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Commentary title: Elimination, not Reduction: Lessons from the RDoC and Multiple Realisation

Author's name: Pernu, Tuomas K.

**Author's institution: Department of Philosophy, King's College London
and**

**Molecular and Integrative Biosciences Research Programme, Faculty of Biological and
Environmental Sciences, University of Helsinki**

**Author's institutional mailing address: Department of Philosophy; King's College London;
Philosophy Building, Strand; London, WC2R 2LS; UK**

Author's institutional phone number: +44 78 3511 1893

Author's institutional email address: tuomas.pernu@kcl.ac.uk

Author's home page url: <http://www.tuomaspernu.london>

Abstract. The thesis of multiple realisation that Borsboom & *al.* are relying on should not be taken for granted. By dissolving the apparent multiple realisation, the reductionist research strategies in psychopathology research (the RDoC framework in particular) aim to lead to eliminativism rather than reductionism. Therefore, Borsboom & *al.* seem to be aiming at a wrong target.

Borsboom & *al.* aim to show that reductive research strategies are misguided in the context of psychopathology research. More specifically, they claim that adopting network models as an alternative framework for the analysis of mental disorders will show how the reductive aspirations of

the traditional research are ill-founded. It seems, however, that they have misconstrued their target: the ultimate aim of neuroscientifically-based research (or more generally, physiologically-based research) on psychopathology is not to reduce mental disorders to neural phenomena, but to eliminate the current notions of mental disorder altogether by changing the nosological practices in fundamental ways.

The focus of the analysis that Borsboom & *al.* are offering is on a DSM-based nosology. The DSM defines mental disorders in a symptom-centred way. There is nothing inherently wrong with this: after all, it is from symptoms where all clinical work starts off, and the DSM can therefore be a useful diagnostic tool for clinicians. But Borsboom & *al.* are not interested in clinical practices in psychiatry, at least not primarily, but in psychopathology research – in the question of what mental disorders really are, and how we should conduct research on defining their true nature. Symptoms, however, are mere signs, marks of the underlying disorder or illness, and even in clinical practice the ultimate aim is not just to remove the symptoms, but to cure the physiological condition they stem from.

Therefore, those who are explicitly proposing reductionist research on psychopathology tend to stress that basing our scientific understanding of mental disorders on the DSM is ill-founded. In particular, the Research Domain Criteria (RDoC) project aims ultimately to replace the DSM-based classifications of mental disorders. The main thrust of this project is in the conviction that the DSM nosology is invalid: that it clusters together disorders that are symptomatically similar, but aetiologically and physiologically different (*cf.* Cuthbert 2014; Cuthbert & Kozak 2013; First 2012; Insel & *al.* 2010). We should therefore aim to abandon the superficial DSM classifications, the idea is, and replace them with more valid classifications based on physiological aetiologies. Thus, this agenda is eliminativist, not simply reductionist, and Borsboom & *al.* seem to be aiming at a wrong target.

Philosophically the tension between the DSM and the RDoC can be easily appreciated. The core of the issue is whether mental states – mental disorder types in this case – are identical with their physiological realisers. In current philosophy, this question translates into the question of whether mental states are multiply realised (Fodor 1974; Putnam 1967). This issue is also at the heart of the analysis Borsboom & *al.* are offering. However, Borsboom & *al.* simply take for granted that the answer to this question is positive. But there are a number of reasons to be sceptical of multiple realisation (*e.g.* Bechtel & Mundale 1999; Bickle 1998, 2003; Polger & Shapiro 2016; Shapiro 2000). As illustrated in figure 1, the apparent cases of multiple realisation (figure 1A) have the tendency to become dissolved either by kind splitting (figure 1B) or by realiser merging (figure 1C). In the former case the purportedly multiply realised mental state or function (*M*) splits into two (or

more) separate entities (N_1 and N_2) as it is understood that the mental state or function does not constitute a single, unified psychological or neural entity (e.g. the way that “memory” or “attention” split to several different psychological and neural functions). In the latter case the purportedly multiply realised mental state or function is identified with a single, unified neural state or function (N) as it is understood that the different realisers are actually physiologically the same (e.g. the way that intentions to grasp objects can be identified with the average neural activity of specific neural ensembles).

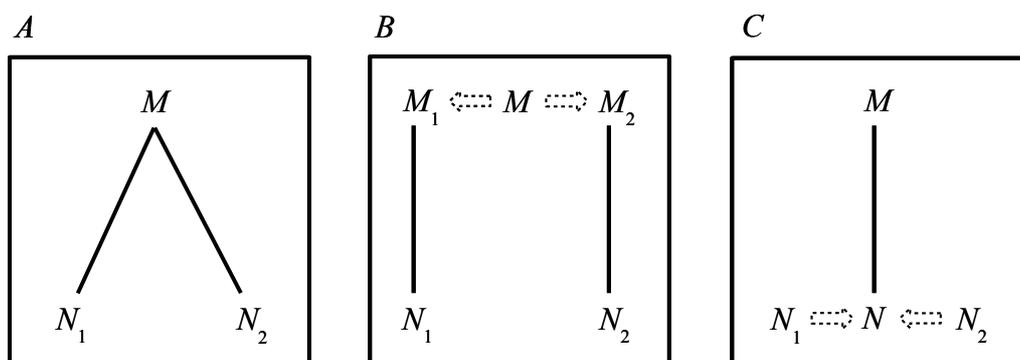


Figure 1: figure 1A represents the multiple realisation hypothesis, figure 1B represents kind splitting, and figure 1C realiser unification or merging. (From Pernu (forthcoming-a).)

The RDoC framework can now be seen to aim at kind splitting: the apparently (symptomatically) homogeneous clusters of mental disorders (classified in terms of the DSM) can be predicted to split into new, homogeneous sub-clusters, each aligned with their physiological constitution (cf. Pernu forthcoming-b). Mental disorders would therefore be multiply realised no more. The result is not reduction (as in figure 1C), but elimination: our current understanding of mental disorders – “folk psychiatry” – will be fundamentally transformed, and the symptomatically defined notions of mental disorders (M) will give way to new notions, aligned with their neural-level realisers (M_1 and M_2).

In principle, there is a more forceful argument on offer for challenging the reductionists (or eliminativists). One could claim that different mental states, different mental disorders in particular, could be realised by the same physiological states. In other words, one could claim that it is not multiple realisation, but rather “multiple realisation in reverse” that the non-reductionists should be focusing on. And in fact, in places Borsboom & *al.* point to this sort of an analysis. Note that this line of thought does not have to be in any way particularly controversial: neural plasticity and reuse would already indicate that the same neural basis could give rise to different mental functions (cf. e.g. Anderson 2010).

If mental disorders would indeed be multiply realised in reverse, that would undermine the reductionist research strategies in a quite straight-forward way: we could not read off mental

disorders from any biomarkers for any (or at least some) markers could ground different mental disorders. However, not only do Borsboom & *al.* fail to focus their analysis on this issue, one can immediately point to a fundamental philosophical problem: multiple realisation in reverse would breach the core idea of nonreductive physicalism, namely the idea that the physical basis is sufficient to exhaustively fix all the higher levels of reality (mental disorders among them), *i.e.* the idea of mind-body supervenience. Basing the analysis on the thesis of multiple realisation in reverse (rather than on the traditional thesis of multiple realisation) would therefore be bound to amount to a Pyrrhic victory.

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