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# From Murphy's Christian Physicalism to Lowe's Dualism

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**Abstract**: Nancey Murphy argues that God created us as physical beings without immortal souls. She supports this Christian physicalism by arguing that neuroscience can better explain minds in terms of physical information processing than dualists can in problematic nonphysical terms. We reply that Murphy overestimates neuroscience and underestimates dualism. She doesn't show how neuroscience can explain the mind's characteristic qualia, unity, privacy, or causality. We argue that Lowe's dualism can better explain minds, often with experimental support and in testable ways. Murphy's physicalism thus serves to highlight the value of Lowe's dualism today.

**Keywords**: Christian Physicalism, Non–Cartesian Substance Dualism, E. J. Lowe

## 1. Introduction

While Christian physicalists take various positions, at a minimum, they hold that people can be Christians while accepting that God created us as purely physical beings. No matter which way this physicalist anthropology is framed, it entails that humans lack nonphysical, immortal souls.

A prominent Christian physicalist is Nancey Murphy. She eloquently argues that because God created us as physical beings, we should relinquish otherworldly aims involving the soul and instead promote God's reign in this world. She adds that this physicalism needn't threaten our moral responsibility and free will. For our neurons don't determine our actions. Instead, we actually modify our neural activity with emergent, autonomous, culturally mediated cognition.

We'll sketch her nonreductive physicalism in §2. In §3, we'll critique her main philosophical case for it, namely, that the neural sciences can explain the mental better than dualists have with their immaterial substances and problematic mind–body interactions. We reply that neuroscience hasn't even explained the simplest mental levels. It hasn't adequately shown how private sensory qualia are related to neural information processing, how our various qualia arise, how they unite to form percepts, and how their causation with brains works. (While these points may also apply to some other Christian physicalists, we won't focus on them here.)

In §4–5, we draw on considerable experimental evidence to refine Lowe's dualism. We argue that it better explains minds than other dualists do—and better than neuroscience does too. We feel that Murphy's physicalist theory of mind unwittingly aids growing atheistic claims that science is the true paradigm of knowledge, and religion is outdated.

## 2. Murphy's Christian Physicalism

### 2.1 Murphy's (2006) Bodies and Souls, or Spirited Bodies?

Murphy's central thesis in 2006 is that "we are our bodies—there is no additional . . . mind or soul," and this physicalism needn't "deny that we are intelligent, moral and spiritual . . . blown by the Breath of God's Spirit; we are *Spirited bodies*" or incarnated souls (ix, her italics).

She argues that Christians hold two contradictory views of the afterlife, namely, immortality, in which the soul departs the body after its death to be with God, and resurrection, in which the soul ultimately receives a resurrected body (7). Resurrection relies on the old Hebrew idea of personality as the body's life or animation, while immortality relies on the later Greek idea of mind–body dualism (8ff.).

The Hebrew idea isn't dualist but monist and holistic. For example, Genesis 2:7 says, "And the Lord God formed man from the dust of the ground and breathed into his nostrils the breath of life and man became a living soul." Here, the Hebrew word for soul is "nephesh," which refers to the whole living person (18). So, Murphy sees resurrection not as a disembodied soul getting a new body, but as a restoring of the entire person to life (22ff.).

She argues that dualism thus entered biblical teaching from poor translations and spread due to cultural influences. So, we should feel free today to update Christianity in light of cultural developments in science (37). This could help Christians replace their otherworldly aim of putting soul over body with the worldly

aim of furthering God's reign on earth (27ff.).

Turning from Biblical studies to philosophy, Murphy rejects Descartes' dualism of interacting immaterial minds and material bodies. She argues that the successes of modern sciences have rendered his view implausible. Darwinian biology came to stress the gradual evolutionary changes (including neural ones) between species, which cast doubt on the idea that humans are unique because God gave them souls (48ff.). Modern physics rendered dualist mind–body interaction dubious, for how can immaterial minds move material bodies (45f.)?

Murphy argues that "physicalism . . . has all the confirming evidence one could hope for," especially from "neurobiological understanding of cognition, emotion, and action" (5, 111, 115f.). She thus replaces dualism with the "physicalist thesis" that capacities once attributed to souls will turn out to be products of complex physical organization rather than properties of immaterial souls (57).

But she rejects reductive physicalism. "The problem with this form of physicalism is that it results in denial of the capacities and functions [e.g., morality and free will] once attributed to the soul. The nonreductive physicalist[1] makes no such denial" (72).

She further describes this denial as follows. "If humans are purely physical, then their behavior *must* be determined by the laws of nature and cannot be free or morally responsible" (72, her italics). To this, she replies (73) that this causal reductionism assumes that all causation is bottom–up, from lower to higher neural levels. But holistic, higher–level activities of systems can influence components at lower levels, which introduces top–down causation. Further, mental causation in humans has self–directing powers that bring autonomy from neuronal causation. This comes from symbolic language, self–reflection, critical thinking, etc.

Murphy's 2006 account of free will is based on this autonomy (see §2.2 below).

She then argues that we can still relate to God without souls. For God can address us via our physical being, including our capacity for free will and moral responsibility (110f.). She extols scientific accounts of mentality but says that they give "an incomplete account of human life" that needs a religious perspective on morality, ultimate purposes, free will, etc. (120).

We'll turn now from this eloquent 2006 defense of Christian physicalism to Murphy's 2007 book with Brown. It is a strident polemic against reductive causation (with no mention of Christian physicalism). Its account of mental causation is sophisticated yet highly controversial.

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[1] Nonreductive physicalists usually construe minds functionally or computationally. Pains are realized in, or identical to, one neural event or another. They aren't reduced to a single type of neural event such as C–fibers firing.

### 2.2 Murphy & Brown's (2007) Did My Neurons Make Me Do It?

Nancey Murphy and Warren Brown develop further arguments for Murphy's 2006 account of mental causation and free will. They contend that physicalism doesn't imply causal reductionism and its allied neurobiological determinism, in which our neurons determine our actions. For downward causation and autonomy preserve our rationality, free will, and moral responsibility.

This causal reductionism is evident in post–Cartesian thought, where physicalists have, in effect, stripped away the Cartesian view of souls and retained the Cartesian view of bodies being determined by bottom–up Newtonian mechanics (10, 15). Here, the parts determine the whole's behavior. Murphy and Brown introduce this primary target early on and return to it later.

In the interim, they address a secondary target: the post–Cartesian idea of the inner "I". They take note of Dennett and others who criticize physicalists for retaining this remnant of Descartes' idea of the soul—the inner ego or subject isolated from the outside world. It resides in an inner theater where images and ideas of the outside appear (15f.). This raises the issue of how this ego views images, which sets up a vicious regress of inner egos.

They note the alternative Dennett (1991) proposes. He says that functional neuroanatomy shows that there's no general meeting place (headquarters) in brains for this ego. Instead, mental functions are distributed around the brain. So, he proposes that there's no definitive stream of consciousness, just a pandemonium of parallel streams continuously revised (29). But Murphy and Brown don't endorse Dennett's pandemonium ("multiple drafts") theory (29, note 38). Instead, they endorse Edelman and Tononi (2000), where distributed neural activity is actually unified by neural synchrony (see §3.3 below) to form something very much like a headquarters.

Murphy and Brown then resume their attack on their primary target, causal reductionism, where the parts determine the whole. They do so while defending downward causation, where the whole system influences its parts. It's usually thought that systems control their components in the mechanistic, bottom–up ways of causal reductionism—as when autopilots use electrical and hydraulic hardware to mechanically move airplanes' control surfaces. But Murphy and Brown's systems approach is different. Self–organizing systems aren't concrete things but hierarchical structures of information processing (87). And these processes are often not deterministic but a matrix of probabilities, as in the flight of a fly (97f.):

> How far we have come from Descartes's hydraulic animal bodies and Newton's clockwork universe! The universe is now seen to be composed not so much of objects as of systems. The components of the systems themselves are not atoms but structures defined by their relations to one another and to their environment, rather than by their primary qualities [such as forces] . . . Concepts of causation based on mechanical pushing and pulling have been replaced by the concept of attractions in phase space . . . notions of determinism and indeterminism are replaced by notions of probability. (77)

So, Murphy and Brown replace the matter and forces of reductive (mechanistic, bottom–up) causation with the information and probabilities of their non–reductive (holistic, top–down) systems approach.

Complex systems can become autonomous. They can control themselves by exerting constraints on components and selecting environmental stimuli to respond to. They are their own causes, and this autonomous organization increases freedom at higher system levels (89ff.). Lower–level systems produce mid–level variations which higher–levels in turn select.

In contrast to the disembodied, isolated Cartesian mind, Murphy and Brown's informational approach tends toward an externalist theory of mind in which beliefs, desires, etc. are inextricably tied to the environment (215). Downward causation from cultural information helps restructure the brain so that it realizes rational mental processes. In their externalist view, the mind is embodied and contextualized in these feedbacks with the environment (209f.).

Murphy and Brown only briefly mention consciousness and qualia (mainly on 136–146, 217–221). They criticize several of Dennett's practices: his definition of mental states in terms of their causes and effects, his unclarity about whether he rejects consciousness or just misleading accounts of it, and his neglect of top–down causation (297).

They adopt Edleman and Tononi's (2000) account of consciousness as being unified, informative, private, and associated with the dynamic core of thalamocortical reentrant loops that underlie attentional activities. This core functionally interconnects distributed areas and binds their differentiated activity through the synchronized firing of neurons in the loop (141ff.). Consciousness is embodied in this dynamic core, which opens up flexible, adaptable behavior in a temporary workspace (144f.). We'll return to their view of consciousness and qualia below.

Murphy and Brown end with free will. As noted above, they think autonomous top–down causation is reinforced by language and flexible, hierarchical cognition, which allows humans to evaluate their aims and moral principles. This undermines

causal determinism's purely bottom–up causation and its allied neurobiological determinism, where our neurons determine our actions (2006, 105ff.; 2007, 272ff.). This autonomous causality is the basis of their view of free will, which is intimately tied to our capacity for morally responsible choices.

Three views of free will now prevail. (1) Hard determinism: our choices are determined, so we can't choose otherwise than we actually did as free will requires. (2) Libertarianism: our choices are not determined, so we have free will. We're free to act as we choose (which involves liberty) and to do so without determinism (which requires indeterminism). (3) Soft determinism: our choices are both determined and free, for freedom is self–determinism (autonomy).

While Murphy and Brown adopt soft determinism, they focus heavily on Kane's version of libertarianism (2007, 277ff.). Here, free will is the power of agents to be ultimate creators of their own purposes (which parallels soft determinism). Coercion precludes this, as do social and biological determinism. So, Kane feels that mental causation must be partly indeterministic.

It's often suggested that this indeterminism might occur at quantum levels as neurons are poised near their firing threshold. This could influence thought during moments of mental turmoil (or perhaps during creative spontaneity) when the course of thought is susceptible to subtle influences. (This needn't make choices accidental, for indeterminism can instead help create options for choices to select from—so that indeterminism becomes integral to choices.)

Kane thinks free will requires not only indeterminism but also that agents have ultimate responsibility for their character. Here they are the ultimate creators and arbiters of their own aims (indeed, the latter motivates the former).

As already noted, Murphy and Brown adopt soft determinism, which bases free will on autonomy. So, they approve of Kane's stress on free will involving self–creation (2007, 279). But they don't accept his indeterminism. They scoff at the debate between libertarians like Kane and hard determinists over whether actions are determined. For when top–down causation brings autonomy, it makes no difference to the autonomy whether bottom–level causes are deterministic or not. In their view, if we act on considered principles without undue social or biological interference, then we're autonomous and free. This is free will as autonomy without the unrealistic expectations of total autonomy that many incompatibilists demand. It's good enough for assigning responsibility in ordinary life and law courts (2006, 108f.; cf. 2007, 277f.).

Murphy and Brown conclude that neurobiological reductionism is false. We cannot say that our neurons made us do it (2007, postscript).

## 3. Problems in Murphy & Brown's Theory of Mind

Murphy and Brown argue that neuroscience can be used to explain the mental in terms of information processing without need for Cartesian dualism's problematic immaterial minds and mind–body interactions. We reply that they don't show how neuroscience can explain the mind's qualia, unity, privacy, or causality, so dualism isn't threatened. Specifically, neuroscience can't explain how qualia are related to neural information processing. It can't go beyond specifying the qualia's neural correlates to establishing whether the precise relationship between the qualia and the correlates is one of identity, causality, or some other metaphysical relation. Nor does neuroscience adequately explain how the different varieties of qualia arise, how they unite to form perceptions, and how their causation with brains works. We'll start with these four problems. Then, in §4–5, we'll draw on experimental evidence to reformulate Lowe's non–Cartesian subject dualism in an attempt to avoid these problems and those in Cartesian dualism.

### 3.1 How are qualia related to information?

Murphy's first problem arises from her information–processing approach to the mental. To start with, her 2006 book argues for a nonreductive physicalism in which the mental exists physically, yet its causality is autonomous of the neural. Here, she treats minds and their qualia as physical information–processing functions. For example, she says, "we are our bodies, there is no additional . . . mind our soul" (ix). Also, "minds are . . . functions of the brain" (40)—to which she later adds, "rather than properties of a non–material entity" (57).

So, she treats minds and their qualia as physical information–processing functions rather than nonmaterial things. Yet she doesn't address how qualia can be information. Information involves (for example) alternative states in a network of correlations between receivers and senders. It's realizable in different materials and is thus abstracted from them. So, information is a public, objective, abstract relation. By contrast, our sensory and emotional qualia are private, subjective, concrete qualities that we feel. So, it's quite unclear how qualia can be information processing. Murphy steps here into the hard, ontological problem of why information processing is accompanied by qualia (Chalmers, 1996).[2]

Murphy thus faces a dilemma in her 2006 book. If qualia are physical information

[2] She mentions the hard problem (60) but doesn't define or address it. Her 2007 book misconstrues it as "the hard problem of explaining the causal relevance of qualia per se" (217).

processing, she's stuck with an explanatory gap concerning how they are the same, and this thwarts her effort to show that neuroscience supersedes dualism. But if qualia aren't physical properties, she's stuck with the nonmaterial qualia of the dualism that she explicitly rejects.

Her 2007 book with Brown also adopts nonreductive physicalism (with its explanatory gap). Yet some passages seem to take the dualist option in which minds and their qualia are nonphysical properties dependent on our bodies (rather than minds simply being our bodies).

One step toward this property dualism is their clear statement they clearly state that consciousness and qualia do exist (297, 216). This is their response to physicalists who talk about pain's causes and effects and ignore how pain actually feels (after all, nonconscious robots could have the same causes and effects).

Another step toward property dualism is their functionalist view that the causal relevance of consciousness and qualia come from the flexibility, adaptability, etc. they bring to behavior (139). For example, red's contrast to green is causally relevant in discriminating wavelengths. But the redness of red (the red quality in itself, apart from its causality) is causally irrelevant. So, it's "epiphenomenal" (221). (In contrast, on 3, 234f. they reject epiphenomenalism for higher functions like reasoning.)

The overall point is that these epiphenomenal qualia stand in contrast to Murphy's earlier physicalist claim above that "we are our bodies." For if qualia were physical, as this earlier quote implies, then they'd interact with brains—which conflicts with her later claims that qualia are epiphenomenal. So, here in the 2007 book, qualia in themselves are nonphysical.[3]

Therefore, Murphy arguably shifts from her stark physicalist claims in 2006 like "we are our bodies" to a property dualism in 2007. In the latter, the mental exists as information processing that is realized in brains and the environment. At the same time, qualia in themselves (their intrinsic nature, apart from their causes and effects) are epiphenomena existing nonphysically outside of information processing. They're irrelevant to their purely causal account of minds (221).

This property dualism is the source of the 2007 book's problems with qualia. It thwarts their claim that their functionalism doesn't undermine our capacity for emotion and motivation (104, 138). For example, they can stress how much the feeling of love influences our lives, but there's still no place in their functionalist

[3] Another example of their property–dualism is their account of consciousness. It focuses mainly on Edelman and Tononi's dynamic core—the functional interconnection of diverse brain areas produced by rapid, two–way processing loops between the thalamus and cortex. They suggest that "consciousness might be embodied" in this core (p 144f.). Here, "embodied" suggests that minds and their qualia differ from our bodies (dualism) and come to be realized in them.

theory for love's intrinsic nature apart from its causes and effects. Love is far more than a mere box in an information–processing flow chart. So, their functionalism yields an impoverished view of the mind. It ignores what's of real intrinsic worth in life, including in Christians' lives. It ignores our feelings and aspirations.[4] These are precisely what nonconscious robots lack. This is why robots depend on us for their basic aims.

To summarize, Murphy's 2006 book allies itself with a physicalism where minds are information processing. Here she fails in her aim of showing how neuroscience can supersede Descartes' dualist theory of mind, for she doesn't explain how the mind's qualia are information processing. Her 2007 book arguably allies itself with property dualism. Here again, she (and Brown) fails to take qualia seriously, this time by ignoring their intrinsic nature apart from their causality. This impoverished view of minds prevents both books from threatening Descartes.

### 3.2. How do our various qualia arise?

The second problem in Murphy and Brown's claim that neuroscience supersedes Descartes' theory of mind is that neuroscience has failed to adequately explain how the brain creates the mind's various qualia.

Neuroscientists often attribute qualia to special circuits (labeled lines) with their own detectors and processing areas. Each labeled line for color, taste, etc. compares detector outputs to resolve ambiguities about which sensory stimuli are present. But their operations of stimuli detection and signal integration are so similar in the various sense modes that it's unclear how computational circuits actually differ enough to account for stark differences in their qualia.

Such computations do undoubtedly work extensively behind the scenes to refine images (in mechanisms for constancy, disambiguation, depth, recognition, etc.). But they can't explain how our different qualia arise (Jones, 2019). They can determine which visual circuits are activated, but they can't explain what makes a circuit red or blue.

This also applies to the relatively recent Integrated Information Theory. It has speculated about qualia in highly abstract, global terms. But, crucially, it doesn't systematically spell out the neural correlates of qualia in testable ways. All this shows how severely limited neuroscience's accounts of qualia are.

[4]We won't cover standard citicisms of functionalism such as the Chinese brain, Chinese room, and twin earth.

### 3.3 How do qualia unite to form perceptions?

The third problem in Murphy and Brown's claim that neuroscience supersedes Descartes' theory of mind is that neuroscience has failed to explain how qualia unite to form overall perceptions. This is part of neuroscience's unresolved binding problem, which concerns how distributed neural areas create unified mental objects (perceptions, thoughts, etc.) and the unified subject that experiences them. This binding isn't explicable by neural mechanisms such as synapses, synchrony, or attention. So, it's unclear *how* the obvious unity in our experience can arise.

To start with, "there is no single cortical area to which all other cortical areas report exclusively, either in the visual or in any other system" (Zeki, 1993, 296; 2003; 2015). More recent studies still find no evidence that a single, central brain circuit binds cortical activity into unified, coordinated experience (Jones, 2019). This isn't surprising, given the combinatorial capacity limitations of brain circuits (Crick & Koch 2003; LaRock 2007; Zeki 2003, 2015b).

This is especially evident in visual processing. It uses separate, parallel circuits for color and shape, which raises the visual binding problem of how they combine to form complete images. Ascending color and shape circuits have few (if any) synapses for linking their cells to create colored shapes (Zeki 2003).

Arguably, Zeki overlooks how higher cortical feedbacks into lower cortical maps might indirectly bind color and shape (e.g., Kawato, 1997). But to encode detailed images, feedbacks would have to systematically connect shape and color features *point by point all across the lower visual cortex*, which hardly seems plausible.[5]

Such evidence may seem to support Daniel Dennett's insistence that there's "no central Headquarters" where all processing comes together. Instead, there are just "multiple channels in which specialist circuits try, in parallel pandemoniums, to do their various things...." (Dennett 1991, 257–258). This view, which Murphy and Brown mention in passing (2007, 29), would preclude binding altogether. But Anne Treisman's (2003) research on false bindings (binding properties from the wrong objects) has provided one of many lines of compelling evidence that cognition does in fact rely on binding. This, and the fact that "Dennett continues to deny the

[5] Arguably, there are various processing hubs in brains that could actually help unify experience. For example, the dorsolateral prefrontal cortex helps control attention and working memory, while the claustrum may detect object salience. But as just noted, there's no evidence that they (nor any other structure) serve as a single, central brain circuitry that binds all experiences together. Nor do high–level hubs account for the unity in lower–level activities such as color and shape circuits—nor in preattentive activity such as peripheral vision. It's also unclear how neural hubs unify experience without the binding issues in §3.3.

existence of consciousness, and continues to deny that he's denying it" (Strawson, 2003), makes it hard to take his functionalism seriously.

Murphy and Brown end up (141ff.) endorsing the view that synchronous firing of neurons binds them into a unified, conscious form (e.g., Gray et al., 1989). But this binding code has well–known issues. Binding can occur without synchrony, as illustrated by Gray and Singer's own data (1989), which shows that color and shape circuits don't fire in synchrony during visual perception. Also, synchrony can occur without binding or conscious unity during seizures, anesthetized states, and NREM sleep (e.g., Koch et al., 2016; LaRock, 2019).

Given their emphasis on higher–level cognition, Murphy and Brown might resort to Crick and Koch's (2003) idea that focal attention binds perceptual features into a unified, conscious object (as when we suddenly spot a friend in a crowd). But binding can occur without attention. In the Treisman (2003) study above, subjects reported mistaken combinations of color and shape in objects if their attention was diverted—and this involved binding, despite the mistakes (LaRock, 2007).

Another approach to mental unity might come from Murphy and Brown's own information account. This approach could adopt Coleman's (2016) suggestion that high–order processing integrates information within the cognitive system and thereby supplies a functional unity to the mind. But there's an explanatory gap between conscious unity and functional–informational unity. Moreover, without specifying some neural activity for unified consciousness (synchrony, etc.), abstract talk of unified information is empty.

A final problem is Murphy and Brown's externalist theory of mind in which thoughts are inextricably tied to the environment. This externalism, together with their inability to explain the mind's unity, leaves them unable to explain another key feature of minds—their boundaries and privacy. Why can't we access each other's thoughts or see other's images in their brains? This issue doesn't arise if the outer world is internalized by representing it within an inner self's memories and thoughts.

Therefore, neither Murphy and Brown—nor neuroscience generally—explain how qualia are related to information, how our various qualia arise, and how they unite to form percepts.

### 3.4 How does causation between qualia and brains work?

The fourth problem in Murphy and Brown's claim that neuroscience supersedes Descartes' interactionist dualism is that their own account of mind–brain causation is no less problematic than Descartes'.

As already explained, Murphy and Brown replace the matter and forces of reductive (mechanistic, bottom–up) causation with the information and probabilities of their non–reductive (holistic, top–down) systems approach. We won't delve deeply into this debate. We'll just note two problems in their account.

(1) Murphy and Brown themselves actually outline the first problem. They admit that the reductive view is the predominant one. Ant colonies exemplify this reductionism. Genetic rules govern their behavior. Ants use various pheromones to signal the source of food, danger, etc.—and their gradients along trails indicate directions. In foraging trips, if an ant meets over a certain number of other ants per minute, it stops foraging and returns to the nest. Murphy and Brown acknowledge that computer simulations show how colony behavior can be explained bottom–up by genetically fixed rules such as these (96f.).

But Murphy and Brown stick to their guns and reiterate the systems approach outlined above in §2. Here, colonies are construed not just as queens and workers run by genetic rules, but as a system of processes, such as foraging and reproduction, that runs on information. Here, ants' neurons are affected by their probability states. For example, the holistic property of forager density affects the probability that a foraging ant will encounter other foragers and thus return to the nest. This is "a non–forceful constraint on the ant's behavior that is causal" (96f.).

The criticism here, as Murphy and Brown note, is that this arguably adds a new level of causality that is just a theoretical construct, not a real thing. For example, Bunge (1979, 13–14) argues that wholes can't affect parts—a level of organization "is not a thing but a set and therefore a concept … All talk of interlevel action is elliptical or metaphorical."

Murphy and Brown see this as an ontological bias towards concrete things over abstract relations (89). Again, information is abstract here because it's realizable in different forms of matter, which abstracts the information from the matter (cf. Kim 1996, 76).

But the opposing point remains: it's hard to see how abstractions (or theoretical constructs) can make matter to do anything. This is much the same problem that faced Plato and Aristotle when they considered how forms affect matter. It's a stubborn perennial issue.

So, for the same reason that it's hard to identify abstract information with minds, it's also hard for information to have causal relations with matter. This makes Murphy and Brown's information–mind causation no less obscure than Descartes' mind–body causation.

This criticism could be avoided by an ontology of pure information in which the universe (including matter and mind) is nothing but information. But Chalmers

(1996) and others argue that this is a world without substance. They thus adopt Russell's claim that science reveals matter's abstract, mathematical nature, but not its intrinsic nature, which may, for all we know, be experiential (1927, 10, 320). This gives the abstract world substance. However, this view treats all causality as experiential, so it isn't open to authors like Murphy and Brown, who embrace epiphenomenal qualia.

(2) The second problem with Murphy and Brown's mental causation is that they rely on synchrony to explain mental unity. Recall that evidence no longer supports binding by synchrony. This leaves them without an explanation for the unity of external objects and the unity of the inner subject. (The existence of this subject will be covered below.) Without this explanation of inner unity, they can't explain the unity of mental causation involved in cognition.

This is a problem in neuroscience generally. Recall that there's no single place in the cortex where all information converges for decision–making (Zeki, 1993). While the nature of executive and prefrontal areas is unclear, the diversity and complexity of their functions are becoming more evident in recent studies. Some processing hubs do exist, but these studies still find no evidence that a single, central brain circuit binds all neural activity into a unified, coordinated experience (Girotti and Adler, 2018; Miyake et al., 2000).

To conclude, Murphy and Brown's claim that neuroscience supersedes Descartes' theory of mind fails. For they haven't shown that neural information processing can explain what the mind's qualia are, how our various qualia arise, how they bind together to form perceptions, and how their causation with brains works. Murphy and Brown arguably end up with a dualism that differs from Descartes' but is no less problematic than his. One recurring problem for Murphy and Brown is that the sheer abstractness of information renders its identity or causal relations with minds and brains deeply obscure.

Drawing on experimental evidence, we'll now reformulate Lowe's non–Cartesian subject dualism below to explain the mind's qualia, unity, and causality without the problems above in neuroscience, Murphy's nonreductive physicalism, and Descartes' substance dualism.

**4. Lowe's NCSD**

Simply put, E. J. Lowe thinks that we're mental substances (subjects) with mental properties (such as thoughts) and that we also have physical properties (such as spatial location) due to our possession of bodies (physical substances). In contrast, Murphy's nonreductive physicalism only has a physical substance with mental

properties. Lowe's theory also contrasts with Descartes' substance dualism of bodies and wholly incorporeal minds (this muddles their interaction). Now let's look in detail at Lowe's non–Cartesian substance dualism (NCSD) and our refinements of it.

Lowe begins his approach with some foundational definitions in the philosophy of mind. The term *dualism* picks out two main kinds: substance dualism and property dualism. Substance dualism holds that mental substances and physical substances are fundamental, ontologically distinct kinds of substance, wherein *substance* denotes a *bearer of properties:* "By a mental substance, then, is meant a bearer of mental or psychological properties, while by a physical substance is meant a bearer of physical properties" (Lowe 2008a, 167). Generally speaking, then, substances are fundamental *bearers* of properties. Property dualism holds that mental properties and physical properties are fundamental, ontologically distinct kinds of property, wherein the former can refer to such familiar examples as pain and desire, and the latter can refer to such ordinary examples as mass and velocity. The logical upshot is that substance dualism entails property dualism, but the inverse relation wouldn't follow (Lowe 2010).

While substance dualists have much in common, they disagree over whether a mental substance can possess both mental properties and certain physical properties. For example, the French philosopher and mathematician, Rene Descartes, held that mental substance is *not* extended in space. By denying the property of spatial extension to mental substance, Descartes famously confronted the bogey of mental causation, the dreaded problem of *how* an unextended thinking thing (*Res Cogitans*) could causally interact with an extended thing (*Res Extensa*), as well as the pairing problem (Lowe 2008b, 2010; cf Kim 2005).

But not every advocate of substance dualism is committed to denying spatial extension to mental substance. For example, Lowe's (1996, 2006, 2008a, 2008b, 2010) non–Cartesian substance dualism (NCSD) is *not* a dualism of wholly incorporeal *minds* and bodies but a dualism of *persons* and their organized bodies, wherein *persons*—though distinct from their organized bodies—*are the bearers of both mental properties and certain physical properties*, including shape, height, spatial location, and velocity—in virtue of possessing bodies that possess those properties. As Lowe observes,

> According to non–Cartesian substance dualism, it is *I*, and not my body nor any part of it, who am the bearer of mental properties, just as Descartes maintained. However, unlike Descartes, the non–Cartesian substance dualist does not make the further claim that I am not the bearer of any physical properties whatsoever. (2008a,

169)

Bearing *some* physical properties does not entail bearing *all* physical properties. NCSD maintains that there are some physical properties that a person cannot possess without pain of contradiction, such as being *entirely* composed of bodily parts. Being entirely composed of bodily parts is a property exemplified by organized bodies alone, presumably not by persons (Lowe 2008a, 2010). Furthermore, NCSD insists that a person is a *simple* (i.e., not composed of parts), unified mental substance, unlike a person's brain, which is composed of 100 billion dispersed neurons and other cells (see Lowe 2006, 2008a, 2008b, 2010; cf. Hasker 1999; LaRock 2019; LaRock and Jones 2019; LaRock et al. 2020). These distinct observations about persons and their organized bodies, Lowe argues, preclude their identity (Lowe 2008a, 2008b, 2010).

A broader metaphysical implication is that NCSD is *not* compatible with even the weakest sorts of non–reductive physicalism (including Murphy's) because it takes a "non–materialist position" about persons and their causal powers (Lowe 2008a, 2008b, 2010). If NCSD is neither a species of Cartesian substance dualism nor a species of nonreductive physicalism, then where might it fall on the spectrum of contemporary theories? In *Personal Agency*, Lowe (2008b) is quite clear that NCSD can be "fairly described as an *emergentist* position" precisely because it regards the causal powers of nonmaterial persons as "complementing and supplementing" the relevant events in their organized bodies (i.e., their brains). As Lowe observes,

> NCSD is, however, still a nonmaterialist position because it is incompatible even with very weak forms of non–reductive physicalism. It may also be fairly described as an *emergentist* position, in that it regards the causal powers of persons as complementing and supplementing—rather than either being reducible to or existing entirely independent of—those of their bodies. (Lowe 2008b, 92)

In sum, we've observed (1) that NCSD is *not* compatible with non–reductive physicalism, (2) that NCSD can be fairly characterized as an emergentist position, and (3) that it counters Cartesian substance dualism by maintaining that persons possess not only mental properties but also certain physical properties such as spatiality, thereby opening the theoretical door for the possibility of explaining *how* persons can interact with their bodies without Descartes' causal issues.

While Lowe has not developed the preceding claim that NCSD can be "fairly described as an *emergentist* position," we find this claim intriguing and worth developing. Thus, in what follows, we incorporate our emergentist approach and

improve on Lowe's model.

What emerges on our account are not merely mental properties in specialized, distributed neural areas, but also a new individual entity, i.e., an emergent subject, that functions to integrate mental properties across cortices of its brain. Our account of experience is a species of emergent (substance) dualism that coheres with the ontology of subjects and mental properties advocated by Lowe (2008, 2010) and Hasker (1999) with a potentially important scientific advance: we aim to support our NCSD with a testable hypothesis. To be clear, the term subject (or person), according to our NCSD, picks out an entity that is ontologically distinct from its brain—a simple, non–composite entity in its own right—and that is capable of integrating mental properties across cortices of its brain (LaRock 2019; LaRock and Jones 2019; LaRock et al. 2020).

Why is an ontologically distinct subject in the aforementioned sense needed over and above mental properties? For one thing, if all that emerged were mental properties in specialized, distributed neural areas, we would have difficulty explaining the unity of experience. For example, sensory phenomenal properties are presumably correlated with physical processes in geographically separate sensory cortices of the brain; when I observe a lion, for instance, the lion's roaring sound correlates with a physical process in my auditory cortex, while its yellow color correlates with a physical process in my visual cortex. At the same time, there is most likely no single cortical area (or "convergence zone") in the brain where phenomenal properties could be bound together (and thus unified), as already noted. Yet, somehow, I experience the lion's sound and color as a phenomenal unity. For the sake of economy, let's call this kind of unity subject unity. What must be true about my nature to make subject unity possible? Notice, neither phenomenal unity nor the bearer of such unity could be identical to distributed physical processes (across geographically separate sensory cortices) and/or their correlated sensory phenomenal properties, for that would entail the very problem under discussion. After all, what we aim to show is how these properties, though distributed in space and time, are bound together (see LaRock and Jones 2019, Jones 2016; LaRock 2007, 2019; also Zeki 2003, 2015). This is why we think that expanding the ontology of mind (beyond mental properties) to include an ontologically distinct subject (that functions to integrate mental properties) is necessary.

Analytic philosophers are not alone on this score. For example, neuroscientist Semir Zeki argues that, because the functional architecture of the brain essentially involves distinct temporal hierarchies—in virtue of processing an object's properties at different times—the subject, rather than the brain, is the only feasible ontological ground of a single unified consciousness (2003, 2015). Similarly, Sir John Eccles, the

Nobel prize–winning neuroscientist, argued for a similar view several decades ago: "the experienced unity comes, not from a neurophysiological synthesis, but from the proposed integrating character of the self" (Eccles and Popper, 1993, 362). Eccles proposed that the self (or subject) functions to select and integrate information pieces from different modules in the liaison area of the dominant hemisphere. Unlike Eccles, we are willing to grant that attention mechanisms function to select sensory information pieces from geographically separate areas of the brain. But we still agree with Eccles (and, by logical extension, Zeki) that the subject (or self) plays a fundamental role of binding (e.g., cross–modal binding). Finally, Koch and Tononi (2008) have suggested on their information integration theory (IIT) that experience depends upon "a single integrated entity with a large repertoire of states." While IIT comes close to NCSD in this regard, there is an important difference: NCSD maintains that a subject is a single entity in its own right and that it integrates mental properties across cortices of its brain.

How can a subject integrate mental properties? One possibility is that a subject bears a persistence relation to the processing hierarchy and makes a causal contribution to integration on grounds of being a *formal cause* (i.e., an integrative cause), a claim that traces all the way back to Aristotle (if not also to Pythagoras). The upshot is that a subject's formal causal role in relation to the recurrent flow of information is crucial to integration. This view can be tested, in part, through transcranial magnetic stimulation, masking techniques, and the application of certain anesthetics (for details, see LaRock 2007, 2010, 2019; LaRock et al. 2020). Another possibility is rooted in our NCSD field theory, which we elaborate in the succeeding sections of this paper.

**5. Experimental Evidence that Minds Are Seated in Neural Fields**

Drawing on experimental evidence, we'll further refine Lowe's non–Cartesian subject dualism here in §5. The aim is to explain the mind's qualia, unity, and causality without the issues above in Descartes' substance dualism, in Murphy's nonreductive physicalism, and in neuroscience.

We've noted that NCSD takes the mind's consciousness, unity, and causality seriously. But Lowe's account raises two questions that will be dealt with below. First, how do subjects come to be unified, simple substances? Second, how do subjects' conscious, purposeful causes affect their bodies' physical causes so as to translate purposes into actions? Lowe (2006) thinks that the subject's choices explain bodily motions by giving reasons for the choices, but not by giving physical–like causes or forces to the subject. Giving subjects both reasons and forces (in addition

to their spatiality) could help win over skeptical readers who demand efficient causes.

Interestingly, the brain's electromagnetic (EM) field has just these features of unity and forcefulness that NCSD needs to account for. So, seating subjects in the field generated by neural circuitries may help account for the subject as a simple, unified substance that interacts with brains and binds circuits together. Casting NCSD into an EM–field theory of mind may also avoid the various issues involved with the mind's qualia, unity, and causality. This theory differs from standard neuron–based neuroscience and argues that the latter can't fully explain minds.

EM–field theories of mind have long seated subjects in neural EM fields. They first arose from renowned thinkers like Kohler, Libet, Eccles, and Popper (see Jones, 2013, for references). They're proliferating because they draw on considerable experimental evidence, withstand past criticisms, and help to avoid the problems in neuroscience listed in the sections above.

The two field theories relevant to our refined NCSD will treat the subject as a unified substance that acts back on the brain it arose from and binds neural activities to create unified mental objects. The brain's EM field is useful here because it interacts with neurons and has a continuity lacking in neurons, which enables it to bind separate neural processes to create unified mental objects. The subject will be seated in the neural EM field (including the electricity that produces it) in the sense that *the field generates the subject, yet the subject and its causal powers aren't reducible to the field as described by physics*. The nature of this nonreductive "seating" relation between subjects and fields will be clarified below in terms of nonreductive identity and (alternatively) looser causal relations.

We'll start now with four types of fast–growing evidence for these EM–field theories of mind. This evidence, along with the evidence against competing views, lends considerable support to these field theories, although it doesn't prove them. We'll turn in §6 to how this evidence helps field theories to metaphysically explain the seating of subjects and their qualia in brains and their fields—both ontologically and causally.

### 5.1 Locally activated EEGs

One type of evidence for field theories of mind comes from locally activated EEGs. They reveal local EM fields in brains. Importantly, these EEG responses track and correlate with conscious perceptions better than other known activities such as synchrony (Koch et al., 2016). This lends support to field theories that confine conscious perceptions to the diffuse ion currents localized right along sensory

circuits (these diffuse currents can even extend to neighboring circuits). While these strong, local fields extend long distances along each circuit, they nonetheless differ from the global EM field that wholly permeates the brain (including its inactive circuitries).

Attributing conscious perceptions to these local fields helps explain why we aren't aware of each other's experiences. For fields between brains are too weak—relative to the strong field localized right around each brain's circuitry—to unify experiences between brains. Seating the subject in the brain's EM field thus helps explain why the subject is a single, unified entity with boundaries and privacy—something that Murphy and Brown failed to explain above (§3.3).

### 5.2 Downward Causation

In our NCSD, the subject influences neurons in a recurrent (top–down) manner via these local fields. So fields aren't impotent by–products (epiproperties) of neurons. Instead, fields act back on the neurons generating them, as field theorists have long claimed. In this causation, spatially extended minds interact with brains via EM forces. This avoids the problems with Murphy and Brown's abstract/material causality and Descartes' immaterial/material causality. Yet these spatial minds still introduce conscious dynamics irreducible to those of physics (see §6).

This field approach draws support from recent studies of naturally oscillating neural fields, whose frequency comes from the firing frequency of the neurons generating the fields. Some experiments indicate that these fields affect circuits by sculpting the focus of attention and content of working memory. For example, ascending gamma–frequency oscillations correlate with sensory activity, while descending beta oscillations correlate with attention's inhibition of the gamma activity (e.g., Bastos et al., 2018). While these synchronized oscillations, themselves, don't unify consciousness (§3.3), they can reinforce the EM fields that do unify consciousness.

Skeptics dismiss all these studies by arguing that it's the neurons, not the fields, in this oscillating brain activity that affects attention and memory. This issue was addressed by Ezzyat et al. (2018). They showed that the fields do seem to help us perform memory tasks. They gave people lists of words to recall while electrodes monitored their lateral temporal cortex's oscillations. A computer algorithm spotted the neural EM waves that appeared when the people were most likely to recall the words. When those good–performance waves were absent, the researchers filled in for them by stimulating the cortex electrically. This nudge to the waves enhanced task performance. These good–performance EM waves thus seem to be needed for

recalling words.

Other skeptics argue that such field effects are really just caused by ions streaming out of gap junctions in cell membranes. But 2019 studies (e.g., by Chaing et al.) showed that when a hippocampus circuit is sliced through to block transmissions by synapses and gap junctions, then action potentials on one side of the slice still generate an EM field that actually propagates the signal across the slice. This slice showed that fields propagate signals even if gap junctions and synapses are blocked. So fields alone seem to effectively propagate neural activity at a distance.

Together, these studies offer dramatic new evidence in support of field theories of mind over standard neuroscience's purely neuronal theories. Chiang et al. take a major step toward performing Benjamin Libet's (2004) proposed test for EM–field theories of mind. The next test to ascertain whether such slices affect reports by human patients about their experience.

### 5.3 Neural Binding

As already argued, standard (neuron–based) neuroscience has trouble showing how our separate color and shape circuits bind together to form the unified colored shapes in images. This binding isn't explicable by synapses or synchrony (Murphy relies on the latter).

But NCSD may explain binding with EM fields. The brain lacks a single, central circuitry to bind colors and shapes together, yet its separate circuits generate a simple, continuous, and unified EM field. So, *seating experiences, and the subject that possesses them, in this field may help explain nonreductively how separate colors and shapes become the unified colors and shapes in images*. Binding in general can be enriched by the subject's active focal attention. All this is what we mean by saying that the subject helps bind experiences together.

This strong, local field reaches across discrete neuronal spaces and neuronal processing times as a continuous substance (for quanta in strong fields form a probability cloud of continuously high energy). Even where circuits don't connect synaptically, they can still unite if the localized fields in their ion currents make contact. This continuity supports the cross–modal binding of percepts, emotions, and thoughts that we attribute to the subject. These diverse experiences are ultimately unified by, and inherent in, the subject (LaRock and Jones 2019).

These reasons for attributing experiences to fields aren't sheer speculations. Recall the evidence in §5.1 that locally activated EEGs track conscious perceptions across brains better than other methods. This correlates perceptions with local neuroelectrical fields. Also, as noted in §5.2, there's growing evidence that

oscillating fields help attention to consciously control cognition. This suggests that consciousness may exert itself in the form of EM fields. (Recall that this activity occurs in Edelman and Tononi's dynamic core, which they tie to consciousness.) Further, there's evidence below (§5.4) that qualia tightly correlate with neuroelectrical activity.

Seating the subject in the brain's single, unified EM field offers replies to skeptics about the subject's existence. As already noted, Dennett denies that the subject exists like a little man in a theater inside the head. He criticizes this view because it has the little man interpreting incoming sensory information to perceive it as images. But this requires another man to explain how this perceiving works. This regress doesn't occur in NCSD, where images arise from neural circuitry in a ready, conscious form in the subject's awareness (see §5.4). Images are conscious inherently. The subject doesn't consult incoming information processing to perceive them.[6]

So, NCSD treats subjects as unified, private "ghosts in the machine" in that subjects are seated in the brain's field and interact with the brain through this field.

### 5.4 Sensory Qualia

Grounding the subject in the brain's EM field may enable NCSD to explain in testable ways how different sensory qualia arise. It may thus avoid the serious problem standard neuroscience faces here. Namely, processing circuits don't differ enough to explain the stark differences between qualia in the visual, taste, and other modes.

NCSD tries to explain how we're aware of different qualia by drawing on fast–growing evidence that different sensory qualia correlate with very intense, localized electrical activity in different sensory–detector cells. (The hard problem here is dealt with nonreductively in §6.) These cells reside at all levels of sensory circuitries. The electrical activity occurs in the cells' membranes, specifically, in their ion–channel proteins and G–protein–coupled receptors (GPCRs).

An example of these qualia–protein correlations is that temperatures correlate with unique ion channels, including TRPM8 for cold, TRPV3 for warm, and TRPV1 for hot. Also, sweet tastes correlate with the unique GPCR complex of T1R2 and T1R3, while savory correlates with the complex T1R1 and T1R3, and bitter correlates with the large GPCR family TAS2R (https://www.genecards.org/). Additionally, the

[6] Hume also treated the subject as illusory by arguing that it isn't observable introspectively. But arguably it is observable in the form of the mind's decision making, which involves plans, values, and memories. This controlling center gives the mind's contents a continuous, coherent identity (cf. Whiteley, 1973).

primary colors correlate with OPN1MW, OPN1LW, and OPN1SW, which are GPCRs of the opsin class (https://www.genecards.org/). There are far too many correlations across the various sense modalities to cover here (see Jones, 2019, for the full list and all citations). Such correlations arguably apply also between emotional qualia and limbic hormonal receptors (such as love and oxytocin, euphoria and endorphin, vigilance and adrenaline).

Some of these qualia take the form of pictorial images. This pictorial form can come from the undistorted arrays of grid and place cells in the entorhinal cortex and hippocampus, which help us recognize and navigate through scenes.

If all our different qualia ultimately do correlate with different electrically active proteins in detector cells, this would support this neuroelectrical theory of qualia over the existing theory of how different qualia arise (which is highly problematic). Our approach is thus testable. Unlike functionalists and computationalists, it takes qualia seriously. Unlike existing neuroscience, it may explain how our various qualia arise and how they unite to form our overall perceptions.

## 6. NCSD Field Theory

Before addressing exactly how NCSD can seat subjects in EM fields, we'll look at two existing field theories which agree with NCSD that subjects exist irreducibly and have powers outside physics. One field theory is dualist, the other is monist. Both can draw on the evidence above linking EM to the subject's unified experiences and to mental–physical interactions. We'll start with the dualist and monist field theories, then end (thirdly) with NCSD field theory.

### 6.1 Traditional Dualist Field Theory

Traditional (Cartesian–leaning) dualists argue that subjects are nonspatial. Of course, this faces the problem of how radically different subjects and brains can interact. But Lindahl and Arhem (2016) mount a sophisticated defense of Cartesian–leaning field theories—from Kohler, Libet, Eccles, and Popper—that seem less vulnerable to this traditional dualist worry. They argue that the subjective mind is nonphysical yet still interacts with the brain's action–potential patterns via the mediation of the brain's EM field. This can fit claims above that emergent subjects are seated in the brain's EM field and have a causal and unifying presence in relation to their brains.

Lindahl and Arhem defend dualist interactionism by, for example, drawing on Popper's view of De Broglie's pilot waves. Empty pilot waves aren't linked to

particles and don't carry energy. In some views, they can interfere with non–empty, energy–carrying waves. Non–energetic processes may thus influence energetic processes such as membrane potentials poised at firing thresholds. While their account is sketchy, it suggests how autonomous subjects that are incorporeal, non–energetic, and not directly observable might (via EM fields) have a causal presence in brains and influence physical operations there. Their theory thus aligns in various ways (apart from their nonspatial subject) with our NCSD.

### 6.2 Monist Field Theory

The second field theory is a non–reductive monist approach which draws on realist ideas that we experience our thoughts and feelings directly—while perceiving matter indirectly through eyes, instruments, reflected light, etc. So, we can't know matter's underlying reality beyond its sensory appearances. Authors from Russell onward have further argued that we can't know what brain matter is really like beyond perceptions of it. So, for all we know, this underlying reality of the brain could be the mind. Galen Strawson (2016) adds that all matter–energy may be conscious like this. This panpsychism is odd, yet Jones (2016) shows how it avoids perennial mind–body issues.

These are now familiar positions. They don't reduce conscious activity to the observable activity of neuroscience (which creates an explanatory gap). Instead, the conscious subject and its experiences are the underlying reality of neural activity beyond neuroscience's descriptions of it. This aligns with a non–reductive monist field theory in which the subject is the underlying reality of the brain's field, and this subject's powers are *autonomous* of physics.[7] For, in this view, if we weigh moral feelings or even choose what foods taste best, these *qualia comparisons* are determined by the *conscious, underlying reality* of our neural fields, not by electrodynamic principles (see Jones, 2017). So, this theory is a causal dualism (mental causality isn't reducible to physics) paired with an ontological monism (just one substance exists, consciousness).

This non–reductive monist field theory, like traditional dualist field theory, backs core claims of our NCSD—that the subject performs cross–modal binding and interacts with the brain via the neural EM field, yet exists irreducibly and is partly

[7] This monist field theory thus rejects bold claims that the empirical sciences will ultimately explain everything. While it isn't religious, it's compatible with monotheism's conscious act of creation (cf. the big bang), theistic ideas of free will, and mysticism's oceanic consciousness. Its account of how subjective minds emerge from oceanic consciousness (Jones 2016) might render mystical and theistic views compatible.

autonomous of physics.

### 6.3 NCSD Field Theory

Recall that Lowe's NCSD adopts a dualism of physical and mental substances (bodies and subjects) as well as a dualism of physical and nonphysical causes for subjects. Subjects and their causality are emergent from brains and hence can't be adequately described in neural terms. Yet subjects have spatial properties that allow them to interact with brains without Descartes' causal issues. Subjects are also simple, unified substances (unlike brain matter's myriad, dispersed neurons).

So, NCSD is genuinely dualist (causally and ontologically) like traditional dualist field theory. But it rejects this dualist field theory's claim that subjects are nonspatial. The two approaches represent cogent alternative formulations of dualist causality.

NCSD also resembles monist field theory. Both treat subjects as simple, unified, irreducible substances that exist in space and bring conscious, purposeful causes to brains.[8] But they're incompatible in several ways. Mental life arises from brain organization in NCSD's emergentist account, while mental life exists (to a degree) at all levels in monist field theory's panpsychist approach. Also, NCSD is causally and ontologically dualist, while monist field theory is causally dualist and ontologically monist. These two views represent two intriguing ways of reconciling dualist and materialist theories of mind. They blur the line between the two.

Despite their incompatibilities, NCSD might be modified by borrowing from monist and dualist field theories. For these views of fields might help NCSD explain two points that Lowe wasn't clear about. First, how do subjects come to be unified, simple substances? This unclarity may render Lowe's theory mysterious to some readers. Second, how do subjects' conscious, purposeful causes affect their bodies' physical causes so as to translate our purposes into actions? The subject's choices explain bodily motions by giving reasons for the choices, but not by giving physical–like causes or forces to the subject (Lowe, 2006). Accounts of motions without forces may be hard for many readers nowadays to accept. As already noted, giving subjects both reasons and forces might make conscious, purposeful causality more palatable to many readers.

How might fields help NCSD deal with the first question concerning how subjects come to be unified, simple substances? Recall that monist field theory explains this by treating the subject as the real nature of the brain's EM field, which is a simple,

[8] See Nathan Otteman's excellent unpublished manuscript, "The 3 tenets of non–Cartesian substance dualism as compatible with realistic monism."

unified substance in contrast to the neurons it emerges from. (Alternatively, Libet's (1993) traditional dualist field theory treats the subject as a unified field that arises from myriad neurons and acts back upon them—this field can be linked to neural EM, but it's irreducible to anything physical.)

Concerning the second question of how conscious, purposeful causes affect physical causes, recall that monist field theory treats subjects as EM fields that exert EM forces. This kind of approach might help NCSD explain how the subject's causality affects its body's causality. For it would show how reasons and intentions can exert forces upon brain activity.

In modifying Lowe's theory and recasting it to tackle these questions above, perhaps the two most viable options are as follows.

(1) One NCSD field theory could treat subjects as a *new kind of energy field* that interacts only with EM fields at short distances.[9] That is, each subject would arise from a brain's EM field, exist alongside it in space, and act back on this EM to govern the brain. The subject's unity would reflect the unity of the EM it arises from. This NCSD field theory would be dualist in that it would have both physical and nonphysical causality—and conscious and nonconscious substances. Yet everything is spatial, which arguably blurs dualism and physicalism.

(2) The other NCSD field theory could claim that consciousness is the *"real nature"* (in monist field theory's sense) *of EM fields*.[10] These conscious fields would be simple, unified substances, unlike the nonconscious neurons that generate them. As neuronal networks evolve, their conscious EM fields develop ever–more–complex experiences (from primitive sensations to organized thoughts) and emergent causality. The full–fledged subject emerges as self–reflection, planning, and free will evolve. But, even at earlier stages, the conscious neural field acts as a proto–subject, for without it, only separate neurons would exist—with no single, unified, guiding consciousness. This subject would also fulfill the other core features of NCSD above: it would interact with brains and be irreducible (ontologically and causally) to physics' observable fields.

Both NCSD field theories are a substance dualism of nonconscious matter and conscious subjects. And both are a causal dualism of nonconscious causality and conscious, purposeful causality. In these dualisms, subjects aren't part of physical science and often deviate from physical science's causal laws. Both help NCSD explain how subjects get their unified, simple form and interact with brains. Both avoid monist field theory's ontological monism—yet, like the monism, the NCSD

[9] This new field could interact with EM fields somewhat like the W boson interacts with EM.

[10] This would be a *greatly simplified* dualist field theory because EM fields wouldn't mediate between brain matter and subjects, as in other dualist field theories.

theories blur dualism and physicalism, retaining their virtues but avoiding their flaws.

Finally, note that all these field theories can adopt free will. They can adopt the libertarian stress on indeterminism as well as soft determinism's stress on self–determination versus social–biological determinism. But they all avoid Murphy's functionalist approach to free will, which ignores our feelings (§3.1 above). Murphy's approach overlooks the vital role of feelings in our self–determination, which involves consulting, prioritizing, and reconciling these competing feelings. Her view leaves us no more autonomous than a nonconscious robot that gets its fundamental aims from its programmers. Her supposedly autonomous top–down causes are really just puppets of the social and biological factors that dictate the goals of their information–processing.

By contrast, in the NCSD field theories, agents aren't puppets of sociobiological forces. For mental causation has *inner, conscious dynamics irreducible to external sociobiological factors*. Here, we construct our own autonomous goals in the form of principles and values. They're strongly influenced by external factors. But, crucially, these passionate principles introduce their own unfolding logics into our creative imaginations—a logic of ideas. New ideologies, art forms, etc. arise with lives of their own. They harness the external forces that help create them, transforming them into new directions. The input–output charts of Murphy's information–processing approach ignore the intrinsic passion that these principles embody.[11]

## 7. Conclusion

According to Murphy's Christian physicalism, neuroscience can explain minds better than dualism while at the same time preserving free will. But her view is just as problematic as Cartesian dualism. For example, her view ignores qualia, which impoverishes its accounts of minds, mental causality, and free will. We've refined dualism to avoid its issues and the issues Murphy and neuroscience face. This NCSD draws on experimental evidence but concludes that science can never fully explain minds and their causality. NCSD doesn't readily oblige Christian beliefs in immortality, but it does deny atheistic claims that science is the true paradigm of knowledge and that religion is outdated. Murphy's physicalist theory of mind unwittingly abets this atheism.

[11] So, unlike in Kane's Libertarianism, these field theories don't need indeterminism to preserve free will from the threat of social and biological determinism. For mental causation is already autonomous of this determinism.

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