

Neuroscience

and its hitchhiker's guide to the galaxy

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'Psychology has always been in bit of an identity crisis', Lisa Feldmann Barrett states in her article about the future of psychology, 'trying to be both a social and a natural science' (2009, 326). 'The largest challenge in 21st-century psychology' is the 'mind-brain correspondence' (Ibid). With this statement Feldmann Barrett enters the gap between psychology and *cognitive neuroscience*¹ that has expanded tremendously ever since the first neuroscientific successes. Typical questions within the current neuroscience are about the evolvment and even overruling of neuroscience regarding psychology as a scientific discipline. The question of concern in this essay is how the relation between neuroscience and psychology will unfold in the next decades. Its answer is metaphorically speaking subject to *multiple realizability* (Putnam, 1980; In: Kievit et al., in press), and will be considered in the light of the scientific foundation of psychology's identity crisis.

The question about the future relation between psychology and neuroscience is a layered one, which could be answered at (but not reduced to) different levels. The question concerns two scientific domains that are practiced in different institutes with different means by differently educated scientists. Are we heading towards a paradigm shift (Kuhn, 1962), or might there still be a chance for these two domains to reunite? A second layer concerns the object of study, that is, the connection of the opposing terms 'brain' and 'mind' to neuroscience and psychology, respectively. Are these terms just different words that shape the way we look at our object of study (Feldmann Barrett, 2009, 329) or are they different concepts that are yet incommensurable (Kuhn, 1962)? The final layer concerns the linguistic content of the term 'psychology', that might refer to psychological knowledge as opposed to neuroscientific knowledge, but also to the general scientific discipline 'psychology' that contains the domain cognitive neuroscience among others. Is it possible for cognitive neuroscience to escape psychology's maternal wings?

According to Thomas Kuhn, science is always processed out of and within a certain scientific perspective, that shapes scientific observation as well as the questions about and the interpretation of these observations (Kuhn, 1962). In this so-called *paradigm* scientist's heads are more or less turned in the same direction. This

¹ Hereafter referred to as 'neuroscience'.

way researchers in a certain field are able to ‘produce major novelties, conceptual and phenomenal’ (Kuhn, 35). The conjoint effort to extend psychological hypotheses about brain functioning in a variety of psychological domains, to actual neuroscientific research, might serve as a perfect example of such major novelties within a paradigm. Starting out as convenient novelty, neuroscience now heads towards being the new leading perspective in psychology. Being the (self-stated?) mayor of the discipline, one might ask if neuroscience is progressing towards being a broadly established *school* within psychology, or that it might actually cause a paradigm shift that will result in a degradation of classic psychological research (Kuhn, 165). Unfortunately prediction of this sort does not seem to be more than a wild guess, but attention might be paid to the implications of both options for the other layers of this essay’s central question.

In order to reunite the concepts mind and brain, Feldmann Barrett states that ‘psychology may need a different set of psychological categories’ (2009, 330). These categories ought to be ‘described in [their] own terms and with [their] own vocabulary’, ‘as a combination of psychological primitives’(Feldmann Barrett, 332). How far this solution may reach with regard to the reconnection of psychology and neuroscience, depends on the development of neuroscience as either a psychological school or as a new established paradigm. If neuroscience is headed towards taking over psychology’s throne entirely, then according to Kuhn *incommensurability* is lurking (Kuhn, 1962, 103). Embracing a new scientific perspective may lead to an all new scientific language, in which the formerly common language might henceforward fundamentally be misunderstood. So within neuroscience as a currently established psychological school, Feldmann Barrett’s suggestion of creating a new vocabulary might be useful to gain a better understanding of the object of study. However, if neuroscience is on its way to state a new paradigm, the traditional psychological perspective, including Feldmann Barretts psychological primitives, might be fundamentally degraded. In that case, the aim of reuniting brain and mind is likely to be trampled by the paradigm shift marching in.

Whether neuroscience is able to become the big winner of such a paradigm shift is doubtful though. As Kievit et al. state, ‘cognitive neuroscience involves simultaneous analysis of behavioral and neurological data’ (Kievit et al., in press, 2). The ultimate goal of neuroscience, however, seems to be a model in which the psychological attributes (P-indicators) are altogether replaced by neurological

processes (N-indicators; Kievit et al., 8) – for example, finding the *g factor* without extensive consideration of observable or adaptational behaviour. To this aim several objections could be made. Practically, it is impossible to develop such a variant of the reflective model without guidance of psychological constructs and measurements (Kievit et al., 37). Furthermore, neuroscience will always remain focused on understanding human beings, that is, people. Without input from the functioning human being, there will be no observations, no questions, no interpretations that can add up to testable hypotheses or formalizable models about the functioning of the brain. This statement might be repudiated stating that the neuroscientific object is the brain itself, and that the scientific aim is to find out how the brain is build up – either as a total of structural parts, or as a network of dynamic processes. However, this would imply that the aim of neuroscience is to describe the functionality of its object of study, which is to say that neuroscience is focused at *Verstehen*, rather than at *Erklären*². Having identity crisis already, as Feldmann Barrett points out (2009, 326), such a twist of scientific focus would push neuroscience to a side of the psychological field it actually pleads to avoid, not to say overcome.

So assuming that neuroscience is not eager to become a describing science – as Kievit et al. (in press) state that ‘the conceptual elephant in the room is *how* [...] concepts relate [...] and] what the causal relationships between them are’ (Kievit et al., 5, underlining by author) – it will rather be unavoidable for cognitive neuroscience and psychology to somehow stay intertwined. That is to say, however intriguing the brain itself is, to properly explain it, psychology will at least stay around as neuroscience’s hitchhiker’s guide to the galaxy.

² For a thorough consideration of the division between *Verstehen* (to understand) and *Erklären* (to explain), see Leezenberg & De Vries, 2007.

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