Six challenges to theoretical and philosophical psychology

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The confusion and barrenness of psychology is not to be explained by calling it a "young science." […] For in psychology there are experimental methods and *conceptual confusion*. The existence of the experimental method makes us think we have the means of solving the problems which trouble us; though problems and method pass one another by.

> Wittgenstein (1958, p. 232)

Sometimes it pays off to "think."

> Pernu (2008, p. 36)

Psychology is not a young science anymore: as the textbooks tell us, it won its independence, from philosophy, a century and a half ago, through the efforts of such luminaries as Gustav Fechner and William James. And yet, if an offhand remark by a long-dead philosopher on psychology's conceptual confusion still touches a raw nerve in some of us psychologists, it is probably because psychology's intellectual roots have been all along, and will likely remain, firmly planted in the philosophy of mind.

Philosophy and psychology may be seen as rivals insofar as each counts the other as a proper part of its subject matter. This stand-off can, however, be resolved in a peaceful and productive manner, if we only realize that psychological science and the philosophy of mind are also natural partners, because these disciplines have joint custody over some of the most daunting – and most exciting – questions that humanity ever dared to contemplate. This partnership is too precious to be treated casually: arguably, the most momentous theoretical advances in psychology are typically motivated by deeply philosophical considerations, and the best thinking in the philosophy of mind is inspired by, and reflects back upon, scientific findings and theories.

An exemplary approach to the relationship between philosophy and psychology is the one advocated by Quine (1969, pp. 126–127):

My position is a naturalistic one; I see philosophy not as *a priori* […] groundwork for science, but as continuous with science. I see philosophy and science as in the same boat – a boat which, to revert to Neurath's figure as I so often do, we can rebuild only at sea while staying afloat in it.[1] There is no external vantage point, no first philosophy.

In the remainder of this brief note, I list some of the challenges that mark the frontiers of theoretical and philosophical psychology and that are motivated both by the lingering echoes of Wittgenstein's criticism and by Quine's positive outlook.[2]

HOW TO PAINT THE BIG PICTURE

Perhaps the greatest challenge facing any attempt to understand how the mind works is the need to take in massive amounts of data. In physics, the fate of a foundational theory, and hence a certain broad-canvas conception of the universe, may hinge on the outcome of a single experiment.[3] In contrast, in psychology (and in the neurosciences), a vigorous but undiscriminating application of the scientific method can only result in a big picture in the style of Jackson Pollock – unless, on the one hand, proper theoretical tools are brought to bear on all stages of the scientific inquiry and, on the other hand, intellectual discipline that characterizes properly conducted philosophical inquiry is exercised. The present journal, *Frontiers in Theoretical and Philosophical Psychology*, will adopt precisely this two-pronged approach.

Given the mind's complexity and the need for its explanation to span many levels (Marr and Poggio, 1977; Marr, 1982), theorists who study it must develop a sophisticated strategy for dealing with published experimental findings. Which ones should I ignore as insignificant, even if they appear in the best journals? Which ones should I think hard about, even if the theoretical accounts offered by their authors make little sense to me? And which ones should I actively seek out, to fill a gap in my understanding of things?

Interestingly, insofar as these meta-scientific questions have to do with differential *value* that we place on different items of knowledge, they are also philosophical. Hilary Putnam[4] described this situation as follows (Putnam, 2012, p. 47):

I have argued that even when the judgments of reasonableness are left tacit, such judgments are presupposed by scientific inquiry. (Indeed, judgments of *coherence* are essential even at the observational level: we have to decide *which* observations to trust, which scientists to trust – sometimes even which of our *memories*

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[1]Here's Otto Neurath's boat metaphor (*Protokollsaetze*, Erkenntnis 3: 204–214, 1932), as explained by Quine (1960, p. 3): "We are like sailors who on the open sea must reconstruct their ship but are never able to start afresh from the bottom. Where a beam is taken away a new one must at once be put there, and for this the rest of the ship is used as support. In this way, by using the old beams and driftwood the ship can be shaped entirely anew, but only by gradual reconstruction."

[2]For a somewhat different set of challenges to theoretical psychology, which complements those listed here, see Lloyd (2010).

[3]Here and elsewhere in the present article, I single out physics in the hope of helping to dispel the popular misconception that scientists who are not physicists are prone to physics envy. Given how much more complex psychology and the neurosciences are, compared to physics, cognitive scientists should by rights be proud enough of their own domain and mode of inquiry. Moreover, when a research program in cognition (e.g., "generative" linguistics; Chomsky, 2004) does make a point of looking up to physics, the results tend to be, historically, less than encouraging (see Postal, 2004, for an overview and Bouchard, 2012, for an in-depth critical examination of a central aspect of Chomsky's Minimalist theory).

[4]Putnam is, to the best of my knowledge, the only living philosopher who has been compared with Aristotle, Leibniz, Kant, Mill, and Russell all at once (De Caro and Macarthur, 2012, p. 1).

to trust.) … I have argued that my pragmatist teachers were right: "knowledge of facts presupposes knowledge of values."[5]

TRUTH AND CONSEQUENCES

The realization that values have a place in meta-theoretical discourse in psychology (just as they do in other sciences) gives us license to set our sights considerably higher than merely gathering reliable and ample empirical findings with regard to whatever psychological phenomenon that is under investigation. Psychology should, I believe, position itself so as to be able, with full confidence, to echo a sentiment with which the emeritus MIT professor of linguistics Morris Halle reportedly used to open his course: "I'm not here to tell you the news; I'm here to tell you the truth."[6]

Can one reasonably hold a theoretical claim in psychology to be true, in the same sense that, say, special relativity is in physics? I think so, and my case in point, which I argued at length elsewhere (Edelman, 2008a,b), is the identification of cognition with a class of computations (e.g., Minsky, 1985; McDermott, 2001). It seems to me also that making such claims – as long as they are empirically sound and theoretically pleasing – is the right thing to do methodologically speaking: we can truly keep abreast of the news only if we keep asking after the truth.

IDEAS WITHOUT BORDERS

In psychology, unlike physics, truth straddles disciplinary boundaries: crucial information on the strength of which a psychological theory may stand or fall can come from another discipline altogether. For instance, findings from neuroscience can lend support to a broad explanatory framework in psychology, such as Bayesian inference (Lee and Mumford, 2003) or Hebbian learning (Caporale and Dan, 2008). In the same vein, complexity estimates, arrived at by methods of computer science, that show a certain class of algorithms to be intractable, can doom a corresponding family of psychological theories, as in the case of theo-

ries of visual perception and learning that ignore issues of dimensionality (Tsotsos, 1990; Edelman, 1993).

Such considerations notwithstanding, psychological theories can be surprisingly resilient (Greenwald, 2012, Table 1). My impression is that this happens because too often theories are stated in a conceptually inadequate language, which in turn stems from glossing over interdisciplinary issues. It seems strange that at this time, decades after the disciplines referred to collectively as cognitive science came to be recognized as interrelated, a call for more interdisciplinarity in psychology should still sound like a challenge. Nevertheless, a challenge it is: what may count for a big picture in psychology is likely to span only a few pieces of the great jigsaw puzzle of how the mind works.

It is important to note that the need for conceptual breadth exists not just in trying to understand how various cognitive tasks are addressed, but also at the more basic level of grasping the nature of the tasks themselves. Thus, neglecting to question the common assumption that the purpose of vision is to reconstruct the geometrical layout of the environment can lead an entire field on a decades-long wild goose chase (Sloman, 1989; Edelman, 2009), which ends with a realization that vision and the rest of cognition (in particular, motor control) are intimately interrelated and must therefore fit within the same overarching psychological theory.

By acknowledging and pondering the importance of interdisciplinarity in theoretical psychology, we can better appreciate the role of philosophy in opening up for us a whole new set of dimensions of conceptual breadth. The contribution of philosophical thinking to psychology will be particularly effective if such thinking avoids being parochial in its own domain. As one can learn from Scharfstein's (1998) outstanding survey of the history of world philosophy (which unfortunately goes only as far as late eighteenth century), insights into all of the questions of interest to psychologists can be found in philosophical traditions both in the East and in the West. We must, therefore, encourage work that connects those philosophical traditions to one another (e.g., Kalansuriya, 1993) and draws upon Eastern thinking, which is still under-appreciated by Western scientists, in the context of psychological theorizing (e.g., Waldron, 2002; cf. Metzinger, 2003, p. 566).

The final frontier of interdisciplinarity in psychology is the no man's land that separates it from the humanities – "the last bastion of magic" (Kean, 2011). The traditionally strong humanistic undercurrents in philosophy (Putnam, 2012),[7] the growing interest among cognitive psychologists in aesthetics (e.g., Kintsch, 2012) and in literature (Zunshine, 2010), and the emergence of a "third culture" that is equally at home in science and technology and in the humanities (Brockman, 1996; Kelly, 1998) all indicate that a further blurring of the intellectual borders is to be expected, and that it is a good idea to help this process along.

"NOTHING IN BIOLOGY…"

If theoretical thinkers in science, philosophy, and the humanities are all concerned with what we humans (and other animals) are, they should also be interested in understanding how we got to be this way. The short answer to this latter question is, of course, evolution. Given that the mind as we know it is first and foremost a biological phenomenon and that "nothing in biology makes sense except in the light of evolution" (Dobzhansky, 1973), it should not be surprising that rigorous evolutionary thinking has much to contribute to understanding it (for recent overviews, see Jablonka and Lamb, 2007; Pinker, 2010). Specific examples that come to mind have to do with individual learning (Lehmann et al., 2008), comparative neurobiology (Lefebvre et al., 2004), animal culture (Danchin and Wagner, 2010), and language (Chater and Christiansen, 2010; Syal and Finlay, 2010).[8]

EXPLAINING CONSCIOUSNESS

Just as the *sui generis* status of language in cognitive science has given way to a realization that it might be amenable to explanation within the same theoretical framework as the rest of cognition, so did consciousness

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[5]Putnam (2012, p. 47, footnote 18) traces this phrase to William James.

[6]Quoted by two of Halle's former students, Peter Culicover and Ray Jackendoff, in an epigraph to their book *Simpler Syntax* (Culicover and Jackendoff, 2005).

[7]As (Putnam, 2012, p. 49, footnote 21) writes, "I do not think that philosophy can be turned into a science because there are areas of philosophy that are essentially humanistic, and I think that turning the humanities into science is a fantasy, and a dangerous fantasy at that. But there are parts of philosophy that overlap with science."

[8]A rebooted evolutionary psychology is clearly capable of doing much better than generating "just so stories" for which it used to get a bad reputation a decade or so ago.

research return into the fold of psychology after a century-long exile.[9] Although there are now journals in the field of psychology devoted entirely to consciousness research, a little theoretical help here could still go a long way.

The greatest challenge in this domain seems to lie in the project of naturalizing phenomenology (Petitot et al., 1999), which, if successful, will culminate in a resolution of the so-called "hard problem" of consciousness: offering a convincing explanation of qualia, or the phenomenality of experience (Chalmers, 1995). As one may expect, progress in this undertaking can only be expected through a sustained interdisciplinary effort rooted in philosophy and informed by psychology, neuroscience, mathematics, and computer science (Dennett, 2003; Metzinger, 2003; Rudrauf et al., 2003; Merker, 2007; Yoshimi, 2007; Tononi, 2008; Fekete and Edelman, 2011, 2012).

In this effort, the role of philosophy *qua* the art of argument and persuasion is absolutely critical. A good explanation of phenomenal awareness – one that is both true (in the sense of section Truth and Consequences) and intuitively plausible – is bound to be in some sense reductive, even if it posits phenomenality as an emergent property (Dennett, 1995, p. 195). Specifically, and especially with regard to plausibility, such a reductive explanation would have to include a claim of *identity*, as when the temperature of a gas is identified with the mean kinetic energy of its molecules, or a performance of *Café Müller* by the Pina Bausch ensemble – with the series of bodily configurations and movements of her dancers.

THROUGH THE DEN OF THE METAPHYSICIAN

If outrageous methodological moves made earlier (such as broaching the possibility that a psychological theory may turn out to be true) have not yet stirred up enough trouble, arguing for an identity claim of the kind that I just mentioned will surely land

us square in the middle of what Warren McCulloch (1965) so memorably called "the very den of the metaphysician, strewn with the bones of the former explorers" (among which McCulloch singles out "the femur of Immanuel Kant" and also "his skull, which housed his computing machine").

As McCulloch showed us (always leading by example), we need not be afraid of metaphysics. Not that our attitude toward it matters much: a repudiation of metaphysics is in itself a metaphysical stance (as noted, for instance, by Putnam, 2012, in his discussion of logical positivism and of Wittgenstein's philosophy). Admittedly, by explicitly allowing metaphysics into our discourse (for instance, the metaphysics of embodiment or of reality; Edelman, 2011a,b), we face the challenge of separating idle speculation from serious ideas – but the very same challenge is, of course, the first order of business in any respectable inquiry, be it scientific or philosophical.

This brings us back to our theme: the relationship between science and philosophy and the challenges that they face together, summarized perfectly by Putnam (2012, p. 626):

> Q: What is the proper role of philosophy in relation to psychology, artificial intelligence, and the neurosciences?
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> A: To be a gadfly, of course. Seriously, … the most exciting task of philosophy of science is to combine clarification of the concepts of science with reflection on the implication of scientific theories, both proposed theories and theories that are not considered to be confirmed, for great metaphysical issues.

Sharpening psychology's theoretical tools by focusing on its conceptual foundations in a broad perspective, which includes philosophical considerations and, indeed, metaphysics, may help us make sense of the deluge of findings that would otherwise sweep us into the barren ocean of mere data.

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[9]The topic of consciousness was, of course, effectively banished from academic psychology between the time of James (1890) and Crick and Koch (1990), along with most other interesting aspects of the mind, at the hands of behaviorists, some of whom, however, were nevertheless attracted to it (Lashley, 1923).

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