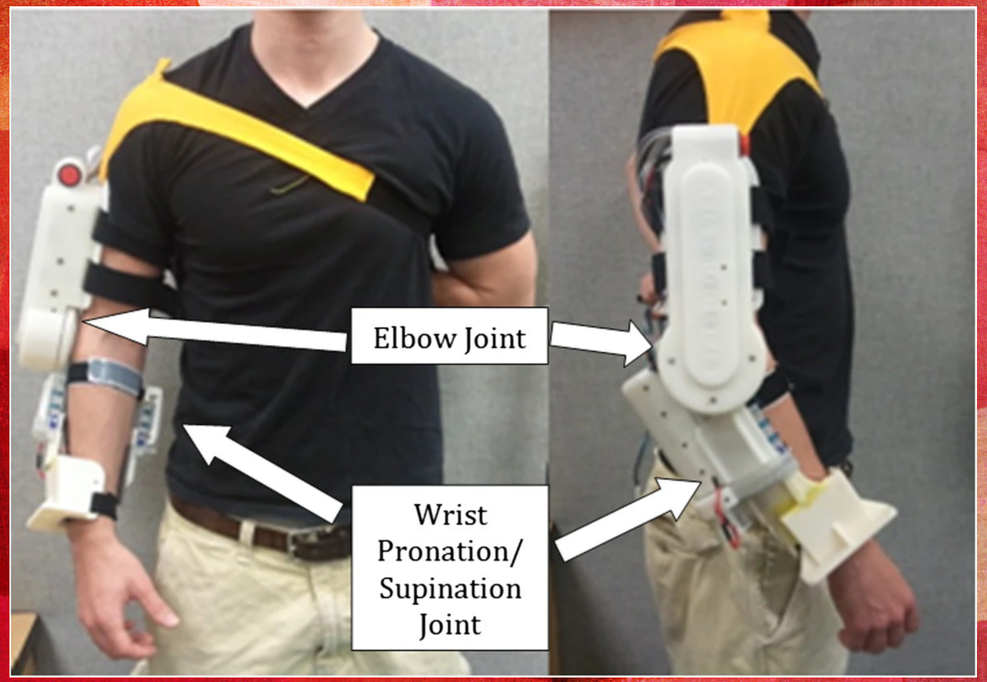
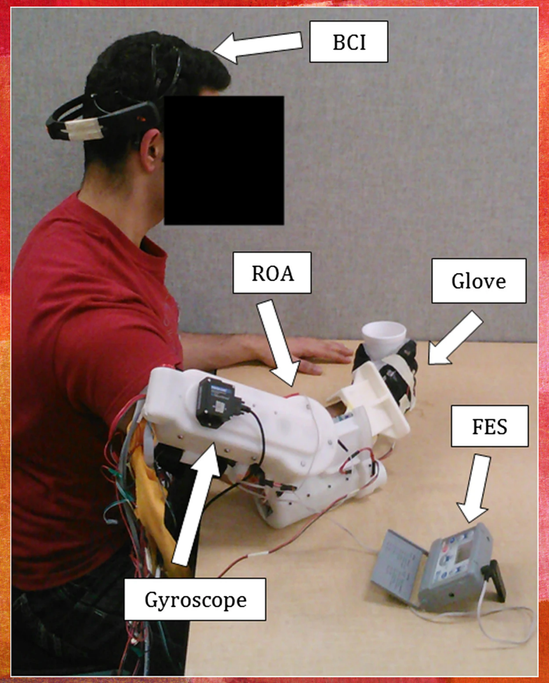


SPOOKY (MENTAL) ACTION AT A DISTANCE?

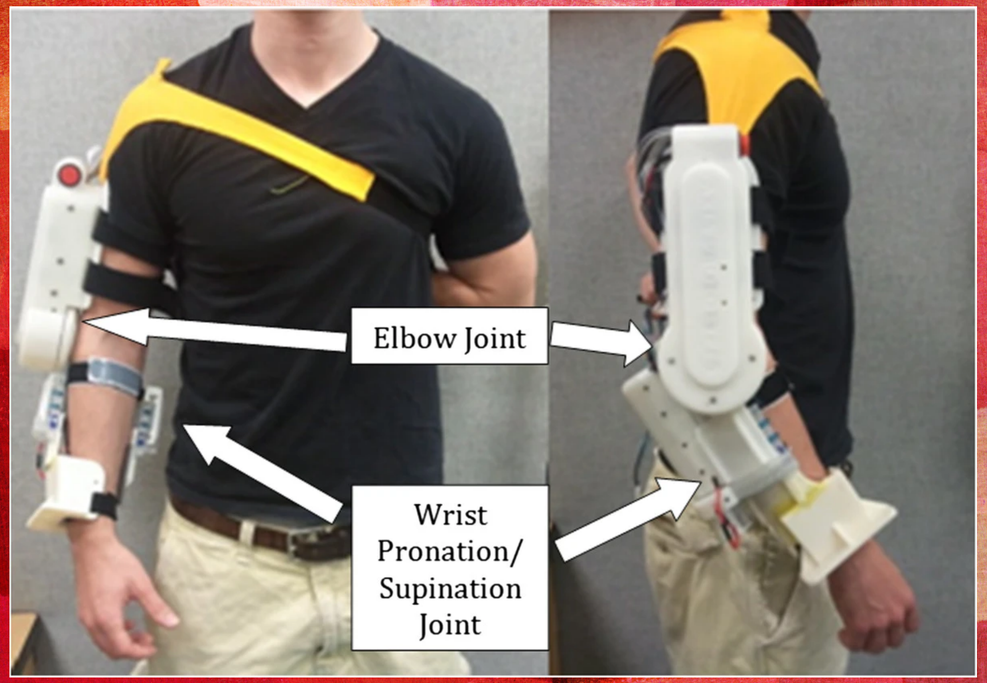
Michael J. Hegarty, UMass Boston

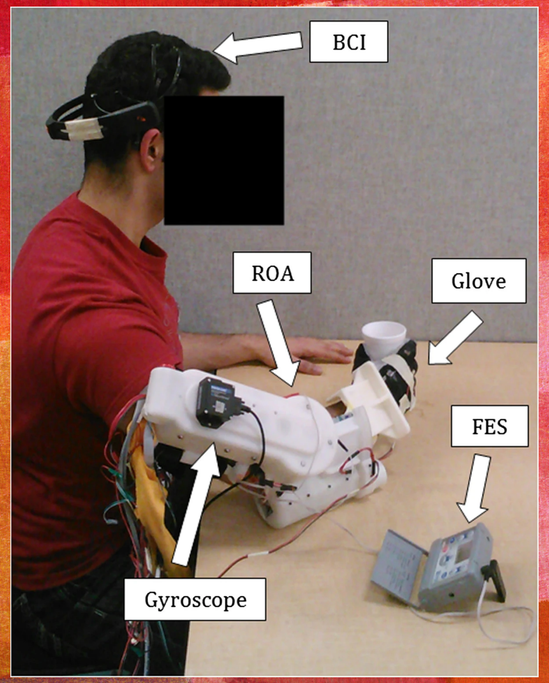




DOING THINGS WITH BCIS

- Brain-Computer Interfaces (BCIs) allow subjects to control external systems by thinking.
- Consider one example, a robotic arm orthosis (RAO) controlled by the user through a wearable BCI that collects EEG signals (Looned et al. 2014).
- Subjects can learn to move the arm to succeed in simple tasks, such as taking a drink of water.





DOING THINGS WITH BCIS

- What should we make of this case?
- Is the movement of the robotic arm an action performed by the thinking subject?
- If it is, then is it a special kind of action that differs from ordinary embodied actions?
- What makes this different from ordinary embodied actions, or the usage of tools?

THE CAUSAL THEORY OF ACTION

- The world is material, and events occur in that world. Which events in the world are intentional actions and which are not?
- On the causal theory (Davidson 1980), those events caused by the 'right' mental states are actions.
- The 'right' mental states both *cause* and *rationalise* one's actions.
- On a simple version, the right mental states are beliefs and desires.
- Believing and desiring are not themselves actions; they are mental states.
- The causal theory distinguishes basic and non-basic actions: basic actions are typically bodily movements, and non-basic actions are the further causal consequences of those.



Believe: (there's water in the glass)

+

Desire: (drink water)

[Reaching…]

[Grabbing… etc.]

CAUSALISM + MATERIALIST FUNCTIONALISM

- How does mind exist in a physical world? A popular answer: mental states are functional states.
- Beliefs, desires etc. are defined by their causal roles in one's thinking and doing.
- A causal role isn't inherently physical, but something physical (e.g., a pattern of neuronal activation, a computer) can *realise* that role.
- As Nick Bostrom has popularised, functionalism entails the 'substrate independence' of mental states (so computers can have minds…).



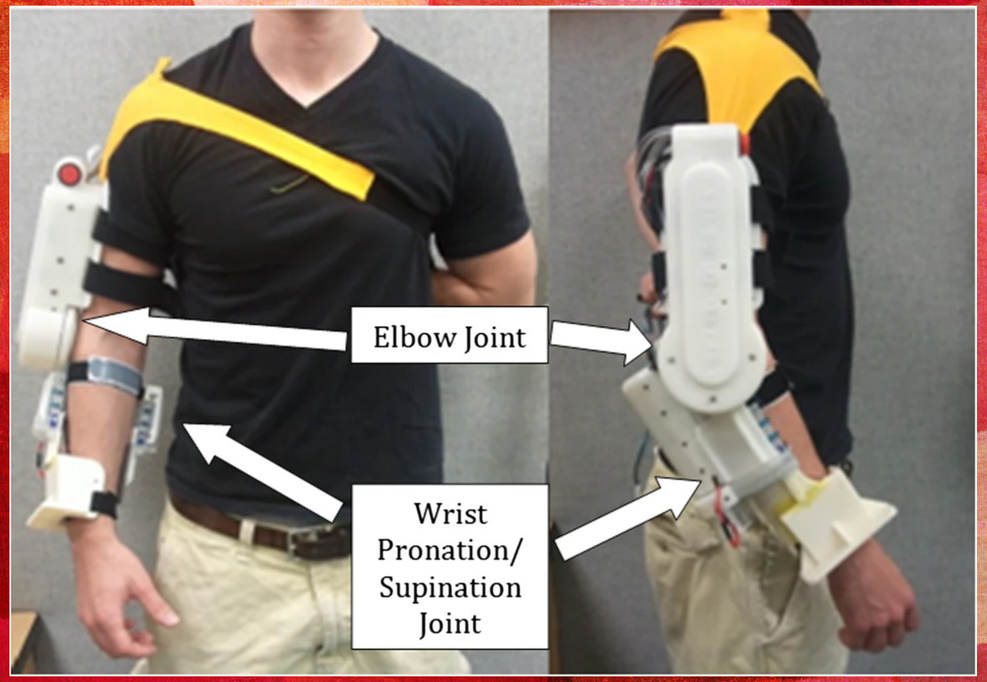
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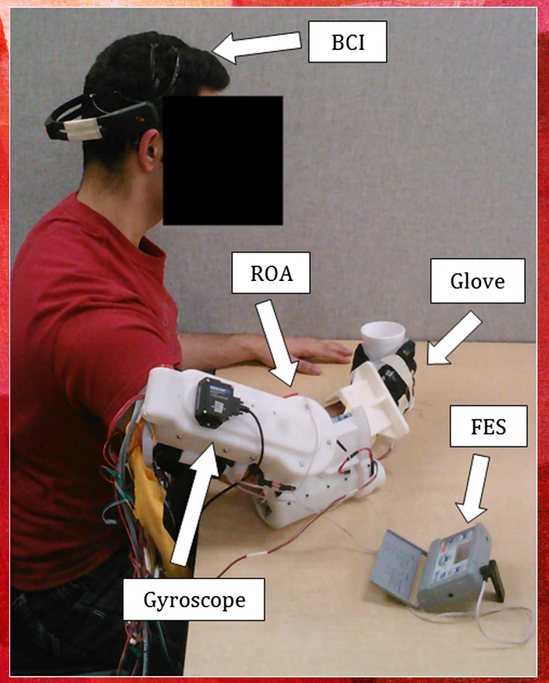






A RETURN TO ARMS

- Steinert et al. (2019): "A striking peculiarity of BCI technology is that the kind of actions it enables seems to differ from paradigmatic human actions, because, effects in the world are brought about by devices such as robotic arms, prosthesis, or other machines, and their execution runs through a computer directed by brain signals. In contrast to usual forms of action, the sequence does not need to involve bodily or muscle movements at all. A motionless body, the epitome of inaction, might be acting." (479)
- "BCIs… create a new output channel to interact with the world, bypassing the muscular system of the body." (459)

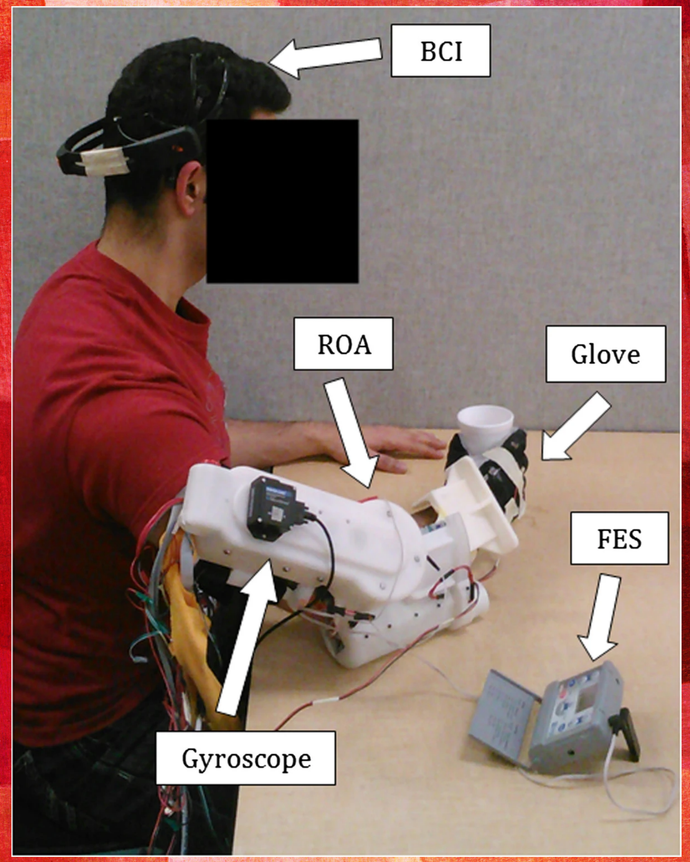






A RETURN TO ARMS

- So, assuming the causal theory of action (as Steinert et al. do), the question is whether BCI-mediated events are peculiarly ‘disembodied’.
- Steinert et al. want to claim the following weirdness for BCI-mediated events: “an action with identical effects—say, an arm reaching for a glass—is a basic action under natural circumstances (that is in non-BCI contexts), but a non-basic action when it is facilitated with a BCI-prosthesis. This is the third peculiarity of BCI actions we wish to highlight.”
- Recall: non-basic actions are caused by basic actions, which are caused by non-action mental states.



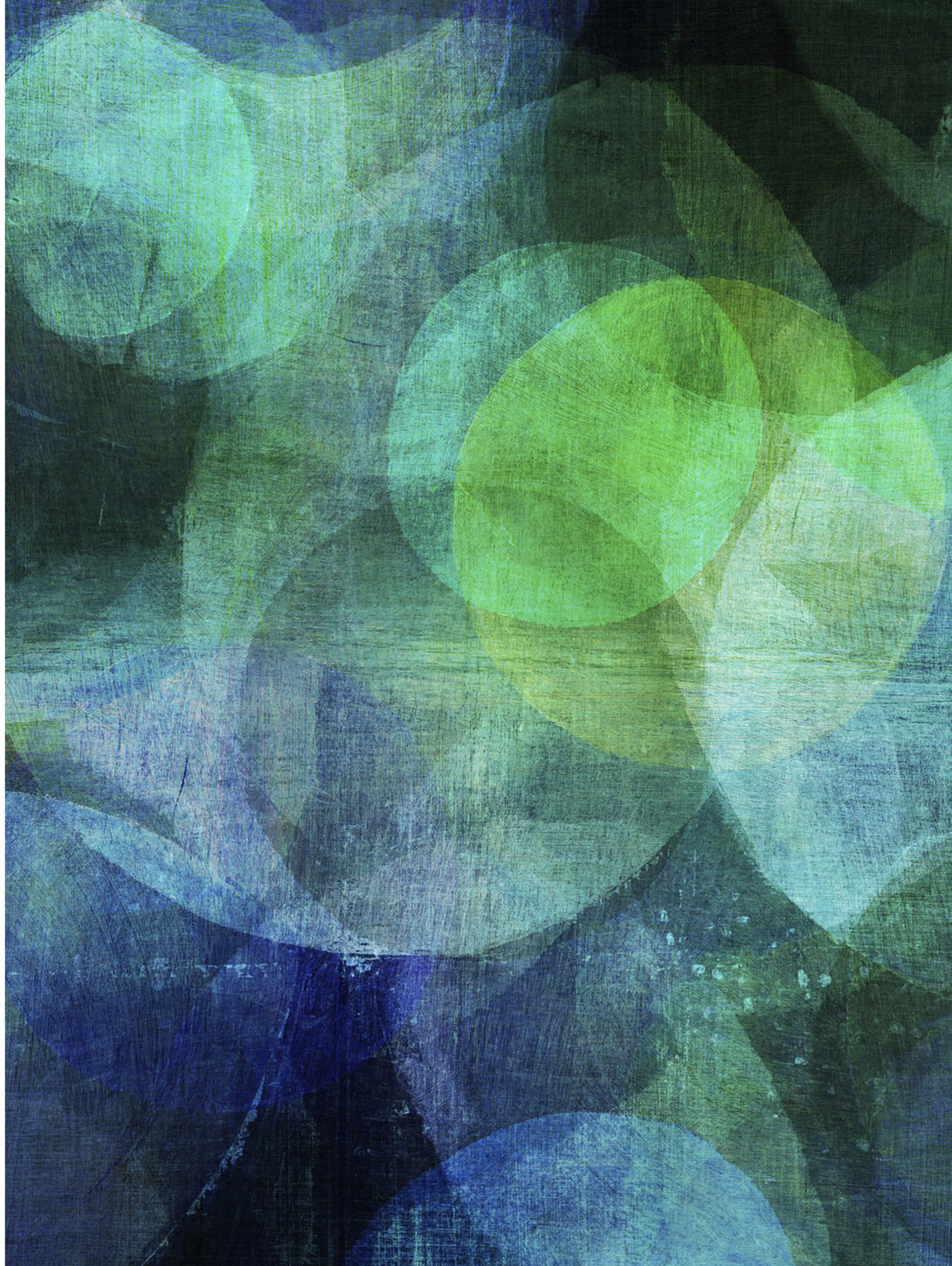


MOTOR IMAGERY, THOUGHT, & ACTION

- They reason: motor imagining is an action, so in the BCI case water-drinking is non-basic.
- And they also reason: ordinary water-drinking with one's own arm is basic.
- So: the BCI makes it weird.
- But they commit to a contradiction here.
- Motor imagery needs to be both a mental state (satisfying causalism) *and* be a basic action (ensuring the 'weirdness' of water-drinking being non-basic).
- But it *cannot* be both on the causal theory.

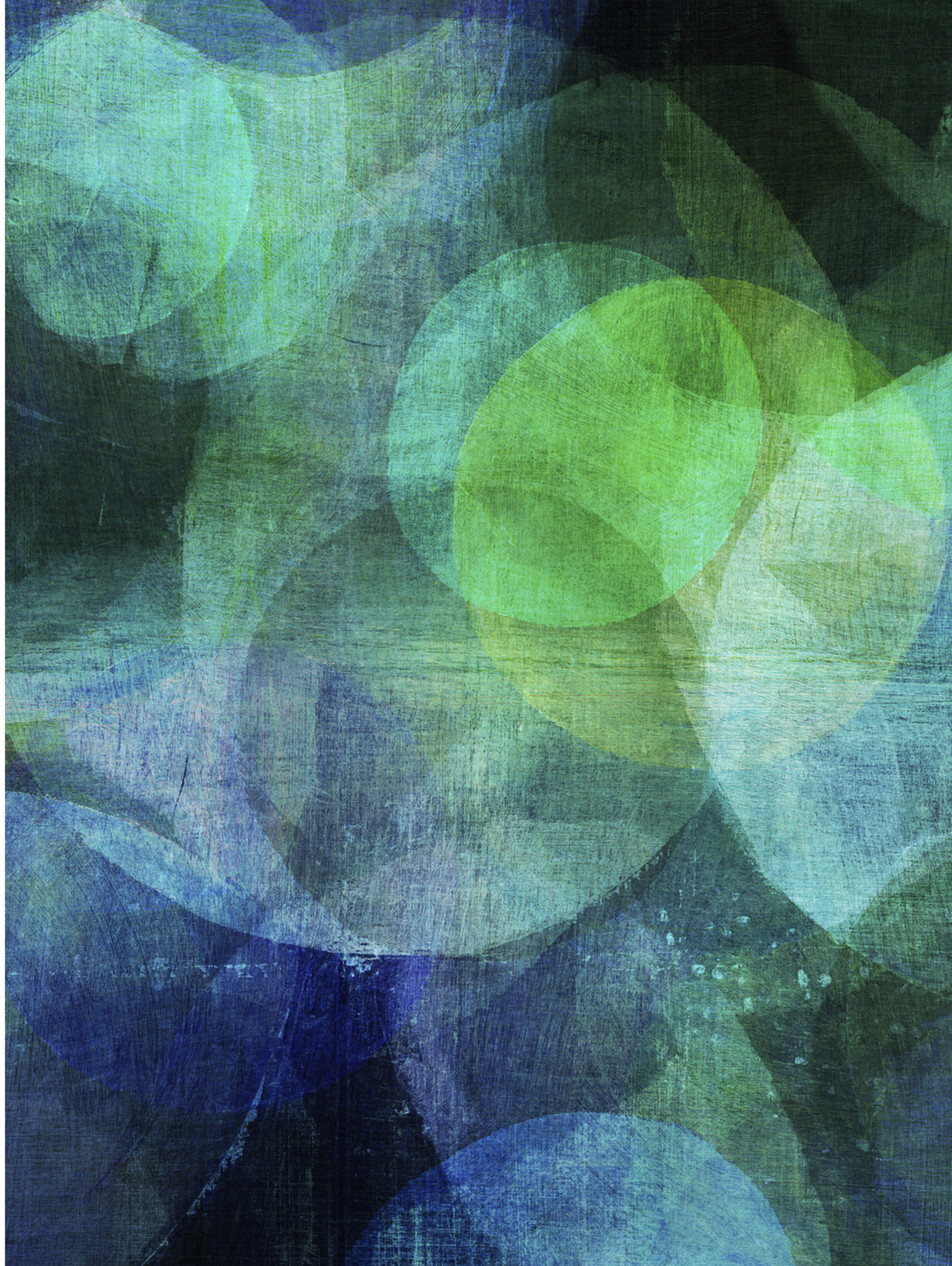
INTUITIONS ABOUT DIRECT AND INDIRECT CONTROL

- Steinert et al. are impressed by the ‘direct’ connection between thought and the robotic arm.
- Can we draw that distinction on the causal theory?
- It can’t be a difference in the mental states. As it were, the ‘essence’ of action on the causal theory is be caused by the right mental states.
- So, if there’s a difference, it must be in the causal chain.
- Steinert et al. keep bringing up the importance of the causal chain passing by-passing my body.
- **But the nature of the causal chain really doesn’t matter.**
- And, indeed, this is part of the attraction of the functionalist materialist picture! Substrate independence.



USING TOOLS

- Consider cutting the grass with a lawnmower.
- My muscle movements are links in the causal chain initiated by mental states, as are the electrochemical events in the lawnmower.
- From a causalist perspective, whether those links are in my body or not is quite irrelevant.
- And this is important if you want to avoid Cartesian Dualism, i.e., believing that mind is a different kind of stuff from matter.
- Where in this picture can we distinguish ‘direct’ and ‘indirect’ control? Not in the mental states, and not in the causal chain.
- There is nowhere else to look.



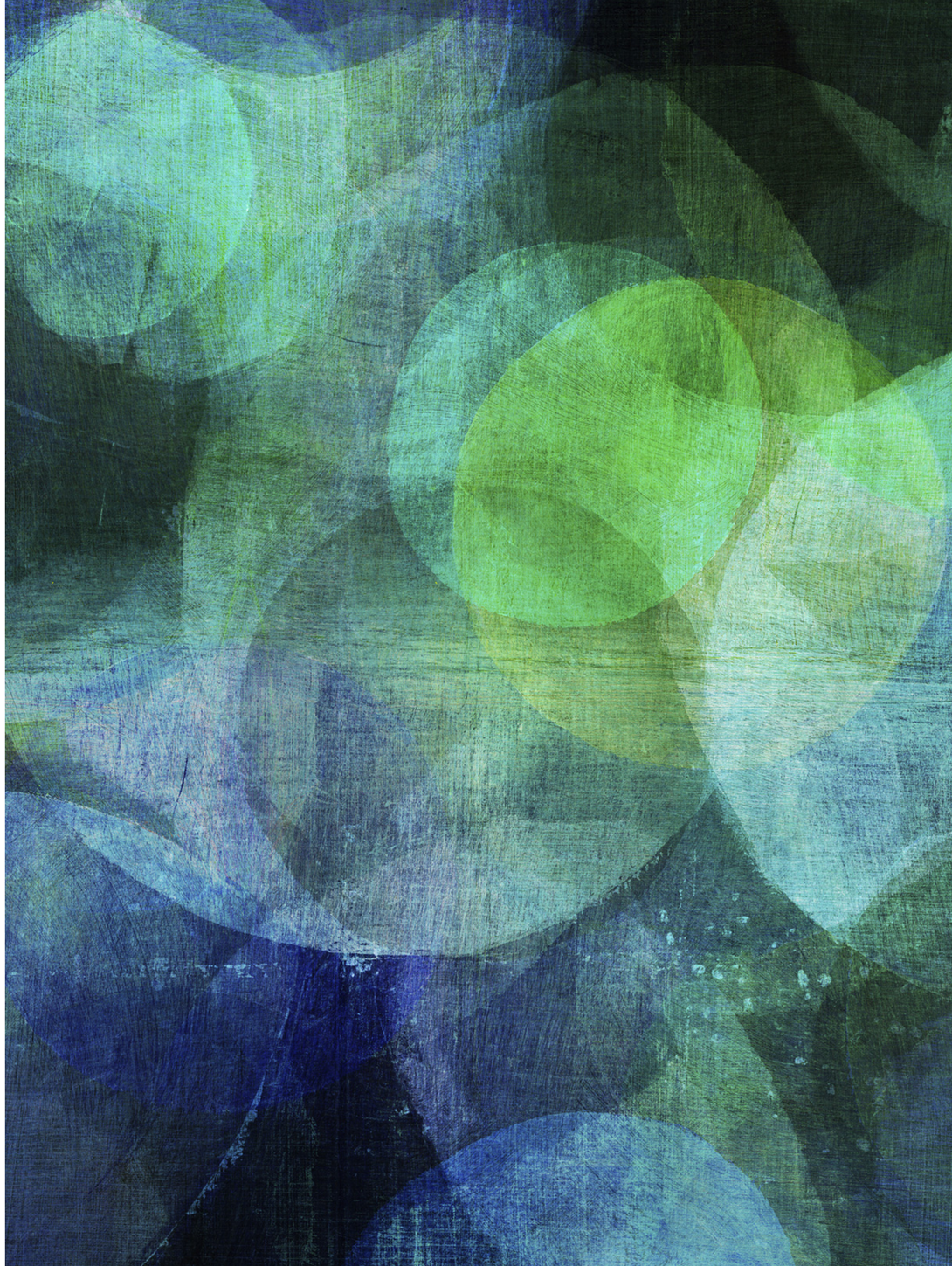


EXECUTORY COMMANDS

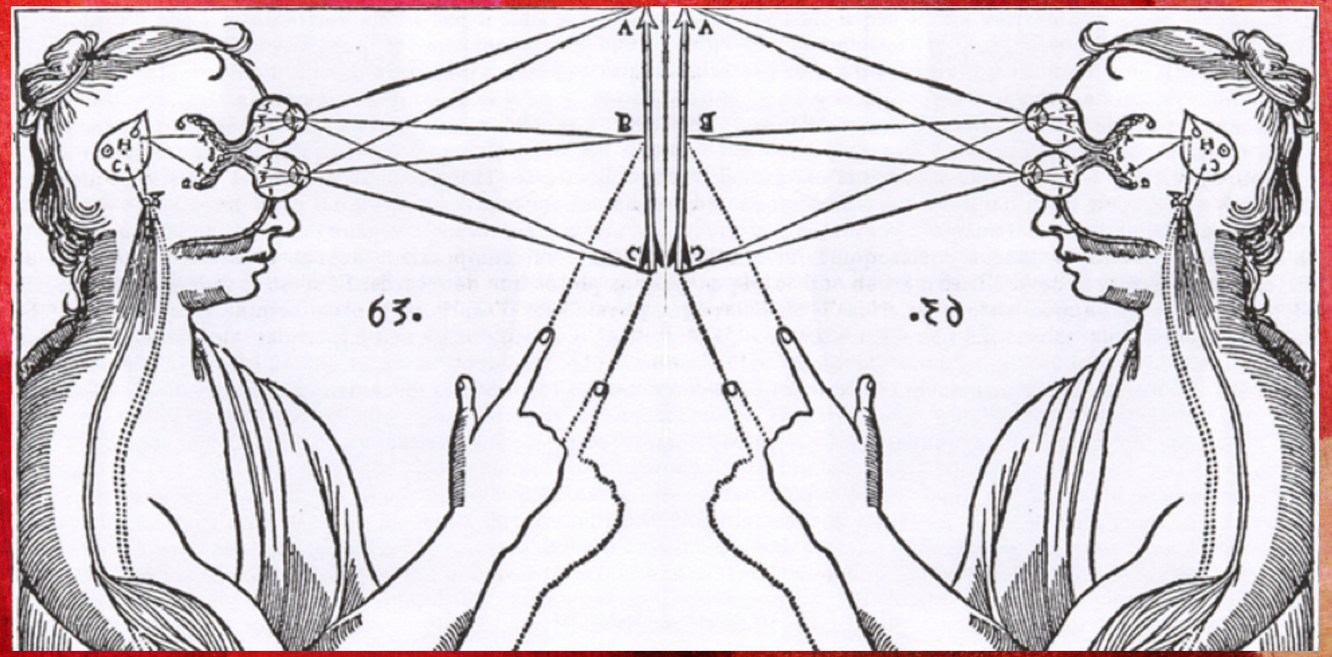
- Steinert et al. seem to postulate something like non-physical mental causes.
- “People have many desires, beliefs, and intentions on which they do not act. Something additional has to come in to realize such intentions: an executory command. Often, it is called a volition.” (Steinert et al. p.468)
- But… the belief-desire pair is supposed to play this role in the causal theory.
- Worse, it sounds like Steinert et al. are positing a kind of ‘agent-causation’—which is a core objection to… the causal theory.

WHAT'S GONE WRONG?

- Steinert et al. seem to have an unstable view because they don't fully grasp the implications there claims have regarding core philosophy of mind and action.
- Another example: "A surprising peculiarity of… BCIs is that users have to give a go-command via the respective mental action." (468)
- This is surprising if you're expecting BCI-mediated events to be analogous to bodily actions.
- It's not surprising if they're tools!



CONCLUSIONS



- At least on the causal theory, it is false that BCI-mediated events constitute a unique class of actions.
- Untutored intuitions about mentality—e.g., spooky action at a distance—tend towards Cartesianism.
- So, you get people arguing in ways that actively undermine their core commitments, e.g., functionalism, without realising it.

Thank you!

Questions/comments?

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