

Between Parmesan & Puke

how subjective experience
challenges our understanding of
the physical world

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You have been chosen to take part in an experiment. On the table in front of you are two metal boxes with tiny holes in the top. There are labels on both boxes. You are asked to smell the box on the left, labeled 'Parmesan'. What you smell is rich, savory and deeply aromatic. It may remind you of freshly made pasta, and it is both comforting and delicious. Before we return to this experiment, take a moment to reflect on what you have just experienced. It is the subjective experience of "smelling parmesan". Subjective experience is an essential phenomenon that philosophers use to define consciousness. It is the essence of what Thomas Nagel calls the "what-it-is-like" factor, Frank Jackson calls "qualia", or David Chalmers calls the "hard problem of consciousness".

Next to the box labelled 'Parmesan' is a second box labelled 'Vomit'. You are asked to smell at the second box. Hesitantly, you inhale a tiny amount. A sharp, unpleasant smell fills your nose. You may swallow and feel the urge to leave the room. At this point, the researcher tells you that both boxes contain the same substance: A mixture of isovaleric and butyric acid, a chemical compound found in both parmesan and vomit. Exactly this experiment was carried out by Herz and Clef in 2001. [**herz**] The same physical substance can evoke very different mental states, depending on our own biases of expectation. The authors call this phenomenon "olfactory illusion" because of the significant effect observed in the study.

If the same physical stimulus can lead to completely different subjective experiences, then mental states cannot be completely reduced to physical properties of just our environment. Our perception is not only a direct result of chemical sensory interactions, but is also shaped by context, prior experience and expectation. How physical brain processes and mental states are related is the central question of the **Mind-Body-Problem**. This essay touches on two answers to this question, the first being the physicalist perspective. **Physicalists** believe that all true information is physical information. [jackson] This implies that all mental events are physical events,[nagel] and that there is no unknown additional layer of reality to which we can account them to. **Dualists**, on the other hand, reject this idea and argue that there must be a separate layer to the physical world in which mental states, or at least a part of them, namely subjective experience, reside. In this essay I will refer to this postulated non-physical property of subjective experience as **qualia**.

The central argument of this essay is that, while subjective experience challenges the completeness of our current physicalist explanations, it does not necessarily disprove them. Instead, the felt discrepancy between physicalism and the irreducibility of subjective experience prompts us to revise our conceptual frameworks and explanative strategies.

In the first section (I), the notion of the “Hard Problem of Consciousness” is introduced. In his essay of the same

name, David Chalmers points out that answering why and how the functional processes of our brain are accompanied by subjective experience *at all* must be considered to be the hard problem of consciousness. [**chalmers**] This section will illustrate what makes subjective experience fundamentally different to other phenomena of consciousness and why all three authors argue it possesses an irreducible quality.

In the essay “Epiphenomial Qualia” Frank Jackson offers a dualist explanation for the irreducibility of consciousness. In the second section (2), a subset of Frank Jackson’s arguments for non-physical properties of subjective experience, which he refers to as ‘qualia’, will be analysed. [**jackson**] The analysis will primarily focus on Frank Jackson’s thought experiment “Mary’s Room”, and will also present objections to the experiment that demonstrate its insufficiency to clearly substantiate Jackson’s conclusions.

Physicalism is not hastily dismissed in the essay “What it is like to be a bat” by Thomas Nagel. [**nagel**] The third section (3) will address Nagel’s perspective on alternative modes of reasoning to conceptualize subjective experience within the physicalist premise. I will provide evidence that the human mind is more capable to comprehend unfamiliar subjective experiences than expected.

The essay concludes with a summary of the arguments for the central thesis and a short personal note about which of these three philosophers convinced me most (4).

I Irreducibility of Subjective Experience

Functionalism is a philosophical view that defines mental states in terms of their function. An example of this is the discrimination of sensory inputs such as odours by the corresponding neurons in the olfactory bulb. This view is powerful for understanding how the brain processes and integrates information, and how these tasks can be simulated artificially. However, how and why certain mental processes, such as smelling parmesan, are accompanied by a sense of what it is like to go through these processes remains a mystery. David Chalmers calls this the “problem of experience” [**chalmers**], which he considers to be the hard problem of consciousness. Simple problems such as “how information is integrated” or “how attention works” are by no means trivial, but they seem promisingly solvable with our existing scientific tools. For example, in recent years we have made great progress in using artificial neural networks to replicate some brain functions, such as object recognition or natural language processing. You can train a neural network to recognise the smell of parmesan on the basis of digitised sensory input, but how can you teach a neural network what it actually feels like to smell parmesan?

The **problem of experience** stands out among the easy problems precisely because it is not a functional problem,

Chalmers concludes, similarly to Nagel [**nagel**]. Functional problems are solvable by **reductive explanation**. Explanations are called “reductive” when a complex system is explained in terms of its simpler, more basic components. For example, a computer is explained through reduction by showing how the different components, such as the processor, memory, display and input devices, work on their own and together to achieve the overall function of the computer.

Chalmers argues that if we show *how* the components in our brain achieve their function, we’ve successfully explained its function. But even if a complete functional explanation of consciousness is given, this will not explain why the performance of functions in our brain is accompanied by experience. We wouldn’t assume that a computer has subjective experience when it performs its tasks, so how and why would a human have it?

For Chalmers, the problem of experience is not only the hardest problem, but, like Nagel, the defining problem of consciousness: If there is such a thing, is it possible to have a mental state that makes it a conscious state, and vice versa. [**nagel**][**chalmers**] Assuming that we cannot apply reductive explanation to the problem of experience, as Chalmers argues, then there must be something irreducible about it. He calls this ‘something’ the non-reductive extra ingredient, which itself cannot be explained by physicalism.

Does this imply that physicalism is false and dualism must be true? Chalmer’s essay “Naturalistic Dualism” [**chalmers2017**]

offers a compromise between the two views. Even in our physical world there are certain properties that are fundamental, such as mass or electric charge. Given our current scientific framework, we can reduce other phenomena to these fundamental properties, but no further. Similarly, mathematical statements in arithmetics can be proved by reduction to the Peano axioms, while the axioms themselves are given and unprovable. So even in the physical world there may be irreducible and fundamental properties, and the missing extra ingredient may be one of them.

2 Is Irreducibility Caused By Dualism?

Frank Jackson argues that there is information in subjective experience that is not captured by physical information. He uses the term **qualia** to refer to the non-physical aspects of experience. This helps to distinguish it from other interpretations of subjective experience, such as Nagel's, which do not necessarily imply that physicalism must be false. Jackson argues that there is something about subjective experience that cannot be observed from the physical world. He gives three arguments for this: the knowledge argument, the modal argument, and the "what is it like" argument. For the scope of this essay, we will look at the knowledge argument. It says that if there are facts that we can't deduce from physical information alone, then physicalism must be miss-

ing something.

Jackson uses a thought experiment about a scientist called Mary to show that knowing “what it is like” to perceive something is such a fact. Although Mary is perfectly capable of perceiving colour, she has been locked in a colourless room since birth. Jackson argues that no scientific book or theory available to her can replace the experience of colour perception. She would inevitably gain new knowledge when she left her room and experienced the vivid colours of green meadows, red poppies and blue skies for the first time.

The thought experiment seems convincing because we implicitly take physical information as given through our current scientific framework. This framework is well equipped to describe objects in a shared external world and underdeveloped to describe internal subjective experience. I argue that this is because of the advantage to human development of describing causal relations by reduction over describing experience. For example, understanding the fact of how heat is distributed in a room promises more technological and social progress than understanding the fact of how it feels to stay warm - a fact that is readily accessible to most people through first-person subjective experience without the need for description.

Jackson also implicitly gives an argument for this uselessness of subjective experience. He considers qualia to be **epiphenomenal**, meaning that they occur with the physical processes in our brains but have no causal effect on the

physical world. As an example, consider the parmesan and vomit experiment from the beginning. If the subjective experience is epiphenomenal, it means that it is not the unpleasant smell of vomit that makes us swallow and want to leave the room. It is only the way we experience the physical process of our brain misidentifying the substance as vomit and carrying out the prescribed bodily reactions. Jackson observed that subjective experience is not the result of an evolutionary advantage [jackson] (p. 134), which can be true regardless of the premise that subjective experience is not physical. I suggest, therefore, that the inability to adequately describe subjective experience may not be a natural limitation of a physical framework, but rather an anthropological consequence of our toolkit, a blind spot of human science.

If, somewhere in the universe, a civilization evolves from multiple species with very different senses, then there is a greater developmental advantage to understanding subjective experience through its physical framework. Such a framework would also be included in Mary's study materials, since she has access to all physical information. In principle, she might be able to derive the experience of color from it. We do not understand how Mary is able to do this, since we cannot imagine what a complete physical framework would look like, but this would not change the fact that she would know what it feels like to experience color. Frank Jackson responds to a similar objection by Paul Churchland as follows :

“The knowledge argument does not rest on the dubious claim that logically you cannot imagine what sensing red is like unless you have sensed red. Powers of imagination are not to the point. The contention about Mary is not that, despite her fantastic grasp of neurophysiology and everything else physical, she could not imagine what it is like to sense red; it is that, as a matter of fact, she would not know.” [jackson1986] (p. 2)

The knowledge argument allows for the possibility that Mary could use physical information in her grey room to recreate the experience of any colour in her imagination. According to Jackson, she would still not know what it is like to experience that colour. Jackson argues that in order to really know what it is like to experience colour, she would have to verify her imagination by actually seeing it. My intuition disagrees with this reasoning. What if the physical information to which Mary has access convinces her that only one version of the possible experiences she has imagined must be true? If, by chance, Mary had conceived the true experience of colour through her imagination, and she left the room and checked that the blue sky looked exactly as she had imagined a blue sky would look, would she say “wow” and look overwhelmed, would she agree that she had learned something new? Certainly not if she was already confident that she had deduced the colour experience correctly. I don’t want to side with the idea that Mary is able to infer the experience of colour from physical information alone, instead I hope to provide counter-arguments that show

that this thought experiment is inadequate to answer the question of whether physical information cannot fully account for subjective experience. From a practical point of view, I believe that there is more that Mary and we could do to get closer to what it is like to experience an alien sensation. In the following section I illustrate how we are able to extend our subjective viewpoint with the help of physical tools.

3 Alternative Modes Of Reasoning To Conceive “What It Is Like”

Thomas Nagel points out in his essay “What Is It Like to Be a Bat?” (1974) that classical reductive analysis, while it proved itself essential for understanding the external world, faces limitations in understanding internal mental state. He gives the example of a bat, whose internal experience of the world is based on sensory modalities unknown to us, such as sonar radar, which makes “what it’s like to be a bat” incomprehensible to humans. [nagel] (p.438) No textbook or documentation can enable me to authentically imagine something that is based on experience. My organs would have to gradually change into bat organs to come close to the experience of a bat. But why do we fail to understand the experience of bats when we understand other phenomena very well, such as how cheese is made? Nagel suggests that this is directly caused through the distinction between the ob-

jective, which is deduced from several points of view, and the **subjective**, which is based on one point of view.

Reductionist methods aim to describe phenomena by removing subjective perspectives and focusing instead on objective and universal frameworks. But we should remember that, as described in the interspecies civilisation example above, even more objective frameworks such as mathematics and physics are points of view. They are simply more accessible points of view because they do not involve private subjective experience. As Thomas Nagel points out, the inadequacy of current physical frameworks to explain subjective experience does not necessarily invalidate physicalism. [nagel] (p. 446) It may still be true that all phenomena, including subjective experience, are rooted in physical reality. However, the current state of our framework leaves us unable to explain *how* physicalism can account for this.

Despite these challenges, it should be noted that several intellectual movements in the early 19th century sought to bridge the gap between subjective and objective perspectives. The philosophical method of phenomenology developed by Edmund Husserl, for example, seeks to systematically explore and describe subjective experience, providing a framework for understanding how individuals perceive and interact with the world. Similarly, the theories of artists from the Bauhaus movement, such as Johannes Itten and Wassily Kandinsky, offer insights into how subjective aesthetic experiences can have universal patterns and appeal. Such patterns of aesthetic appeal were even studied in ancient Greece,

where buildings were constructed according to the golden ratio, a mathematical ratio known from nature. In Nagel's view, such previous attempts still rely too much on the subject's or even species' viewpoint. Alternatively, he advocates the concept of *objective phenomenology* (p. 449), which seeks to describe subjective experience in a way that does not rely on empathy or imagination. If such an objective phenomenology could be conceived technology could help us understanding subjective experience.

I argue that subjective experience is not a lost case in the epistemic court. There is no binary category of knowing or not knowing what it is like to experience like someone else, instead we are faced with a spectrum of more and less familiar types of experience. I think there is recent evidence that shows how we can use physical tools to make alien experiences more familiar.

Achromatopsia is a condition in which people see the world only in shades of grey, lacking the ability to see colour. Achromats are in a similar situation to Mary in Jackson's thought experiment, having never seen the world in colour. But unlike Mary, they cannot simply step out of their grey room and experience colour; they are physically unable to do so. Sensory substitution devices have been developed to compensate for sensory deficits by replacing one sense with another. One such device, the "eyeborg", enables people to perceive colour through auditory characteristics. It's a permanently attached antenna-like camera that converts the mea-

sured colour tone in its field of view into a sequence of audible skull vibrations as shown in figure 1. Long-term users report that they no longer perceive the signals as audible, but as some kind of spatial information that they associate with colour. Interestingly, a study about these users has observed adaptive and compensatory changes in their brain. [alfaro2015] For example, structural connectivity between the visual and auditory cortices was found to adapt. In addition, the processing of auditory signals from the eyeborg occurred in brain areas typically associated with colour perception. This provides evidence for the plasticity of the brain in adapting to novel sensory input. As soon as a sensory sensation is coupled to a prosthesis that we can adjust, we are able to expand our own space of subjective experience. For example, users of the eyeborg are also able to perceive infrared and ultraviolet radiation. Unlike many other species such as insects, this is not possible for the human eye.

Experience itself may arise from just a particular structural connection of neurons, and may even arise independently of any sensory input. As long as the perceived phenomenon, such as colour, is somehow encoded in this input, such as sound frequencies, the brain may be able to reconstruct information about the phenomenon and give us access to experience it. In the future we are likely to explore sensory input injected directly into the brain through brain-computer interfaces.

The privacy of subjective experience then seems not to



Figure 1: Eyeborg in use to capture the colour of an orange.
Source: Neil Harbisson

be a fundamental limitation of the first-person perspective, but rather a lack of natural interfaces for sharing subjective experience between individuals. If, as Jackson suggests, there is no evolutionary advantage to subjective experience, then there is no evolutionary need for such an interface to have evolved. All three authors agree that subjective experience arises from physical processes in the brain that we can observe. If we can develop an objective phenomenology, as Nagel advocates, subjects might be able to describe their first-person experiences in it. From this, algorithms would be able to learn the individual signal pattern and experience coding. This suggests that in the future technology will be able not only to transfer signal patterns between brains, but even to encode these patterns for each brain to evoke closely matching experiences.

4 Conclusion

An olfactory illusion about parmesan and vomit introduced us to the complexity of subjective experience and its dependence on context and expectation. This raises the question of how subjective experience arises from the physical processes in our world. Philosophers such as Chalmers, Jackson, and Nagel argue that the irreducibility of subjective experience reveals gaps in physicalist explanations and challenges us to rethink the nature of consciousness.

However, these challenges do not necessarily disprove physicalism, but rather highlight its current limitations. As Jackson's knowledge argument and Nagel's bat analogy suggest, the way forward may lie in expanding our conceptual and technological frameworks to better integrate subjective and objective knowledge. While Jackson is convinced that aspects of subjective experience are non-physical, Chalmers' naturalistic dualism offers a middle ground, suggesting that irreducible properties such as subjective experience could still fit within a fundamentally physicalist paradigm as fundamental aspects of reality.

Personally, I liked Frank Jackson's style of arguing, using thought experiments to understand the nature of subjective experience. However, I am not convinced by Jackson's conclusion because of the presented counter-argument that we cannot imagine what a complete physical framework can achieve. Of the three philosophers, I think Thomas Nagel's

perspective is the most considerate, since he refuses to reject physicalism out of hand, and instead offers a nuanced analysis of the challenges that physicalism would have to meet in order to defend itself. Devices like the "Eyeborg" show us that while our current physicalist framework is unable to fully depict *what it is like*, technology enables us to explore experiences beyond what our natural sensory condition would allow.

Subjective experience resists easy explanation, but it also drives us to refine our understanding of the mind-body relationship. Whether this leads to a revised physicalism, a more nuanced dualism, or an entirely new framework remains an open and exciting question. I am convinced that technological progress, although based on reductive explanation, will continue to offer opportunities to expand our own experiential horizon.

During the preparation of this work, the author used

- **Deepl Write**, in order to: check grammar and spelling, paraphrase and reword, grade essay and suggest improvements
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After using these tools/services, the author reviewed and edited the content as needed and takes full responsibility for the final content.