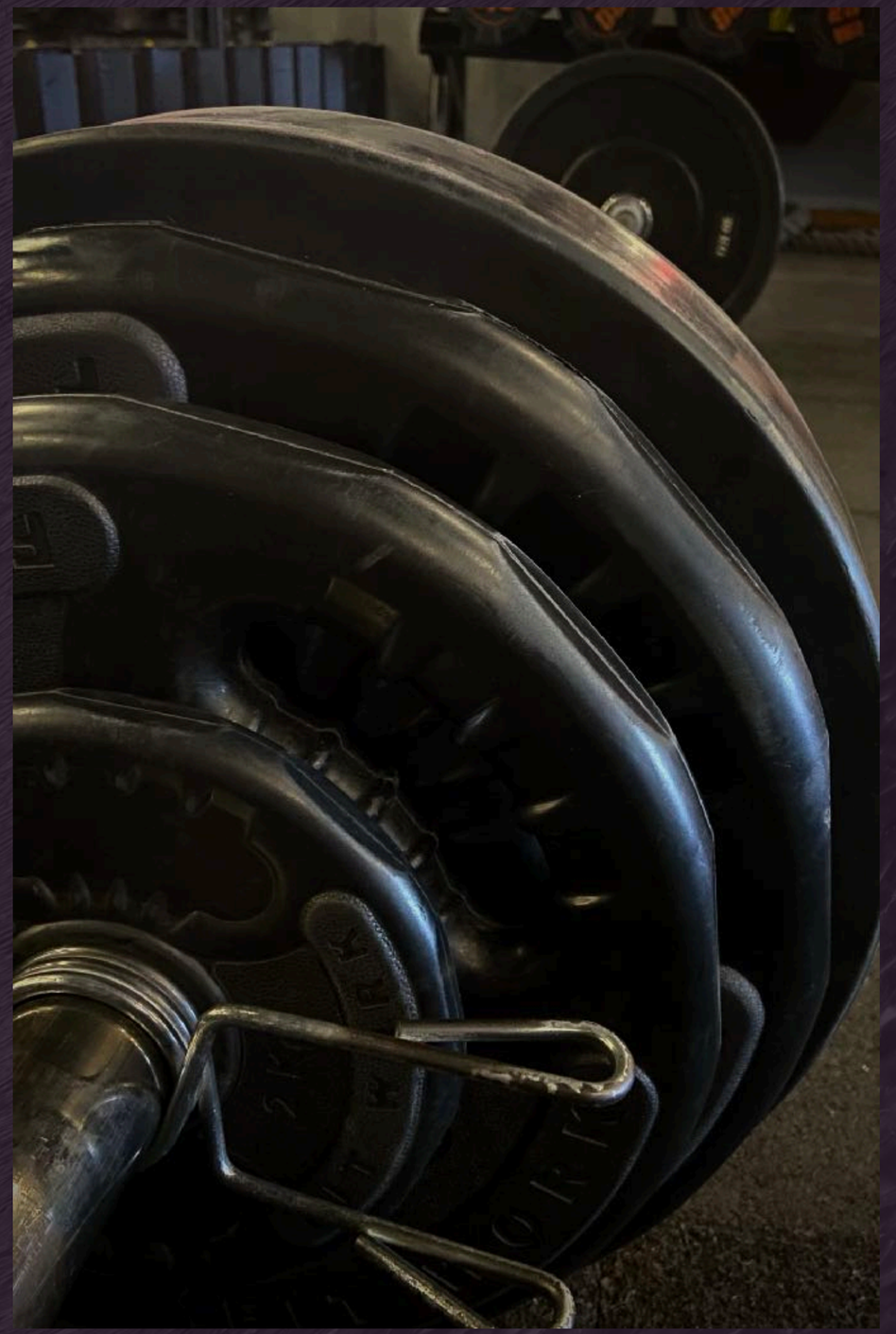
Self-Knowledge from Resistance Training

Forthcoming in *Phenomenology and the Cognitive Sciences*

Giovanni Rolla (UFBA) — SBFA 2024/Olinda



Self-knowledge from Resistance Training

- What's mental about self-knowledge?
- Ecological-Enactive approach and its epistemological stance
- Resistance training: a case study for ecological-enactive self-knowledge

What’s mental about self-knowledge?

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- Long discussion within Analytic Philosophy about Self-Knowledge (SK)
  - Knowing what I believe (the contents of my thoughts), what I want (the content of my desires);
  - *Sometimes* including knowledge about my own character, values, and emotions (only for *really progressive, open-minded analytic philosophers*)

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- **(1)** SK is about one's own mind
- **(2)** Mind is mostly contentful (linguistically articulated content)
- **(3)** Mind is disembodied/separable from our bodily doings

What’s mental about self-knowledge

- From the embodied turn in the cognitive sciences (90s-today)
  - We cannot fully understand the mind apart from its dynamics with the environment. The unit of analysis for embodied cognition:
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  - We cannot fully understand the mind apart from its dynamics with the environment. The unit of analysis for embodied cognition:
    - Dynamics between brain, body, and environment
- Ecological-Enactive Cognition (EEC = *radically* embodied cognitive science)
  - *Cognition emerges from the direct, autonomously enacted exploration of possibilities for action*
  - Mental content is, at best, a "top of the iceberg" phenomenon. Not pervasive of all cognitive states

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- SK should in principle include one’s body…
  - … but how?

What's mental about self-knowledge

- General agreement on 3 desiderata for a good SK theory:
  - (1) It must be an achievement
    - SK is not *cheap*
    - (SK ≠ self-awareness)
  - (2) It must be *somewhat* asymmetrical (SK ≠ KOM)
    - SK is generally more authoritative than KOM

What's mental about self-knowledge

- General agreement on 3 desiderata for a good SK theory:
  - (3) It cannot be *too* asymmetrical (KOM must be possible)
    - If SK is the paradigm of knowing minds in general, it should not be an internal/immediate access, otherwise, KOM turns out to be impossible

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- What I want to show here:
  - Ecological-Enactive Cognition (EEC) can meet those desiderata,
  - Case study: SK from resistance training

Ecological-Enactive approach and its epistemological stance

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    - Cognition is the direct detection of information for action
    - Exploration of affordances (possibilities for action)
  - From Enactivism
    - Cognition is an emergent feature of autonomous systems
    - Autonomous systems: develop their own organization

Ecological-Enactive approach and its epistemological stance

- Cognition is a continuous process of *bringing forth a world* of significance for the agent
  - Not an *internal* world (or projected outwards from “within”)…
  - But cumulative **transformations** of the environment through organic actions
  - Environmental changes feedback into the organism’s structure
    - Agent-environment codetermination

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  - Not an *internal* world (or projected outwards from “within”)…
  - But cumulative **transformations** of the environment through organic actions
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    - Agent-environment codetermination
- Cognitive performances are fundamentally **practical**, not descriptive of an external environment

Ecological-Enactive approach and its epistemological stance

- The epistemological stance of EEC
  - Knowledge is a transformative, fundamentally practical process
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Ecological-Enactive approach and its epistemological stance

- The epistemological stance of EEC
  - Knowledge is a transformative, fundamentally practical process
- What about SK?
  - SK is a transformative, fundamentally practical process
    - Transformative of the person themselves
    - Achieved fundamentally through practical means

Resistance training: a case study

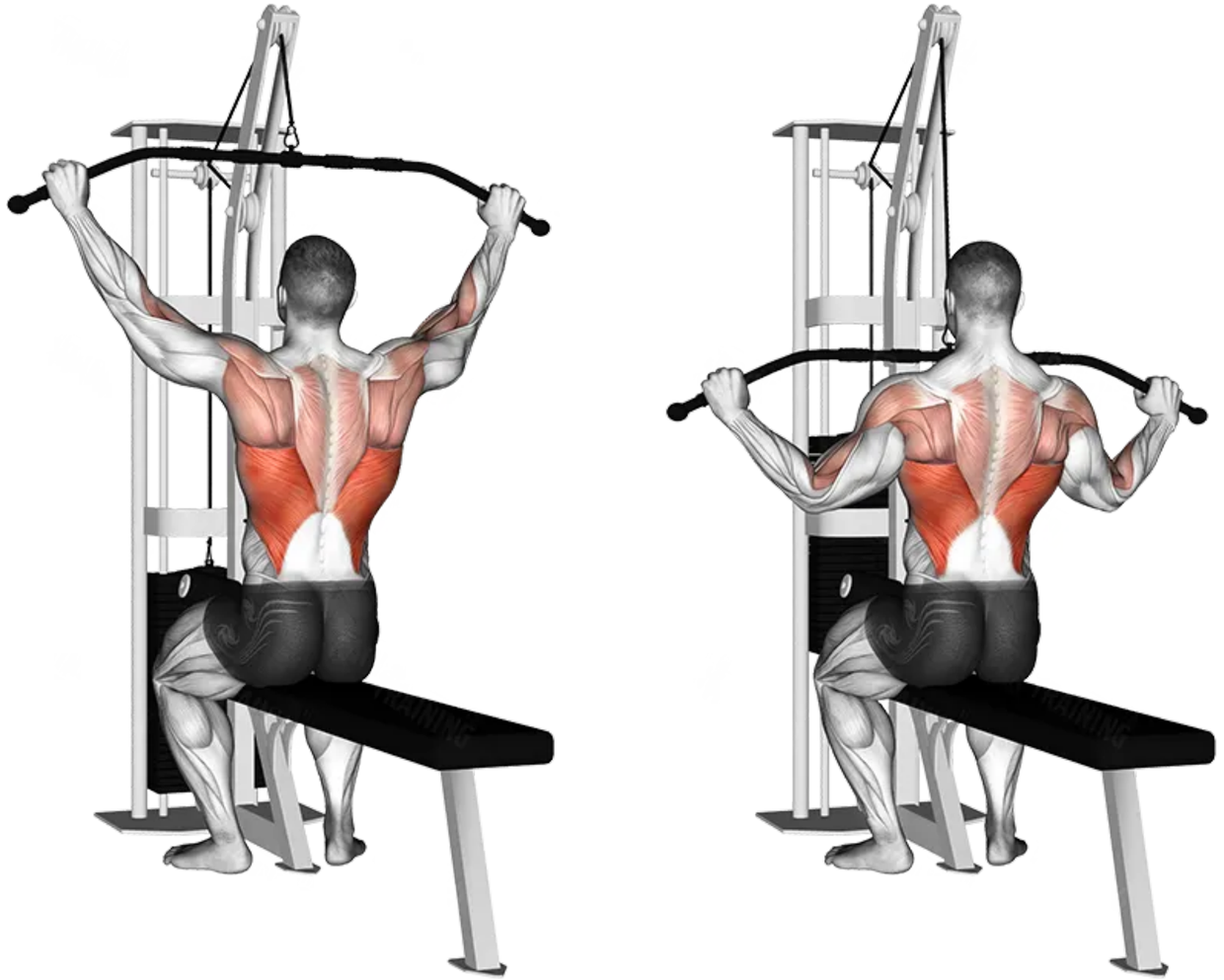
Resistance training: a case study

- Resistance training: any exercise that requires moving (or attempting to move) against an opposing force.
    - Barbells, dumbbells, kettlebells, cable machines, elastic bands, or the practitioner’s own body weight
- The more common goal of practitioners of resistance training, especially weightlifting, is muscular hypertrophy:
    - A gradual and long-term adaptation of the musculoskeletal system (increase of muscle cross-sectional area) a after the recurrent practice of resistance training

Resistance training: a case study

- Some definitions:
  - An exercised is composed of **repetitions** and **sets**. A repetition is one complete motion of the movement. Two or more repetitions make a set
  - Throughout a repetition, the relevant muscles are shortened and lengthened in a controlled manner. The muscles' shortening is the movement's **concentric phase**, and its controlled lengthening constitutes the **eccentric phase**.
  - **Proper lifting technique** (or **form**) involves the activation of the relevant muscles targeted by that exercise (its prime movers or agonists), the activation of the synergists (auxiliary muscles that help to move the weight) and inhibition of the antagonist muscles (those that would move the weight in the opposite direction)

Resistance training: a case study



Resistance training: a case study

- **Technical failure**, or **improper form**: the wrong set of muscles is activated/inhibited to complete a repetition.
- The **repetition maximum** (RM) is the maximal number of repetitions per set that can be performed in succession *with proper lifting technique* using a given resistance
- **Mechanical failure** is the point during a set when muscles can no longer produce necessary force to concentrically lift a given load.
    - The same weight becomes harder to lift at every repetition, up until a point in which the motor units recruited *cannot move it concentrically without technical failure*.

Resistance training: a case study

- Mechanical failure (good) without technical failure (bad):
  - Demands a high level of practical knowledge about the activation/inhibition of the relevant muscles
- Novices typically activate other muscles to evade mechanical tension (lack of practical knowledge - technical failure)
  - Aiming hypertrophy, you should do the exact opposite: bring the target muscle as close to mechanical failure as possible

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- Changes in the *perception of affordances*
  - During a set, at each repetition, the weight is perceived as increasingly *less movable*
  - After a few training sessions, the same weight is perceived as *more moveable*

Resistance training: a case study

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    - Systematically reaching the point of failure is transformative of one's own bodily limits.

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- Some interesting philosophical consequences:
  - Reaching failure shows the **transient limits** of one's bodily capabilities.
    - What the body momentarily can and cannot do
  - Those limits are transient because training can **transform** one's bodily capabilities over time (changes in the perception of affordances)
    - Systematically reaching the point of failure is transformative of one's own bodily limits.
  - Learning how to fail is **fundamentally practical**
    - One's current point of failure, for any given exercise, can only be discovered in practice

Conclusion

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- Resistance training offers a unique case study for SK withing the EEC
  - Mechanical failure (requires practical knowledge);
  - Bodily limits (knowledge about the self);
  - Changes in the perception of affordances (transformative)

Conclusion

- SK from resistance training meets the desiderata for a good theory of SK:
  - (1) It is an achievement
    - *Definitely* not easy to arrive at
  - (2) It is asymmetrical
    - Very authoritative, *you* cannot know *my* rate of perceived exertion (closeness to failure)
  - (3) It is not *too* asymmetrical
    - If one is well trained, one can perceive the imminence of failure (e.g. change of tempo in each rep.) in others

Thanks!

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