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Specific Mechanisms versus General Theories in the Classification of Disorders

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Oulis (2010) pointed out that there is a great deal of interest in specific mechanisms relating to mental disorders and that these mechanisms should play a role in classification. Although specific mechanisms are important, more attention should be given to general theories. The following example from Salmon (1998) illustrates the difference.

Imagine a boy in an airplane holding a string attached to a helium-filled balloon. The airplane accelerates down the runway and takes off. Does the balloon move forward or backwards? Actually, the balloon moves forward and Salmon (1998) points out that there are at least two ways of explaining it – the mechanism explanation and the general theory explanation. The mechanism explanation is that the rear of the airplane pushes on the air molecules in contact with it, which in turn push on other air molecules, and so on until the balloon is pushed forward. The general theory explanation uses the equivalence principle from Einstein's theory of relativity. According to this principle, gravity and acceleration are indistinguishable. Therefore, forward acceleration is equivalent to inducing "gravity" towards the rear of the airplane. The helium-filled balloon is less dense than air and moves against this "gravitational force" due to displacement, as usual. Salmon (1998) points out that both theories are "right" but that the explanation that uses Einstein's theory is more unifying than the mechanistic explanation. Although mechanisms often are mistaken for theories, it is the theories that are unifying.

Moving to the issue of clinical classification, I have argued in a previous Dialogue (Trafimow, 2010) that such classification should be based on theories. The problem is that we currently do not have any theories of sufficient quality to make this work. Can a focus on mechanisms help us develop better theories?

Frankly, I am skeptical. One never knows what will stimulate someone to discover a brilliant theory and so it is entirely possible that advances in elucidating mechanisms will fulfill this role. Nevertheless, a quick look at the very successful science of physics suggests otherwise. Consider some famous physics equations such as force = mass x acceleration, energy = mass x square of light velocity, and others. Note that there are no causal mechanisms in these theories; the theories merely state how variables are related to each other. In general, the problems with defining causality are well known, there are no widely accepted definitions, and planting classification systems in such unstable soil is likely to be problematic.

For those who insist on causality, despite the known difficulties, I have a compromise position. Let us restrict causality to experiments but have theories that are not causal. For example, Newton's force = mass x acceleration implies that applying a force will result in an acceleration. If one wishes to say that applying a force will cause acceleration, I am willing to compromise to the extent of allowing this. But let us not mistake this causal mechanism for a theory; to reiterate, the equation has no inherent causality though one might derive a variety of causal hypotheses from it.

I have suggested that the goal is to have general theories that specify relations between variables rather than causal mechanisms, though

causal mechanisms might be useful as hypotheses to test general theories. Given this, it seems unlikely that expanding the list of causal mechanisms is likely to lead to the kind of profound theorizing that is needed to provide a strong basis for clinical classification.

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