

2. Institutional factors shaping the performance of research organizations

Groundbreaking research achievements are rare and unevenly distributed across research organizations and countries. In addition, national research systems are institutionally stratified, i.e., divided into a core area of elite institutions and a peripheral area of all other research institutions. Sociologists Joseph Ben-David and Rogers Hollingsworth have investigated the relationship between global groundbreaking research and institutional stratification using the example of biomedicine. Prof. Thomas Heinze's research group is continuing this work with grant-funded research projects and PhD dissertations, including the DFG-funded Research Training Group "Transformations of Science and Technology since 1800: Topics, Processes, Institutions." An important part of this work involves establishing high-quality repositories and making them available to the research community. This includes a dataset of all Nobel Prize winners and their career stages, a repository of all available Nobel Prize nominators and nominees, and a repository on the development of subject structures at state universities in Germany. The empirical analyses carried out refer to middle-range sociological theories.

2.2 Institutional inertia and performance deficits in the German university system

The shift of the global center of science from Germany to the United States (or North America) in the first third of the 20th century is largely due to institutional deficits in the German university system, in particular considerable institutional inertia that have (so far) prevented a fundamental reform of public universities in Germany. Its long-standing structural problems include the hierarchical structure of professorial chairs and institutes and the lack of comprehensive, research-oriented graduate training.

In order to better understand the institutional inertia in the German university system, Prof. Heinze's research group took a closer look at the activities of the Science Council (WR), an influential advisory body on higher education and science policy founded in 1957 (Heinze, Fehsel, et al. 2019; Jappe & Heinze 2026). A key finding of the analysis by Heinze, Fehsel, et al. (2019) is that the WR's role as a higher education policy reform body lasted only about ten years. By the mid-1970s at the latest, the WR's initial efforts to initiate comprehensive structural reforms had come to an end. Two of its key reform proposals, the abolition of professorial chair system and the widespread introduction of graduate schools, have not been implemented or have been implemented only partially. The WR is essentially a body for reaching consensus between the federal and state governments on higher education and science policy. This finding points to the need for a politically independent council of experts that provides research-based reform impetus for higher education and science policy.

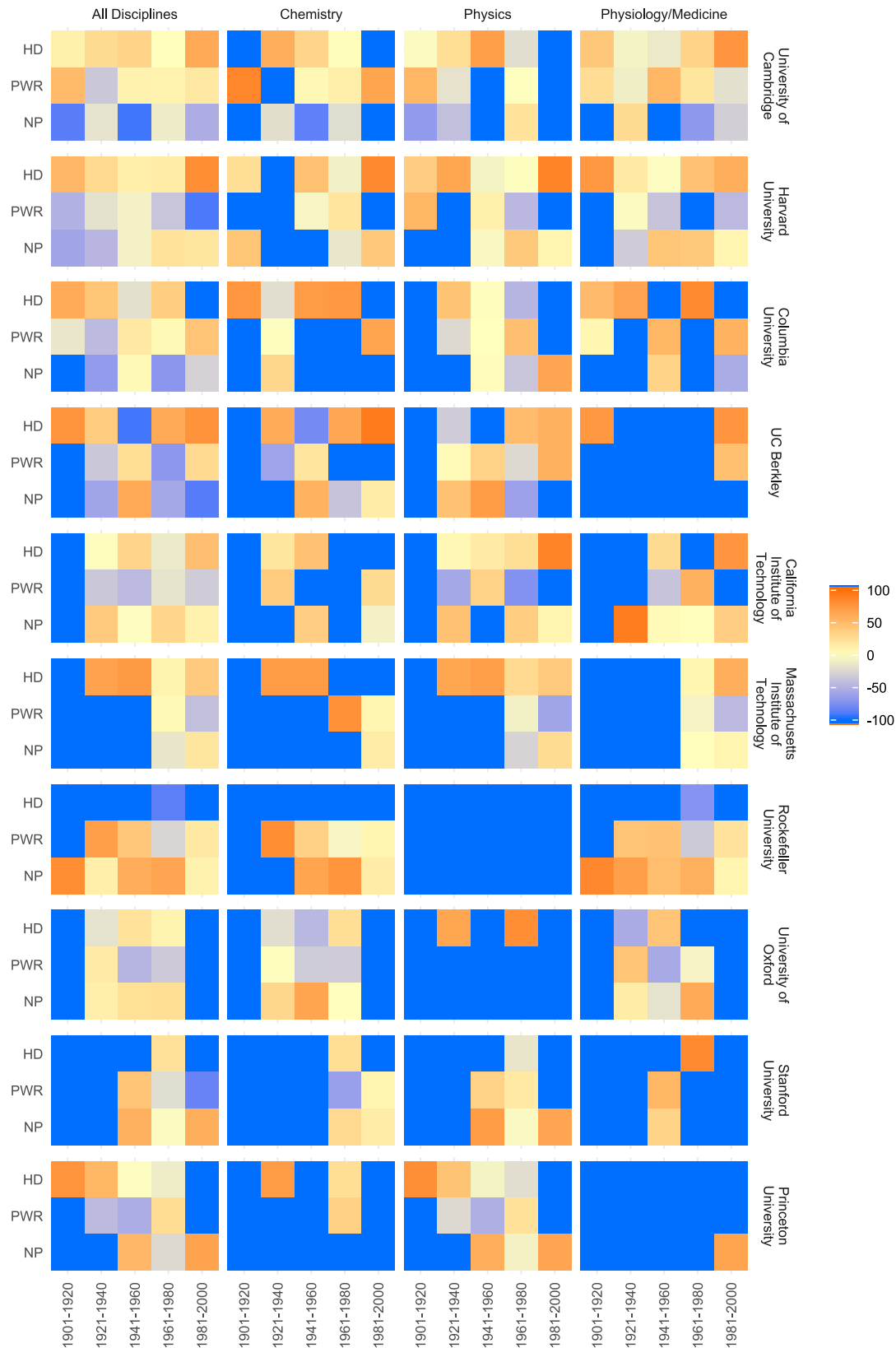


Figure 4: Top 10 universities and research organizations that represent 29 percent of all career events and 34 percent of all Nobel laureates, source: Heinze & Fuchs (2022). The representation includes all career phases (HD, PWR, NP). Heat maps for 20-year periods are shown, calculated on the basis of the RESP.

In another essay, Jappe & Heinze (2026) interpret the history of the WR from the perspective of historical institutionalism (Streeck & Thelen 2005; Mahoney & Thelen 2010, 2015). At first glance, the change in the WR's tasks appears to be a process of *layering*, in which the original tasks of political coordination aimed at expanding universities were increasingly supplemented by tasks of reform recommendation, evaluation, and ultimately the promotion of scientific excellence. This raises the question of why the WR's committees and decision-making structures have remained virtually unchanged despite the significant change in its tasks. The political and scientific environment of the WR has also changed considerably since its foundation. The persistence of the WR's structures indicates a *drift* between formal structure and context of action. The social mechanism that causes this gap is referred to by the authors of historical institutionalism as *deliberate* neglect. The most important actors, i.e., the political executive elites of the federal and state governments and the state-funded non-university research organizations, have no interest in adapting the formal structures of the WR to changed societal conditions. This in turn raises the question of the long-term consequences of this development for the institutional renewal of the higher education and science system in Germany.

The structural problems of German universities have resulted in considerable performance deficits in research. Ben-David (1960, 1971) and later Hollingsworth (2006; 2011) pointed out the global scientific supremacy of US universities, especially in biomedicine. In order to empirically verify these findings for areas outside medicine, Prof. Heinze's research group conducted analyses comparing the development of new research fields in physics and chemistry in Germany and the United States (Jappe & Heinze 2016). An important finding of this study is the considerable time lag with which scientists at public universities in Germany respond to research breakthroughs in these two areas. Their colleagues at state universities in North America have a clear lead of several years in establishing new and promising areas of research.

Even the Excellence Initiative has not been able to effectively address these structural problems. Compared to the world's leading universities in the United States, even the largest German universities – such as LMU Munich, TU Munich, and Heidelberg University – are rather small and therefore unable to maintain the disciplinary breadth and research capacity necessary for comprehensive international competitiveness (Lepori et al. 2019). This is mainly due to the fact that Germany maintains a large and costly state research sector outside the universities, consisting of four major non-university research associations: the Max Planck Society, the Fraunhofer Society, the Leibniz Association, and the Helmholtz Association. A significant portion of the funds flowing into this sector – currently around €12 billion annually – would likely be needed to bring universities and their departments to a significantly higher level of financial support.

As Jappe & Heinze (2026) argue, it is neither in the interest of the functional elites of the state-funded, non-university research sector represented in the WR nor of the ministerial offices at the federal and state levels to engage in discussions about substantial resource transfers to universities and the legal changes required to make this happen. Instead, the functional elites represented in the WR have opted for a far less costly and politically more convenient path. Together, they have constructed and spread the illusion that Germany has already significantly improved the international performance of its universities by implementing the Excellence Initiative (since 2019: Excellence Strategy). However, this illusion prevents a serious debate about necessary reforms. The illusion created by the Excellence Initiative

hinders an evidence-based discussion in higher education and science policy about effective measures to improve the international competitiveness of German universities.

Related to this is another long-term project in Prof. Heinze's research group that maps disciplinary patterns in teaching and research in German universities, including financial and human resources of public state universities, their students, their scientific publications, and their visibility in the form of citations are collected and made available on a dedicated website (<https://fachprofile.uni-wuppertal.de>). The indicators are based on personnel, financial, and student data from the Federal Statistical Office and bibliometric data from *the Competence Center for Bibliometrics*. A special feature of the data presentation is its comprehensible graphical representation in the form of heat maps (Fig. 5) and growth graphs (Fig. 6). This project presents further empirical evidence of the widespread absence of institutional change in the German university system (Heinze, Tunger, et al. 2019; Heinze et al. 2024). A clear finding of the analyses is the high stability of the universities' academic teaching and research profiles. There have been few fundamental changes in university subject structures since the early 1990s – despite the expansion of the system and the changed social environment. By far the most dynamic area of German universities and their subjects is the sharp increase in grant funding (Fig. 6). As mentioned in the overview in 1.3 ("Gradual transformations from a historical-sociological perspective"), Tobias Grabosch (2nd PhD cohort, RTG 2696) is investigating the effects of the sharp increase in grant funding on the diversity and performance of research at state universities in Germany.

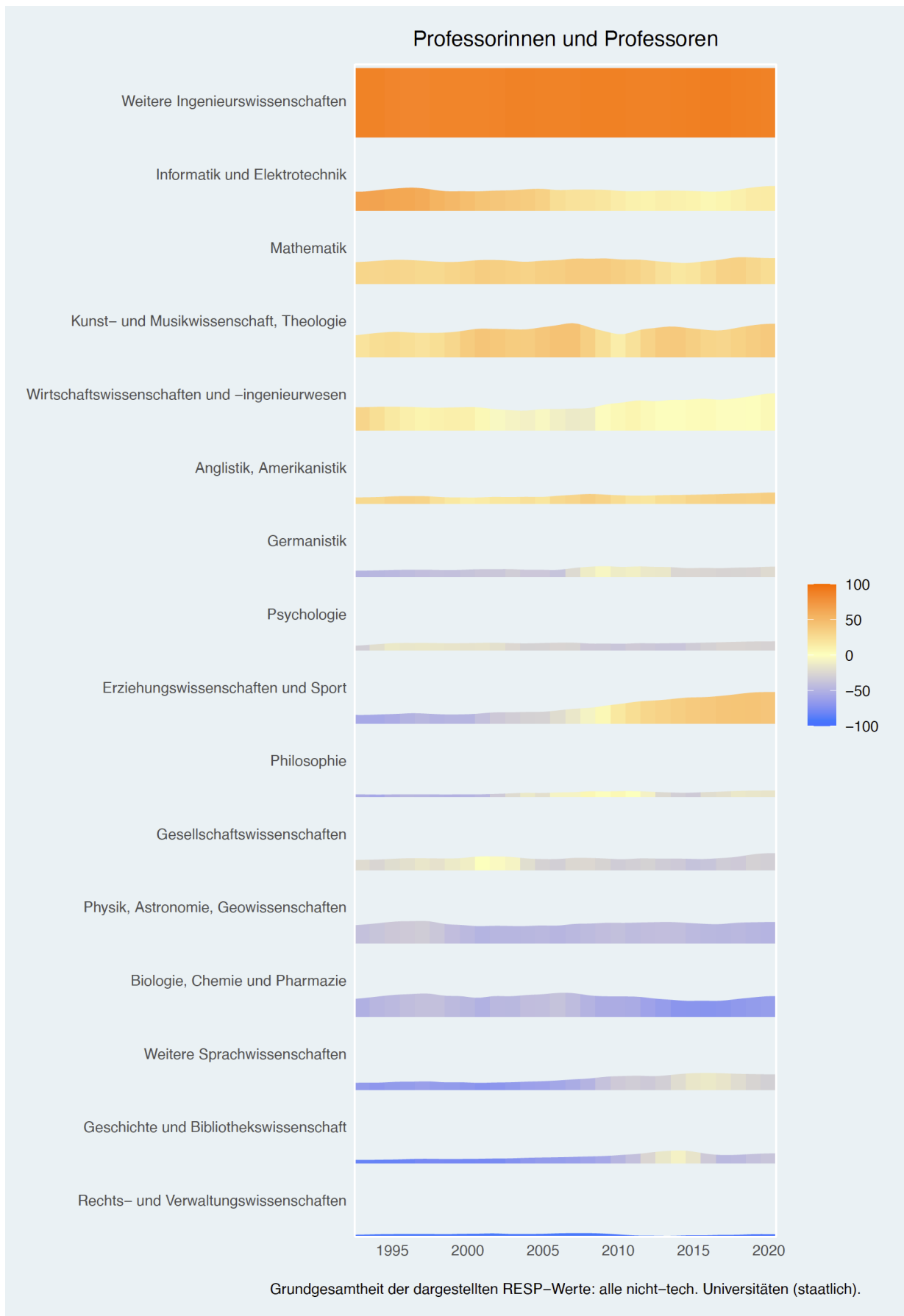
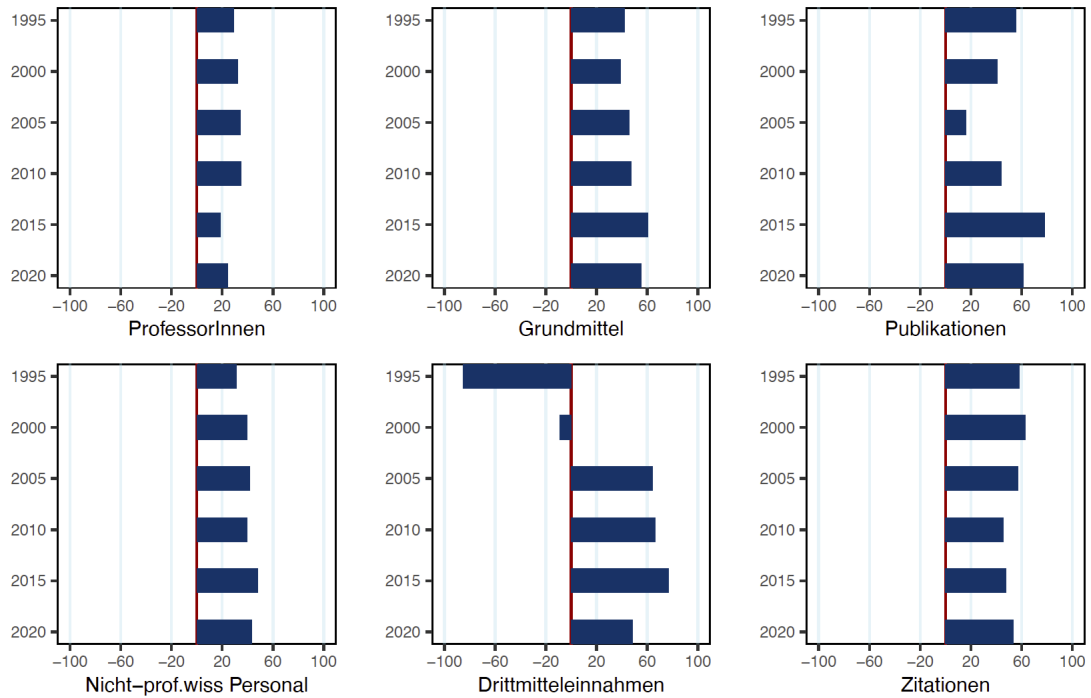
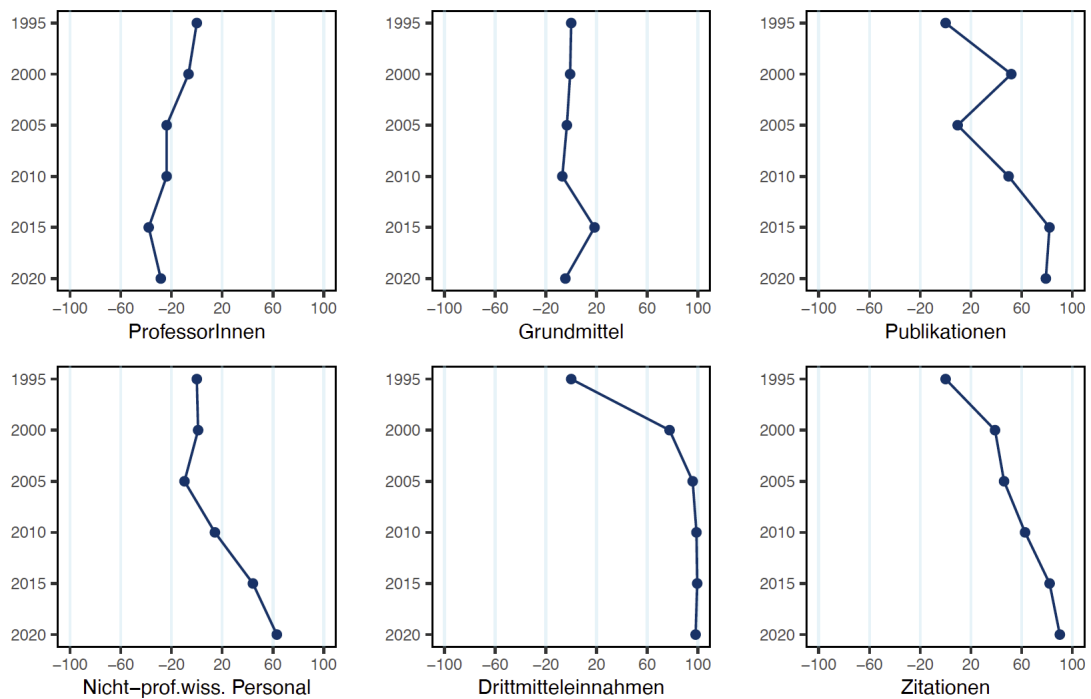


Figure 5: Teaching profile map of the University of Wuppertal (professors). Source: Heinze et al. (2024).

Mathematik



Grundgesamtheit der dargestellten RESP-Werte: alle nicht-technischen Universitäten (staatlich).



Es sind die prozentualen Veränderungen gegenüber dem Basisjahr angegeben (logarithmierte Skala).

Figure 6: RESP values and growth of selected indicators for mathematics at the University of Wuppertal.

Source: Heinze et al. (2024).

Publication of Prof. Heinze's research group

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