Lost in Translation: The Flow of Graduate Education Models Between Germany and the United States

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This paper examines the origins and current system of doctoral education in both Germany and the United States emphasizing the extent to which each country has mythologized the contribution of the other. In the United States it is widely believed that "the" German university in the 19th century was the model for the creation of US doctoral programs. Today in Germany under the Bologna Agreement and the Excellence Initiative it is believed that both of them are modeled on the American higher education system, particularly on the research university. The argument made here is that there is a broad lack of real knowledge about the systems in the model country as well as significant historical, legal, and social reasons why the ability of either to copy from the other is limited. The discussion is comparative including the different origins of the research university, home of the doctoral degree, a short summary of the post World War II period, how and why doctoral education developed in both countries up to now, and significant current issues. Greater weight is given to discussing the US, however, because of its diverse universities, the variety of doctoral programs, and the way they are run. Emphasis is given to internal evaluation of the success of US doctoral training by doctoral students versus how it seems to be viewed in Germany.

Higher education form, content, values, and practice are imbedded in particular national, social, economic, legal, and linguistic environments. When the US introduced graduate education based – it was thought – on "the German model", it translated that model to suit US conditions. Likewise when Germany (and Europe) began introducing US/British models, the same level of misunderstanding of the US research university has come into play. The implication is that copied forms of aspects of university organization may be 1) imperfectly understood; 2) difficult to implement because alien to the environment in which introduced; 3) immediately modified if deemed potentially useful (Bachmann-Medick 2009, for deeper discussion).

This raises questions about the ultimate utility of the introduced ideas, in particular about whether the US style graduate education model should be copied when it has some serious problems.

6.1 The Origins of the Research University in the United States

Individual faculty, deans and university presidents created local and national organizations to establish necessary standards

Nothing approximated the newly founded German university of Berlin in 1810 in the US. Although the University of Virginia aspired to a modern secular curriculum, almost all higher education institutions were tiny denominational colleges with antiquated curricula. By 1900 most states had created actual universities such as the University of Michigan and California, even if they granted relatively few doctorates and lacked a research culture. In the course of the 19th century the US developed a differentiated higher education landscape with

separate colleges for both men and women, co-educational colleges, liberal arts and doctoral granting institutions. It was chaotic and largely unregulated and no college was exactly like any other. There was no state ("Land") or federal agency to regulate higher education, so individual faculty, deans and university presidents created local and national organizations to establish necessary standards. Colleges shared some similarities in organization such as requiring central registration for each class and providing grades for each class. Students were tracked and monitored within each college through a central registration system. Concepts such as "Bildung" or "Wissenschaft" were not generally emphasized and there were no general standards for Bachelor degree content (Rudolf 1962, Thelin 2009).

All of these institutions, whether newly founded or not, drew on a similar body of English law in shaping their institutions. Under this legal system institutions had to secure a charter to become an independent entity under the supervision, but not governance of a board. Each board and each college was self-governing in sharp contrast to the German system of tight state regulation and lack of self-governance.

Morrill Land Grant Act of 1862

Graduate Education prior to the Civil War was undeveloped, although it had serious advocates including Thomas Jefferson, Benjamin Rush, and George Washington. The only graduate degree was the Master's degree. But doctoral education was highly valued and several hundred American men had studied in Germany by 1861. Those American doctorates earned after this date were something of an anomaly granted by individuals holding usually a German Ph.D. and employed in a college whose faculty lacked a research culture and many of the supports of advanced research such as libraries, well equipped laboratories, or special collections. Both faculty and new doctorates also lacked the support of professional associations, research journals, or even funding sources for research. But research-based education and science and engineering were at the time considered inferior subjects for the not especially gifted (Thelin 2011). The real expansion of both doctoral education and science occurred after the Civil War thanks to the Morrill Land Grant Act of 1862. The Act mandated that the new institutions develop new knowledge and make it available to the citizens of the state. These goals subsequently were enshrined in individual charters. From the first doctorate granted from Yale in 1861, the numbers grew to 293 doctorates awarded in 1902. In 1877 the first women earned a Ph.D. in the US (Lori et al. 2006).

The process was completely unregulated, initially an add-on to the undergraduate college. Master's degrees were by the end of the 19th century more common. But doctoral degrees were different. Most doctoral granting institutions eventually appointed a Graduate Dean and to this day Graduate Divisions keep track of doctoral student enrollment, academic progress through the steps of a program including preliminary and qualifying examinations and advancement to candidacy. Before being finally certified to receive the Ph.D. almost all

students are required to fill out a questionnaire created by six federal agencies with detailed information about the field of degree, educational and family background, funding, plans after the degree, and more called the Survey of Earned Doctorates (SED), from 1957 ongoing (NSF and NCSES 2012). Graduate Divisions also are part of the approval process for new doctoral programs or the dissolution of others, setting policy for student welfare, student services, and a host of other activities. Exact data in individual universities are available on each student and the National Science Foundation (NSF) maintains databases on all students. This administrative structure is in sharp contrast to Germany where there does not exist precise enrollment data for each doctoral student on every university campus.

Doctoral education continued at a greatly reduced pace through the Great Depression until after World War II

Research came to be imbedded in US university culture from 1870 to the 1920s when formal doctoral programs were established, research facilities created, libraries founded and expanded, and specialized university presses came into existence (Geiger 2004, Gumport 1993). From a tiny educational establishment in 1800, the United States had so grown in academic research eminence that US scholars regularly competed with their German and other counterparts in prestige and scholarly influence. In the 1920s US Ph.D. production increased by 274 % until 1930. The Great Depression brought this expansion to an end and doctoral education continued at a greatly reduced pace until after World War II (Snyder et al. 1993). Through this period most faculty at the many types of US colleges had a Master's degree or even only a Bachelor's, so there also was not a huge demand for new Ph.D.s.

6.2 German University Development

The German university landscape in the 19th century could not have been more different in key aspects of its structure and organization. The doctorate was the only degree offered, universities were financed and administered largely by the territorial state, and control and governance were external through ministries of education and as part of the state bureaucracy. Professors were state employees ("staatliche Angestellte"). Universities were located in towns and cities. Students were considered adults free to behave as they wished with little university administrative oversight, no services were provided beyond the academic. Students could move from one university to another with ease to profit from particular professors or faculties. Students signed on with individual professors, but were not "enrolled" in the university itself.

Constant changes of German Universities in the 19th century

While the majority of the 35 German universities were moribund at the end of the 18th century, the founding of the "Universität Berlin" in 1810 began a new era in Prussian university life which had a large influence on other German institutions in the 19th century. Universities in the German Confederation, Prussian or not, increased in number and changed their curriculum while attaining scholarly

pre-eminence in most fields. Admission standards were established in 1834 by making the attainment of the "Abitur" mandatory for university admission in Prussia. Through the century enrollment in universities was confined to students from the aristocracy and of the "Bildungsbürgertum". Oddly, prejudice against women may have been broken down in part by American women applying to audit university courses and doing well in the period after the Civil War (Singer 2003). The political inclinations of German university faculty and students went from the radicalism expressed in the Revolution of 1848 to deep conservatism, nationalism, and support for the Kaiser. In addition, after the 1830s the surviving old style universities increasingly gave up their ancient corporate academic and financial rights for direct state support. There was no such thing as "the" German University in the 19th century because it was changing all the time (McClelland 1980, Turner 1987).

Structural aspects of university teaching practice in the German Empire were gradually introduced into US universities from the 1870s on. Among these were the seminar, the stipulation that faculty combine their research with their teaching mission ("Einheit von Forschung und Lehre"), and publish their research. Missing was a full appreciation of the subtleties of "Wissenschaft" and how it shaped a powerful research ethic between 1820 and 1870. "Wissenschaft" was intrinsically related to faculty structure as it evolved in this period, professorial professionalization, and the dynamic pursuit of new knowledge which produced the greatest number of publications of any country accompanied by the creation of new journals and research institutes (McClelland 1980). German was the leading international language of scholarship. Of the purported 10,000 Americans who studied in Germany until 1914, it is doubtful that many truly understood much of this (Jarausch 1995). This contributed to the fundamental misunderstanding in the US that "Wissenschaft" means "science" as narrowly defined by the natural and physical sciences. The neo-humanistic interpretation of "Wissenschaft" current after 1810 as a (stringent) method and means of achieving a cultivated personality never seems to have been understood (McClelland 1980).

Great loss of credibility for higher education in Germany

Both German and US universities expanded greatly up to World War I, but then the paths separated. While US universities more or less continued to build and enroll more students, German universities were devastated by the War effort. The sequence of events following the German Revolution in 1919 left universities weakened and greatly underfunded. After 1933 universities began to be better funded and attract more students, but the takeover of university administration by a series of Nazi offices and officers and then the physical devastation of World War II left universities once more in a perilous condition. As an institution it was discredited. How much was lost in the credibility of education as a means of personal development can be seen in Meinecke's wistful post-War call for the founding of Goethe societies (Meinecke 1955).

This all too brief historical summary suggests the extent to which universities in the US copied aspects of German university education organization without fully understanding its nature within the German system. Moreover, since the US had a collegiate system the imported ideas about graduate education were grafted onto a system totally unlike that found in Germany. Equally disparate were the legal, economic and social environments in which the US university developed. Yet, the idea of "the" German university acquired a kind of mystical quality and has been referenced by university leaders from the 19th century onwards as a form of sanctification of the US graduate system. The truth of this belief is still widely held in the US.

6.3 The Post World War II Period

Expanding federal funding for research in the US

At the same time the equally biased perception in Germany and many other countries is that the US research university is a model to be emulated. Part of the widespread admiration of the US research university as it developed after World War II is based on the metamorphosis the university experienced. The War itself raised the profile of science through the Manhattan Project and the close connection of military research with universities and their faculty (Geiger 2004). Two federal scientific funding agencies were given new roles to advance and support scientific research at universities: the NSF and what became the National Institutes of Health. Today these are the largest sources of federal funding for campus research ("Drittmittel"). But it was politics and the Cold War which resulted in the huge expansion of research universities as the US response to Sputnik in 1957 was to pour money into science both in universities and in national labs. A great leap was taking place in undergraduate enrollment in this decade made possible by the G.I. Bill which paid veterans to go to college. By the 1970s many new campuses were created to meet the demand of a new expanding generation of students, more of whom in the 14–18 year old cohort started to go to college and included more women, minorities and those from the working class. New doctoral programs were founded and doctoral awards began to climb significantly from 8,611 in 1957 when NSF began its SED to 49,010 in 2011. This was in tandem with the increase in doctoral granting institutions from 260 in 1971 to 412 in 2011 (Allum et al. 2012, NSF and NCSES 2012).

The great expansion of research universities in the 1970s still emphasized research above education and training (Geiger 2004). Thanks to federal spending and its relation to the military, facilities at the leading research universities only continued to improve. This is the period when US science became pre-eminent worldwide and the research reputation of leading US universities continued in the subsequent decades. But in all this expansion, while the number of enrolled doctoral students grew ever larger, little changed in the way in which

graduate programs were run or the power held by the thesis director ("Doktorvater/-mutter") over their students.

In brief: US graduate system in 2011

In summary the US graduate system in 2011 enrolled 1.73 million in all graduate programs, 58 % are women. There were 445,000 new enrollees, but 84 % were seeking Master's degrees. A total of 556,685 students were enrolled in 2010 in science and engineering (CGS 2009b, Kang 2012). There are 412 Doctoral granting institutions (2011) bestowing 49,010 doctorates (46.8 % going to women) in all fields out of 6,000 postsecondary institutions. US citizens and permanent residents (PR) comprise 31,573 of which 52 % are female. International students earned 13,625 Ph.D.s, 36 % of these are female. Doctorates earned by international students are predominantly in science and engineering where they earn more than 50 % of all US engineering Ph.D.s (NSF and NCSES 2012).

Rebuilding the Federal Republic of Germany focused on training a new elite through doctoral education

Immediately after the War, the German university system was under severe scrutiny because of its widespread support for the Nazi regime. The occupying powers went so far as to at least consider "Americanizing" the system by introducing Bachelor's degrees and re-organizing graduate training (Fallon 2012). The imposition of the Berlin blockade put a quick end to these ideas, although the focus in the "Bundesrepublik Deutschland" was on rebuilding and on training a new elite (Ellwein 1997). Once the West German economy revived Germany, university expansion superficially resembled that of the US in that in the 1960s and 1970s new universities were founded to meet a growing university eligible population and new university institutes were created (Führ and Furck 1998). But the Ph.D. remained the only degree program within the university, although "Magister/Diplom" and "Staatsexamen" as established steps along the way to the doctorate were also recognized levels of qualification for employment. The natural and physical sciences continued to be built up as in the past in external research centers such as those of the "Max-Planck-Gesellschaft" or The Fraunhofer Institutes. Federal funding and the direction of research is steered through the "Wissenschaftsrat" through the "Deutsche Forschungsgemeinschaft" (DFG) and a few other foundations.

In brief: German graduate system in 2012/13

The total German system enrolled in Winter/Spring semesters of 2012/13 a total of 2.4 million students at "Hochschulen", a record number, with 518,700 beginning in bachelor's programs (Brugger et al. 2012). Within this total in 2010 it is estimated that almost 200,400 are supervised doctoral students, but only around 104,000 are actually registered with their universities. The majority (51 %) are in mathematics, natural sciences and engineering. Unlike the US 89 % of all doctoral students are German citizens, while 41 % are female (Wolters and Schmiedel 2012). Supervision and research training vary greatly in their organization from the traditional model in which a student is taken on by a professor, to the three year programmatic doctoral programs such as the DFG Research Training Groups/"Graduiertenkollegs".

6.4 General Current Issues of Doctoral Education

"Wissenschaft als Beruf"

Doctoral programs in both the US and Germany share several characteristics inherent in the nature of this kind of training. The greatest, perhaps, is the transformational impact on students who persist in the program. This includes acquiring discipline specific analytical thought and vocabulary, socialization to its values, behaviors and characteristic forms of communication (Gardner and Mendoza 2010). But socialization has several facets: not only is the student gradually shaped intellectually into membership in his or her particular discipline, but also into the life of an academic, or in Weberian terms, "Wissenschaft als Beruf". Ideally this also implies a "calling" in which the future academic is expected to be dedicated to his or her profession, sustain and transmit values about the integrity of scholarship, among many others (Weber 1922). Implicit in the capacity to sustain an academic vocation, however, is that the student comes from a middle class or higher social background in which manners, broad cultural knowledge and habits are intrinsic and related usually to a certain income level. In the years since Weber gave his talk in 1918 this element has persisted in both the US and Germany, but can manifest itself in perverted forms which work against students from working class backgrounds ("bildungsferne Schichten"), women, and students of color in the US and "Studenten mit Migrationshintergrund" in Germany (Lovitts 2001, Maas 2011, Maki and Borkowski 2006). In the 21st century "vocation" has lost ground to competition and achieving success at any price, particularly in a climate in which research universities are expected to run as if they are businesses.

High rate of doctoral dropouts

Beyond doubt the US university continues to lead in research achievement and looks like the kind of institution most countries would like to have on their own soil. But the enormous emphasis on research deliberately pursued after World War II has not produced clarity on how doctoral students are to be most effectively trained, particularly in the natural and physical sciences. In fact, however, half of those enrolled in Ph.D. program in the US leave before finishing their degree (CGS 2009a, Lovitts 2001). While reasons for departure range from those who find that the program in which they are enrolled is not what they want to do, others find the environment hostile, faculty unsupportive, and may not have come to terms with the intense work demands. Indeed, the expectations for dissertations have been increasing in terms of the amount of research expected, the novelty and innovative character of the analysis, and publishing in refereed journals before finishing the Ph.D.

Expectations for student achievement do not necessarily match the opportunities offered

The increased expectation for student achievement ("Leistung") is not necessarily matched by formal extensive orientation to a particular program, or by increased mentoring. In a competitive environment, students are also implicitly encouraged by their faculty to compete with one another, thereby undermining potential cohort sup-

port. There are expectations that students will understand the many unwritten rules of doctoral student behavior based on an implicit belief that the really brightest will figure out what is required of them. Students continue to characterize their programs as a "boot camp" in which Darwinian struggles take place. For students who are the first in their families to attend college from working class milieus the complexity of full socialization is not always evident to faculty (Gardner and Mendoza 2010).

Other problems in US doctoral education are related to the sustained implicit assumption that students will become professors and function in a world similar to that of their doctoral program in a prestigious university. But few doctoral programs truly train their students to become effective faculty by providing programs on course design, effective teaching methods, grant writing, article preparation and publishing, lab management and the many other activities of faculty. Some US research universities have made efforts to address these issues and reform is discussed, but the problem is that programs are not necessarily sustained (Flaherty 2013). Although not intended, the importation of the almost unlimited power of the "Doktorvater" from the German model is one of the few aspects of US graduate education which is unambiguously following the source. And, as in Germany today where the traditional model is still in place in the many doctoral programs, similar problems with students arise (Egeler 2012, Knigge Illner 2002). These in turn lead to attrition and non-completion of the dissertation.

Looking closely at each countries' positive developments offers the possibility of selectively copying aspects of the other's programs

So far this discussion raises many questions about the nature of doctoral education and whether the US research university really ought to be the model used for emulation in Germany. Observed from the US side, it appears that the positive aspects of the US research university are all that have been noticed. The huge differences in the totality of higher education systems in both countries and the preconditions controlling their structures do not seem to be taken into consideration. As a result bits and pieces are copied, like selective admissions to special programs such as "Graduiertenkollegs", tighter curricula in such programs and a structured research program, fellowships, etc. University ranking is another imported idea which compromises the previous idea of German universities providing roughly equivalent education to their students, choice of university being related to the strength of individual faculties and institutes. The real question is what was wrong with the German old system? That it lacked glittering research universities like Massachusetts Institute of Technology (MIT) or Stanford was in part related to the fact that natural and physical science is still largely conducted at the independent institutes of the Max Planck Society and others, as the system was established in the 19th century. University science departments today are somewhat overshadowed as a result. Graduate student training, however, was as inefficient as it is in the US – so US training models are not really something to be replicated.

Graduate Programs created under the Excellence Initiative in Germany demonstrate new successful approaches

Instead, I would suggest, the most effective new models of graduate education in Germany are entirely new, even if they think they are following the US lead. Graduate Programs created under the Excellence Initiative demonstrate that the issues affecting graduate education are fully thought through in order to generate forms of organization which both support and sustain students, but also promote academic distinction. Several factors make this possible: whole universities engage in lengthy self-reflection in order to design a proposal for the DFG along with significant internal reorganization. Some of these, like the official inclusion of scholars from independent research centers in "Promotionsrecht" and in participation in faculty affairs, crossed historical boundaries and widened the teaching pool substantially. The internal structure of the doctoral program involves highly selective admission, committees of three with no all-powerful "Doktorvater", student committee contracts, extensive advising, individual research programs tailored to future employment sector expectations along with external internships. While these features are taken from a specific Graduate Program, The Max Planck Research School in Biology at Göttingen (► http://www.gpmolbio.uni-goettingen.de/), and are not the same in all Excellence Centers, they address many areas in which doctoral training in the US and in the old system in Germany fall short. It should also be noted that "Excellence" programs are not universally popular (Meyer 2010). These very expensive new programs are made possible by the fact that excellence universities are part of the state bureaucracy so that wholesale restructuring is done within a legal context. This is not possible in the US.

6.5 Conclusion

So what has been lost in translation and what has been gained? Any form of intercultural knowledge transfer is circumscribed by the cultural lenses of the receiving party. Of all objects for study, the university is surely one of the most complicated and subject to substantial myth building. Doctoral education as a subset of university activities too often has the sanctity of long practice without necessarily the scrutiny it requires to be efficient, of service to the students in the program, to society and to the economy at large.

The argument presented here is that doctoral students in both countries, with the exception of those in innovative programs like the German graduate centers or programs within some US graduate schools, are not necessarily as well served as they could be. In both countries there is little agreement about the purpose of this form of training when far too many with doctorates do not find employment for which they were trained. A particular German issue is the social status of doctorate holders within politics and public and private bureaucracies in which the content of the degree appears incidental to its

status. So does doctoral training as it exists produce scholars creating cutting edge research? Certainly, but not universally. In the US it is also argued that a legitimate function for this training is to prepare teachers of undergraduates. Another issue is who currently benefits from large populations of doctoral students in departments, institutes and "Fachbereiche"? In both countries they are hired to teach introductory courses and in laboratory fields to work on the research projects of the lab director. Universities in both countries could hardly function without this poorly paid labor. All of this taken together raise the ultimate question: Is it the best way to develop human potential when there are many negative aspects to the experience and too often no designated employment afterward?

Some broader concerns should also be considered in relation to graduate education. Why is it that the increase in female Ph.D.s over the past 20 years has not substantially improved the climate in the academy or the number of women professors relative to the number of Ph.D.s? The growing requirement for postdoctoral training and its potential great length and poor pay also raises the question about whether this system means that doctoral training is inadequate?

In conclusion it seems that through piecemeal takeover of parts of each other's system, each has missed the cultural and other determinants which shaped an activity in the copied system. The myth in the US about the contribution of historical German doctoral education to the US seems less significant today than the German introduction of US university activities and institutions which are unconnected legally or historically to their system. It makes much more sense to follow the lead of innovative German universities in creating fair and efficient programs for training doctoral students under the Excellence Initiative than thinking the US system is being imported.

Following the lead of innovative German universities makes more sense than adapting piecemeal innovations from abroad

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