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Response to Fred D'Agostino's "Disciplinarity and the Growth of Knowledge"

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The concept of interdisciplinarity has become so increasingly popular with researchers, universities, and institutional funders of research that there has been even the notion that disciplinarity might be already dead. Interestingly, the ideal of interdisciplinarity and the growth of interdisciplinary fields have not made the traditional disciplines obsolete and it does not seem as if the organization of science and knowledge in disciplines would go away anytime soon. What are the reasons for the survival and indeed continued success of the established disciplines? Fred D'Agostino has thrown some light on the social mechanisms that make disciplinarity work and succeed in their objectives of advancing knowledge. In his insightful recent article in *Social Epistemology,* Fred D'Agostino (2012) has argued that disciplinarity facilitates the growth of knowledge by exploiting the tension between disciplinary tradition and "innovative elements of disciplinary enquiry" (331)

There would be two types of research activity, one based is on the idea of exploration with the aim of new discovery and innovation and the other is based on the idea of exploitation of an already existing paradigm or body of knowledge with the aim of adding details and filling the gaps left by the disciplinary innovators. D'Agostino essentially claims that the dynamic interplay of "exploration and exploitation" (346) within a disciplinary community held together by a "shallow consensus" (346) on values, including the value of being part of a greater community with shared interests and stakes, allows science and knowledge to advance in an "orderly" (332) manner. In other words, disciplinarity would not be a constraint or obstacle to the advancement of knowledge, as sometimes claimed, by limiting scientific enquiry through consistent rules for what constitutes good research.

To the contrary, it appears that disciplines are actually the enablers of scientific innovation, which is made possible by their ability to tolerate incoherence. The disciplines would offer only a common rationality and an agreement on the research agenda, but they would not prescribe the desirable results or impose strict rules for getting a result. This flexibility inherent in disciplinarity would allow innovators to take disciplines in new directions and the disciplines themselves to manage the risk of innovation. If novel ideas and approaches take the discipline in a profitable direction, then the discipline can renew itself or expand. Otherwise the system simply assigns individual responsibility for the failure of interpreting the shared standards of the discipline correctly. This dynamics of traditionalism and innovation would make it possible to balance the need for scientific innovation against the need for coherence that creates and maintains the discipline-based community.

A good part of the article is devoted to understanding disciplines and disciplinarity before the article explains in detail how disciplines facilitate knowledge growth. Understanding what disciplines are is indeed crucial for understanding how academia works and it is also to some extent crucial for D'Agostino's argument. Even the term 'interdisciplinarity' makes only sense in its reference to disciplines and disciplinarity. You could not have

one without the other. Unfortunately, as pointed out by D'Agostino, there simply is no straightforward definition of what constitutes a discipline. This means he ends up with a long list of criteria that are shared by most of the established disciplines. He divides the criteria into *institutional* and *intellectual* aspects of disciplines. The institutional aspects underline the social nature of disciplinarity by describing disciplines in terms of culture and community, while the intellectual aspects point at the intangible and informational nature of disciplinarity based on ideas, methods, a specific rationality, a specific object of research, a specific research agenda, specific criteria for evaluating disciplinary research, a distinctive body of knowledge associated with the discipline and so on. Interestingly, D'Agostino comes to the conclusion that "disciplines have histories, not essences" (332), which raises the question whether the disciplines and the very concept of disciplinarity itself could be also historically contingent.

While Fred D'Agostino's objective is to simply explain how disciplines enable and facilitate innovation, the bigger question is whether the existing disciplines represent the optimal way for producing new knowledge and managing innovation. With respect to their intellectual aspects, disciplines are just handy tool boxes, which provide researchers with directions and tools (methods, theories, specific knowledge) for pursuing original research on their own. It has been often pointed out that the most innovative research occurs in the disciplinary borderlands of interdisciplinary research fields (Dogan and Pahre 1990). These interdisciplinary research fields can usually not be appropriated by any single discipline and it is also not the case that they would naturally move towards becoming disciplines themselves, although this can happen. But is it really true, as D'Agostino writes, that "intra-community differences pale in comparison with their differences from those 'beyond the pale'" (344)? Could it be possible that it is rather the dynamics and tension between disciplines or the interplay between disciplinarity and interdisciplinarity, which enables much of the innovation that occurs *within* disciplines?

It often seems that it is much easier for researchers to cooperate with researchers from other disciplines, who happen to work on similar problems, although coming from a different perspective, than with researchers of their own discipline, who have different interests or come from different or opposing schools of thought. The major established disciplines have grown so big that they have become unmanageable empires hampered in their effectiveness by a combination of "imperial overstretch", the fracturing into too many sub-disciplines, accompanied by narrow-mindedness, ignorance, and petty rivalries. Large disciplines can rarely provide clear directions or concrete values to a young researcher. They only offer opportunities for specialization in one of the disciplines numerous divisions, which usually have their own values, methods, theories, and specific problems that can be totally independent from the discipline as a whole. What once started as an effective division of scientific labor in the 18th and 19th centuries may now have become in many respects obsolete. It is already the case that universities have begun to reorganize themselves through the establishment of interdisciplinary schools, departments, centers and research groups, also offering a wide range of interdisciplinary degrees and research opportunities (Thompson Klein 2005; Thompson Klein 2010). While it is still a smart career move for young academics to join a discipline-based professional association and participate in the activities of the

association, most importantly the main conferences of the association and publishing in the main journals of the profession, there are few advantages of being a traditionalist and sticking to the own turf and the limitations of the own disciplines. The pressure of having to produce not only original, but also innovative research with a high impact makes many researchers look beyond the confines of their discipline. The question becomes how attached do academic researchers have to be to an established discipline? This would obviously vary from case to case, but generally speaking there is much more flexibility in today's academic careers.

Academics may still consider themselves to be primarily mathematicians, philosophers, physicists or biologists, and so on, but there is no need for exclusiveness with respect to belonging to a specific academic community. Academics sometimes change their fields and even their discipline. It is also no longer uncommon for academics to have membership in several different professional associations and to spend much, if not most of their careers doing research and teaching in interdisciplinary fields or being affiliated to schools and departments outside of their original disciplinary profession. Being part of a discipline-based community is not fate, but can be chosen freely and the choice is neither necessarily exclusive nor permanent. The borders of what constitutes the academic community of a discipline have become equally blurred as the borders of disciplinary knowledge.

What seems to be happening in science is an increasing hybridization of various fields of knowledge and a declining relevance of disciplinarity and traditional disciplinary knowledge, especially when it comes to applied research and more vocational training offered by universities. For example, *social epistemology* itself is a hybrid field, which bridges sociology and philosophy. Social epistemology may fulfill some of the criteria of an academic discipline, like the existence of a community of researchers tied together by a common research agenda and shared values/ rationality, but it is debatable whether it is already a discipline or to which discipline it would belong. Cultural Studies and other "studies" type of subjects are according to Simon During best described as postdisciplines, which lack key characteristics of disciplinarity such as charismatic founders, traditions, or specific methods (During 2011). It is not uncommon for traditional disciplines to reject or ignore interdisciplinary projects, programs, and knowledge because they are competing over resources in the institutional setting of universities. From my own limited professional experience working in an interdisciplinary field or postdiscipline, I can say that the response of traditional departments can be outright hostile to the establishment of an interdisciplinary program that seems to be treading on their turf and to which they may not be able to contribute much since they may not agree with key assumptions and values that gave rise to the interdisciplinary field in the first place.

Fred D'Agostino has proven that disciplines can, and do, facilitate the growth of knowledge, but one can have doubts that the organization of academia and science into historically established disciplines is the best way for promoting innovation and the growth of knowledge in the 21st century. Disciplines and disciplinarity are becoming more and more futile attempts of ring fencing areas of knowledge for the benefit of

interested professions and parties. It is harder and harder to brand specific knowledge to belong to a specific discipline. It is not even plausible that disciplines can plausibly lay claim to the ownership of specific methods or theories just because they historically originated within a particular discipline. Do we really need disciplines for doing research and advancing knowledge, or do we just need tools (information, methods, theories etc.) that we can take from anywhere in the academy? Does it really matter where these tools come from and whether the scientific output that they enable 'belongs' to a specific discipline because of the disciplinary affiliation of the creator of the output or the creator's disciplinary values supposedly inherent in the research? From a pragmatic perspective, it only matters whether the tool is suitable for the task at hand and whether there is some societal benefit to the result other than keeping academics busy and gainfully employed. Luckily, research and other academic outputs are no longer simply judged by their compliance with fuzzy disciplinary standards and values, but also by their societal usefulness or the applicability of the research to the "real world".

Should interdisciplinary fields aim to become disciplined in order to improve the quality of their research by introducing some more stringent disciplinary standards? No doubt, there are political benefits connected to achieving the status of a discipline, as this would create opportunities for the establishment of respective departments, chairs, and distinctive professional career paths. It would improve the standing of the academic field within academia and universities, which could divert more resources and talent to this field. At the same time, one has to understand that there is already an unmanageable amount of disciplines and sub-disciplines in existence at a time when the golden age of higher education is over and universities find themselves under increasing pressure to downsize and combine smaller and less profitable academic units into larger interdisciplinary units with little considerations whether the new arrangements make any epistemic sense (During 2011). These are pragmatic management decisions, which often undermine traditional disciplinarity within the main institutional setting of science, namely the universities. Under such circumstances it is almost impossible to get new disciplines established at a greater set of institutions.

What we are left with is the complex reality of the continued existence of some established disciplines in their separate dedicated departments with their heavily entrenched subdivisions together with an ever-growing number of interdisciplinary centers, academic programs, and research agendas that are more accurately described as postdisciplines because they will never achieve disciplinarity. I believe that the established disciplines remain successful mainly because they receive many impulses from, and lay claim to, the more dynamic interdisciplinary fields at their borders. It is very hard for a mature discipline to remain dynamic and to innovate. There is only so much one can do with a given disciplinary cognitive apparatus and a research agenda that goes back to the founding of the discipline one hundred or more years ago. The real breakthroughs seem to come these days from the hybridization of knowledge in interdisciplinary/postdisciplinary applied science fields such as nanotechnology, artificial intelligence, or biotechnology, than from any singular established discipline.

More modestly, newer postdisciplinary endeavors like Science and Technology Studies, Cultural Studies, or even Security Studies (my field) have probably contributed more to the growth of knowledge than their much more established parent disciplines on their own in recent times. Disciplinarity will certainly remain a factor in the academy and the growth of knowledge, but probably a factor of declining importance.

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