

FURTHER THOUGHTS
ON THE PSYCHOLOGY—BIOLOGY RELATIONSHIP

I want to thank Piotr Oleś for bringing this discussion together. I also want to thank the commentators for their responses which by and large, I think, help to extend and enlighten debate about the relation between psychology and biology. The point made by Strelau, Uchnast, and Wolski that the issue can be traced back to that of the mind-body problem, and to the rejection of behaviorism on the part of psychologists interested in what is central to human experience, is noteworthy. The roots of the issue in the mind-body problem is something considered in the more extended treatment of the topic in my book *Current Controversies and Issues in Personality* (2002). At the same time, in its current manifestation the issue has taken on a somewhat different form with implications specific to current society (e.g., the treatment of mental illness, research funding).

As I read them, the commentaries range in point of view concerning the relation between psychology and biology, covering those presented in the original article. Cervone clearly is supportive of the levels view. Strelau, who was ahead of most contemporary personality psychologists in his emphasis on temperament and its biological correlates, at times seems to support Bandura's view of the psychological and biological as separate, alternative constructions, although he also, like Bandura, emphasizes the value of establishing relations between the two. His suggestion of a fourth view, that of psychology and biology as complementary and needing each other, very much fits within the spirit of the levels view presented in the original article. Finally, Fafrowicz and Marek appear to me to support the view that the phenomena of interest to many psychologists are reducible to biological explanations. They contrast the “traditional approach” based on behavioral indices with a “reductionist approach” that emphasizes neural structures and processes. They view the former as involving vague and ambiguous terms as well as unclear and imprecise measures.

The Fafrowicz and Marek commentary raises the issues of conceptual units and measurement of these units. The former is an issue addressed by Cervone and Strelau as well, with their not surprisingly feeling more comfortable with socially constructed, observer dependent units (Cervone) and “immaterial entities” that have the status of emergent properties (Strelau) than are Fafrowicz and Marek. As a personality and clinical psychologist sitting in on presentations from the fields of neuroscience and molecular biology, I often marvel at the foundation of accepted basic concepts as well as technological developments that allow for reliable measurement in these two fields. In their current form, most (perhaps all) concepts in personality and social psychology are what Cervone calls socially constructed, lacking a material entity basis. I believe this to be the current state of affairs and perhaps this will always be the case for concepts such as *self*, *self-efficacy*, *stress*, and *social support*. I might include here as well that of *goals*, a concept of theoretical and research interest to me for quite some time and one noted by Fafrowicz and Marek.

The lack of a material basis for a construct does not alone rule out its utility. After all, physics and biology have made use of such constructs prior to pinning down their material properties. However, I suspect that the constructs of some parts of psychology, such as in much of personality and social psychology, will always be of a different, nonmaterial order. This alone does not rule out their utility. Far more important is the issue of measurement. Although modern measurements in neuroscience, such as those associated with *fMRI* research, are not without problems, my overall sense is that the current state of measurement in neuroscience and molecular biology is beyond that in the areas of personality and social psychology. Frankly, I do not expect this to change in the immediate future and, in what may seem like heresy to my colleagues in personality and social psychology, this may always be the case.

So why do I still subscribe to the levels point of view and stand in agreement with Strelau that psychology and biology complement one another? First, although accepting that measurement is key to advances in science, many measures in psychology are sufficiently efficacious to lead to important advances in our understanding of psychological phenomena. Second, investigation of psychological phenomena can lead to an interest on the part of neuroscientists in otherwise neglected phenomena. I have in mind here issues such as unconscious information processing, various aspects of memory functioning, disturbances in the sense of self, and current interest in the neuroscience of behavioral decision-making, following the work of Tversky and Kahneman (Kahneman, 2003).

Third, as Cervone and Strelau point out, the relation between phenomena emphasized at the psychological level and those at the biological level are very complex. The complex goals pursued by people generally are multiterminated, that is, they represent the interactions among many sub-goals, some of which are integrated with one another and others of which are in conflict with one another (Pervin, 1983). Personality characteristics are influenced by multiple genes and the development of these characteristics is determined by the continuous interplay between genetic and environmental influences. Illustrations are given in the original article but one can add here as well research by Suomi (2006) on gene x environment interactions in the development of risk factors in rhesus monkeys and that of Magnusson (Magnusson, 1999; Magnusson & Bergman, 2000) on the importance of biological and environmental variables in the development of social behavior and problems in adaptation.

Finally, current research suggests greater plasticity in brain functioning than previously was thought to be the case, in part due to external environmental influences (Gould, 2007). Although some of these environmental influences can be measured objectively (e.g., reared with or without a mother or peers, primates raised in more or less complex environments), many will likely depend on the meaning given to events by the organism. This will increasingly be the case as research is done with humans and, given the idiosyncratic meanings given to events by individuals, presents a challenge for such research. And, to the extent that many psychological problems experienced by people have to do with the cognitive and affective meanings they give to events, it seems unlikely that such problems will be treatable by biological methods alone.

In concluding this response, I must say that at times I have found myself uncomfortable juxtaposing psychology and psychological with biology and biological, as if one precludes the other or the two are in competition with one another. There is much in psychology that is biological and, as Wolski suggests, much in biology that is psychological. As Strelau suggests, rather than being viewed as in competition with one another or as one having hegemony over the other, it seems most profitable to view phenomena as capable of being understood at different levels with utility in the conduct of research on the relations among levels.

REFERENCES

- Gould, E. (2007). Structural plasticity. In P. Andersen, J. Morris, & J. O'Keefe (Eds.), *The hippocampus book* (pp. 321-342). New York: Oxford University Press.
- Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist*, 58, 697-720.
- Magnusson, D. (1999). Holistic interactionism: A perspective for research on personality development. In L.A. Pervin & O.P. John (Eds.), *Handbook of personality: Theory and research* (pp. 219-247). New York: Guilford.
- Magnusson, D., & Bergman, L.R. (2000). Individual development and adaptation: The IDA program. In C.G. Janson (Ed.), *Seven Swedish longitudinal studies in the behavioral sciences* (pp. 115-139). Stockholm: Swedish Council for Planning and Coordination of Research.
- Pervin, L.A. (1983). The stasis and flow of behavior: Toward a theory of goals. In M.M. Page (Ed.), *Personality: Current theory and research* (pp. 1-53). Lincoln: University of Nebraska Press.
- Pervin, L.A. (2002). *Current controversies and issues in personality*. Hoboken, NJ: Wiley.
- Suomi, S.J. (2006). Risk, resilience, and gene x environment interactions in rhesus monkeys. *Annals of the New York Academy of Science*, 1994, 52-62.

Lawrence A. Pervin
Professor Emeritus, Rutgers University