

REPLY

Psychology and Neuroscience: How Close Are We to an Integrative Perspective? Reply to Staats (2016) and Tryon (2016)

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This article responds to commentaries written by Warren Tryon (2016) and Arthur Staats (2016) concerning Schwartz, Lilienfeld, Meca, and Sauvigné (2016). In this reply, we reiterate our key thesis—that psychology, and the problems it addresses, are likely best approached from multiple levels of analysis. Unlike Tryon, we are not convinced that neural networks and computational neuroscience provide a single template through which all of psychology can be integrated. We are in agreement with Staats that attempts to reduce psychological phenomena to neural events alone are likely to be misleading and unproductive. One important example where such reductionism has been alive and well is addiction, where prominent biomedical models have defined *addiction* as a “brain disease.” Our reply article concludes by arguing that a multilevel approach to psychology is essential in guiding hiring practices, funding agency priorities, and training students.

Keywords: psychology, neuroscience, reductionism, multilevel

As we noted in Schwartz, Lilienfeld, Meca, and Sauvigné (2016), neuroscience has assumed an increasingly prominent role within psychology, shaping our discipline’s research, funding, hiring, educational, and intervention priorities. Fields such as cognitive, affective, social, and cultural neuroscience have emerged from the simultaneous consideration of neurobiological and experiential phenomena. A number of threads of neuroscience research, including functional brain imaging but also molecular and computational methods, have rapidly increased the contributions of neuroscience to a variety of subfields of psychology. We welcome all of these methods as promising advances that will almost surely contribute to our knowledge of psychological phenomena.

At the same time, the primary thesis of our article was that the rise of neuroscience within psychology does not contraindicate allowing—and indeed encouraging—various nonneuroscience subfields of psychology to flourish. There are almost certainly many pressing basic and applied research questions in subfields such as cultural, personality, developmental, and social psychology in which neuroscience may not be the most appropriate level of analysis at which to focus or intervene. For example, examining how immigrants adjust to their new sociocultural environments, or how family members derive meaning from one another’s statements and nonverbal cues, might more profitably focus on subjective perceptions of events, and on assessments of observable behavior, than on individuals’ brains. This is not to say that neuroscience *cannot* play a role in addressing these issues, of course. Rather, our argument is that the most fruitful level of analysis (and intervention) for these issues is, at present, likely to be experiential and relational, rather than neural.

Tryon (2016) argues that our levels-of-analysis framework is unnecessary because computational and neural-network models are already available to explain all, or nearly all, psychological phenomena. We agree that neural network models should be pursued and are likely to provide

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valuable insights (Tryon, 2014). Nevertheless, we do not share Tryon's unbridled optimism. Indeed, we do view with skepticism the claim that neural network models—or any other models, for that matter—currently provide a basis for integrating all of psychology. Tryon himself referred to a “proof of concept” for neural network models (Tryon, 2014), but a proof of concept—that is, a demonstration that a theory *can* in principle account for a phenomenon—does not constitute evidence that it *does* account for this phenomenon. Henriques (2004) has cautioned our field regarding “unification traps,” whereby a single, dominant paradigm—whether it be neuroscience, behaviorism, or psychoanalysis—is taken as the answer to all of the field's unresolved questions. Such premature proclamations are tempting, but they often lead to logical errors when principles from the dominant paradigm are used to explain phenomena that are beyond that paradigm's reach (Satel & Lilienfeld, 2013).

Supporting our perspective, Staats (2016) contends that many attempts to explain psychological phenomena using neuroscience principles entail logical flaws, such as assuming causation based on correlational evidence. At present, neuroscience and more experiential areas of psychology employ different concepts, adopt different language, and make use of substantially different methodological approaches. The *bridge laws* that link brain functioning to psychological processes have yet to be explicated in a way that would allow a full integration between neuroscience and various areas of psychology. Computational methods may ultimately have the potential to establish such linkages, but this realization remains to be seen.

We close by reiterating that neuroscience must be humble in its aspirations and that psychological phenomena are best construed at multiple levels of analysis. For example, we

caution against assertions that psychological and behavioral problems, including addictions, are exclusively *brain diseases* (e.g., Volkow, Koob, & McLellan, 2016) without attention to relevant psychological variables. The optimal role for neuroscience will almost certainly be to supplement, rather than to supplant, various subfields of psychology. It is essential for hiring practices, funding agency priorities, and training of students, among other areas, to attend to the diversity of approaches in our field and to the important contributions that each of these approaches can make.

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