Parts, Wholes, Humans, Fallacies

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Summary: Bennett and Hacker (2003, 2007) charged neuroscientists with a 'mereological fallacy': 'Psychological predicates' like 'to have sensations' refer to faculties ascribed to whole humans rather than to their parts, such as the brain. For the use of common language does not support an ascription to mere parts of humans. Seeking an alternative to this linguistic justification, I argue with inseparability, supervenience and emergence. My main point: A 'psychological predicate' refers to a faculty of complex behaviour, which is an emergence from a neuronal mechanism. The emergence supervenes the action of the human parts and their mechanisms and appears on the system level above that of the parts. By definition the emergence forces ascription of the faculty to the whole human rather than to a part of the human, justifying the fallacy. This reasoning also applies to animals that have no speech. It is more general than a reference to guidance by and limitations of human language.

Key words: Wittgenstein, mereological fallacy, psychological predicates, behaviour, inseparability, supervenience, emergence, mereology, systems theory.

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The problem

Based on a Wittgenstein quotation a "mereological fallacy' was proposed and numerous statements in the literature of neurobiology, which ascribe psychological predicates or faculties to something less than the human whole, were pinpointed as fallacious (Kenny 1971, 1984; Bennett and Hacker 2003; Bennett et al. 2007). Is this criticism justified?

The Wittgenstein quotation, Anthony Kenny calls it a dictum, reads:

> "Only of a human being and what resembles (behaves like) a living human being can one say: it has sensations; it sees; is blind; hears; is deaf; is conscious or unconscious"

(see § 281 in (Wittgenstein 1953)). In other words: Only of a complete human can one say 'She is conscious' or 'He loves music'. Attribution to a human part, like in 'Her brain loves music', does not make sense.

Why can a faculty, referred to by a 'psychological predicate', not instead be ascribed to a part of a human? Several reasons, they may all apply, come to mind:

a) The faculty or its 'psychological predicate' [2] is one of *behaviour,* the faculty permits to behave in a certain way.[3] Hence it is labelled 'psychological', it is a topic of psychology which deals with the behaviour of whole humans, not of neuroscience, which deals with neuronal mechanisms[4] in parts of humans. The faculty must be ascribed to behaving entities, deciding agents,[5] humans. In contrast parts do not behave, they function.

b) Because a faculty like 'to love music' is *emerging* [6] from the concerted activity of many human parts, it cannot be ascribed to a single part.

c) Because the use of *common language* does not allow to form sentences like 'Mary's brain loves music' or 'Mary's brain goes for a walk'. Such sentences do not make sense (Bennett and Hacker 2003; Bennett et al. 2007).

2 'Psychological predicates' refer to faculties (capacities, abilities) which may cause specific events and experiences and are expressed in *common language*, not in the biophysical idiom of spike-rates, convergence etc. To ascribe a faculty to A means that A is identified as the agent who can execute this faculty by causal interaction. To ascribe an event to X means that X caused this event, is its author. The verbs 'to attribute', 'to attach' and even 'to apply' have the same meaning as 'to ascribe', in this context.

3 Behaviour is understood as the complex (in cases stereotype) response of an agent (partially autonomous) to an internal or external stimulus.

4 Mechanisms are optimized and highly reproducible. The result or product of a mechanism is an emergence, it has the over-sum feature and is a property of the whole.

5 An agent is an at least partially autonomous being which can decide and act upon its decisions.

6 An emergence is a 'new' or 'over-sum' faculty or function owned by the whole (see Aristotle's over-sum principle (Aristotle ca. 330 B.C.)). It appears on a supervenient system level, due to a concerted action of parts constituting mechanisms on the next lower (the subvenient) system level. The 'over-sum' faculty is a property of the whole, not of separate parts. It may be difficult to predict or explain. This, however, may improve with increasing experience. See also Dennett's 'innocent emergence' (Dennett 1991).

In (a), psychological predicates are understood as predicates of behaviour (e.g. to vote, to go for a walk, to love ones neighbour, to behave as expected, to joke, etc.). Behaviour, in turn, is understood as a complex *emergent faculty* [7] generated by mechanisms of many concerting human parts and owned by a human whole. Thus a psychological predicate refers to an emergent faculty of a human.

In (b), an emerging faculty like 'to love music' is generated by many concerting human parts on system level n. 'Emergence' by definition implies attribution to the system level n+1, above that of the concerting parts. This is the level of the human whole, who owns the faculty.[8] Therefore, Wittgenstein's dictum can be recognized as a case of emergence. Simply by applying basic systems theory to emerging faculties, the dictum would be justified, the case solved.

However, Bennett and Hacker paid little attention to emergence (Bennett and Hacker 2003: p.359,360) and systems theory. In the tradition of the 'linguistic turn' they focussed on language.

Language

The language argument (c) of Bennett and Hacker is intriguing. What we can say may be true or not, that is not the point. In any case it must conform to the implicit roadmap or framework of concepts, supposedly including past-present-future and parts-whole distinctions or subject-object duality. If it does not conform to such ancient framework, which guides and limits our thinking, it will not make sense. Therefore “conceptual questions antecede matters of truth and falsehood”. [9]

There is no doubt that any hidden 'framework of concepts which guides and limits our thinking' will meet with great interest. However, the reasoning leaves unmentioned that the words (and concepts) available in common language are slowly changing as the language develops. Thus the reasoning does not account for a development of language, it neglects the steady advance of our concepts since ancient times.

Psychological predicates are at the centre of the linguistic justification. Since ancient times they permit the formulation 'He loves', but not 'His brain loves', preventing an application of the predicate 'loves' to parts. For the use of common language does not support an ascription to mere parts of humans.

However, the use of language does not always prevent attribution to parts. Suns are parts of galaxies. We have no problem saying “Light is emitted from the galaxy” or “Light is emitted from parts of the galaxy, from the suns.” Apparently, in this case the mereological principle 'do not attribute to parts' does not apply. This because the predicate “to emit light” refers to a physical emergence of parts of the galaxy, while Wittgenstein's dictum is concerned with psychological emergences which are properties of the

7 Francis Crick discussed the relation of emergence and behaviour (Crick 1994).

8 The human whole includes all human parts, as will be shown when discussing inseparability.

9 See page 4 in (Bennett et al. 2007).

whole, not of parts.

Note further that the linguistic justification is hardly applicable to animals even though animals establish bonding (love) and are conscious, faculties which may well be referred to by psychological predicates. But animals do not enjoy the benefit of human language.

Therefore it seems worthwhile to look for a foundation of Wittgenstein's dictum more general than guidance and limitation by language. Below, I attempt this search using concepts from mereology and systems theory.

Parts and wholes

Ascription of a faculty to humans and / or to their parts is best discussed in terms of mereology, which deals with the relation of parts and wholes. Let us begin with the wholes. Wittgenstein's dictum specified a 'living human being', which has rather broad associations. Bennett and Hacker, by coining a 'mereological' fallacy, implied that a human being and a mereological whole are related if not identical. Yet the terms 'human being' in common language and 'human whole' in mereology have diverse meanings:

1. *The human being as the psycho-physical and whole-parts unity.* This will be the meaning of Wittgenstein's term 'living human being'. The prerogative nature of a whole that cannot cause and the executive power of interacting parts are fused into an inseparable unity.
2. *The prerogative whole:* is an official representation, like a state representing its subjects. When a human is called by name, the name stands for this individual living being. Prerogatively, the human Self claims responsibility (authorship) for the bodily and mental phenomena it becomes aware of, even though most of them are initiated by unconscious processes(Wegner and Wheatley 1999).
3. *The constituted whole:* is made of parts. The whole is constituted by the parts, say by the components of a mechanical clock.
4. *The whole as owner of emerging properties:* A whole is the property bearer of faculties emerging from underpinning mechanisms. Given the functional parts of a running mechanical clock, a distinct angular velocity of the arms emerges. It is owned by the whole, comes about by concerted action of the parts and cannot be attributed to merely a single part.
5. *The realized whole:* The parts realize the whole (Kim 1994: p.582). For example, the neuronal is realizer (and therefore is reduction base) of the mental. Then mental phenomena can in principle be reduced to neuronal mechanisms, a position known as reductive physicalism.
6. *Others*

Case (1) comes close to the conclusion of this paper, we shall postpone it for the moment. Note that in all of the above cases the wholes are not independent and interacting entities. This was aptly pointed out in the 'double subject fallacy' (Mudrik and Maoz 2015). Rather, a whole depends on its parts. The parts, in turn, are real objects. They have an independent existence and may undergo causal interaction. The whole, however, merely has a dependent ex-

istence, is not concrete, cannot exist without its parts and, as we shall see, cannot undergo causal interaction.

Inseparable

Clearly, parts which exist independently may be removed physically from the remaining parts and thereby from the whole (e.g. Winston, Chaffin, and Herrmann 1987). The whole will change accordingly, but remain a whole. A whole, however, cannot exist without its parts. Hence there is no way to physically separate a whole from its parts (inseparability).

Wholes cannot cause

As a consequence of inseparability, a whole lacks the power of interaction (1) with its parts as well as (2) with other objects. Therefore a whole cannot cause.

1. For a whole can interact with its parts only if separated from them. But such separation is impossible (e.g. Lindemann 2014; 2015: p.12).
2. Further, the whole *supervenes* over its parts,[10] it cannot be changed except by changing a part. Therefore an *inter*action of the whole with concrete objects, which are not parts, would change the whole without changing the parts. This, however, is impossible as it would violate the supervenience of whole over parts.

Thus causal interaction, the *modus operandi* of neurons, cannot be ascribed to a whole. Wholes cannot cause, they cannot be the agent who executes a faculty. Ascription of a faculty to a whole alone is impossible.

This conclusion affects the Wittgenstein dictum. We have to distinguish 'human being' from 'human whole'. A 'human whole' cannot cause, while a 'human being' can.

Ascription to 'human being'

We are guided by the principle that whole and parts are not separable. Since a whole has a dependent existence, since it supervenes over the parts, it adjusts *per relationem* when a part is changed. 'Ascription' of a faculty or predicate means that the agent is named which causes events resulting from a faculty or predicate. Given inseparability, the agent is always a fusion of the whole and its parts. Thus a faculty ascribed to a part is implicitly also ascribed to the whole, which adjusts to the change *per relationem*. Further, a faculty ascribed to a whole, which cannot cause, must also be ascribed to parts, which are the true origin of causal events. Ascription to a whole alone but not to a part or to a part alone and not to the whole is not possible, foremost

10 Supervenience: As introduced by Donald Davidson (Davidson 1970), S supervenes over R if S cannot change without a change of R. Being constitutive, a whole supervenes over its parts (see Kim's *mereological supervenience*, which is asymmetric (Kim 1994: p.582), as discussed in (Lindemann 2015: p.17)). Thus whole and parts are not independent, interacting subjects (Mudrik and Maoz 2015).

because it violates the principle of inseparability. Thus ascription is always to the unified 'human being'.

Emergence

Inseparability and supervenience apply to faculties emerging from mechanisms. As an example, take an alarm clock. It consists of many parts which are engaged in concerted action on system level n. The emerging faculty “to ring on time” arises on system level n+1 as a property of the whole. The whole cannot exist when separated from the parts. The faculty cannot be ascribed to anyone part alone, even though each part may be essential for the emergence. Further, it cannot be changed except by changing a part. Thus the emerging faculty “To ring on time” is not separable from the concerted activity of parts and supervenes over the concerted activity.

Notably, in the example the (in this case physical) emergence on system level n+1 is that faculty, which is referred to by the predicate “to ring on time”. Based on this identity, ascription of the faculty must automatically be to the whole owning the emergence or rather, because the whole is not separable from its parts, to the 'alarm clock with its parts'. This is exemplified for humans by Wittgenstein's dictum, which is a special case of emergent systems.

Animals

When animals are considered, a linguistic justification based on spoken words is hardly applicable. Yet animals certainly have neuronal mechanisms which give rise to emergencies, forcing ascription to the animal-being, the whole animal. We arrive at the animal dictum:

> “Only of a whole animal, not of its parts, one can say: It has sensations; it sees; is blind; hears; is deaf; is conscious or unconscious.”

The populations of animals include humans. Replacing Wittgenstein's dictum with the animal dictum, we remove the linguistic justification but retain the more general justification by emergence, which arises from neuronal mechanisms of parts and supervenes them.

Conclusion

The justification given for Wittgenstein's dictum, based on the use of common language which guides our thinking with a framework of time-proven relations, tends to neglect the slow advance of concepts apparent in the development of language. Further, the linguistic justification is hardly applicable to animals who love (establish bonding) and are conscious, but communicate with body language rather than with spoken symbols.

The new argumentation developed here, based on inseparability, supervenience and emergence, offers a more general alternative. In short, a psycholo-

gical predicate refers to a faculty of complex behaviour, which is an emergence. It supervenes the parts and appears on the system level above that of the parts, forcing ascription of the faculty to the human being or whole human, rather than to a part of the human. Thus the definition of emergence already suffices to justify Wittgenstein's dictum.

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