me to judge that it rained last night. Mental transitions of thought are guided by rules of inference, for example *modus ponens* or *modus tollens,* where the subject infers q from p with the goal of acquiring a true belief about q. Metacognitive feelings also play a crucial role in the way we perform inferences and other reasoning processes. De Sousa (2009) claims that epistemic feelings play an important role in shaping our beliefs and decisions by providing emotional guidance of our inferential processes.

During a reasoning process we can also distinguish the three functional stages: *self-prediction, intermediate assessment* and *post-evaluation*. In reasoning, each stage is associated with a different type of metacognitive feeling: the feeling of inferential ability evaluates our ability to generate new inferences or solve reasoning problems (*self-prediction*). The feeling of reliability monitors the performance of inference and determines whether it is on track to reach the desired goal, allowing for adjustments to the cognitive strategy if necessary (*intermediate assessment*). Finally, the feelings of confidence, rightness, and endorsement evaluate the result of the reasoning episode and afford accepting the conclusion of a reasoning episode (*post-evaluation*). In the following paragraphs, we will analyze each of these types of feelings related to reasoning.

According to cognitive psychology, reasoning ability develops through the acquisition of inferential skills, including the capacity to recognize logical relations between propositions, distinguish validity from empirical truth, and reason from hypothetical premises (Markovits & Vachon, 1989; Moshman & Franks, 1986). As these abilities develop, agents become increasingly sensitive to their own capacity to solve reasoning problems. We suggest that this sensitivity is often experienced as a feeling of inferential ability: a metacognitive feeling through which agents evaluate, prior to engaging in a reasoning task, whether they are likely to succeed in generating an inference or reaching a solution. This feeling does more than provide information about one's cognitive capacities. By presenting a reasoning problem as manageable or solvable, it motivates engagement with the task and guides the initiation of inferential activity. In this respect, the feeling of inferential ability functions as an affordance for reasoning.

The feeling of inferential ability may be understood by appealing to Chudnoff's notion of "inferential seeming" (Chudnoff, 2024). Chudnoff argues that there is a type of phenomenal experience (an inferential seeming) that occurs in the context of drawing a conclusion from some premises. According to him, there is "a felt difference between following an argument to its conclusion and keeping up with an argument in your judgments while failing to see how its conclusion follows from its premises" (Chudnoff, 2024, p. 315). Thus, we propose that when confronted with a familiar inferential problem, one may undergo the feeling of inferential ability that affords trying to solve the problem. One feels that one knows how to address and solve the problem. In contrast, when confronted with an unfamiliar type of reasoning problem, one may feel confused about how to even start solving the problem. For example, the student might experience a feeling of confusion when faced with the problem $x^3 \cdot x^2 = x^5$ if she has not been trained to multiply powers with the same base by adding their exponents (x^{3+2}). The feeling of confusion may be discouraging in some cases, but it also affords more thorough information processing or looking for alternative strategies to solve the problem (either in a book, on the internet, or by asking the teacher) (Vazard & Audrin, 2022). This feeling does not merely signal the absence of understanding. It motivates specific cognitive responses, such as slowing down, searching for additional information, or adopting alternative problem-solving strategies. In this sense, it functions as a mental affordance.

During the unfolding of the reasoning process (that is, during the intermediate assessment), individuals may experience feelings of reliability or unreliability. These feelings pertain to the ongoing monitoring of a reasoning process. If an individual feels that their reasoning is reliable, this will afford continuing to use the chosen argumentative strategy. Oth-

erwise, if an individual feels that their reasoning is unreliable, it will afford reevaluating the argumentative strategy and any mental transitions that are taking place at that moment.

A modified version of the "Rain Inference Example" (Boghossian, 2018) can be used to illustrate how reasoning can be calibrated through explicit evaluation of the inferences being made. For instance, someone infers that it rained last night from seeing that the street is wet:

1. The street is wet
2. If the street is wet, it rained last night
3. It rained last night

But imagine that before arriving at the conclusion in (3), the subject evaluates the if-then premise (2). Suppose she realizes that it could not have rained last night because it is summer, and the street must be wet for some other reason. Suddenly, the individual gets the feeling of unreliability about the mental transition that is taking place at that moment and modifies the reasoning strategy by including other propositions. For example, the subject might consider that her neighbor washed his car last night, which could explain the wetness of the street. The feeling of unreliability thus functions as an affordance for cognitive revision. Rather than merely informing the agent that something has gone wrong, it motivates the search for alternative premises and explanatory hypotheses.

1. The street is wet
2. If the street is wet, my neighbor washed his car last night
3. My neighbor washed his car last night

The ability to modify one's reasoning process is shaped by metacognitive feelings of reliability and unreliability. The feeling of reliability affords adherence to the premises and the current reasoning strategy, whereas the feeling of unreliability affords revising both the premises and the reasoning strategy. These feelings express the *intermediate assessment* of one's reasoning processes concerning whether they are on track to achieving a desired goal. In the previous example, the desired goal is to explain why the street is wet even though it is summer. Thus, both the feelings of reliability and unreliability allow the individual to adjust their cognitive strategy according to their monitoring of the reasoning episode. Moreover, according to the theory of dual processes of cognition, the feeling of unreliability may trigger a type 2 process where the agent deliberates about the logical or inferential rules she is following (Thompson, 2009).

Finally, there are three types of epistemic feelings that have been discussed in the literature and occur once one arrives at an inferential conclusion: feelings of confidence, rightness, and endorsement. Although these three types of epistemic feelings occur after the inference has been carried out and enhance the action of accepting the conclusion, each one differs in some respect. The feeling of confidence concerns the truth of the conclusion, the feeling of rightness concerns the validity of the inference, and the feeling of endorsement concerns the epistemic justification of both the conclusion and the inference. We characterize these feelings in detail in the following paragraphs.

The feeling of confidence pertains to the level of certainty one has in the truth of a conclusion.[9] If one does not feel confident in the truth of a conclusion, one may be less likely to rely on it. Moreover, without a strong feeling that one's conclusion is right, one won't accept it as true, and one will hesitate to take actions based on it. Instead, one would carefully revise the reasoning process and consider other options before making decisions.

The feeling of rightness concerns the validity of the inference. It is the feeling that our conclusion follows correctly from the premises and provides us with a sensation that we have done it in a proper manner (Thompson *et al.*, 2011).

[9] Here we are not talking about objective truth, but about the way a subject estimates that a given content of a conclusion is true. According to Reber and Unkelbach (2010), fluency or the ease of processing of some information inclines the subject to consider that it is true.

For instance, when solving a simple linear equation such as $2x + 3 = 7$, a student may experience a feeling of rightness in her answer when inferring that $x = 2$. This feeling affords terminating the calculation and accepting the result. Conversely, if the student experiences a feeling of error, it prompts her to revise her strategy and look for new ways to approach the math problem. As with the other metacognitive feelings, cognitive scientists have demonstrated that the feeling of error is correlated with error, and thus it is a reliable marker of error (Fernández-Cruz *et al.,* 2016). This feeling motivates the student to revise the calculation procedure or even to ask the teacher for help. Thus, the feeling of error affords the revision of the outcome of a reasoning process.

The feeling of endorsement plays a distinct epistemic role when a thinker considers the epistemic justification of a conclusion. Kornblith, for example, holds that the feeling of endorsement is at play when the thinker appreciates that his conclusion is correct and it follows from a set of premises (Kornblith, 2012, p. 143). Along the same lines, Chudnoff (2024) discusses normative characteristics of inferential processing that describe how premises support a conclusion which is justified by the premises.

Although all of these metacognitive feelings seem to occur during the same stage of cognitive processing (i.e., post-evaluation), it is unclear whether the different terms used to describe them refer to three different experiences or to the same underlying one. Some researchers have used one of these concepts while others have used different terms. As we have seen, Thompson has studied the f*eeling of rightness,* whereas Kornblith examines the *feeling of endorsement,* and de Sousa analyzes the *feeling of confidence*. The varied terminology used to describe the feelings elicited after a reasoning outcome—during the post-evaluation stage—reflects the specific interests of different researchers and highlights various aspects of the experience, whether cognitive or epistemological. It is possible that the character of these feelings (the way they are felt) depends on the context and goals of the cognitive task at hand. However, further research is needed to determine whether the differences in the naming reflect actual differences in the phenomenal experience or merely reflect different theoretical perspectives. In other words, it remains unclear whether these three feelings are reducible to a single experience.

Regardless of whether confidence, rightness, and endorsement correspond to distinct metacognitive feelings or different aspects of a single experience, they play a similar functional role in reasoning. They present the outcome of a reasoning process as acceptable, questionable, or in need of revision, thereby guiding subsequent cognitive action. Taken together, the examples discussed in this section illustrate how metacognitive feelings structure reasoning across all three stages of cognitive processing: they motivate engagement with a problem, regulate the unfolding of inferential activity, and guide the acceptance or revision of conclusions. In doing so, they satisfy both the sensitivity and potentiation requirements of the Mental Affordance Hypothesis and therefore constitute genuine mental affordances.

4.3. Metacognitive feelings related to attention

McClelland (2020) identifies attention as one of the mental actions that can be afforded by environmental stimuli. According to the affordance model of perceptual motivation (McClelland & Jorba, 2023), perceptual salience can motivate attentional shifts, making certain features of the environment function as attentional affordances. While this account captures an important aspect of attentional guidance, it focuses primarily on externally driven attention and leaves open the question of how attention is regulated from within.

Cognitive psychology suggests that attention can be modulated both externally and internally. While certain external stimuli possess properties that automatically capture attention ("exogenous attention"), agents can also voluntarily direct their attention toward specific targets ("endogenous attention") (Carrasco, 2011). This distinction is consistent with Wu's (2014) action-centered account of attention. According to Wu, attention is fundamentally a form of selection for action rather than merely the selection of information. On this view, attentional states are individuated by the role they play in coordinating subsequent action. A complete account of attentional affordances should explain not only how attention is guided by salient features of the environment, but also how it is regulated from within. Following Wu's action-centered conception of attention, we argue that metacognitive feelings constitute an important class of internal at-

tentional affordances. Feelings such as curiosity, surprise, interest, boredom, and disorientation can guide the initiation, maintenance, or redirection of attention by making certain informational goals appear more or less worth pursuing.

One useful framework for understanding the role of metacognitive feelings in attention is informational foraging, that is, the activity of seeking and acquiring information from the environment. According to several authors, informational foraging is modulated by feelings such as curiosity and boredom (Bench & Lench, 2013; Carruthers, 2024; Eastwood *et al.*, 2012; Goupil & Proust, 2023; Kurzban, 2016). Within this framework, curiosity is generally characterized as an intrinsic motivation to acquire information, whereas boredom is understood as an aversive state that motivates the pursuit of alternative informational goals. From our perspective, what matters is that both feelings function as internal guides for attentional regulation. Curiosity presents the environment as containing information worth acquiring and thereby affords sustained attention, exploration, and information-seeking. Boredom, by contrast, presents the current task as no longer worth pursuing and affords disengagement and the search for alternative sources of information. In this sense, both feelings function as internal attentional affordances that regulate attentional engagement.

Evidence from habituation studies supports this interpretation. Infants tend to attend longer to novel stimuli than to repeatedly presented ones (Day & McKenzie, 1973).[10] This pattern is commonly interpreted as reflecting the motivational influence of curiosity in the presence of novelty and boredom in the absence of new information. Even if this interpretation is not correct in every detail, these findings are compatible with an affective interpretation of attentional engagement and disengagement. Thus, curiosity and boredom do not merely accompany attentional processes; they actively guide the direction and persistence of attention.

Attention offers a particularly clear example of how metacognitive feelings function as mental affordances. Feelings such as curiosity, interest, boredom, surprise, and disorientation do not merely accompany attentional processes; they regulate them by making agents sensitive to their informational needs and motivating specific patterns of attentional engagement or disengagement. In doing so, they satisfy both the sensitivity and potentiation requirements of the MAH and therefore constitute genuine mental affordances.

Conclusion

We have argued that metacognitive feelings are best understood as mental affordances. Rather than merely informing agents about the state of their cognitive processes, these experiences motivate, guide, and regulate mental action. By making agents sensitive to features of their own cognitive activity while simultaneously motivating specific cognitive responses, metacognitive feelings satisfy the two core requirements of the MAH: sensitivity and potentiation.

Like bodily affordances, metacognitive feelings are relational properties. However, whereas bodily affordances emerge from the relation between an agent and her physical environment, mental affordances emerge from the relation between an agent and her own cognitive system. In our view, metacognitive feelings instantiate such relational properties. They reveal possibilities for mental action relative to the agent's abilities, goals, dispositions, and ongoing cognitive tasks. In this sense, metacognitive feelings map the agent's mental environment by making certain cognitive actions available, salient, and actionable.

A reasonable concern is that identifying metacognitive feelings with mental affordances might either over-intellectualize the feelings or, conversely, oversimplify the complexity of cognitive processes. Our response is that the complexity resides primarily in the subpersonal mechanisms of the cognitive system—memory stores, retrieval algorithms, comparison processes, attentional dynamics—not in the felt experience itself. The metacognitive feeling is not a representation

[10] Curiosity has been observed not only in monkeys but also in various other non-human species, including pigeons and starlings (Fortes *et al.*, 2016; Gipson *et al.*, 2009; Vasconcelos *et al.*, 2015). Many animals engage in activities that suggest exploratory or investigative behavior, using their energy to investigate and understand their environment (Berlyne, 1950, 1966). However, there are some debates about the nature of curiosity, including whether it is metacognitive (Carruthers, 2024; Goupil & Proust, 2023).

of that procedural complexity. Rather, it is the affective, non-conceptual manifestation through which the latent capacities of the cognitive system become available to the agent as opportunities for mental action. For this reason, our proposal offers a more parsimonious alternative to informational models that treat metacognitive feelings as detectors of independently existing cognitive affordances. On such views, the feeling and the affordance are distinct entities. By contrast, we have argued that the feeling itself constitutes the affordance. This avoids unnecessary ontological duplication while preserving the motivational and action-guiding functions that affordances are meant to explain.

Expanding the MAH in this way provides a richer account of mental agency—one that recognizes that opportunities for mental action are not only perceived in the external environment but are also felt from within through the dynamics of our own cognitive lives.

Acknowledgments

Earlier versions of this paper were presented at the VII ALFAn Conference of the Latin American Association for Analytic Philosophy (Universidad de la República, Uruguay, 2024), the online workshop *Cognitive Affordances: Theoretical Foundations and Developments* (UNAM, Mexico, 2024), the *Transcending Borders: International Philosophy Seminar of the Americas* (UNC/Arizona State University, 2024), and the *X Jornada de Filosofía de la mente* (Universidad de Antioquia). We thank the participants for their valuable comments and feedback, as well as the two anonymous reviewers for their insightful comments and suggestions.

Declaration of AI Use

The authors used ChatGPT (OpenAI, GPT-5.5) during the editorial revision of the manuscript as a writing and copy-editing assistant to improve clarity, grammar, style, and internal consistency of the English text. All substantive arguments, interpretations, and editorial decisions were made by the authors, who take full responsibility for the final version of the manuscript.

Funding Statement

This paper is a research output of the project "Mental agency: actions and omissions", funded by Comité para el Desarrollo de la Investigación (CODI) de la Universidad de Antioquia. Project code: 2022-52270.

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