Chapter 13
Neuro-Ornamentation in Psychological Research

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I have coined the term "neuro-ornamentation" to designate the insertion of references to neuroscience in psychological texts with the intention of strengthening their scientific impact. I chose the term "ornamentation" to emphasize the similarity to decorating an object in order to strengthen its appeal. A text is supposed to become more scientific when it contains references to brain studies (McCabe and Castel 2008), just as an object is expected to become more beautiful when decorated. In this article, I propose to examine the logic of three different variants of neuro-ornamentation and argue that the belief that neuroscience can contribute to psychology may have little foundation in fact and may consist mainly of programmatic ideology.

However, first, I introduce and comment on what can be labeled "The Correspondence Premise" which forms part of the background for the subsequent analysis.

The Correspondence Premise

This premise may be stated as follows:

For every psychological event there is a corresponding neural event.

The Correspondence Premise goes far beyond what can be concretely demonstrated. For the most part, one has no or only very sketchy knowledge of what goes on in the brain during a psychological event. Even so, it would be strange to deny that

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there *is something*, at least this makes no sense in within our modern naturalistic frame. According to this widely acknowledged frame, it is impossible to understand that people can experience and act unless *something* goes on in their brains, whatever that is. This Correspondence Premise is a general background for all research aimed at revealing more specific correspondences between psychological and neural events. However, it also leads to a question about the autonomy of psychology. Must a finding in one of these fields lead to a change in the other? Here, I will limit my discussion to whether or not and in what way it is possible for neuroscience to change psychology. The answer will also influence how we regard neuro-ornamentation. I pursue the question by discussing three types of such ornamentation. I conclude that they are misleading, because research and practice of psychology can go on *without any knowledge of the brain,* and that adding such knowledge cannot change psychology and the ways human beings have always known each other.

My stance in interpreting The Correspondence Premise is monistic and "two-language." I take it that there is one world described in two basically different types of language. The psychological language describes the world as it exists *for* persons in one sort of conceptual framework, and the physical language describes the world as it exists *independently* of persons, and within another type of conceptual framework. These differences in conceptual framework are related to the traditional distinction between "subjective" and "objective," but this article is not the place to comment on and discuss even parts of the immense relevant philosophical literature.

The Correspondence Premise Cannot be Implemented

The difficulties of implementing the principle stem from the vast difference between the two kinds of language. Ordinary languages have developed over eons of time as part of human life. There are thousands of special languages, but they all appear to have a common semantic core (Wierzbicka 1996) and are acquired early and very rapidly by children everywhere. I find it virtually impossible to conceive of a theoretical or practical psychology that does not take its departure in the basic conceptual framework of ordinary language. This language enables us to talk about both thoughts and feelings, our perception of external objects and the body, and interpersonal relations. On the other hand, the technical language of neuroscience involves physical–chemical terms and special concepts such as fMRI, PET SCAN, and Neuro-transmitter and is anchored exclusively in instrument readings. However, just as we cannot use psychological terms to fully describe neurological and biochemical events, neuroscience is incapable of describing psychological phenomena. This can be illustrated by the following simple example:

The setting is a dark road with no other persons. "Excuse me for bothering you, Miss" said the man and stepped closer, "but could you tell me what time it is." "My watch has stopped and I don't want to miss the last train."

The vast amount of information conveyed to English-speaking persons by this description can easily be formulated and handled in terms of psychological interpre-

tations and opens for many possibilities and probabilities to be explored in terms of ordinary language. On the other hand, the corresponding neuroscientific formulations would have to be based on complicated technical instrumentation and even this possibility is totally ephemeral and programmatic. It would involve an inconceivably difficult translation process from meanings to physical and chemical measurements. One is forced to conclude that while The Correspondence Premise must be accepted, it does not offer any useful alternative to ordinary language when it comes to psychological practice and understanding. The measurements of neural activity can increase our knowledge of the brain but are not very helpful in describing and understanding the full range of what goes on within and between people.

I find it illuminating to think of the distinction between the neural and the psychological as in some ways analogous to the distinction between hardware and software in computers. For every instance of software, there must be an instance of hardware, but the belief that a study of the hardware will lead to better understanding of the software is as ephemeral as believing that psychology will be advanced by studying brain processes.

To repeat, it would seem that the psychological and neural languages cannot be manageably translated into each other, which means that the Correspondence Premise cannot be practically implemented.

I now turn to three types of neuro-ornamentation of psychological texts. The first involves frequent use of the prefix "neuro-"(as in "neurocognition"). The second concerns the insertion of references to neuroscientific studies, and the third one is the introduction of the concept of "endogenic depression" that, per definition, has *only* neural explanations.

Occurrences of the Prefix "Neuro-"in a Psychological Text

A recent review of research on schizophrenia (Rund 2015) contains numerous instances of the terms "cognition" and "neurocognition". It is hard to ascribe any empirical content to this distinction, since according to The Correspondence Premise *every* instance of cognition corresponds to something neural. Nevertheless, I have tried to investigate whether the two terms are perhaps used in different contexts, involving respectively psychological or neuroscience methods and data and, hence, describe different types of content.

The outcome is presented in Table 13.1.

Table 13.1 The relation between type of term and type of data

	Cognitive	Neurocognitive	Total
With neuro-data	5	13	18
With psychological data	30	26	56
Total	35	39	74

What do these findings tell? First, that terminology is not very reliably linked to type of data, even though the prefix "neuro-," not unexpectedly, is more frequent when there is actual measurement of brain processes. Second, in the case of purely psychological data, the two terms are equally and seemingly haphazardly distributed. Given The Correspondence Premise, it cannot be that the term "neurocognitive" is used to refer to cognition involving brain processes, whereas the term "cognitive" is not. Since the terminological difference cannot be taken to be totally meaningless, it is hard to avoid the conclusion that the prefix "neuro-" is used intermittently merely to emphasize a belief that psychology should move in the direction of neuroscience. Hence, the prefix "neuro-" may be taken to look more "scientific." Further investigation of occurrences of the prefix "neuro-" in other texts may or may not support my interpretation that the prefix has no factual, but only ideological, content.

The next example involves a genuine neuroscientific study. It is argued that inserting references to this study in psychological texts would not change or add to psychological understanding but would serve only as ornamentation.

The Spatial Orientation of Rats

The Nobel Prize was recently awarded to two researchers (Moser et al. 2014) for their discoveries of neural processes underlying the spatial orientation of rats. Their work represents an undisputable neuroscientific advance but does not improve psychological understanding. Already Tolman (1948) and his coworkers demonstrated by purely psychological methods that rats have "cognitive maps." For example, they observed that, when the ordinary route to food in a familiar environment was blocked, rats selected the shortest available alternative route. These results were arrived at by purely psychological methods and without any knowledge of brain processes. The findings coincide with what can be predicted from our shared common sense knowledge that both rats and humans have cognitive maps of familiar locations. By "psychological common sense," I mean "what follows from the shared meanings of the concepts involved," and not empirical "folk psychology" that may or may not be correct (Smedslund 1997).

The hypothetical example of inserting reference to Moser and Moser in a psychological text describing spatial orientation in rats illustrates why neuroscientific advances cannot contribute to psychology. The neuroscientific findings only reveal some of the content of the Correspondence Premise, namely, how rat brains manage spatial orientation. The fact that rats have cognitive maps is already known to psychologists. The general question is whether there are or can be neuroscientific findings that contradict or add to psychological knowledge. If a neuroscientific finding has psychological implications, these can also be independently established by psychological methods and explained psychologically. To deny this appears impossible. Therefore, one can develop psychology without neuroscientific knowledge, and "neuro-ornamentation" can be recognized as a purely cosmetic process.

Apparent exceptions to the preceding are effects of neural damage to the brain (strokes and accidents). They involve discovery of correlates between psychological and neural effects of head trauma and hence provide some content to The Correspondence Premise. However, since the Premise cannot be implemented in everyday life and in psychological practice, one can continue to believe in the independence of psychology relative to neuroscience.

My third example is use of the concept of "endogenous depression."

Endogenous Depression

By definition, this concept has *no* psychological but *only* neuroscientific explanations. Hence, insertion of the concept in a text has a strong neuro-ornamentation effect.

Use of the concept of endogenous depression means that the psychological approach is seen as insufficient and must be supplemented with neuroscience. The concept and the related one of *bipolar disease* have been widely used and have been the subject of much theorizing. People are seen as depressed (and manic) solely because of altered brain processes. The idea that this variant of depression cannot be psychologically explained sets it apart from our vast commonsense knowledge about depression, including such self-evident elements as hopelessness induced by consistent personal failures and consistently adverse surrounding conditions. Some people certainly appear to be depressed without any known psychological explanation. However, this conclusion may be based on insufficiently extensive investigation of the total psychological context.

The concept of *endogenous* depression and the related more inclusive concept of *bipolar disease* implies that some *psychological* phenomena cannot be *psychologically* explained. Allegedly, only physical–chemical intervention is possible. It differs from cases of accidents or strokes, and where treatment (re-training) is only psychological.

I would like to emphasize that none of the above threatens the autonomy of psychology. Depressed and stroke victims can and must be understood and treated from a psychological point of view and with psychological methods, especially since the alternative of pharmacological treatment is becoming increasingly questionable (Rose 2003; Whitaker 2010; Goetzsche 2013).

A general argument for a psychological approach is that since human beings generally function without fixed constraints ("laws"), the observed regularity of depressive behavior must reflect *dynamic equilibria*, maintained by stable consequences. This means that when a psychologist encounters a depressed client, he or she should always search for the *psychological* conditions that *maintain* the depressive state. The search for and selection of efficient procedures can go on unaffected by knowledge of the concurrent neural processes. It follows that the neuro-ornamentation effect of referring to "endogenous" depression has only ideological content.

Conclusion

The three cases cited of neuro-ornamentation have increasingly strong persuasive power: The first one contains intermittent reference to neuroscience in the form of the prefix "neuro-." There is no clear empirical content, and the prefix merely appears to serve as a reminder of the alleged importance of neuroscience in psychology.

The second case involving spatial orientation contains reference to undisputable and substantial neuroscientific findings that make the text appear very "scientific." However, this does not change psychology. The neural studies demonstrate how rat *brains* function, but psychological studies demonstrate how *rats* function.

The third case concerns the concept of "endogenous depression" that it, per definition, requires a neuroscientific explanation. The person is seen as depressed because of neural processes without a psychological explanation. This case is the most powerful ornamentation, because it not only emphasizes the neural but also directly excludes the psychological.

In summary, the first case of neuro-ornamentation has no empirical content whatsoever, the second case involves neuroscientific advance but does not add to psychological knowledge, and the third case is highly disputable since it excludes psychology by simple definition.

In all three cases, it still remains to understand *why* psychologists are turning increasingly toward neuroscience and indulging in neuro-ornamentation of their texts.

I think the current mainstream trend builds on an unrecognized contradiction between a *monistic materialist* and a *dualistic* position. On the one hand, one takes it that there is one world, and it is material, and the relations in this world are causal. On the other hand, the predominant view is that neural states *cause* psychological states. However, this dualistic position is replete with intrinsic difficulties because causation presupposes *two* separate entities, in this case, a brain state and a psychological state. I think the confusion originates in, and is maintained, because there actually appears to be two clearly different sets of findings, the brain measurements and the introspective reports and test results. From a materialist position, one can in principle explain that the first cause the second, i.e., that neural processes cause the vocal cord movements and sound waves in verbal reporting. However, this does not explain the "meaning" of the verbal reports, and hence, the position of psychologists as brain researchers remains engulfed in an unsolved mystery.

In contradistinction to this, I take it that there is one world described in two very different languages. This means that there are two kinds of conceptual frameworks for describing the same world and that the relation between the neural and the psychological is a matter of *translation* rather than *causation*. A neural state may coexist with psychological depression, but this does not show one- or two-way causality, but only correct translation. Suppose that the same event is described both in Swahili and Urdu, an observed change described in Swahili may be closely mirrored by the observed change described in Urdu, but the first change does not *cause* the second

or vice versa. The covariation merely indicates correctness of translation between the two languages. Much confusion and useless speculation originates in the failure to distinguish between causality and translation. As I see it, the attempt to understand how a neural state can "cause" a psychological state or vice versa is misdirected. The instrument-based neuroscientific research discovers neural correlates of psychological processes. The two-language assumption reduces the problem to one of mapping the details in the covariation between the psychological language that has developed to serve human social life and the recently developed physical–chemical instrument-based measurements of neuroscience. No causation is involved; there is only one subject matter and two conceptual frameworks.

The neuroscience conceptual framework developed by applying physics and chemistry to the brain by means of instruments cannot cope with the richness of ordinary language developed over eons. Translation is, therefore, virtually impossible, and neuro-ornamentation of psychological texts raises a false hope. It is simply inconceivable to me for the reasons given above, that further study of the brain can importantly revise or add to psychological understanding and practice.

Disregarding the subtle philosophical problems involved, what is at issue is the autonomy of the discipline of psychology. I take it that everything psychological can be studied by psychological methods and that a psychology can exist and develop independently of neuroscience. If this is the case, then neuro-ornamentation not only has no factual content but also promotes a misleading idea. Psychologists have falsely come to believe that the neuroscientific findings can explain psychological phenomena, and that physio-chemical measurements of brain activity may engender contributions to psychology.

Finally, I would like to add that when it comes to psychology as an independent discipline, psychologic (Smedslund 2012) takes a special position compared to other approaches. This is because *meaning* is a general basic concept in all of psychology, and the meaning of something is what follows (logically) from that something (Smedslund 1970). The study of meanings is a discipline far removed from neuroscience.

References

Goetzsche, P. C. (2013). *Deadly medicines and organized crime*. London: Radcliffe Publishing.

McCabe, D. P., & Castel, A. D. (2008). Seeing is believing: the effect of brain images on judgments of scientific reasoning. *Cognition, 107*, 343–352.

Moser, E., et al. (2014). Grid cells and cortical representation. *Nature Reviews Neuroscience, 15*, 466–481.

Rose, N. (2003, November/December). Neurochemical selves. *Society*, *41,* 46–59.

Rund, B. R. (2015). Schizofreni er en nevrokognitiv forstyrrelse. *Tidsskrift for Norsk Psykologforening, 52*(4), 323–333.

Smedslund, J. (1970). Circular relation between understanding and logic. *Scandinavian Journal of Psychology, 11*, 217–219.

Smedslund, J. (1997). *The structure of psychological common sense*. Mahwah, NJ: Lawrence Erlbaum.

Smedslund, J. (2012). Psycho-logic: some thoughts and after-thoughts. *Scandinavian Journal of Psychology, 55*, 295–302.
Tolman, E. C. (1948). Cognitive maps in rats and men. *Psychological Review, 55*(4), 189–208.
Whitaker, R. (2010). *Anatomy of an epidemic*. New York: Crown.
Wierzbicka, A. (1996). *Semantics: Primes and universals*. Oxford, New York: Oxford University Press.