

Normal Science and Innovation

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According to the National Science Board (NSB) of the National Science Foundation (NSF), transformative research is “research that has the capacity to revolutionize existing fields, create new subfields, cause paradigm shifts, support discovery, and lead to radically new technologies” (National Science Board, 2007). Transformative is one of the new terms invented in the last few decades to get away from ‘pure’ science (and its variants: fundamental, basic), a category no longer used because few people believe in its existence or relevance (Godin, 2003):

Pure, fundamental, basic → (mission -) oriented, strategic → transformative

Today, every organization has its own similar label. The National Institute of Health (NIH) talks of “translational” research, the OECD of “blue sky” research, the European Research Council of “frontier” research. A new label is essentially a semantic innovation introduced to emphasize a new idea and catch the attention. Semantic innovation is not limited to public organizations. Social researchers have their own labels too: “mode 2” is certainly the most popular label invented in recent years to name a (supposedly) new mode of knowledge production.

If one thinks a bit, he will observe that transformative research is nothing else than innovation (innovative research). Why not simply use that word? It may have to do with the fact that innovation has had, for most of its history, a pejorative meaning and that today it is industrially connoted (Godin, 2011). The technological and commercial representation – a spontaneous representation because hegemonic – involves a ‘bias’ that most academic researchers do not accept – at least publicly.¹

Yet, for 2,500 years innovation covered anything which is new, and etymologically innovation is precisely what transformative research is. Innovation is a word of Greek origin (καινοτομία), used in Antiquity for talking about changes in the political and constitutional cycles. When the word got into our everyday vocabulary, namely after the Reformation, it meant ‘introducing change to the established order’ (religious and political). Such a meaning was pejoratively connoted. After the English revolution of 1649, then the French revolution of 1789, innovation got still more negatively connoted when it got associated to revolution: revolution became the emblematic example of innovation.

What is a revolution? A revolution is a radical and disruptive change – a ‘transformative’ change! Innovation still has this revolutionary meaning today, but in a positive sense. To the theorists and the statistical mind a technological innovation is necessarily revolutionary (for its (measurable) impacts on the economy) – although incremental changes are increasingly admitted as innovation too. In this context (and semantics), what is innovative research? Innovative research is research which is radically new on the following elements:

- Object
- Hypothesis
- Framework
- Method
- Approach (like multidisciplinary and reflexivity in social sciences and humanities)
- Impacts (scientific and socio-economic)

What are the implications of innovative research so defined? Let’s limit the discussion to policy (there are more implications discussed in Godin and Lane, 2012). Policy needs categories for action. I suggest that, in place of

1. Although the NSF, as organization, has been active on studying innovation from its very beginning (see Appendix)

the previous categories (basic and applied) we shift to the following two: normal science and innovation. Researchers would have to decide to which category they submit their proposal. But beware: normal science would have a very small pot of money and innovation would have high criteria: if the NSF is serious about transformative research, it should fund projects that are innovative on ALL of the elements above. This is certainly a huge demand put on the researchers (but possible, believe me). Yet, it is certainly a way to ‘clean’ the publications market and reduce the (voluminous) number of minor works no one reads. To be sure, normal science has a place in the research system, but not most of the place as it actually has. If research is to be transformative, it has to be innovative – innovative on all fronts: scientific, technological⁷ and socio-economic, and the latter should have equal weight to the other five together. In order to meet the socio-economic objective the researcher would have to include a specific and concrete plan for development or application in his proposal – depending of course on the stage of development of the research.

It remains the question of who evaluates the proposals in order that the NSF get real innovation research. Given the conservatism of the peer review system, one needs an appropriate mechanism. I suggest that, as a counterpart to getting a large grant, the innovation grantees should be asked to evaluate the proposals during the time of their funded project.²

References:

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2. In a large sense: a good, a method, a protocol, a policy or law, a service; briefly stated anything that is ‘useful’ to society