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March 2, session 1: Challenges to enter into the career and general work situation

Responsive work conditions in academia – setting the scene

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The globalisation of higher education is the convergence of the academic profession's position in the academy, and the working conditions in the academy. In this paper we discuss the role of the academic profession in relation to civil society and the general work conditions in the context of societies. The overall expectations of the higher education sector have changed (Aarrevaara & Dobson 2015). Clark (1998) has noted that there is a demand-response imbalance: the expectations of higher education exceed resources at every level.

We can identify an *international relevance discourse* aimed at the fundamental transformation of universities and their core functions. In this paper, we compare countries in which higher education is predominantly and heavily publicly funded. This feature means that universities' public information management, performance management systems and regulation are first and foremost determined by governments. It is also necessary to set other criteria. Finland has a dual system in which working conditions differ significantly, depending on whether higher education institutions focus on teaching or research. It is also essential that the countries in the comparison have a career system in which an effective affiliation with higher education institutions requires pre-defined career path rules, such as a tenure track system.

Under these circumstances, working conditions are determined by the autonomy, regulation, and collective employment agreements of higher education institutions as a whole. The tension of these elements has led to a situation in which researchers can study whatever they want but funding is increasingly provided only for certain topics, which are judged beforehand to be of social relevance (Kekäle, Diego & Varis 2017; Kaldewey 2018).

In recent decades, universities have increasingly been seen as a part of the innovation chain, producing the innovations (and key employees) for the industrial and business sectors (Goddard et.al 2016). However, the awakening to the climate crisis brought in yet another emphasis on social relevance: seeking solutions to global grand challenges (Kekäle & Varis 2019). Grau et.al (2017, 38) have even maintained that universities have “the singular responsibility of helping to provide appropriate and adequate responses to both legitimate needs and interests to contribute to overcoming the global challenges of the world”.



The relevance of the discourse on working conditions in the academy is connected with higher education institutions' core functions of research, education and service functions (Enders & Teichler, 1997). In this paper, we pay particular attention to the working conditions of the two discussions that are identified as the quality movement in academia and the responsive university. The key initiatives in the storyline of the *quality movement* in academia from the 1980s onwards is stressed through the perspectives and expectations of the various stakeholders, including internal and external stakeholders, in defining the desirable outcomes of higher education processes (Vroeijenstijn 1995; Aarrevaara & Dobson, 2013). The *Responsive University* (Tierney 1998) needs to be in constant conversations with public knowledge, and experience should flow in both directions. The justification of institutional existence is in the outcomes, social relevance, high quality research, education, and service. Institutional efforts and resources should be directed to those who are served by the university, not for the university for its own sake.

Within the framework presented above, this paper presents discussion of how working conditions at the universities have changed between 2008 and 2018. The classic theory of Herzberg et al. (1959) on motivation and working conditions is relevant; in particular Herzberg's motivator, "the work itself" – which might be changing according to the discourse - has been noted as a significant predictor of job satisfaction (Smerek & Peterson 2006).

As there are basic disciplinary differences (Becher 1987) fundamentally affecting academic leadership (Kekäle 2001) and conceptions of quality (Kekäle 2000; 2002), these changes vary according to disciplines or more generally between "soft" disciplines in the humanities, social sciences and the arts, and science, medicine and engineering or the STEM fields. The soft areas receive less policy attention (Benneworth & Jongbloed 2010) and in the STEM fields, stakeholders are more often invited to discuss goals and objectives (Jesiek et.al.2009), in line with the relevant discourse.

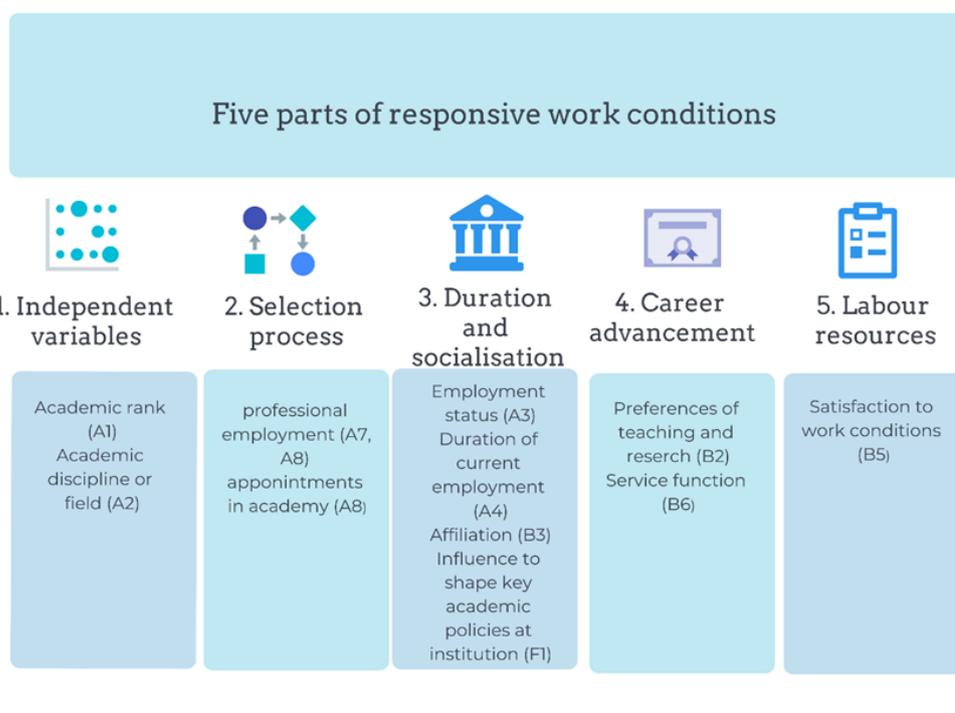
The research questions presented in this paper are:

- Is there a change in working conditions between 2008 and 2018?
- Is there a difference in working conditions in the humanities and the STEM fields, comparing the working conditions in 2008 and 2018?

We respond to these research questions by combining factors which describe the variables of the relationship. Based on variables presented in the illustration below, we will draw conclusions



about the progress of work conditions. We chose Finland, Germany, and Portugal as reference higher education systems. These countries meet the conditions we have set in this abstract.



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Doctoral socialization and the academic profession: an international comparison of doctoral experience

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The move to managerialism and New Public Management (NPM) in governance of public higher education institutions (HEIs) over the last three decades, has changed the role of academics in the governance of their institutions (De Boer et al., 2007)—and arguably with it professional autonomy and academic freedom (Carvalho & Videira, 2019). As a result we have also seen an accompanying decline in public funding and, thus, a move towards a more market-focused mindset with reduced focus on the teaching and learning functions (Santiago & Carvalho, 2016) in favour of money-making structures. Based on the results of their research in European higher education systems, DeBoer, Enders, and Schimank (2007) argued that this changing to a top-down management structure did not always weaken the professoriate entirely, frequently allowing academics to maintain their influence on aspects of policy.

The higher-level academics occupying these leadership positions are the academic ‘elite’. As they may use their legitimacy and prestige to co-ordinate and implement their intentions instead of the legitimate authority offered by the positions they hold (Bleiklie et al., 2011), this may have an effect on the types of policy decisions being made. With this group of academic elites retaining powers over aspects such as research programs and peer review (Musselin, 2013), there is the potential for those not in the ‘elite’ group, the so-called “non-guild” academics (Macfarlane & Jefferson, 2021), to be side-stepped in preference for those who do represent ‘elite’ group membership.

For Bourdieu, the social “power” used to increase one’s position within the hierarchy of a social space is derived from the volume and composition (comparative *weight*) of economic capital, cultural capital, and the confluence of social and symbolic capital which they hold (Bourdieu, 1987). Using the Bourdieusian definition we could argue that social capital is fundamental to the academic profession, since it is “the aggregate of...resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance—or in other words— to membership in a group” (Bourdieu, 1986, p. 248). Inherent within membership of any group is the idea of obligation, through the exchanging of gifts; not solely a physical object, this ‘gift’ can often be symbolic in form, as *recognition*, making one “worthy of being known” (Bourdieu, 1986, p. 250) to other members of the group, expanding one’s social network. If we have a subgroup of elite academics occupying leadership positions, whether it be



with regards to hiring, research, publication, or funding, those decisions may lead to a cumulative advantage to those already advantaged. In an age where equity and diversity are primary concerns in higher education and with the increasingly heterogenous population of doctoral students (Cantiller, 2019; Choy & Cataldi, 2006; Gardner, 2009; Taylor et al., 2020)—the future academic population—it is important that we explore the doctoral experience to prevent further disadvantage. It is essential that we identify those aspects of socialization within graduate education and the route into scholarly careers which need to be transformed, to ensure that the structures within doctoral education and higher education more generally undergo transformation along with the changes in make-up of students and staff studying and working within it.

Academic elites occupying leadership positions are the gatekeepers to academia, controlling “access to careers, research funds, co-authorship options and possibilities of publication in high-status journals” (Stichweh, 2022, p. 50). This group of ‘elite’ academics “demonstrate strong loyalty towards their peers” (Geschwind & Edström, 2022, p. 216) when acting in their evaluative capacity. In many nations, research shows that “preference for hiring local or ‘known’ academic over those best suited academically to the position reinforces the importance of social networks and relationships in academic systems” (Jones & Jefferson, 2021, p. 9). It therefore makes sense that doctoral students are being made in their supervisors’ image, and those who successfully complete doctoral study and go on to secure academic professorial positions are those who can gain membership to this ‘elite’ group of academics.

Applying socialization theory (Weidman et al., 2001; Weidman & Stein, 2003) to the doctoral student experience shows that students require the opportunity to secure the knowledge needed for their discipline, and that of the scholarly role, through teaching and research experience, guided by their supervisors. Doctoral students require faculty support, research collaboration, and publications to secure funding, to enable them to invest more of their time on various scholarly activities, which in turn provides the time and opportunity to get involved with scholars in their department and the wider discipline for further collaboration, widening their network, and so on.

Yet, socialization is more than gaining knowledge and experience of a specific field for doctoral students, but requires “hands-on” experience of scholarly activity (Gopaul, 2011, 2015; Walker et al., 2008). Socialization can only be successful through interaction with, and integration into, the department and institution as well as the general field (Johnson et al., 2017), developing necessary values, behaviors, and skills from not just direct supervisors but also those in the wider discipline (Bragg, 1976). The student becomes invested in the field of study through involvement



with internal and external communities (Weidman et al., 2001, 2020; Weidman & Stein, 2003) via conference attendance, academic service activities, and publication, to name but a few. Through hereditary transmission of cultural capital, we reproduce the pre-existing social hierarchy and bias, imparting on other group members (including doctoral students) prestige through association, and symbolic capital through embodiment of the values and behaviours of the wider group (Bourdieu, 1986).

Although there are formal requirements for doctoral success in most higher education systems such as course completion, qualifying exams, and writing a thesis or dissertation (Jefferson, 2021), many of the *valued* activities for effective socialization transcend the department and even the discipline. Activities that are now often referred to as being part of the 'hidden curriculum' (Elliot et al., 2020), such as collaboration on research projects, working as a teaching assistant, publication in top journals, and conference attendance (Gopaul, 2011, 2015, 2016; Walker et al., 2008) appear to be equally as important for successful completion of the doctorate and a future in academe as passing the formal aspects of doctoral education. However, access to these informal but valued activities is not necessarily equally available to all, but to those who have had conferred on them in some form a marker of 'elite' group membership (or potential for membership).

If we want to ensure diversity and equity in academia, it is vital to understand the structures and components that make up the academic profession: the academic professoriate, and their pathway into scholarly careers. What are the valued activities within doctoral programs which lead to scholarly careers? What factors may be affecting socialization success? Are there 'local' differences influencing these valued activities between regions or nations? How has doctoral study and the expectations on emerging scholars changed over time? How has the academic profession itself changed?

Though the informal, "unwritten rules" for successful socialization appear to change between disciplines, they retain some similar components since they remain largely aimed at those wanting to remain within academia as opposed to those intending on seeking employment in industry; doctoral programs are still targeting the 'traditional' student (Acker & Haque, 2015; Offerman, 2011) seeking a 'traditional' scholarly career of teaching, research, and service (Cummings, 1998) in a higher education institution. A 2019 Nature survey (offered in five languages to encourage international participation) found that just over half of all doctoral students who participated intended to enter into academia (Woolston, 2019); however, those numbers do not appear to match subsequent careers. Those who go on to secure academic positions in higher education institutions upon completion of their doctorates are in decline.



Though we are seeing an increase in the number of PhD holders, fewer tenure-track positions are becoming available (Peters, 2021). Fewer than one fifth of Canadian PhD holders are working in tenured or tenure-track faculty positions, the majority in precarious employment, if they even venture into the world of academia at all, with many making the shift to industry and government positions (Peters, 2021). It must be acknowledged, however, that some disciplines are better suited to industry than others, which may partially account for the continuing high numbers studying for PhDs despite the current climate in academe. A similar picture has been seen in other higher education systems such as the United States and the United Kingdom, with just 30% of PhDs remaining in academic research positions just three years after graduation (HEPI, 2020), reporting high levels of anxiety and mental health issues, and feeling unprepared for the job market (Elliot, 2021; Li & Collins, 2018; Weidman & DeAngelo, 2020).

With the changing academic job market—which will no doubt be affected by recent COVID-19 pandemic restrictions for some time to come—and the changing doctoral population, there are pertinent questions to be explored if we want to retain equity and diversity in higher education. We need to understand how the doctoral experience has changed over time and across higher education systems to ensure we are providing equity in opportunity for the future professoriate.

- What do the valued activities for successful doctoral socialization look like? Are they different across systems and nations? Have we seen a change over time?
- What do we understand to be the valued attributes and behaviours of the professoriate, sufficient to acquire academic positions in higher education institutions?
- How have doctoral programs prepared students for an academic career? And how do the longstanding requirements and preferred activities/behaviours undertaken within doctoral programs prepare contemporary students for future academic careers, given the shift in attitudes and perceptions of higher education and its potential to impact society as part of a global knowledge economy?

The answers to some of these questions can be sought through the APIKS survey data. Results from the Canadian data of the APIKS study indicate that financial and research support appear to have, so far, been key components in successfully socializing the role of scholar within doctoral programs (Jefferson, 2021). Faculty support—particularly in relation to research—alongside a greater potential for funding accompanying scientific research, may be key to doctoral success, marking candidates with the potential for ‘elite’ group membership. In Canada,



support for doctoral students from faculty has increased over time, as has doctoral students' involvement with faculty on research specifically (Jefferson, 2021).

However, of those who undertook doctoral education in Canada and successfully gained employment in academic positions at Canadian institutions, fewer than one third reported receiving any training in teaching methods (Jefferson, 2021), despite teaching being a major component of the scholarly profession (Gopaul et al., 2016) and the “unbundling” of the traditional academic role (Macfarlane, 2011) of combined teaching, research, and service. As the participants in the study had successfully secured scholarly roles, this dearth of instruction in the teaching aspect of the tripartite role of academics clearly was not a hindrance, which leads to questions around the nature of the academic work itself.

There has been a noteworthy increase in the number of teaching-only positions and temporary contracts in recent years, not only in Canada (Karram Stevenson et al 2020) but in other higher education systems around the globe (Rogers & Swain, 2021). With the increase in precarious positions—usually teaching-focused—in addition to the increase in teaching-steam tenured positions in recent years (Chiose, 2015; Karram Stephenson et al., 2020) it begs the question, does there need to be a greater focus on teaching doctoral students the pedagogy they need to be effective teachers and mentors? The initial results from the APIKS data might suggest not, given that at the time of the survey, participants were Professors at Canadian institutions, and were clearly able to successfully socialize into both their doctoral programs and subsequently gain these traditional, tripartite academic roles which include a teaching component. It is not possible to be certain given the data at this time, but investigating and comparing across nations might provide some insight. There are indications that this dearth in teaching instruction might lead a certain subgroup of ‘elites’ into the more traditional academic roles in which teaching is not quite so prominent, focusing more on research and publication-based elements; however, this could also indicate that doctoral programs are shifting a large proportion of doctoral students into teaching-based roles for which they are underprepared which will have a knock-on effect in the long-term for academic performance outcomes.

The APIKS survey data provides means of answering some of the questions surrounding doctoral socialization and the academic profession. Looking at the data on participants career and professional situation, the survey collected information on participants' current position, location, where and when they achieved their doctorate, and in what discipline (section A). We can explore questions surrounding their doctoral experience through their answers to the question “how would you characterize the doctoral training you received?” (A6), which covers financial situation, employment, and activities undertaken. It is possible to compare their



responses with their general work situation as it stands in their current positions at the time of the survey to explore whether their current activities such as teaching, research, and publication relate to their doctoral activities. As the participants were asked for the date of their doctoral qualification, we can potentially track their responses over time to explore how doctoral experience—or at least, the perception of doctoral experience—changed over time.

It would be interesting to compare the perceptions of doctoral education activities and students' experiences between nations, as the 'local' context (in terms of where the doctoral study is taking place, rather than a focus specifically on home-grown academics) may have a bearing on how higher education, and specifically academic work and doctoral study, is perceived and thus managed. By investigating perceptions of their own doctoral experiences, the support and collaboration they experienced, and the training in research and teaching, we can see if there are common trends between nations, and perhaps discover whether this affects the structure of programs and subsequent career decisions.

The high level of faculty support reported by participants in the Canadian data from the APIKS study (Jefferson, 2021), along with the high reporting of financial support received in the form of fellowships and studentships, suggests that these may be key factors to doctoral success. Given disciplinary differences and the changing student population, a large swathe of contemporary doctoral students may be at an unfair disadvantage, potentially one of the underlying reasons for high attrition from doctoral programs. Further investigation to compare local conditions for doctoral students as well as the job market and structure of the academic profession may shed more light on these issues and help to prevent further inequality as we move forwards in a COVID-adapted, global knowledge society.

We know that doctoral education and indeed, academic careers, are different across nations. One broad example is the differences in doctoral programs in terms of length, comprehensive exams, and other course requirements which are not ubiquitous. There is the well-known example of the teaching-based doctoral program as seen in places like the United States (U.S.), versus the work-based, apprenticeship model as seen in Germany (Schneijderberg & Teichler, 2018). The number of students applying to doctoral programs in a particular country and whether they are home-grown or international depends on myriad factors—former colonies such as in France; English-speaking nations like the United States (U.S.), the United Kingdom (U.K.), Australia; and countries with a long history of doctoral education such as Germany, are all attractive to international students and have seen high numbers of international doctoral students (Yudkevich et al., 2020). In much of Europe and the United Kingdom, doctoral students are thought of as early-career researchers (ECRs) as opposed to students as they are in the U.S.,



and in Germany and the Scandinavian countries, they are classed as university employees (Yudkevich et al., 2020). This difference in status is likely to have bearing on the activities doctoral students undertake, and how much training versus responsibility they have for teaching students and managing research labs. Socialization to doctoral study, and to the academic profession, may have a very different composition in different regions of the world. It would be interesting to explore these questions through a comparative analysis with external research data from nations against the APIKs data sets, to explore these concepts further.

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March 2, session 2: Segmentation and career paths

Working conditions in Argentina's academia: different career paths and segmentation of the profession

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Introduction

Since the mid-twentieth century, higher education systems worldwide have gone through huge transformations. Universities have had to respond to the challenge of massification on all fronts. In particular, when it comes to the academic profession, it is possible to observe enormous changes in the last decades. The increase in the number of students, the changes in the governance and management models (Trow, 1994; Teelken, 2012; Leišytė et al, 2020; Deem, 1998; Santiago & Carvalho, 2012; Amaral, Bleiklie, & Musselin, 2008; Amaral, Jones, & Karseth, 2002; Santiago, Carvalho, & Cardoso, 2015), the emergence of new teaching modes, the intensity of research, performativity and accountability pressures impact directly on academic work, and consequently, in academic working conditions (Altbach, 1975; Teichler & Bracht, 2006; Teichler, & Höhle, 2013; Brante, 2011; Finkelstein, 2010; Finkelstein & Jones, 2019; Carvalho, 2017).

Although universities everywhere share common roots and most of them have evolved into modern institutions with the same three missions -teaching, research and public service-, they present different patterns of organization and structure (Altbach, 2007,159–179). As Altbach states, while academics around the world teach and perform research and management tasks, working conditions vary greatly from country to country. Despite the fact that the professoriate has increased enormously in recent decades, the rate is still far behind the number of postsecondary enrollments. This, in turn, led to a deterioration of working conditions (Altbach, 2007,159–179).

In this abstract we aim to analyze the changes that the professoriate has undergone in Argentina in the last decades. The main goal is to characterize the professoriate in national universities in order to establish the current state and evolution of the segmentation and heterogeneity of the academic workforce. We will focus on different aspects related to the working conditions. To do this we have relied on data from the Academic Profession in the Knowledge-Based Society (APIKS) survey.



Theoretical framework

The academic profession in Argentina: a history towards heterogeneity and segmentation

In Argentina, as a result of the explosive increase in enrolment during the Perón governments (1945-1955) there was a multiplication of public and private, university and non-university institutions. Before then, the university system in the country had been predominantly of a professional nature, with research development occupying a secondary place (Buchbinder, 2005). Alongside the institutional expansion, Perón also gave a green light to the creation of a significant number of science and technology institutions and organizations (Hurtado, 2010; Beigel et. al., 2018). A few years later, under the coup d'etat of 1955, a strong push was given to research outside of universities. One of the most noteworthy institutions that was created in 1958 was the National Council of Scientific and Technical Research (CONICET). After dark decades under two dictatorships (1966-1973 and 1976-1983), the scientific system and the national universities in Argentina went through a process of democratization. As a first measure, an attempt was made to reinforce the number of tenured professors (many had been dismissed or forced to resign for ideological reasons). However, in response to the increase in the number of university students, many part-time teachers were hired (Buchbinder & Marquina, 2008; Miguez, 2020). Since then, this subgroup delivers the majority of university lectures. At the same time, there was an attempt to decrease the distance between CONICET full-time researchers and full-time professors at the national universities (Albornoz & Gordon, 2011).

This took place hand in hand with the adoption of public policies based on the World Bank directives. The main goal was to align the higher education systems with a common global agenda. Accordingly, the new public policies promoted research productivity and implemented quality assurance systems (i.e., The National Commission for Evaluation and Accreditation of Universities -CONEAU- was created through the Higher Education Act of 1995, and a year later the National Agency for the Promotion of Science and Technology -ANPCyT- was created). This, in turn, led to a new model for academic work. In Argentina in particular, different incentives and regulations were implemented, i.e., peer review systems for the evaluation of teaching, research projects, and grants (Marquina, 2013; Marquina & Luchilo, 2021). Nevertheless, its first attempt showed the weakness of research activities carried out in universities, as well as the low portion of teachers with graduate degrees and scientific publications (Beckerman, 2016). As we have already mentioned, in Argentina, historically, teaching has been the main activity among academics.

Between 1999 and 2002 the economic crisis led to budget cuts that affected the academic field. In CONICET, the annual application for a tenured position was reduced to a minimum number.



As of 2003, the academic profession, particularly those engaging in research activities, experienced a strong recovery for science and technology institutions and public universities. The passing of the Sciences, Technology and Innovation Act (Law N° 25467) in 2001 provided a comprehensive framework for the national scientific and technological field. During the Kirchner governments (2003-2015) the system went through a sustained growth of financial and human resources, with CONICET being the main beneficiary. During those years this institution tripled its staff and number of fellows, fully oriented towards research, in stark contrast to what happened in the national universities, where full time positions decreased (Unzué & Emiliozzi, 2017; Marquina & Luchilo, 2021).

Despite the institutional expansion with new research institutions and new national universities, the Argentinian research system still stands behind European countries, although in the region it is by far the one with the highest rates (Beigel, et. al., 2018). At this point, the professoriate in the country evolved into different pathways. On the one hand, we've stated that the core activity since the beginning has been teaching, but over the years the different policies mentioned have attempted to reinforce research activities not only in universities, but also by creating science and technology institutions.

Although the global trend shows an increasing share of part-time teachers and a reduction among full time professors (Jones, 2013; Shin, Kehm, & Jones, 2018; Carvalho & Diogo, 2018a; Yudkevich, Altbach & Hans de Wit, 2020; Cardoso, Tavares, Sin, & Carvalho, 2020), in Argentina, as we have pointed out, the situation seems to be somewhat different. Indeed, as far as national universities are concerned, we have seen a clear reduction in the number of full-time professors. However, when analyzing the science and technology system as a whole, and considering that in national universities there is a convergence of academics that also carry out research activities and who belong to science and technology institutions, we find differentiated career paths: academics of national universities and research institutes, and also a strong increase in the number of part-time professors who, nevertheless, carry out full-time research activities subsidized by external research organizations (i.e., CONICET). In addition, there is a majority of part-time teachers who only develop teaching activities at universities. It is important to note that this differentiation of career paths does not appear between institutions, like in other countries where it is easy to identify research universities and others that are more teaching oriented, but within the institutions, where the different career paths live together. This is a consequence of the higher education Act of 1995 that established that all universities in Argentina must develop the three main functions: teaching, research and public service.



We assume that, when analyzing the working conditions in the last decades, it is possible to observe profound changes along the years, which resulted in a process of segmentation and heterogeneity in the academic community. We argue that public policies have highly impacted the academic profession in Argentina. As Marquina et. al. (2021) state, the changes can be seen through the different academic generations, which have received the new rules stated by the new policies in different manner. We agree with Shaw's definition of generation, which considers that the aspects of time and space affect the aggregate of subjects' generations because of their presence in a delineated historical period, as well as the specific processes of socialization in terms of values, beliefs, attitudes and demands towards academics' work in higher education institutions (Shaw, 2008).

Hypotheses and methods

The worldwide trend shows an increase in the number of part-time teachers and a significant decrease in the number of full-time professors. This has been analyzed as part of a segmentation process of the academic body, and different characteristics in each of the subgroups have been highlighted (Jones, 2013; Shin, Kehm, & Jones, 2018; Carvalho & Diogo, 2018a; Yudkevich, Altbach & Hans de Wit, 2020; Cardoso, Tavares, Sin, & Carvalho, 2020). However, the segmentation process in Argentina seems to be more complex.

Some of the questions that prompted our research are as follows: What kinds of sub-groups of academic work exist (e.g., Full-Time professors, Full-Time researchers, Part-time professors and Full-time researchers, Part-Time professors)? How does academic work differ in these sub-groups (with some more dedicated to teaching and others to research)? How are these sub-groups composed in terms of the profile of their academics? What are the potential effects on academic work (preferences, satisfaction, stress, institutional involvement, etc.)? Do we find distinct working conditions (e.g., teaching only, research only, and combined teaching and research positions) and contracts (tenured, interim, per/hour contracts)? Who is their main employer in each case?

For the purpose of this study, we have made an attempt to identify subgroups based on two main variables (employer and contract-time) that, we believe, will allow us to gain an in-depth understanding of the composition of the academic career paths in Argentina. We have defined 4 main sub-groups:

- Group 1: Full-time professors that carry out their research in and are employed by national public universities.



- Group 2: Full-time researchers that are employed by a research institution and/or organization that is associated with public universities (CONICET, and others), and they have a part time position at the university for teaching tasks only.
- Group 3: Part-time teachers, employed by a national public university, that carry out research activities more than five hours per week but are far from being full time professors and or full-time researchers.
- Group 4: Part-time teachers employed by a national public university that focus their activity on teaching and they do not carry out research or do it less than five hours per week.

We argue that changes in public policies over the years have increased the segmentation process in Argentina, with at least four groups with different composition in terms of education, genre, rank and generation (H1). Moreover, we claim that this segmentation has an impact a) on the practices that the academic profession engages with; and b) on the perceptions they have about some aspects of their academic careers (H2 a and b).

We have used data from the Argentine APIKS survey to support the hypotheses and answer the formulated questions. This survey was carried out in 2019, with a total of 1,450 responses obtained, which, after a detailed cleaning, resulted in 1,025 valid responses. The resulting database was weighed in accordance with employment status, gender, and rank to ensure representativeness of the public university system. Consequently, the final number of valid cases was reduced to 954.

The analysis of the hypotheses was based on an analytical model which allowed us to relate our main explanatory variable (career-path group) to dependent variables. For H1, we first identified:

Career path group: As was explained above, we identified four groups based on different career paths according to the main employer (D7) and the employment time (full-time or part-time A3_A). This variable became independent and was measured against the following dependent variables:

1. *Generation:* (A8_1) Three generations of academics, according to key moments of the national policies and the year of access to the first teaching position:
 - a) Novice: They began their academic career after 2008, have 10 or fewer years of experience in the profession, and entered the profession during President Cristina Fernandez' administration.



b) Intermediate: They got their first position between 1995 and 2007, are up to about 25 years in the profession and entered the profession in the second administration of President Carlos Menem or during Nestor Kirchner's administration.

c) Consolidated: They began their career before 1995, the year the Higher Education Act was approved; they have worked as academics for more than 25 years and entered the profession during the de facto military government or during the administrations of Raúl Alfonsín or first Carlos Menem's).

2. *Type of contract:* (A4) Three types of contracts for academics:

a) Tenured: In general, access to these positions is decided through an "open selection process through competitive examinations and interviews" ("concurso público de antecedentes y oposición") in which the institution issues an open call for an available position and the selection is made by an evaluating committee composed of peers in similar or higher hierarchical positions. This competitive evaluation of teachers grants the tenure position to whomever obtains it, and the selected professional enjoys stability, with a career performance evaluation mechanism for permanence. However, for the promotion to a higher position, a new call for an open selection process, similar to the previous one, must be made; therefore, the teacher who wants to be promoted must compete with other new candidates.

b) Interim: These contracts are appointed without going through an open process of competitive examination. The duration of the contract normally lasts six to twelve months and has an automatic renewal. Although the law establishes that there must be an open call for the position, most universities do not fulfill this requirement.

c) Contract per hour: These contracts fulfill the need to cover teaching hours for short periods of time, without guaranteeing continuity.

3. *Rank:* Two main ranks, junior and senior (A1)

4. *Gender:* Male, Female

5. *Training:* Three groups:

a) Undergraduate

b) MA and Specialization

c) PhD and Postdoc



This exercise allowed us to characterize each of the career-path groups in a descriptive analysis, in terms of who are included in each group according to different profiles of academics and, then, to make an association between each path and specific characteristics of the academics. To test H1, we addressed the career-path group as a dependent variable to analyze variations by generation, type of contract, training, rank and gender. We carried out a descriptive analysis and we employed chi-square in order to evaluate the association between these variables.

After characterizing the four groups for H1, we considered them as an independent and explanatory variable, which we have named “career-path group”, and we have used new dependent variables to work on H2, that is, in order to predict some aspects of the academic practices and perceptions about their careers.

1. Academic practices

- *Hours devoted to teaching research (B1_1 and B1_2)*

2. Perceptions about academic careers

- *Preferences on academic work: teaching vs. research (B2)*

- *Stress/ Satisfaction (mean of B5_1/2/3)*

- *Institutional influence (F1)*

Then, to test H2, we ran a multivariate regression model (see annex) for dependent variables because we assumed that the time devoted to teaching/research and the assessments of preferences on academic work, stress/satisfaction and institutional influence might be expected to be related to additional factors beyond the career-path group differences alone. As presented in the annex, in the regression models we included as control variables gender, academic rank, contract time, generation, discipline and employer, which were of particular relevance to test H2, either because some of them are part of the explanatory variable and we wanted to test them in isolation, or because they are relevant variables to explain perceptions and use of time, like “discipline”.

Results

Descriptive analysis: Four different groups of academics

According to our sample, most of the academics in Argentina began their academic career after 2008, therefore they belong to the youngest generation of academics. Sixty two percent of them



hold junior positions and, despite the fact that the Law establishes that, in order to access to the position, university teachers and professors must complete an “open selection process through competitive examinations and interviews” (“concurso público de antecedentes y oposición”), 66% hold interim positions and only 25% are tenure-track.

Another characteristic that emerged from our sample is that a significant percentage of academics in Argentina do not have a graduate degree (35.7%) and those who do, hold a master's or specialization degree (37%). Only 27% have PhD's and postdocs. In terms of gender, on the other hand, it is possible to observe parity among the academics in Argentina.

It is possible to observe that a large majority of the professors are part-timers (67.7% of our sample, which matches with the official data). Nevertheless, such numbers do not necessarily mean that they do not carry out research. Regarding the full-time professors, on the other hand, 32.3% carry out research activities in universities or in another science and technology institution besides having a teaching position.

According to the criteria we used to define the four groups in the Academic Profession in Argentina, we have identified the academic profile of each of the four groups:

Group 1: These are mostly academics that belong to the oldest generation (21 points above the average) and who are mostly tenured (17 points above the average) for their senior positions (33 points above the average). Among them, the ones who hold a Master's or a Specialization degree, are the larger group (43.2%), while 20% hold only an undergraduate degree and 37% hold a PhD or higher. When it comes to gender composition, women are in the majority, with 7.4 points above the average for the profession.

Group 2: This group is composed of academics that mostly belong to the younger generation, in a proportion similar to that of the total. In relation to teaching positions, this group is primarily composed of non-tenure-track positions (68.9% have an interim period of junior positions), whereas only 24.9% are tenured professors. At the same time, it is noteworthy that their degrees differ notably, since a larger group hold PhD's or postdocs (67%). Lastly, it has a balanced gender composition.

Group 3: This group is comprised primarily of the oldest generation, but unlike the first group, most of them are not tenure-track. In comparison with the other groups, most of them hold an undergraduate degree (40.7%), although 22% hold a PhD or higher. Regarding their positions, the proportion keeps up with the average (63% for juniors and 37% for seniors). It also has a balanced gender composition (44.2% women and 55.8% men).



Group 4: Most of them are young teachers (8.5% above the general average), on fixed-term contracts (4.3 above the average), and hold pre-graduate degrees (11.8% above average). Most of them have junior positions (9.2% above the average) and in comparison with the other groups, the gender composition comprises mostly on men.

Table 1. Composition of career-path groups

| | | Career-path groups | | | | | | | | | |
|-----------------|-------------------|--------------------|------|--------|------|--------|------|--------|------|-------|------|
| | | G1 | | G2 | | G3 | | G4 | | Total | |
| | | N | % | N | % | N | % | N | % | N | % |
| | | 115 | 12.1 | 193 | 20.2 | 271 | 28.4 | 375 | 39.3 | 954 | 100 |
| Generation | Young | 29 | 25.7 | 83*** | 44.4 | 115*** | 43.7 | 198*** | 54.2 | 425 | 45.7 |
| | Intermediate | 35 | 30.3 | 67 | 35.5 | 82 | 31.2 | 110 | 30.2 | 293 | 31.6 |
| | Old | 50*** | 44 | 38 | 20.2 | 66 | 25.1 | 57 | 15.6 | 211 | 22.7 |
| Tye of contract | Tenure | 48 | 42 | 48 | 24.9 | 66 | 24.2 | 78 | 20.8 | 240 | 25.1 |
| | Interim | 63*** | 55.4 | 133*** | 68.9 | 187*** | 68.8 | 246*** | 65.5 | 629 | 65.9 |
| | Per hour contract | 2 | 2 | 12 | 6.3 | 14 | 5.3 | 45 | 12.1 | 74 | 7.8 |
| | Other | 1 | 0.6 | 0 | 0 | 4 | 1.6 | 6 | 1.6 | 11 | 1.2 |
| Training | Undergraduate | 22 | 19.4 | 32 | 16.4 | 109*** | 40.7 | 172*** | 47.5 | 335 | 35.7 |
| | Esp o Mg. | 49*** | 43.2 | 32 | 16.6 | 100 | 37.4 | 166 | 45.7 | 347 | 37.1 |
| | Doc or PosDoc | 43 | 37.3 | 129*** | 67 | 59 | 21.9 | 25 | 6.8 | 255 | 27.2 |
| Rank | Junior | 33 | 28.9 | 122*** | 63.2 | 171*** | 63 | 268*** | 71.5 | 594 | 62.3 |
| | Senior | 81*** | 71.1 | 71 | 36.8 | 100 | 37 | 107 | 28.5 | 360 | 37.7 |
| Gender | Male | 49 | 43 | 98** | 50.5 | 120 | 44.2 | 214** | 57.1 | 481 | 50.4 |
| | Female | 65** | 57 | 95 | 49.5 | 151** | 55.8 | 161 | 42.9 | 473 | 49.6 |

Source: APIKS Argentina, 2018. CPG by XA8, XA4, A1, H1 & XA5.

*p<0,05 **p<0,01 ***p< 0,001

Based on the analysis carried out, we can state that there is a significant decline in tenure track positions when comparing the different career-path groups, with a higher percentage in group 1 and a sharp decrease as we move on to the other groups. Moreover, there is an increase in the number of contracts per hour among groups 3 and 4, compared to groups 1 and 2. At the same time, junior positions increase sharply from group 1 to group 2 and continue increasing in groups 3 and 4.

Overall, we can highlight that tenure-track positions are concentrated, mainly, in group 1. However, the highest successfully completed level of education or training is a characteristic of group 2. Furthermore, it is noted that those who hold an undergraduate as the highest degree are the majority in group 4. At the same time, we have noted that most of them are men with



junior positions. By comparison, those who hold interim positions and have earned a graduate degree, are in group 3. In particular, we must highlight that a significant percentage hold a PhD. Finally, when it comes to gender, we can find a percentage of women above the average in group 1. This last variable is the one that presents the least significance, but some, when comparing with the rest, that have shown strong association.

In sum, we clearly recognize four career paths based on the institutional affiliation (main employer) and the contract time. Additionally, we can identify clear academic profiles in the population of each of the four groups, which show segmentation and allow us to confirm our previously established H1.

Results of multivariate analysis: Academic practices and perceptions

After the analysis of the first hypothesis, and once we have clearly identified the composition of the variable “career-paths groups”, for H2 we applied a test on this variable in order to further understand if it can be considered explanatory of some aspects linked to the academic practice, as well as to some perceptions that the academics have about their profession, specifically their preferences about teaching or research, their satisfaction or stress in the profession, and their influence on different organizational levels of the university.

Therefore, we ran a multivariate analysis that included, in addition to the “career-paths groups” other variables related to professional characteristics (see annex). We essentially sought to find out how these additional variables impact the above-mentioned aspects in order to conclude whether “career-paths groups” is a determinant factor. This exercise allowed us to confirm that the variable “career-paths groups” can mainly explain some of the aspects selected for the analysis (see table in the annex). Indeed, we have found a high correlation between this variable and the hours devoted to teaching (-0.21***) and research (-0.87***); their preferences between teaching and research (-0.55***) and their perception of stress (-0.26***) due to the profession. On the contrary, it explains neither satisfaction nor institutional influence. Among the control variables that were included in our model, the academic rank has a significant influence on the explanation of these perceptions (including stress). On the other hand, “employer” is the main variable that allows us to explain their institutional influence. In regards to the other control variables that were used in our model, it should be noted that discipline does not present a strong correlation with any of the variables under analysis (only teaching hours 0.07* and preferences -0.07*). Neither does gender, with the exception of satisfaction (-0.09**). For its part, generation carries some weight in explaining stress and institutional influence.



Based on this statistical analysis, we will now concentrate on those aspects in which we have verified a significant explanatory impact of our main variable, career-path group, since we are interested in further understanding the effects of segmentation on practices and perceptions.

Table 2. Academic practices, preferences, and stress according to career-path groups

| | Mean | Career-path groups | | | | |
|--------------------|---|--------------------|------|------|------|------|
| | | Total | 1 | 2 | 3 | 4 |
| Academic practices | Average weekly hours dedicated to teaching | 9.4 | 11.8 | 9 | 11.7 | 7.2 |
| | Average weekly hours dedicated to research | 11.4 | 14.3 | 23.7 | 13.5 | 2.6 |
| Preferences | Primarily and leaning towards in teaching | 64.8 | 59 | 23.6 | 67.6 | 85.8 |
| | Primarily and leaning towards in research | 35.2 | 41 | 76.4 | 32.4 | 14,3 |
| Stress | Mean of 3 variables related $((B4_1+B4_2+B4_3)/3)$ | 2.56 | 2.39 | 2.94 | 2.57 | 2.41 |

Source: APIKS Argentina, 2018. CPG by B1_1, B1_2, B2 & B5.

*p<0,05 **p<0,01 ***p< 0,001

The study shows that the different aspects of the academic profession that we have analyzed allow us to further understand the segmentation process that it has gone through. With respect to the hours dedicated to teaching and research, there are several aspects to highlight that confirm our hypotheses. Group 1, which has full time dedication to the university and whose population is more consolidated in terms of positions, generation, and type of contract, dedicates more time to teaching than the overall average, even though their positions are expected to be dedicated also to research. On the other hand, and as expected, in spite of their part-time position at universities, group 2 mostly carries out research activities, as their main employer requires. Although it corroborates our assumptions, group 3 stands out since, despite the fact that they have part-time contracts, their interest in research is above average. Finally, group 4, which is specifically hired to teach, devotes fewer hours to this activity than the overall average, even in groups 1 and 2, which include research among their duties in addition to teaching.

As for preferences, the data does not reveal unexpected aspects. Although it mostly prefers teaching, group 1 shows an interest in research above the average by 6 points. Group 2 mostly prefers research, with 41 points above the average. Group 3 leans towards teaching a few points above the average, and this is even more pronounced in group 4, which prefers teaching 20 points above the average.



Finally, in terms of perceived stress, group 2 presents above-average values, while groups 1 and 4 seem to be more at ease with their work, perhaps for different reasons that we will try to explain in the next section.

Discussion and Conclusions

In this paper we have discussed several aspects of the segmentation process that the academic profession has gone through. We think that the changes that led to this fragmentation were mainly driven by public policies implemented in recent decades.

In particular, we have confirmed the existence of, at least, four different groups when analyzing the structure of the academic profession in the country. Not only have we found differences based on the analysis of their generation, but also taking into account other aspects that turned out to be highly significant, such as their academic rank. In the first place, we have found a strong segmentation between those who hold full-time positions and those who hold part-time positions at universities.

At first, this could seem to show that Argentina's academic profession has undergone changes similar to those observed as a worldwide trend. However, when analyzing these groups in depth, we have found an important difference between full-time professors whose main employer is the university and those whose employer is a science and technology organization, i.e., CONICET. The latter, in contrast to the first ones, engage more in research activities. Likewise, we have brought to light the existence of part-timers at universities that carry out full-time research activities, since their main employer is not the university. At the same time, we have found a number of part-time teachers that engage with research activities although they do not have full-time research positions, neither at a science and technology institution nor a university. Lastly, there is a fair number of teachers that do not carry out research activities. Most of them are young and have per-hour contracts. The years of training is also noteworthy, since it varies greatly among and between these groups. Contrary to what is usually assumed, full-time university professors do not always have a PhD, unlike those whose main employer is a science and technology institution, be it full time or part time professor at the university.

In contrast with other higher education systems, where it is possible to find inter-institutional segmentation, we may affirm that the Argentinean system presents an intra-institutional segmentation. This can be related to the policies implemented in recent decades, as the academic requirements have continued to increase. Indeed, we have shown that most members of the youngest generation that engage in research activities hold a PhD. However, we have also shown that there is a significant number of young part-time teachers that do not hold a PhD nor



engage in research activities. Accordingly, it is important to point out that although the requirement to obtain a doctorate has increased for those engaged in research activities, whether in universities or in science and technology institutions, there is also a significant group of teachers who have not continued with graduate training. As a hypothesis for future analysis, this may be related to the increase in enrollment and institutional expansion that Argentina has experienced in recent decades, whereas universities require more teachers for a short period of time, especially during the new students' first year. However, we can also consider another particular phenomenon in Argentina: as a result of the policies implemented in the science and technology system between 2003 and 2015, there is a surplus of PhDs. As a rash conclusion, we suggest in future studies to focus on group 3 and their surplus of PhDs, in order to investigate the reasons for carrying out research activities during hours that exceed their employment contract.

The characteristics described up to this point allow us to discuss the results obtained when analyzing the variables linked to the perceptions that these groups have of the academic activities they carry out. Contrary to what usually is assumed (or may be assumed in other countries), group 1 shows less signs of stress. This can be considered as a result of their career paths: they have earned a fully consolidated senior rank and most of them are tenure-track (regulares). By contrast, group 2 shows signs of stress when analyzing their academic activities. This can be explained because their academic rank depends on their performance. Some may be tenured, but still lack a consolidated senior position, which means that they will have to undergo periodic peer reviews and evaluations in order to advance in their careers. A similar situation can be found in group 3; as already presented, they work over hours in order to continue carrying out research activities and, perhaps, to try skipping to group 2 or 1. Anyway, this may be considered as a way to advance in their academic careers in the future. Group 4 shows very low levels of stress, which may be directly linked to the fact that their academic position might not be their main work. Many of them have not completed a PhD and are not involved in research activities.

This first approach to the process of segmentation that the academic profession has gone through allows us to shed light on the youngest generation. Considering the recent transformations and the particularities of academic work for groups 2 and 3, many questions arise. The possibilities and career path options keep narrowing. Access to group 1, at this point, depends on more than individual efforts, achievements and results.

Finally, from the explanation of career path segments, we have not been able to find evidence that explains the satisfaction of the academics, nor the institutional influence, so future studies



could identify what other variables can explain these aspects, starting from the attempt made here.

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Table 3. Variables Used in Regression Analysis

| Name | Description | Range |
|---|---|---|
| <i>Dependent variables</i> | | |
| Average weekly hours dedicated to teaching | Considering all your professional work, how many hours do you spend in a typical week on each of the following activities? (B1) | 0 hours - 50 hours |
| Average weekly hours dedicated to research | | |
| Preferences | Regarding your own preferences, do your interests lie primarily in teaching or research? (B2) | 1= teaching 2= research |
| Stress | Please indicate your views on the following (B4) | 1 (Strongly disagree)– 5 (Strongly agree) |
| Satisfaction | How would you rate your satisfaction with (B5) | 1 (Very low)–5 (Very high) |
| At the level of the department or similar unit | How influential are you in helping to shape key academic policies at your institution? (F1) | 1 (Not at all influential)–5 (Very influential) |
| At the level of the faculty, school or similar unit | | |
| At the institutional level | | |
| <i>Independent variables</i> | | |
| Career-path groups | | 1 (group 1) – 4 (group 4) |
| Gender | | 1 = Male 2 = Female |
| Academic Rank | | 1 = Junior 2 = Senior |
| Contract time | Full time (40 hrs./week) Part time (less than 40 hrs./week) | 1 = Part time 2 = Full time |
| Generation | Young (2008–2019) Intermediate (1995–2007) Old (before 1995) | 1 = Young 2 = Intermediate 3 = Old |
| Discipline | | 1 = STEM 2 = NO STEM |
| Affiliation (employer) | What is your affiliation as a researcher? | 1 = Your own university 2 = CONICET 3 = Other science and technology entities |

Table 4. Regression model: Academic practices and perceptions



| <i>Variables</i> | Average weekly hours dedicated to teaching | Average weekly hours dedicated to research | Preferences | Stress | Satisfaction | At level of the department or similar unit | At the level of the faculty, school or similar unit | At the institutional level | |
|------------------------|--|--|-------------|---------|--------------|--|---|----------------------------|---------|
| (Constant) | 12.805 | 59.848 | 2.809 | 4.390 | 3.339 | 1.537 | 0.574 | 1.576 | |
| Career-path groups | -0.21*** | -0.87*** | -0.55*** | - | 0.26** * | -0.09 | 0.01 | 0.08 | -0.06 |
| Gender | -0.01 | -0.01 | -0.01 | 0.03 | -0.09** | -0.08* | -0.04 | -0.06 | |
| Academic rank | 0.12** | 0.02 | -0.01 | - | 0.15** * | 0.17*** | 0.18*** | 0.20*** | 0.15*** |
| Contract time | -0.05 | -0.47*** | -0.29*** | - | 0.18** * | 0.12** | 0.11* | 0.15** | 0.01 |
| Generation | -0.01 | -0.02 | -0.04 | -0.10** | -0.03 | 0.12** | 0.12** | 0.11** | |
| Discipline | 0.07* | -0.12 | -0.07* | -0.01 | -0.01 | -0.01 | 0.04 | 0.01 | |
| Affiliation (employer) | -0.14*** | -0.13*** | -0.11** | -0.06 | 0.13*** | -0.10** | -0.11** | -0.10** | |
| R2 (Adjusted) | 0.080 | 0.436 | 0.180 | 0.079 | 0.058 | 0.111 | 0.118 | 0.079 | |

Source: APIKS-survey 2018

***p < 0.001, **p < 0.01, *p < 0.05



Labour segmentation of the academic profession in Mexico: changes in academic career patterns as an effect of the researcher promotion policy

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Introduction

In the last three decades, the academic profession on an international scale has presented increasingly accentuated segmentation features that are manifested in activities and in the work situation (Altbach, 2000; Chait 2002, Schuster & Finkelstein, 2008); Mexico is no exception, to such an extent that the emergence of a new academic meritocracy has even been identified (Galaz, Martínez & Gil, 2020). The results of the previous survey: Reconfiguration of the Academic Profession in Mexico (RPAM from its initials in Spanish) showed a tendency towards segmentation based on the participation, or not, of academics in the recognition program for researchers called the National System of Researchers (SNI from its initials in Spanish) (Galaz, 2010; Galaz y Gil, 2013; Gil y Contreras, 2017).

The APIKS survey in Mexico shows that currently new academics, unlike in the past decade, enter their academic career with a researcher profile close to that of their veteran colleagues in terms of having the level of doctoral studies, the number of publications, and direction of postgraduate thesis, in addition to a higher degree of preference for research activity (Estévez, et al, in press).

These antecedents justify the need to analyse in more detail the working conditions and labour segmentation of academics, with the aim of identifying and characterizing changes in academic career patterns as an influence of participation in the SNI, which is itself an instrument of recognition for the researchers who work in higher education institutions.

Theoretical framework

This paper presents an analysis of the differences which result from the segmentation of the labour markets of Mexican academics, from the perspective of the sociology of work and labour markets (Barriers and Musselin, 2009; Musselin, 2009). It is of interest for the analysis to be carried out as on the one hand, “by labour markets are meant recruitment procedures, processes allocating individuals to positions and devices organizing career paths” and, on the other hand “the nature of the regulation which prevails on academic labour markets impacts on academic work and vice versa” (Musselin, 2009, pp. 1). The labour market can be institution



driven (when internal labour markets prevail), profession driven (when only peers control the career paths) or market driven (when all events in the labour markets result from competition and exchange).

From Musselin's perspective, it is useful to recognize the existence of primary (permanent) and secondary (non-permanent) segments in labour markets, since each of these labour segments has sub-segments that are different in number and characteristics, depending on each country (the US has more subdivisions). The timing of access to the primary labour market differs between countries, but it differs more in the secondary market, although the main differences are between the two large segments.

Lately, the number of casual academics (uberization) has grown, associated worldwide with the increase in the pool of academics with doctorates, in addition to insecure and precarious working conditions. This global trend towards the configuration of two subgroups: permanent and non-permanent (tenure/non tenure in the USA) acquires different features in each country (Musselin, 2009; Barriers and Musselin, 2009). Hence the interest in analysing, from an international comparative perspective, the national sub-segments considering the context and higher education policies of each country (Finkelstein and Jones, 2019).

In this sense, it can be hypothesised that in the case of Mexico, the regulation that prevails in the academic markets of the last decade has been strongly marked by the guidelines established in the policy of recognition and promotion of the academic as a researcher, in a combination of institutional and professional influences (driven), rather than market influences. The confluence of these two factors - institutional and professional - is observed in the entry requirements to the SNI - holding a doctoral degree, permanence in the employment contract (*tenure* positions in USA and *Beamter auf Dauer* in Germany) and scientific production - which in turn are promoted and supported by higher education institutions (HEIs) with the participation of academic peer reviewers interested in complying with this policy.

Methodology

In Mexico, the APIKS survey was applied during 2018 to a sample of academics from various public and private HEIs. All research centres, federal institutions and state universities were included, in addition to 38% of technological institutions, all of them from the public system. This was complemented by the participation of academics from 14 private institutions, which have the greatest experience and size. The universe of academics considered the criteria of the type of contract and teaching for a minimum time of 10 hours per week. For such purposes, a questionnaire in digital format (<http://www.mie.uson.mx/encuesta>) was used.



To define the proposed hypothesis, three independent variables were used: the distinction of the SNI, the main program of the research promotion policy in the country (SNI / non-SNI) and two requirements for admission to the SNI: level of degree (with doctorate/without doctorate) and type of contract (permanent/non-permanent). The following were selected as dependent variables: type of position (full-time/part-time), academic career (less than seven years/ more than seven years), satisfaction with salary (satisfied/not satisfied), type of HEI (a lot of research/little research). In this text, the results of a sample of 4,668 academics are analysed, of which 1,983 (42.5%) received some distinction from the SNI, 2,801 (58%) have doctoral degrees, and 3,534 (75%) have a permanent contract in a HEI.

Data analysis and discussion

Table 1 presents results where differences in academics are noted, considering their participation in the researcher promotion policy. Despite their few years of contracting, a third of the academics already have the recognition of the SNI and, although the percentage of academics with SNI is higher among those with more seniority, in both segments the majority are those who do not participate. The type of HEI where they work represents an important difference. It is also worth noting the presence of SNI academics among part-timers and the high percentage of SNI members not satisfied with the salary they receive, in contrast to the high percentage of non-SNI academics who say they are satisfied.



Table 1. Academic career stage and other variables, according to SNI distinction

| | | Non-SNI | SNI |
|-----------------------|--------------------|---------|-------|
| Academic career stage | Less than 7 years | 70.5% | 29.5% |
| | More than 7 years | 55.8% | 44.2% |
| Type of HEI | Strong in research | 52.1% | 47.1% |
| | Weak in research | 80.5% | 19.5% |
| Disciplines | Non-STEM | 64.2% | 35.2% |
| | STEM | 54.2% | 45.8% |
| Type of contract | Full time | 49.4% | 50.6% |
| | Part time | 93.2% | 6.8% |
| Academic salary | Satisfied | 66.2% | 33.8% |
| | Not satisfied | 54.1% | 45.9% |

In table 2 it is evident that the academics with a doctorate are concentrated mainly among those who have more years in an academic career compared to those who are starting their career. As expected, it is noted that in HEIs with a strong research orientation, the percentages of academics with doctorates are higher and vice versa. Another relevant finding is that there are more academics who are satisfied with their salary among those who do not have doctorates.

Table 2. Academic career stage and other variables, according to academic level of studies

| | | Without doctorate | With doctorate |
|-----------------------|--------------------|-------------------|----------------|
| Academic career stage | Less than 7 years | 63.9% | 36.1% |
| | More than 7 years | 37.8% | 62.2% |
| Type of HEI | Strong in research | 35.9% | 64.1% |
| | Weak in research | 62.0% | 38.0% |
| Disciplines | Non-STEM | 47.7% | 52.3% |
| | STEM | 37.5% | 62.5% |
| Academic salary | Satisfied | 38.5% | 61.5% |
| | Not satisfied | 47.0% | 53.0% |

Table 3 shows that precarious working conditions predominate among academics with fewer years in an academic career, especially the non-permanence of their contracts. The HEIs with a strong orientation towards research take more care of the permanence of their academics than the other type of institution; something similar occurs with academics working in STEM areas.



Undoubtedly, permanence is a labour condition that has a positive effect on satisfaction, which is derived from the salary received.

Table 3. Academic career stage and other dependent variables according to permanence

| | | Permanent | Non-permanent |
|-----------------------|--------------------|-----------|---------------|
| Academic career stage | Less than 7 years | 32.9% | 67.1% |
| | More than 7 years | 81.5% | 18.5% |
| Type of HEI | Strong in research | 82.1% | 17.9% |
| | Weak in research | 48.8% | 51.2% |
| Disciplines | Non-STEM | 66.3% | 33.7% |
| | STEM | 80.4% | 19.6% |
| Academic salary | Satisfied | 80.6% | 19.4% |
| | Not satisfied | 63.3% | 36.7% |

If the data from the three tables are compared, two trends can be noted: the high percentages of academics with more years in an academic career and who have contracts with permanent employment do not correspond to the percentages of those who have SNI and a doctorate degree, since they are a high number of points below. In contrast, among academics with less than seven years with an employment contract, the percentage of those who have permanence is very similar to the percentages that have SNI and a doctorate degree.

Conclusions

The objective was to identify and characterize changes in academic career patterns as an influence of the SNI - the main instrument of the policy of recognition of researchers working in HEIs - which has become a device that organizes the trajectories among academics in relation to labour markets in a certain way (Musselin, 2009). The results show two different patterns of academic career derived from the differentiated influence that the guidelines established by politics and HEIs have had in the last decade (Jiménez, 2015), with a more intense effect on the academics who have recently started their career, in the short term. In this regard, in the sector of academics who are in their first years of academic career, a subsector was found in which having job permanence, having a doctoral degree, and the SNI distinction is clearly coupled; on the other hand, new academics who do not have a doctorate degree and are not in the SNI do not have permanence in their employment contracts either.



Therefore, the effect of the policy of recognition and promotion of research can be seen as a development trend in the academic trajectories of the novices who aspire to a contract with permanence and a full-time position, and whose progress in the labour markets depends to a great extent on the institutional regulations derived from the SNI, and which are mediated by the participation and control of academic peers, in the sense proposed by Musselin (2009). In contrast, among academics with more seniority, a slower trend can be seen - over a longer period - towards meeting the requirements to participate in the SNI, despite the fact that a good number of them have the conditions of job permanence and hold a doctorate degree. Even considering that the additional economic income that is granted through this policy program is meant to motivate the academic (Barlas, 2016), many of them distance themselves from participation in this type of researcher promotion policies, even against the trend promoted by governments to transform the contributions of higher education to society (Silva, García y Aquino, 2016).

As for the two segments that are configured based on the permanence of the employment contract, in the non-permanence segment several sub-segments can be identified that suffer from precarious working conditions (Musselin, 2009; Barriers and Musselin, 2009): one is where academics with less than seven years in an academic career are located, another is that of academics who work in HEIs with a weaker orientation towards research, and another is that of those who are dedicated to non-STEM disciplines. It is likely that the global phenomenon of "uberization" to which these authors allude - associated with the increase in the pool of academics with doctorates, and insecure and precarious working conditions - appears in Mexico as a small tip of the iceberg; for example, with the 7% of part-time academics who are in the SNI. The rest of the iceberg will be evident in its magnitude with regard to generational change. The field of academics who will replace those who are in the process of retiring is crowded, since the large number of people with doctorates who are waiting for their contracts to have permanence and/or to compete for full-time positions are not yet fully visible in the academic market; in some cases they are young people who were benefited by government programs that support the training and development of doctors (Navarro, 2021), who also have the expectation of working in activities related to research.

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March 3, session 1: challenges to enter into the career and tenure

Early Career Paths and Employment Situations of Academics in Five Asian Countries

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The aim of this study is to investigate the early career paths and employment conditions of academics in Asian countries that participated in the APIKS project. Drawing on the findings from national surveys in Japan, Kazakhstan, Korea, Malaysia, and Taiwan, the study analyzes and discusses the similarities and differences in their obtaining degrees, doctoral education and training, mode and duration of employment situations, their views of mentoring and support, expectation of their career, and salaries, which are related to their employment.

Various definitions can be attributed to the phrase of early career academics (ECAs), which can be used interchangeably with early career researchers or faculty members. In the UK and other countries, it is most commonly used to refer to academics at the start of their career. However, the phrase itself varies according to whether the period of the PhD is included, and individuals' experiences and circumstances (Bosanquet et al, 2017). Matanle and McIntosh (2020) use the acronym ECA, in recognition that the job of an academic in the UK includes core tasks other than research, such as teaching, administrative and citizenship contributions. McAlpine and Turner (2012) consider doctoral students to be an important part of early career academics as many of them expect to undertake academic work. Ben and Locke (2010) concentrate mainly on academics' doctoral training, as the data linked to first, second and postdoctoral degrees are less easily comparable due to differences in target countries' higher education systems.

This study concentrates on the analysis and discussion of main characteristics of academics career paths starting from their doctoral education to their formative career stages. Data from Japan, Kazakhstan, Korea, Malaysia and Taiwan is used to analyze the similarities and differences of participants' early career paths and employment situations. There are several rationales for selecting the five case countries. First, according to the data of the World Bank (2021), by 2020, the five case countries can be split into two broad groups. Japan, South Korea and Taiwan belong to high income countries while Malaysia and Kazakhstan are included in the upper middle-income countries. Second, although the five case countries have come to be more impacted by the US philosophy of higher education recently, both the modern higher education systems of Korea and Taiwan were more affected by the Japanese ideas, Kazakhstan was part of the former Soviet Union, and Malaysia was a colony of the UK before WWII. Third, while Japan has the



largest population of academics, the size of the population of academics in South Korea, Malaysia, Taiwan, and Kazakhstan can be considered to be almost similar. In contrast, the population of academics in Hong Kong is the smallest. Finally, Japan, South Korea and Taiwan can represent main characteristics of academics in East Asian countries, Malaysia is a one of typical countries in Southeast Asian countries, and Kazakhstan provides an example of Mideast Asian countries.

This study is concerned with several existing research. To illustrate, working conditions in academic society are becoming more difficult for scholars who want to begin their academic careers. After the 1990s, many Asian countries tried to improve their global competencies and status through the advancement of higher education institutions. Therefore, with policy initiatives based on neoliberal ideas focusing on competition, coupled with changes in school-aged populations due to reduction of birth rate, universities are in a dilemma in which they must strike a balance between substantial government interruption and practices of market-oriented ideology. Therefore, academic job stability is worse than before, and the average age of appointment as an assistant professor has risen (Shima, 2012). In addition, fixed-term or part-time appointments are the main recruitment methods for new academics who have just earned their academic degrees as one of the minimum requirements. Although the first positions available to academics are diverse based on academic fields, it is clear that it takes a longer time to enter their first academic job compared with the previous generation.

In addition, there have been extensive changes to the knowledge society; the academic discipline-based education in universities has become more challenging, in order to address the needs of a society where rapidly changing knowledge and abilities are required. Although many doctoral degree holders have been traditionally trained, universities need more experienced academics with up-to-date and interdisciplinary backgrounds who can respond flexibly to cope with social changes and needs. Moreover, there is an oversupply of PhD graduates applying to positions in academia, despite the relatively limited opportunities for traditional tenure-track faculty positions (Larson, Ghaffarzadegan, Xue, 2014; Xue & Larson, 2015).

Another critical issue in Asian countries is the decreasing number of students because of the low birth rate. It is hard to secure a certain number of professors at universities when there is a significantly reduced number of domestic students. Although universities can recruit more international students, slots allotted to these students are not guaranteed to be filled compared to domestic students. In this sense, permanent or tenured positions, which are inflexible positions, are an economic and managerial burden in the organizational aspect. Therefore, as a



result, there have been severe cutbacks in the recruitment of faculty members (Hasegawa & Ogata, 2009), and the number of contract-based or part-time positions has increased.

Previous studies about work conditions have focused more on academic job satisfaction (Aichinger, Fankhause, & Goodman, 2017; Arimoto & Daizen, 2013; Bentley et al., 2013; Enders, 2006; Olsen, 1993; Shin & Jung, 2014). Also, the studies have mainly focused on those who have already entered academic society rather than on graduates or early-career researchers who are trying to enter academia, the complexity of the application process, and the amount of time it takes to succeed in academic positions.

There are many factors to succeeding in entering academia and getting a stable position, which are also called “tenure-track positions.” Research productivity, including publications and funding, is regarded as one of the critical requirements in the competitive context (Waaaijer et al., 2018). International academic degrees in highly reputable schools or universities are another critical factor in the Asian context (Yang, Volet, Mansfield, 2018; Shin, Jung, & Lee, 2016). In addition, an academic’s gender, marital status, and number of children sometimes have some relevance to obtaining a tenure-track position (Wolfinger, Mason, & Goulden, 2008). However, simply fulfilling the abovementioned requirements is not enough to navigate academic careers in the current complicated and limited situation. Visible high performance and reputed certification are not the only factors that influence the attainment of an academic job; diverse invisible factors influence it as well. The quality and coherence of research, departmental fit, and interpersonal interactions with faculty members are also emphasized (Fernandes et al., 2020). However, these factors are not transparently and formally made known to early career academics.

Therefore, early career academics inevitably view postdoctoral positions as steppingstones to assistant professor-level positions. After attaining a doctoral degree in STEM fields, degree holders allot some time for postdoctoral positions before applying for independent academic jobs. In a survey for early-career researchers in STEM fields, the total number of years as a postdoc was diverse, ranging from one to 13 years. In particular, researchers in the life sciences spent a median of five years in postdoc positions, while others spent a median of 2.75 years as postdocs (Fernandes et al., 2020). Holding a postdoctoral position before becoming a faculty member benefits early career academics in research production and international networking, although it does not affect teaching activities (Horta, 2009). In addition to this situation, the increasing number of new doctoral degree holders and lengthening duration of postdoctoral experiences make it more difficult to get even a postdoctoral position (Stephan & Ma, 2005). Since postdoctoral positions are not expected for doctoral degree holders in the humanities and



social science areas, academics in those areas try to find breakthroughs as part-time lecturers or short-term contract-based positions (Collinson, 2004).

The analytical model of this study is derived from institutional theory; in particular new institutionalism, which emerged since the 1990s (DiMaggio and Powell, 1991; Scot, 2008), is used to analyze relevant data. Despite its being basically used in studies of sociology and sociology of education, the previous study suggests that the new institutionalism can be applied to not only explain how colleges and universities are shaped by wider social and political environments at both global and national levels (Manning, 2017), but also to explore how the parts of the academy have come to resemble each other or differentiate from each other because of national filters, institutional spheres, and individual academic backgrounds (Greenwood et al. 2017, Huang, 2021).

Based on the objectives of research above, this study will address three major research issues. First, what is the overall portrait of early career paths and employment situation of academics in the five case countries? Second, what similarities and differences can be found in these aspects between the five case countries? Finally, what factors affected these similarities and differences in individual case countries?

In order to address the three research questions, the study uses respective variables and measurement of comparing this type of internationally mobile academics that are suggested below.

1. The ratio of doctoral degree holders and post-doctoral researchers in each case country (A5-3, A5-4)
2. Place in which they received their doctoral degree and did post-doctoral research (A5-3, A5-4)
3. Year of their first regular full-time or part-time appointment in the higher education/research sector (A6-6)
4. If they receive an employment contract during their studies (for teaching or research) (A6-7)
5. Were they employed at a research institution not belonging to academy (A6-8)
6. Were they employed outside the academy (A6-9)
7. The perceptions in the formative stages of of support in their career development (G2-2), job security (G6-2), and career opportunities (G6-3).



The study presents main findings based on the analysis and discussion above and offers practical implications.

There are several limitations in the study. First, as the concept of early career academics is ambiguous and there seems to be no generally accepted definition of the phrase, it is possible that only very limited characteristics of early career academics in the five case countries are explored. Second, as some countries like Japan only asked full-time academics as the target population in their surveys, not all countries' responses include part-time academics. Further, some key aspects such as respondents' answers to their employment status in the current academic year at their higher education institution cannot be analyzed, including full-time contract, part-time contract, or part-time with payment according to work tasks. Third, the self-reported data may not be perfectly consistent with respondents' actual situation or their perceptions of some questions and statements, which is a classic issue in using data from any surveys. Fourth, Asia is a huge continent, the study is primarily concerned with analyzing the five cases from East and South East Asian countries and they only represent small parts of the continent. Finally, the results may not generalize to early career academics from other continents or countries, and a more comprehensive and comparative study needs to be conducted based on the APIKS databank in the future.

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Academic work, job satisfaction and job stress: tenure- vs. non-tenure-track in South Korea

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Introduction

Academic job conditions have been changing rapidly in the past decades. The number of university entrants has been decreasing in accordance with a rapid decline in the school age population, which has led to financial difficulties for universities (Lee, 2021). On the other hand, in massified higher education, doctoral degree holders have been oversupplied in the academic job market while institutional governance has become politically more visible, economically more strategic, and managerially more evaluable (Enders, de Boer, and Weyer, 2013). In this new environment, most universities apply managerial strategies based on private corporation style (Lavigne & Sa, 2021), and academic job conditions are becoming more challenging and increasingly unstable (Lee, 2021). These changes have been accompanied by increasing the full-time non-tenure track (FTNT) faculty appointments because of cost savings and flexibility (Allen, and Sweeney, 2017; Levin, and Shaker, 2011). Activities once conducted by full-time tenure-track (FTT) faculty members are shifting to FTNT faculty members (Bryson and Barnes, 2000), but FTNT faculty members lack permanent employment protection with low salaries and limited opportunities for promotion (Levin, and Shaker, 2011; Waltman et al., 2012). Meanwhile, senior academics have maintained their prestige and job security in the academic market (Lee et al., 2020).

This situation has led to FTNT faculty members' perception of inequity, which can reduce their motivation and efforts, and is directly related to their academic performance, job satisfaction, and job stress (Greenberg, 2000; Greenberg and Colquitt, 2005). Many previous studies have investigated changes in job satisfaction and job stress in changing academic work environments, especially under managerialism (Houston et al., 2006; Hendel and Horn, 2008; Shin and Jung, 2014). Most research on the academic profession, however, has focused on traditional FTT academics (Mamiseishvili and Rosser, 2011; Lee et al., 2020) and paid less attention to FTNT academics (Seifert and Umbach, 2008). Yet it is crucial to understand how FTNT academics perceive and react to their work environments as the number of FTNT faculty members working at universities has been increasing and their impact on university management and student education has been growing. This study therefore examines FTNT faculty members' academic work, job satisfaction, and job stress under the changing academic environments in South Korea,



where the number of FTNT faculty members have increased significantly in new types of faculty appointments. This study addresses three research questions: (1) Are there differences in the academic work produced between FTNT faculty members and FTT faculty members? (2) Do FTNT faculty members have lower job satisfaction than FTT faculty members? (3) Do FTNT faculty members have higher job stress than FTT faculty members?

Literature Review

Changing academic environment in South Korea

Korean universities have been transformed by new public management approaches that emphasize institutional governance (Lee, 2021). In the 1990s, the Korean government began to increase support to universities through performance-based research funding initiatives such as the Brain Korea 21 project, which was launched in 1999 (Shin and Lee, 2015). In response to such funding initiatives, Korean universities have adopted private corporation styles of management such as stronger executive leadership, performance-based management, and professional management (Shin and Jung, 2014). Strong institutional governance and management is now considered a key performance indicator of higher education institutions.

Along with global neoliberalism, the Korean government initiated the 1996 University Establishment Regulations. It aimed to increase autonomy of universities and promote competition between universities by easing the conditions for establishing higher education institutions in order to diversify university models. Park and Lim (2015) point out that the University Establishment Regulations resulted in the 'mass production' of universities without educational vision and the number of private universities increased from 109 in 1996 to 156 in 2013. Korean higher education relies mainly on private institutions (with 154 private universities out of a total of 189 universities in 2017), and tuition fees are relatively high. High tuition fees are a critical social problem in South Korea, which led the Korean government to freeze tuition fees in 2011. At the same time, the school age population has been decreasing. Both of these factors have led to financial deterioration in Korean universities.

In 2014, the Korean government abolished the University Establishment Regulations and initiated the University Structural Reform Plan to take preemptive action regarding higher education supply and demand (Korean Ministry of Education, 2014). In addition, government-led structural reform has aimed to improve the quality of university education and university competitiveness. The structural reform period is divided into three stages, 2015, 2018 and 2021, spanning from 2014-2022, and every Korean university has been evaluated at each stage. In



response, Korean universities have been trying to reduce the number of newly admitted students per annum, and to enhance their quality and competitiveness.

Academic job condition for FTNT faculty members

FTNT faculty members include research-focused professors, teaching-focused professors, professors for the industry-university collaboration, and so on. Their job positions are unstable due to one- or two-year contracts with low salaries but their contract conditions are very competitive. For example, in the case of one private university in South Korea, contract conditions for research-focused FTNT faculty members require them to publish at least two or three articles in SCI level journals within the journal Impact Factor top 50% during a two-year contract period. In the case of another private university in South Korea, an FTNT assistant professor usually is promoted to associate professor after six years while an FTNT assistant professor generally waits nine years before promotion; moreover, at that point the FTNT faculty cannot be further promoted (Yonhap News, 2019, July 10).

While many of the roles of FTT faculty members have been taken over by FTNT faculty members (Bryson and Barnes, 2000), the terms of employment are not good for FTNT faculty members (Waltman et al., 2012). Unfair job conditions are directly related to academic job satisfaction, which is defined as the extent to which an academic feels self-motivated and satisfied with his or her academic job (Kalleberg, 1977; Tutuncu and Kozak, 2007). Perceived inequity tends to reduce job motivation and effort (Greenberg, 2000; Greenberg and Colquitt, 2005), and academics who conclude that they are underestimated might reduce their efforts compared to those who believe they are treated fairly. Thus, unfair job conditions might have a negative impact on job satisfaction and on academic performance.

Studies on the relationship between academic activities and job satisfaction show that highly satisfied academics can be one of the most important resources of a university (Gappa et al., 2007; Seifert and Umbach, 2008; Mamiseishvili and Rosser, 2011). On the other hand, many of the activities that academics are responsible for, such as lecturing, student guidance, and academic journal publication, are found to cause job stress, and stress appears to have a negative influence on academic work and performance (Olsen, 1993; Abouserie, 1996; Shin and Jung, 2014). It is important to examine FTNT faculty members' job satisfaction and job stress because the changing academic work environment and perceived inequity might reduce academics' job satisfaction, and might be a cause of stress (Olsen, 1993; Houston et al., 2006; Shin and Jung, 2014).



Data

This study uses data from the Academic Profession in the Knowledge-based Society (APIKS) survey in 2018. The APIKS survey, which was conducted online, provides extensive information on academics' work and professional situations, governance and management, and demographic background. In 2018, the population of concern to the current study, that is, full-time faculty members working at four-year universities, numbered 66,795; the survey sample size was 12,714. The current study analyzed the data from the 847 respondents who answered more than 50% of the survey questionnaire. The 847 respondents are considered representative of the population of full-time faculty members in South Korea in 2018 in terms of distribution by gender, academic rank, and discipline.

Analytical strategy

This study used two analytical strategies. First, one-way analyses of variance (ANOVA) were applied to examine differences in academic work, job satisfaction, and job stress according to academic rank and tenure track. Second, ordinary least squares (OLS) regression model analysis was employed to examine whether FTNT faculty members have lower job satisfaction and higher job stress than FTT faculty members.

The independent variables are academic rank and tenure track, with respondents divided into four types: FTNT assistant professors, FTT assistant professors, FTT associate professors, and FTT professors; FTT assistant professors were used as a criterion variable to make a dummy variable.

Academic work was analyzed in terms of workload and research performance. Workload was classified into four areas: (i) teaching, (ii) research, (iii) externally oriented activities, and (iv) administration and services within academia. Teaching covers preparation of instructional materials and lesson plans, instruction in a classroom, reading and evaluating student assignments, advising students, and so on. Research includes reading literature, writing, conducting experiments, fieldwork, and so on. Externally oriented activities include services to clients or patients, unpaid consulting, and public service. Administration and services within academia covers committee work, paperwork, activities in academic associations, reviewing, and so on. Workloads were assessed by hours per week spent on each of the activity types when classes are in session.

Research performance was measured in terms of scholarly books and articles published in domestic or international journals, papers presented at scholarly conferences, and patents secured on processes or inventions within the past three years (2015–2017).



The job satisfaction of academics was surveyed by three questions, “How do you rate your satisfaction with your (1) current employment situation, (2) current work situation and (3) overall professional environment?” and it was measured as the mean of these three survey items with a five point Likert scale (1: very low; 5: very high). Job stress was measured by the reaction to the following statement: “My job is a source of considerable personal strain.” with a five point Likert scale (1: strongly disagree, 5: strongly agree).

For the regression models, demographic background, academic background, affiliation, empowerment, shared governance, performance-based management, and institutional characteristics were controlled. The demographic background factors of gender, age, and marriage status were used in the model as control variables. The academic backgrounds such as country of doctoral studies, postdoctoral fellowship experience, and academic discipline were included in the model. The institutional sector and university ranking were controlled in the model. Affiliation, empowerment, shared governance, and performance-based management were assessed in terms of responses to several survey items, all on a five-point Likert scale (1: very low; 5: very high). Affiliation was measured by means of two survey items on respondents’ feeling of affiliation to their (1) department, and (2) institution. Empowerment was measured by means of three survey items on respondents’ perception of their own level of influence to shape key academic policies at (1) the department level, (2) the faculty level, and (3) the institutional level. Shared governance was assessed by means of two survey items: (1) ‘At my institution, there is good communication between management and academics’ and (2) ‘At my institution, there is collegiality in decision-making processes’. Performance-oriented management was assessed by means of two survey items: (1) ‘At my institution, there is a strong teaching performance orientation’ and (2) ‘At my institution, there is a strong research performance orientation’.

Results

Descriptive statistics

The number of academics by their rank and tenure track are: 79 (9.33%) FTNT assistant professors, 189 (22.31%) FTT assistant professors, 186 (21.96%) FTT associate professors and 379 (44.75%) FTT professors. The number of males is 594 (71.48%) and the number of females is 237 (28.52%). Regarding academic background, 304 (37.39%) obtained their PhD degree at overseas universities, while 509 (62.61%) academics obtained their PhD at Korean universities. The number of respondents who had postdoctoral fellowship experience is 281 (34.48%). A total of 462 academics studied hard disciplines while 385 studied soft disciplines. As for their current



affiliation, 261 respondents are affiliated with public universities and 586 with private universities; 204 work at highly ranked universities while 641 work at relatively low-ranking universities.

As for shared governance and performance-based management, their perception of shared governance was relatively low at 2.50 (out of 5), and the perception of performance-based management was relatively high at 3.75 (out of 5). Their rating of their job satisfaction was 3.02 (out of 5) on average, and their rating of their job stress was 3.63 (out of 5) on average.

Academics' work by academic rank and tenure track

In this study, academic work was assessed in terms of workload (divided into teaching, research, externally oriented activities, and administration and services within academia) and research performance. This study used ANOVA to examine whether academics' workloads differ by academic rank and tenure track. As shown in Table 3, there is no statistically significant difference in academic total workloads by academic rank and tenure track, but there are statistically significant differences by academic rank and tenure track in terms of each activity such as research, externally oriented activities, and administration. FTNT academics might spend more time on research but less time on externally oriented activities and administration than FTT academics, regardless of the latter's academic rank.

Table 4 presents information on the respondents' research performance by academic rank and tenure track. Research performance was divided into scholarly books/articles published in domestic or international journals, papers presented at scholarly conferences, and patents secured on processes or inventions in 2015–2017. This study found no statistically significant difference in overall research performance by academic rank and tenure track, but did find a statistically significant difference in the number of articles in domestic journals by academic rank and tenure track: FTNT assistant professors are less likely to publish in domestic journals than FTT professors.

Academics' job satisfaction and job stress by academic rank and tenure track

Table 5 shows the results of the analysis of the respondents' job satisfaction and job stress by academic rank and tenure track. As shown in the table, FTNT assistant professors have the lowest job satisfaction (2.21) and the highest job stress (3.91) among the four groups. On the other hand, FTT professors have the highest job satisfaction (3.31) and the lowest job stress (3.45).

This study also applied OLS regression models to examine the effects of academic rank and tenure track on academic job satisfaction and stress. As shown in Table 6, FTNT assistant



professors have lower job satisfaction than FTT assistant professors, but FTT professors have higher job satisfaction than FTT assistant professors. In terms of job stress, the analysis found no statistically significant effects of academic rank and tenure track.

Among the control variables, highly performing academics have higher job satisfaction than those with low performance. Similarly, academics affiliated with highly ranked universities have higher job satisfaction than those affiliated with low-ranked universities. Affiliation and shared governance are also important in job satisfaction. For example, respondents who reported high levels of affiliation and positive perceptions of shared governance are likely to have higher job satisfaction than those who ranked those items lower. Total workload, however, is negatively associated with job satisfaction.

In terms of job stress, the demographic background factors of gender and age are statistically significantly related to job stress. Female academics are likely to have higher job stress than male academics, and junior academics have higher job stress than senior academics. In addition, academics in hard disciplines are likely to have higher job stress than those in soft disciplines. Total workload is also positively related to job stress, but shared governance is negatively associated with job stress.

Discussion and conclusion

This study empirically analyzed FTNT and FTT faculty members' work, job satisfaction, and job stress in the changing academic environment in South Korea. This study found that there is no difference in time spent on total academic works between FTNT academics and FTT academics, but FTNT academics tended to spend more time on research and less time on externally oriented activities and administration than FTT academics. In terms of research performance, the analysis found no difference in academic performance between FTNT academics and FTT academics (of any rank), but FTNT assistant professors are less likely to publish in domestic journals, and publish more in international journals than FTT assistant professors. These findings indicate that there is no great difference in academic roles and research performance between FTNT and FTT faculty members (Bryson and Barnes, 2000), despite the poor terms of employment available to the former (Waltman et al., 2012). Academic job conditions are getting unstable with non-tenure track employment, and academics are required to publish more journal articles for job recruiting and promotion in performance-based management system. Therefore, FTNT assistant professors spent more time on research activities than other professors, and they tried to publish articles in international journals for survival in the academic community. The reality of spending a lot of time on classes while achieving the research outcomes needed for re-



appointment and promotion is a cause of stress on academics (Murray, 2008). This phenomenon is much more common in junior academics than in senior academics, who are relatively competent in teaching and research (e.g., Shin, 2011).

This study also examined FTNT faculty members' job satisfaction and job stress. Terms of employment have been identified as a source of frustration, anxiety, and overall job dissatisfaction (Waltman et al., 2012); unstable and unfair academic job conditions reduce the job satisfaction of academics and act as a cause of stress (Olsen, 1993; Houston et al., 2006; Waltman et al., 2012; Shin and Jung, 2014). The study found that FTNT assistant professors have the lowest job satisfaction and the highest job stress among academics. On the other hand, FTT professors have the highest job satisfaction and the lowest job stress. According to the regression model, FTNT assistant professors have lower job satisfaction than FTT assistant professors, but FTT professors have higher job satisfaction than FTT assistant professors. This implies that work conditions and stable job positions are important factors in explaining job satisfaction. Higher academic rank, higher senses of shared governance, more stable employment conditions, and affiliation with more highly ranked universities correlate with higher job satisfaction. In terms of job stress, the study found no statistically significant effects of academic rank and tenure track. This result suggests that, with the recent changes in academic environments, most academics have job stress.

Two additional interesting findings of this study are that junior academics and female academics are more stressed by their jobs than older and male academics, respectively. The finding that gender is an important factor in job stress is consistent with previous studies (Thompson and Dey, 1998; Hendel and Horn, 2008). The implication is that gender equality is still lacking in Korean academic culture, and female academics in South Korea are likely to be more stressed than male academics.

This study supports the argument that job satisfaction is crucial to perform well in a wide range of academic work (Gappa et al., 2007), and that fair treatment and procedures are important in organizational performance (Greenberg, 2000). Considering the increasing numbers of FTNT faculty members and their significant roles in today's universities, it is important to improve their job conditions and ensure that they receive fair treatment.

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March 3, session 2: job satisfaction and working conditions

Job satisfaction and career saturation in academia

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Introduction

Numerous articles have addressed the worries about the changing academic environment and deteriorating job conditions in academia (Lee, 2021; Taberner, 2018; Alvesson & Spicer, 2016), which seem to have resulted in a significant increase in occupational stress (Johnson et al., 2019; Alvesson & Spicer, 2016), and growing dissatisfaction with academic jobs and careers. In many countries, academic personnel are the occupations that have the greatest likelihood of experiencing burnout and stress (Winefield et al., 2003). On the other hand, job satisfaction and job stress tend to vary across age groups and academic ranks, and factors influencing satisfaction are likely to differ as well. In this paper we aim to analyse job satisfaction across age groups and ranks, and to better understand the factors that explain job (dis)satisfaction in different career stages. Particular attention is paid to the issue of job saturation, i.e., when an academic is on a mid-career plateau from which it is difficult to rise further, and which is a challenge in many academic systems. The empirical analysis in this conference paper is based on APIKS data from Estonia, but the final version is also expected to include a number of other countries. An international comparison would provide further insights on how a formal academic career system might alleviate or exacerbate some of the problems with satisfaction and saturation.

Theoretical framework

Academic job satisfaction can be defined as “the extent to which an academic feels self-motivated and satisfied with his or her job” (Lee, 2021). From this definition, we understand career satisfaction as the extent to which an academic feels self-motivated and satisfied with his or her academic career. In this chapter we will focus on two important dimensions that together may help to explain satisfaction with the academic career – the age and the academic position of an individual.

The effect of age. For the first time in history, representatives of five generations are in the labour market at the same time: Traditionalists (born before 1946), Baby Boomers (born



between 1946–1964), Generation X (born between 1964–1981), Millennials or Generation Y (born between 1982–1995), and Generation Z (born after 1995). Universities represent the most likely case where all five generations have to work side by side and thus academic leaders have to consider the expectations of both the 20-year old and 75 year-old. This is especially the case for the countries that have not set a mandatory retirement age (e.g., Estonia) and in academia people can stay active and productive until a high age. 20% of Estonian academic staff are over 60 years of age, which positions Estonia among the top five fastest aging academic systems in Europe (Mägi et al., 2019).

A rich supply of studies note how generations differ not only by their value system, but by their expectations to the employer and career in general (Kindsiko & Baruch, 2019; Kwiek, 2017). For example, Sakdiyakorn et al. (2019) have reported how it is more difficult to engage younger generations within today's workplace as compared to older ones (e.g., Baby Boomers or Generation X). In the case of universities, seniority often goes hand in hand with leadership positions, thus older generations literally determine the work conditions for the younger generations (Kwiek, 2017). Studies also reveal how older generations are often less touched by the precarious work conditions; e.g., in the UK (UCU, 2020) or Australia (Bone, 2021), as they have “largely gained employment many decades ago” (McKenzie, 2018, p. 33). Additionally, based on Japan, Aichinger et al. (2017, p. 218) have noted the “desire of national universities themselves to ensure job security for senior staff by reducing the number of new junior recruitments”.

Complexity emerges also from the fact that older generations in leadership positions have often been socialized in a different system and according to different assessment criteria. Intergenerational tensions are likely to grow “because it is certainly the older generations who make career decisions about the younger one” (Kwiek, 2018, p. 661). Estonia provides a unique case here. In the case of Estonia and other Post-Soviet countries, the entire academic system had to go through a rapid re-socialization process. It had to jump over to a Western scientific space with English as a shared language, from writing monographs to writing peer-reviewed articles, and often focussing on different research questions. That said, their training and career progress (including criteria for promotion) differ from those of the younger generations today. It also means that career opportunities for those who successfully made the transition during this period were very different than for the people who are starting their career now. The situation can exacerbate the problem of career saturation as relatively young people quickly move into careers during a transition period and fill the top positions for a long time.



The effect of academic rank. Existing literature reports how satisfaction with job and working conditions seems to vary across career stage in academia (Castellacci & Viñas-Bardolet, 2021; Albert et al., 2018). In detail, scholars claim how satisfaction in academia tends to be U-shaped, with higher satisfaction at early and later stages of career and age, yet lower in the middle stage and during middle-age (de Lourdes Machado-Taylor et al., 2016; Höhle & Teichler, 2013). As explained by Castellacci and Viñas-Bardolet (2021, p. 1869):

“At young ages, workers often experience high satisfaction due to the excitement of having a job, instead of being unemployed like other peers in the same age group. As the career proceeds, workers typically rise their aspirations and expectations about desired working conditions, which may lead to dissatisfaction when these aspirations turn out to be unmet. Finally, at older age, workers have increased experience and maturity, which lead them to form less ambitious aspirations and more realistic expectations, as well as to put less emphasis on comparisons with other peers and colleagues at work.”

In addition to the career level, studies also reveal how satisfaction is greater among academics with a permanent contract (Castellacci & Viñas-Bardolet, 2021), yet achieving a permanent contract may be often tied to seniority, and or certain types of teaching related positions (as research tends to be more dependent on attaining external funding).

All considered, the current chapter will aim to investigate what might cause career satisfaction in academia, by focussing on age and academic positions.

Methodology – Definition of Hypothesis

Based on this framework, this chapter will study the following hypotheses:

- *Hypothesis 1: Satisfaction with academic career differs systematically by the age of an academic employee.*
- *Hypothesis 2: Satisfaction with academic career differs by academic rank.*

Additionally, we will try to extract the factors that are dominant behind satisfaction and dissatisfaction in different career stages.

- *Hypothesis 3: The factors behind (dis)satisfaction vary across age and academic rank.*

The paper will make use of the APIKS survey and in particular will use the following key variables:

- B5: Satisfaction with employment status, work conditions, and overall professional environment (Dependent variable)



- A1 Academic rank (explanatory variable)
- H2 Age group (explanatory variable)

Data analysis discussion

A preliminary analysis of Estonian data confirm a (slight) U-shape in job-satisfaction over age (Mägi et al 2019). While 70% of academic staff below 29 is satisfied with their work conditions, it drops to below 40% over age 29, and rises slightly to 44% among the 60+ age group. On the other hand, 42% of respondents to the APIKS Estonia survey assessed that it is difficult for younger generation to pursue an academic career these days, especially in humanities and social sciences. Across age groups, those who were most pessimistic about their career prospects were staff below 30 years of age (62%). These controversial signals will be analysed further in the paper, showing how career satisfaction is a multi-dimensional concept.

Satisfaction across academic rankings also shows an interesting picture. Those who are most satisfied are professors (57%) and the lowest is satisfaction among those who hold the Associate professor position, indicating most likely the issue of limited further career opportunities at a mid-career level. It is also interesting how satisfaction varies significantly across teaching and research-oriented functions. By positions, staff at the teaching oriented positions are less satisfied with salary, yet more satisfied with work security (confidence in not losing their job); for the research oriented positions the case is vice versa (likely caused by the fact that research is highly dependent on grants, thus the contracts also have a fixed length). Although research based positions may have better chances in filling the needed “publications criteria” for progressing to higher positions, the biggest obstacle is financing – the availability and length of research grants. 61% of staff from teaching-based positions feel secure about their work, yet only 29% of staff from research positions feel the same. This also demonstrates a peculiarity of the Estonian career system that is currently under revision.

The population pyramid of Estonian academic staff represents rather atypical shape – the bottom part is more of a square than a pyramid. In terms of the sustainability of the academic labour market this shape represents a severe challenge to Estonia – a lack of new entrants to the system, and a growing middle segment that may face dead ends in their careers. Based on APIKS Estonia data, every third academic employee has stayed at the same position over ten years. Dead ends in a career are a strategic risk for academia – when people reach full professorship too late in their career (around 60 years of age), they have only a few years until the recommended retirement age, which would explain the decreasing motivation to retire – thus prolonging the academic career and “booking” full professorship places up to the fifth generation.



Conclusion

The level of job satisfaction is often seen as a problem in academia. Job satisfaction is important for its own value for staff well-being, but it is also important for long-term productivity, and for the ability to attract young talent to academia in the long run. Yet satisfaction is not a uni-dimensional concept and it tends to vary across age groups, ranks, and types of positions. Understanding these differences is important in order to develop effective internal policies, and to understand the strengths and weakness of different career systems.

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Classification of countries according to the research hours ratio by age group

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In recent years, the production of research results has been strongly required for the career development of university faculty members themselves and the development of a knowledge-based society. Therefore, it can be said that securing research time for university faculty members is the most important issue for university faculty members and for the development of society.

However, in order to achieve the social functions expected of universities, the activities required of university faculty members are not limited to research activities to produce research results such as knowledge and technology, but also for society. Educational activities to develop human resources, social activities such as recurrent education and industry-academia collaboration, and management activities to support these activities are also indispensable. This is because the main aspects of academic work are research, teaching, social service, and governance.

Table 1 shows the average number of hours of professional activity, and the ratio of those activities to the average time by age group for the 20 countries participating in the APIKS survey.

Looking at the research activity-time ratio of university faculty members in their 20s and 30s (hereinafter, referred to as “young university faculty members”), the lowest is Mexico with 0.95, followed by Taiwan at 1.06, Korea at 1.16, and Japan at 1.31. Finland has the highest ratio at 1.62.



Table 1. Average number of hours of professional activities and their ratio by age group

| | Educational activities hours | | | | Research activities hours | | | |
|--------------------|--------------------------------|-----------------|-----------------|-------|--|-----------------|-----------------|-------|
| | 20-39 year olds | 40-49 year olds | 50-59 year olds | Total | 20-39 year olds | 40-49 year olds | 50-59 year olds | Total |
| Mexico | 19.98 | 18.94 | 18.46 | 18.93 | 13.93 | 13.88 | 15.90 | 14.74 |
| Malaysia | 20.06 | 19.04 | 19.59 | 19.61 | 12.27 | 12.45 | 13.60 | 12.51 |
| Chile | 15.25 | 12.63 | 11.46 | 13.28 | 11.97 | 12.46 | 11.30 | 12.04 |
| Croatia | 22.03 | 21.67 | 20.91 | 21.63 | 14.42 | 13.83 | 14.91 | 14.35 |
| Kazakhstan | 25.52 | 29.98 | 28.05 | 27.64 | 12.57 | 11.90 | 13.12 | 12.49 |
| Taiwan | 19.94 | 20.97 | 20.92 | 20.81 | 13.04 | 12.67 | 11.90 | 12.33 |
| Lithuania | 22.96 | 22.86 | 21.94 | 22.63 | 15.38 | 13.86 | 14.08 | 14.42 |
| Canada | 22.07 | 21.05 | 21.67 | 21.49 | 15.15 | 13.97 | 13.94 | 14.17 |
| Russian Federation | 29.42 | 30.25 | 31.91 | 30.28 | 13.93 | 11.51 | 13.15 | 13.01 |
| Slovenia | 19.11 | 22.56 | 20.48 | 20.69 | 15.28 | 13.19 | 13.58 | 14.06 |
| Estonia | 16.04 | 18.41 | 22.36 | 19.04 | 17.44 | 13.35 | 16.02 | 15.35 |
| Portugal | 18.16 | 19.21 | 19.45 | 19.19 | 14.66 | 12.42 | 12.29 | 12.63 |
| Korea, Republic of | 19.40 | 20.66 | 19.80 | 20.11 | 20.58 | 17.38 | 16.87 | 17.67 |
| Turkey | 19.26 | 22.21 | 21.89 | 20.84 | 16.74 | 12.28 | 12.81 | 14.36 |
| Argentina | 15.80 | 16.95 | 16.23 | 16.38 | 19.46 | 15.60 | 15.58 | 16.36 |
| Germany | 11.48 | 19.50 | 20.80 | 15.63 | 21.57 | 13.70 | 12.16 | 17.43 |
| Japan | 16.85 | 18.02 | 19.21 | 18.17 | 25.12 | 18.73 | 15.61 | 19.15 |
| Switzerland | 12.60 | 18.24 | 17.28 | 15.66 | 22.34 | 12.68 | 13.02 | 16.65 |
| Sweden | 16.65 | 21.37 | 21.66 | 20.40 | 18.86 | 12.73 | 11.52 | 13.69 |
| Finland | 9.95 | 18.02 | 23.75 | 17.18 | 23.80 | 12.15 | 7.63 | 14.71 |
| Mexico | 1.05 | 1.00 | 0.97 | 1 | 0.95 | 0.94 | 1.08 | 1 |
| Malaysia | 1.02 | 0.97 | 1.00 | 1 | 0.98 | 0.99 | 1.09 | 1 |
| Chile | 1.15 | 0.95 | 0.86 | 1 | 0.99 | 1.04 | 0.94 | 1 |
| Croatia | 1.02 | 1.00 | 0.97 | 1 | 1.01 | 0.96 | 1.04 | 1 |
| Kazakhstan | 0.92 | 1.08 | 1.01 | 1 | 1.01 | 0.95 | 1.05 | 1 |
| Taiwan | 0.96 | 1.01 | 1.01 | 1 | 1.06 | 1.03 | 0.96 | 1 |
| Lithuania | 1.01 | 1.01 | 0.97 | 1 | 1.07 | 0.96 | 0.98 | 1 |
| Canada | 1.03 | 0.98 | 1.01 | 1 | 1.07 | 0.99 | 0.98 | 1 |
| Russian Federation | 0.97 | 1.00 | 1.05 | 1 | 1.07 | 0.88 | 1.01 | 1 |
| Slovenia | 0.92 | 1.09 | 0.99 | 1 | 1.09 | 0.94 | 0.97 | 1 |
| Estonia | 0.84 | 0.97 | 1.17 | 1 | 1.14 | 0.87 | 1.04 | 1 |
| Portugal | 0.95 | 1.00 | 1.01 | 1 | 1.16 | 0.98 | 0.97 | 1 |
| Korea, Republic of | 0.96 | 1.03 | 0.98 | 1 | 1.16 | 0.98 | 0.95 | 1 |
| Turkey | 0.92 | 1.07 | 1.05 | 1 | 1.17 | 0.86 | 0.89 | 1 |
| Argentina | 0.96 | 1.03 | 0.99 | 1 | 1.19 | 0.95 | 0.95 | 1 |
| Germany | 0.73 | 1.25 | 1.33 | 1 | 1.24 | 0.79 | 0.70 | 1 |
| Japan | 0.93 | 0.99 | 1.06 | 1 | 1.31 | 0.98 | 0.82 | 1 |
| Switzerland | 0.80 | 1.16 | 1.10 | 1 | 1.34 | 0.76 | 0.78 | 1 |
| Sweden | 0.82 | 1.05 | 1.06 | 1 | 1.38 | 0.93 | 0.84 | 1 |
| Finland | 0.58 | 1.05 | 1.38 | 1 | 1.62 | 0.83 | 0.52 | 1 |
| | Externally oriented activities | | | | Administrative and other academic activities | | | |
| | 20-39 year olds | 40-49 year olds | 50-59 year olds | Total | 20-39 year olds | 40-49 year olds | 50-59 year olds | Total |
| Mexico | 2.95 | 3.19 | 3.09 | 3.10 | 10.63 | 10.52 | 10.00 | 10.32 |
| Malaysia | 4.59 | 5.11 | 5.54 | 4.91 | 13.41 | 14.42 | 13.79 | 13.84 |
| Chile | 3.88 | 3.69 | 4.04 | 3.84 | 14.26 | 15.12 | 17.78 | 15.41 |
| Croatia | 2.75 | 3.87 | 5.07 | 3.70 | 8.99 | 9.77 | 9.96 | 9.49 |
| Kazakhstan | 3.34 | 3.81 | 3.46 | 3.52 | 9.02 | 11.08 | 12.46 | 10.58 |
| Taiwan | 5.83 | 5.95 | 5.95 | 5.94 | 14.14 | 13.15 | 13.53 | 13.47 |
| Lithuania | 4.05 | 3.79 | 2.53 | 3.51 | 10.11 | 9.92 | 10.71 | 10.21 |
| Canada | 2.54 | 3.22 | 3.49 | 3.21 | 9.37 | 11.84 | 12.87 | 11.81 |
| Russian Federation | 3.46 | 2.12 | 3.15 | 2.98 | 8.49 | 7.90 | 7.26 | 8.01 |
| Slovenia | 3.16 | 3.69 | 4.71 | 3.81 | 8.10 | 9.38 | 10.91 | 9.39 |
| Estonia | 2.73 | 3.89 | 3.27 | 3.37 | 12.01 | 11.82 | 10.23 | 11.36 |
| Portugal | 3.10 | 2.74 | 2.92 | 2.86 | 8.29 | 9.74 | 9.83 | 9.60 |
| Korea, Republic of | 5.26 | 5.33 | 5.31 | 5.31 | 12.62 | 14.05 | 11.77 | 12.90 |
| Turkey | 2.09 | 2.95 | 3.19 | 2.61 | 9.61 | 10.41 | 9.48 | 9.90 |
| Argentina | 2.78 | 3.71 | 3.57 | 3.46 | 9.62 | 11.10 | 9.79 | 10.19 |
| Germany | 3.13 | 2.26 | 3.03 | 2.91 | 7.51 | 11.05 | 10.98 | 9.18 |
| Japan | 2.56 | 2.90 | 3.45 | 3.02 | 7.96 | 10.91 | 13.26 | 11.05 |
| Switzerland | 3.52 | 5.26 | 6.21 | 4.89 | 7.03 | 10.25 | 12.78 | 9.82 |
| Sweden | 1.93 | 2.52 | 3.05 | 2.58 | 8.83 | 12.10 | 14.62 | 12.28 |
| Finland | 1.71 | 2.93 | 2.56 | 2.36 | 3.89 | 7.44 | 7.72 | 6.27 |
| Mexico | 0.95 | 1.03 | 1.00 | 1 | 1.03 | 1.02 | 0.97 | 1 |
| Malaysia | 0.93 | 1.04 | 1.13 | 1 | 0.97 | 1.04 | 1.00 | 1 |
| Chile | 1.01 | 0.96 | 1.05 | 1 | 0.93 | 0.98 | 1.15 | 1 |
| Croatia | 0.74 | 1.05 | 1.37 | 1 | 0.95 | 1.03 | 1.05 | 1 |
| Kazakhstan | 0.95 | 1.08 | 0.98 | 1 | 0.85 | 1.05 | 1.18 | 1 |
| Taiwan | 0.98 | 1.00 | 1.00 | 1 | 1.05 | 0.98 | 1.00 | 1 |
| Lithuania | 1.15 | 1.08 | 0.72 | 1 | 0.99 | 0.97 | 1.05 | 1 |
| Canada | 0.79 | 1.00 | 1.09 | 1 | 0.79 | 1.00 | 1.09 | 1 |
| Russian Federation | 1.16 | 0.71 | 1.06 | 1 | 1.06 | 0.99 | 0.91 | 1 |
| Slovenia | 0.83 | 0.97 | 1.24 | 1 | 0.86 | 1.00 | 1.16 | 1 |
| Estonia | 0.81 | 1.16 | 0.97 | 1 | 1.06 | 1.04 | 0.90 | 1 |
| Portugal | 1.08 | 0.96 | 1.02 | 1 | 0.86 | 1.01 | 1.02 | 1 |
| Korea, Republic of | 0.99 | 1.00 | 1.00 | 1 | 0.98 | 1.09 | 0.91 | 1 |
| Turkey | 0.80 | 1.13 | 1.23 | 1 | 0.97 | 1.05 | 0.96 | 1 |
| Argentina | 0.80 | 1.07 | 1.03 | 1 | 0.94 | 1.09 | 0.96 | 1 |
| Germany | 1.08 | 0.78 | 1.04 | 1 | 0.82 | 1.20 | 1.20 | 1 |
| Japan | 0.85 | 0.96 | 1.14 | 1 | 0.72 | 0.99 | 1.20 | 1 |
| Switzerland | 0.72 | 1.08 | 1.27 | 1 | 0.72 | 1.04 | 1.30 | 1 |
| Sweden | 0.75 | 0.98 | 1.18 | 1 | 0.72 | 0.99 | 1.19 | 1 |
| Finland | 0.72 | 1.24 | 1.09 | 1 | 0.62 | 1.19 | 1.23 | 1 |



Table 2 shows the correlation coefficient between the ratios of each professional activity's hour by age group.

A negative and significant relationship was confirmed between the time ratio of educational activities and the time ratio of research activities in all age groups. That is, in each age group, the higher the ratio of educational activity time, the lower the ratio of research activity time. The same significant relationship was confirmed in research activity and management activity. Total time used by the academics every day is thought to be eight hours on an average. The weight of time consumption for academic works such as research, teaching, social service, and administration defines a typology of academics as follows: researcher, teacher, volunteer, and administrator. Promoting researchers' achievement requires decreasing the achievement of the other types. Increasing the achievement of other types necessarily impedes research activities and research productivity.

Table 2. The correlation coefficient between the ratios of each professional activity hour by age group

| | | 20-39 year olds | | | |
|-----------------|--|------------------------|--------------------|--------------------------------|--|
| | | Educational activities | Reaerch activities | Externally oriented activities | Administrative and other academic activities |
| 20-39 year olds | Educational activities | 1 | -.858*** | 0.361 | .611** |
| | Reaerch activities | | 1 | -.447* | -.762*** |
| | Externally oriented activities | | | 1 | .493* |
| | Administrative and other academic activities | | | | 1 |
| | | 40-49 year olds | | | |
| 40-49 year olds | Educational activities | 1 | -.722*** | -0.184 | .588** |
| | Reaerch activities | | 1 | -0.054 | -.594** |
| | Externally oriented activities | | | 1 | 0.16 |
| | Administrative and other academic activities | | | | 1 |
| | | 50-59 year olds | | | |
| 50-59 year olds | Educational activities | 1 | -.759*** | 0.032 | 0.327 |
| | Reaerch activities | | 1 | -0.17 | -.638** |
| | Externally oriented activities | | | 1 | 0.318 |
| | Administrative and other academic activities | | | | 1 |

Note: *** p<0.001, ** p<0.01, * p<0.05

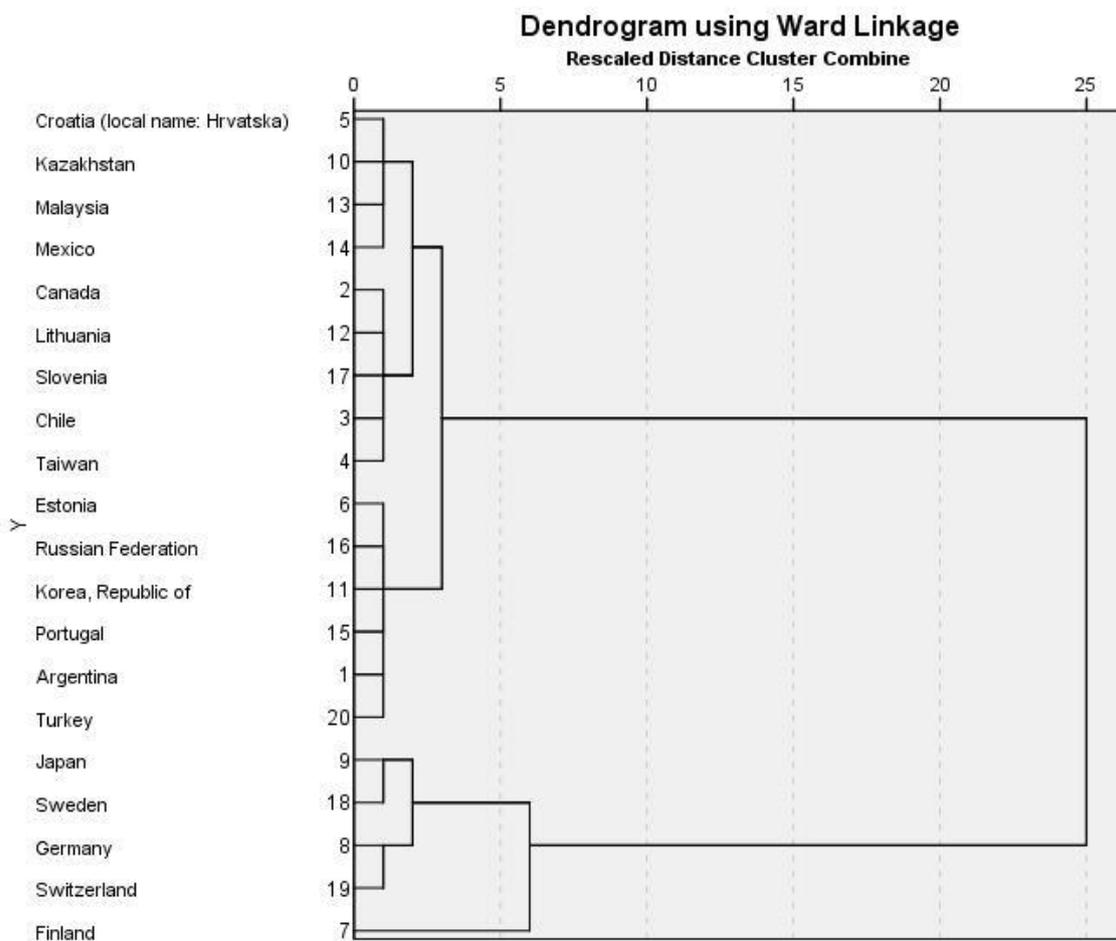


It was confirmed that the time ratio of research activities by age group is related to the age ratio of other professional activities. Therefore, a hierarchical cluster analysis (Ward method) was performed using the time ratios of research activities for each age group in the 20 countries shown in Table 1

Figure 1 shows the results in the dendrogram. The 20 countries were divided into the following four groups.

Group 1 includes Croatia, Kazakhstan, Malaysia, and Mexico. Group 2 includes Canada, Lithuania, Slovenia, Chile and Taiwan. Group 3 includes Estonia, Russian Federation, Korea, Portugal, Argentina and Turkey. Group 4 includes Japan, Sweden, Germany, Switzerland and Finland.

Figure 1. Results of hierarchical cluster analysis (Ward method) by using the time ratio of research activities by age group in 20 countries



In the following two sections, two points were considered:

First, what are the characteristics of the difference in the research activity time ratio by age group; and second, is how the difference in the research activity time ratio by age group is academic productivity.

II . The characteristics of each group

In this section, in order to clarify the characteristics of the difference in the research activity time ratio by age group, the six characteristics were examined, among the four clusters (groups) formed based on the research activity time ratio by age group.

i) The average number of hours of each professional activity

In order to see the characteristics of the professional activities of each group, the average number of hours of each professional activity by age group is shown for each group (Table 3).

In Group 1, it is shown that faculty members in their 50s spend a lot of time on research activities. Conversely, young teachers spend a lot of time on educational and administrative activities. On the contrary, in Group 4, young faculty members spend a lot of time on research activities, and older faculty members spend a lot of time on educational activities and management activities.

Table 3. The average number of hours of each professional activity by age group

| | | Real activity average hours | | | | Ratio for each activity average hours | | | |
|--|-----------------|-----------------------------|--------|--------|--------|---------------------------------------|--------|--------|--------|
| | | Group1 | Group2 | Group3 | Group4 | Group1 | Group2 | Group3 | Group4 |
| Educational activities | 20-39 year olds | 20.6 | 19.8 | 21.1 | 12.5 | 1.03 | 0.98 | 0.99 | 0.73 |
| | 40-49 year olds | 19.8 | 20.1 | 21.4 | 19.3 | 0.99 | 0.99 | 1.01 | 1.12 |
| | 50-59 year olds | 19.6 | 20.6 | 21.2 | 20.9 | 0.98 | 1.02 | 1.00 | 1.22 |
| | Total | 20.0 | 20.2 | 21.3 | 17.1 | 1.00 | 1.00 | 1.00 | 1.00 |
| Research activities | 20-39 year olds | 12.8 | 14.4 | 16.3 | 22.1 | 0.96 | 1.06 | 1.14 | 1.32 |
| | 40-49 year olds | 13.0 | 13.4 | 13.4 | 14.5 | 0.97 | 0.99 | 0.93 | 0.87 |
| | 50-59 year olds | 15.0 | 13.2 | 13.9 | 12.2 | 1.12 | 0.97 | 0.97 | 0.73 |
| | Total | 13.4 | 13.6 | 14.4 | 16.7 | 1.00 | 1.00 | 1.00 | 1.00 |
| Externally oriented activities | 20-39 year olds | 4.0 | 3.4 | 2.9 | 2.8 | 0.97 | 0.87 | 0.88 | 0.95 |
| | 40-49 year olds | 4.3 | 3.8 | 3.3 | 2.7 | 1.04 | 0.98 | 1.02 | 0.94 |
| | 50-59 year olds | 4.1 | 4.3 | 3.5 | 3.2 | 0.98 | 1.09 | 1.09 | 1.12 |
| | Total | 4.2 | 3.9 | 3.3 | 2.9 | 1.00 | 1.00 | 1.00 | 1.00 |
| Administrative and other academic activities | 20-39 year olds | 12.2 | 10.5 | 9.6 | 7.2 | 1.01 | 0.87 | 0.95 | 0.74 |
| | 40-49 year olds | 12.5 | 12.1 | 10.7 | 10.7 | 1.04 | 1.00 | 1.06 | 1.11 |
| | 50-59 year olds | 11.2 | 13.1 | 9.9 | 11.8 | 0.93 | 1.08 | 0.98 | 1.22 |
| | Total | 12.1 | 12.1 | 10.1 | 9.7 | 1.00 | 1.00 | 1.00 | 1.00 |



ii) *Current employment situation*

In Group 1, the ratio of faculty members who are permanently employed is high (90.6%), and in Group 4, the ratio of faculty members who have fixed-term employment is high (38.5%).

The faculty members with fixed-term employment are required to achieve research results during the employment period in order to obtain their next employment contract. Therefore, in Group 4 countries where there are many faculty members with fixed-term employment, the ratio of research activity hours of young faculty members is larger.

Table 4. *Current employment situation by Group*

| | Group1 | Group2 | Group3 | Group4 |
|---|---------------|---------------|---------------|---------------|
| Permanently or Continuously employed | 8610 90.6% | 5023 79.7% | 4317 62.0% | 6505 61.5% |
| Fixed-term employment or Casual contract | 889 9.4% | 1278 20.3% | 2642 38.0% | 4068 38.5% |

iii) *Average age by Group*

The average age was calculated for each group, assuming that the 20s and 30s were 35 years old, the 40s were 45 years old, and the 50s were 55 years old (Table 5).

Group 1 had the lowest average age, followed by Group 2, then Group 3, and Group 4 had the highest average age.

Table 5. *Average age by Group*

| Group | Mean | Std. Deviation | Sig. | N |
|--------|------|-------------------|------|-------|
| Group1 | 43.8 | 7.90 | *** | 8493 |
| Group2 | 46.3 | 7.69 | | 4646 |
| Group3 | 45.0 | 7.86 | | 5539 |
| Group4 | 44.1 | 8.34 | | 8263 |
| Total | 44.6 | 8.04 | | 26941 |

Note: *** p<0.001



iv) Current work situation

University faculty members belonging to Group 1 recognize that their institution has a higher prestige than university faculty members belonging to Group 4, and those in Group 1 also recognize that career opportunities are also blessed. If a faculty member feels that there are limited career opportunities at their institution, young faculty members may be trying to improve their careers with research results.

Table 6. Current work situation by Group

| Current work situation | Group | Mean | Significance level | N | Std. Deviation |
|------------------------|--------|------|--------------------|-------|----------------|
| Career opportunities | Group1 | 3.78 | *** | 2518 | 1.027 |
| | Group2 | 3.41 | | 2803 | 1.040 |
| | Group3 | 2.80 | | 2049 | 1.142 |
| | Group4 | 2.78 | | 4555 | 1.169 |
| | Total | 3.14 | | 11925 | 1.181 |
| Institutional prestige | Group1 | 4.03 | *** | 2520 | 0.900 |
| | Group2 | 3.47 | | 2802 | 1.031 |
| | Group3 | 3.26 | | 2049 | 1.105 |
| | Group4 | 3.21 | | 4552 | 1.146 |
| | Total | 3.45 | | 11923 | 1.109 |

Note: The numbers in the table are average values calculated with Excellent as 5 and Poor as 1.
*** $p < 0.001$

v) Interests lie in teaching or research

The university faculty members with a significantly higher level of interest in research activities was highest in Group 1, followed by Group 4, Group 2, and finally Group 3, (Table 7).



Table 7. Interests lie in teaching or research by Group

| Group | Mean | Std. Deviation | Significant level | N |
|--------|------|----------------|-------------------|-------|
| Group1 | 2.87 | 0.848 | *** | 9524 |
| Group2 | 2.61 | 0.831 | | 6174 |
| Group3 | 2.56 | 0.777 | | 6864 |
| Group4 | 2.81 | 0.929 | | 10624 |
| Total | 2.74 | 0.867 | | 33186 |

Note: The numerical values in the table are average values calculated with 1 point for “Primarily in teaching” , 2 points for “In both, but leaning towards teaching” , 3 points for In both, but leaning towards research”, and 4 points for “Primarily in research” .

*** p<0.001

vi) Management style

Regarding management styles, in the order of Group 1 to Group 4, the characteristics of competent leadership, a strong emphasis on the institution's mission, good communication between management and academics, collegiality in decision-making processes, and a strong teaching performance orientation are stronger (Fig. ?).



Table 8. Management style

| Management style | Group | Mean | Std. Deviation | Significant level | N |
|---|--------|------|----------------|-------------------|-------|
| A competent leadership | Group1 | 3.69 | 1.148 | *** | 9415 |
| | Group2 | 3.32 | 1.200 | | 5968 |
| | Group3 | 3.20 | 1.266 | | 6267 |
| | Group4 | 3.14 | 1.111 | | 6576 |
| | Total | 3.37 | 1.200 | | 28226 |
| A strong emphasis on the institution's mission | Group1 | 3.88 | 1.093 | *** | 9404 |
| | Group2 | 3.59 | 1.110 | | 5955 |
| | Group3 | 3.37 | 1.241 | | 6330 |
| | Group4 | 3.36 | 1.048 | | 6519 |
| | Total | 3.58 | 1.144 | | 28208 |
| Good communication between management and academics | Group1 | 3.45 | 1.201 | *** | 9407 |
| | Group2 | 2.89 | 1.194 | | 5961 |
| | Group3 | 2.94 | 1.191 | | 6347 |
| | Group4 | 2.77 | 1.076 | | 6550 |
| | Total | 3.06 | 1.203 | | 28265 |
| Collegiality in decision-making processes | Group1 | 3.40 | 1.183 | *** | 9408 |
| | Group2 | 3.00 | 1.158 | | 5952 |
| | Group3 | 2.81 | 1.168 | | 6318 |
| | Group4 | 2.74 | 1.034 | | 6467 |
| | Total | 3.03 | 1.174 | | 28145 |
| A strong teaching performance orientation | Group1 | 3.75 | 1.061 | *** | 9410 |
| | Group2 | 3.32 | 1.113 | | 5957 |
| | Group3 | 3.24 | 1.176 | | 6340 |
| | Group4 | 3.05 | 1.058 | | 6515 |
| | Total | 3.39 | 1.132 | | 28222 |

III. Academic productivity

In this section, in order to clarify how the difference in research activity hours ratio by age group is related to academic productivity, it was examined if there is a difference in academic productivity among the four groups.

i) Scholarly contributions in the past three years

When the average value was calculated for scholarly contributions in the past three years, including scholarly books, articles, completed doctoral dissertations and patents or licenses, Group 1 was the largest and Group 4 was the smallest.

It may be better to maximize the research time of older faculty members rather of younger faculty members.



Table 9 Average numbers of scholarly contributions in the past three years by Group

| Scholarly contributions | Group | Mean | Std. Deviation | Sig. | N |
|--|--------|-------|----------------|------|-------|
| Scholarly books you authored, co-authored, edited or co-edited | Group1 | 1.34 | 3.746 | *** | 7800 |
| | Group2 | 1.19 | 1.832 | | 4205 |
| | Group3 | 1.24 | 2.457 | | 5270 |
| | Group4 | 0.89 | 2.014 | | 8076 |
| | Total | 1.15 | 2.730 | | 25351 |
| Articles published in an academic book or an academic journal | Group1 | 10.81 | 20.630 | *** | 7897 |
| | Group2 | 8.59 | 9.426 | | 4765 |
| | Group3 | 9.45 | 10.967 | | 5479 |
| | Group4 | 7.52 | 10.635 | | 8302 |
| | Total | 9.09 | 14.327 | | 26443 |
| Completed doctoral dissertations you supervised | Group1 | 1.28 | 2.973 | *** | 7834 |
| | Group2 | 1.02 | 2.319 | | 4526 |
| | Group3 | 0.70 | 1.989 | | 5388 |
| | Group4 | 0.76 | 1.692 | | 8385 |
| | Total | 0.95 | 2.318 | | 26133 |
| Patent or license secured on a process or invention | Group1 | 0.36 | 5.794 | ** | 7745 |
| | Group2 | 0.26 | 1.146 | | 4069 |
| | Group3 | 0.34 | 1.605 | | 5286 |
| | Group4 | 0.19 | 0.824 | | 8055 |
| | Total | 0.29 | 3.363 | | 25155 |

ii) *Emphasis of primary research*

The research activities of younger Group 4 faculty members who secure a lot of research time are based in one discipline, and conversely, the research activities of older Group 1 faculty members who secure a lot of research time were interdisciplinary, applied/practically-oriented, and socially-oriented/oriented for the betterment of society.



Table 10 Emphasis of primary research by Group

| Emphasis of primary research | Group | Mean | Std. Deviation | Sig. | N |
|---|--------|------|----------------|------|-------|
| Based in one discipline | Group1 | 2.63 | 1.263 | *** | 8612 |
| | Group2 | 2.76 | 1.299 | | 5511 |
| | Group3 | 2.43 | 1.253 | | 5944 |
| | Group4 | 3.03 | 1.256 | | 8743 |
| | Total | 2.73 | 1.285 | | 28810 |
| Interdisciplinary | Group1 | 3.95 | 1.154 | *** | 8617 |
| | Group2 | 3.72 | 1.149 | | 5582 |
| | Group3 | 3.78 | 1.165 | | 6042 |
| | Group4 | 3.59 | 1.206 | | 9071 |
| | Total | 3.76 | 1.180 | | 29312 |
| Applied/practically-oriented | Group1 | 4.03 | 1.122 | *** | 8617 |
| | Group2 | 3.77 | 1.169 | | 5562 |
| | Group3 | 3.98 | 1.063 | | 6028 |
| | Group4 | 3.65 | 1.231 | | 8935 |
| | Total | 3.85 | 1.165 | | 29142 |
| Socially-oriented/intended for the betterment of society | Group1 | 3.53 | 1.363 | *** | 8607 |
| | Group2 | 3.37 | 1.354 | | 5530 |
| | Group3 | 3.14 | 1.383 | | 5984 |
| | Group4 | 2.96 | 1.419 | | 8912 |
| | Total | 3.25 | 1.402 | | 29033 |

Note: The numbers in the table are average values calculated with 5 being very well applied and 1 being not at all.
 *** p<0.001

Results

In this study, a hierarchical cluster analysis (Ward method) was performed using the time ratio of research activities for each age group in 20 countries, and the 20 countries were classified into 4 groups. We explored what characteristics they have and how they relate to academic productivity.

As a result, four particularly remarkable points were clarified.

First, in the countries of the group where the research activity time ratio of young faculty members is large, the number of faculty members with fixed-term employment is increasing.

Fixed-term faculty members are required to achieve research results during the employment period and earn their next employment contract. Therefore, in Group 4 countries where there are many fixed-term faculty members, it seems that the ratio of young faculty members' research activity time is high.



Second, the faculty members of the group whose research activity time ratio is large for senior faculty members, recognize that their institution has a high prestige, and that career opportunities are also blessed.

If a faculty member feels that the career opportunities at his or her institution are not fortunate, the faculty member may be trying to improve his or her career with research results. This is especially true for young university faculty members.

Third, looking at scholarly contributions in the past three years, such as scholarly books, articles, completed doctoral dissertations and patents or licenses, Group 1 faculty members have the highest achievements and Group 4 faculty members have the lowest achievements.

From these results, it may be better to maximize the research time of older faculty members than to maximize the research time of young faculty members.

Fourth, the characteristic of the research activities of Group 4 faculty members who secure a lot of research time by young faculty members is based in one discipline, and the characteristics of Group 1 faculty members who secure a lot of research time by older faculty members are interdisciplinary, applied/practically-oriented, and socially-oriented/oriented for the betterment of society.

Concluding remarks

In the following section, we intend to discuss some points related to the results previously mentioned.

First, there is distinction of concepts of research productivity and academic productivity developed from Sociology of Science. Sociology of Science, created by Robert Merton, conducted research on the traits of scientists' scientific productivity in the field of academic disciplines related to STEM & M (Merton, 1973; Gaston, 1978). On the other hand, in the field of Educational Sociology in Japan, Michiya Shinbori proposed a concept of "academic productivity" replacing "scientific productivity" (Shinbori, 1973). It intended to deal with academic productivity including all academic disciplines not only from natural science but also to humanities and social science, because restriction to only natural science forces a narrow scope of increasing academic disciplines.

This paper does not deal with academics' major academic disciplines which is targeted in APIKS survey but it is interesting if they are used for comparison with additional factors such as gender, sector, position, etc.



Second, this paper intends to make comparisons between the twenty countries related to academic productivity by categorizing the countries into four groups. Comparison of research productivity by age makes four groups consisting of the participating countries. Contrasting characteristics are shown between Group 1 and Group 4. The weight of teaching activity is higher in Group 1 than in Group 4. The weight of teaching activity is higher in young academics than in older academics. On the other hand, the weight of research activity is higher in Group 4 and the weight of research activity is higher in younger academics than in older academics.

If we compare the ratio of younger academics in research activity in both groups, Group 1(20.6) is higher than Group 4(12.5). If we compare the ratio of older academics in teaching activity in both groups, Group 1(19.6) is lower than Group 4(20.9). If we compare the ratio of younger academics in research activity, Group 1(12.8) is much lower than Group 4(22.1). If we compare the ratio of older academics in research activity, Group 1(15.0) is higher than Group 4(12.2). As a result, it is obvious that weight of younger academics and older academics in both groups are in contrast.

Third, the result given from research productivity is different from the result given from academic productivity. Comparison of research productivity shows that Group 1 is considered to be more advantageous than Group 4 because younger academics have much more research time. Accordingly, it is understandable that research productivity is divided into two parts by age stratification. However, this kind of division should be reformed in light of a perspective of academic productivity instead of research productivity on the basis of the following reasons.

Based on a viewpoint of the Humboldtian model, or R-T-S nexus, integration of R(research) and T(teaching) is considered to be inevitable condition necessary for promoting academic productivity (Humboldt, 1910). According to this model, it is desired that both researcher's research and student's study in the teaching and study process are to be integrated by way of their mutual interaction instead of being separated. In other words, academic productivity should be realized by an integration operation of research productivity and teaching productivity. For realizing this purpose, compatible research and teaching is considered to be necessary proposition (Arimoto, 2020).

When the weight of teaching time occupies a large share, compatible research and teaching is impeded; and vice versa. Accordingly, given the Humboldtian model, conditions impeding academic productivity's promotion are put into effect in both of G1 and G4.

Considering all of this, there are probably questions about the results of analysis. There are questions about the system which put weight on younger academics in terms of research productivity and the system which put weight on older academics in terms of teaching



productivity. The reason for this is that Humboldtian model expects all academics to conduct academic works in order to promote academic productivity in the field of research, teaching, study, and social service (Meyer, 2017). According to Ernest Boyer, the former is related to the fact that academics suffer limitations of their age in research productivity (Boyer, 1990). According to Robert Merton, the latter is related to the fact that academics suffer limitations of ability in their growth and development (Merton, 1973, p.427).

In addition, as for the latter, Group 1 is ranked No. 1 in the ratio of tenure employment, followed by Group 2, while Group 3 and Group 4 have a high ratio of fixed-term employment. In the case of Japan, in which there are posts such as professor, associate professor, lecturer, and assistant professor, the last one is an unstable post due to short term employment of three years or so. The incumbents are obliged to find their next posts in short period through competitive research productivity. Unfortunately, it is difficult for these incumbents to conduct basic research leading to a lifework, or perhaps to Nobel Prize Laureate in the distant future, mostly because research activity is forced to be fragmentary, caused by short-term employment.

Fourth, it is estimated that in the 21st century the world of the academic profession is shifting from Group 1 to Group 4. Academics belonging to Group 1 are seemingly satisfied with their academic careers, as shown by: lifelong employment (90.6%); institutional prestige (4.03); happiness (3.78). Contrary to this, their counterparts in Group 4 are seemingly unsatisfied in their academic careers, as shown by: lifelong employment (61.5%); institutional prestige (3.21); happiness (2.78). The former's academics are supposed to be happy, while the latter's academics are supposed to be unhappy, even though they belong to the same kind of category of academic profession. It is interesting to know the reason why such differences appear in the academic profession. In the 21st century, the type of academic found in Group 4 is likely increase as opposed to the type in Group 1, as academia's position in society is gradually worsening.

Fifth, related to the third point mentioned above, the academic profession is moving to a German model, although it is expected to move toward Humboldtian model, or R-T-S nexus model. According to international comparative studies on the academic profession including Carnegie, CAP and APIKS, the countries in which academics' interest is higher in research orientation than teaching orientation, are called the German type (Arimoto and Ehara, 1996, Arimoto, 2015). This type is apparently moving away from the Humboldtian model. Group 1 and Group 4 reveal a strong orientation towards research as opposed to Group 2 and Group 3 which have a weak orientation towards research (in this point it may reveal a strong teaching orientation). However we must pay attention to the fact that Table 8 dealing with “



Management Style” shows that Group 1 has the highest ratio (3.75) in the category of “A strong teaching performance orientation.”

Based on the past results of the international surveys of the academic profession, it is clear that the U.S. shows a pattern close to the Humboldtian model as the demonstration made by Burton Clark (Clark,1995,1997), while other countries show a pattern close to the German model. It is not deniable to express that the present situation is moving away from the ideal pattern, although the Humboldtian model is expected to increase in the 21st century as the population of students continues to diversify, due to the universalization of higher education.

Sixth, it is possible to see a transformation from the separation of Group 1 and Group 4 to an integration of the two groups. As far as academics’ response to questions about research productivity as a part of academic productivity is concerned, Group 1’ s academic productivity is thought to be prominent since it occupies the top position in all items. Such a result is a logical conclusion as older academics’ research activity is higher than younger academics’ research activity. On the other hand, Group 4 shows less output of academic productivity due to younger researchers’ positive activity. The academic system oriented towards short-running research productivity due to contract type and unstable employment is not conducive to promoting research productivity compared to the academic system oriented towards long-running research orientation.

Younger academics in Group 4 are involved in strong research orientation in the contract employment system, making an effort to promote research productivity by short-running and intensive research. They have to the status of researcher in their own academic disciplines by achieving competitive research productivity, while older academics have already established the status of researcher through their academic careers. They have also experienced various kinds of research activities thus far.

Academic productivity as well as research productivity is desired to be integrated to all generations than to be overemphasized to one generation such as younger academics.

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March 3, session 3: NPM and job satisfaction

Work satisfaction among academics: despite or due to Lithuania's new public management reforms?

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Theoretical framework/definition of concepts, according to national rules and norms to become an academic

This study aims to investigate the factors contributing to the autonomy and (dis-)satisfaction of Lithuanian academics and to understand how these are related to New Public Management (NPM)-inspired reforms at Lithuanian universities.

Literature has shown that both the labour market dynamics and factors influencing work satisfaction in academia differ from those in other sectors. Finkelstein (1984) has shown that job changes in academia do not follow rational economic labour market models, but that intrinsic motivation is much more important. Stevens (2006) has found that salary does not play a major role in academics' satisfaction, as they are willing to earn less and stress other factors as being important for their work. Lacy & Sheehan (1997) state that while salary and economic resources do not matter much in academia, the climate or culture of a university has a significant impact on the satisfaction of academics. Shin & Jung (2014) confirm this and show that the main source of academic job satisfaction is their social reputation in society and academic autonomy.

The implementation of NPM-inspired reforms in higher education and research organizations (Deem, Hillyard & Reed, 2007; de Boer, Enders & Schimank, 2007; Musselin, 2009) has had a profound influence not only on university governance but also on academic work (Enders & de Weert, 2009; Leišytė, 2016). However, the influence of NPM-reforms on work satisfaction remains contested in the literature. Based on a comparative study of British and German academics, Pritchard (2005) concludes that academics remain positive despite market forces: satisfaction through professional ethos and dedication. On the other hand, Shin & Jung (2014) claim that market-oriented managerial reforms act as the main source of academic job stress and thus do have negative implications for academic satisfaction.

The literature categorizes Lithuania as a "society of departure" (Park, 2015) and suggests that brain drain particularly affects sectors employing highly skilled employees, especially higher education and research (Kazlauskienė & Rinkevičius, 2006). Furthermore, previous studies have shown that Lithuanian academics face unfavourable working conditions, including



comparatively low salaries and a lack of resources and infrastructure, leading to a lack of incoming international mobility (Leišytė & Rose, 2016) as well as outgoing international or cross-sectoral mobility. Therefore, it is important to understand the work satisfaction of Lithuanian academics in an increasingly managerial environment not only from a theoretical perspective, but also from a practical perspective to be able to retain and re-attract highly qualified academic staff.

We pose the following research questions:

1. *How satisfied are academics at Lithuanian universities?*
2. *How are factors leading to a (dis)satisfaction of academics related to the introduction of NPM-inspired reforms at Lithuanian universities?*

Methodology – definition of hypothesis

In order to answer our research question, we draw on quantitative data collected through an online survey of academics from all career levels and disciplines at ten public universities in Lithuania. The survey (N=389) was conducted within the scope of the APIKS-project (The Academic Profession in the Knowledge-Based Society) between October 2017 and January 2018. We conduct a descriptive analysis of selected variables which have been identified as factors of academic satisfaction based on a literature review to establish a) how satisfied academics are with various factors related to their employment situation, their working environment, and selected aspects of their work, and b) how important they rate these factors for their work life.

We will conduct further analysis by gender, discipline, and career level, all of which play an important role for the work satisfaction of academics according to existing literature. As Lacy & Sheenan (1997) were able to show, males show higher levels of satisfaction than females, possibly due to gender hierarchies. The authors further found satisfaction to vary across disciplines (idem). Moreover, Stevens (2006) shows that academics on higher career levels tend to be more satisfied with their work than early- and mid-career academics.

We will then position the work satisfaction of academics at Lithuanian universities against the background of NPM-inspired reforms, which have been taking place in Lithuania since the early 2000s (Želvys et al., forthcoming in 2021). For this purpose, we draw on the five modes of coordination proposed in de Boer, Enders & Schimank's (2007) governance equalizer: a) state regulation, b) external guidance, c) academic self-governance, d) managerial governance, and e) competition for resources.



Data analysis discussion

Our data shows that Lithuanian academics overall have rather low job satisfaction. Only 11.7% of respondents have indicated that they are satisfied or highly satisfied with their current employment situation, just 22.7% with their current work situation, and 27.1% with their overall professional environment.

A closer examination of factors contributing to work satisfaction has revealed that academics are especially dissatisfied with their salary. Only 10.6% of Lithuanian academics indicated that they are satisfied with their salary, while 83% indicated that salary has a high importance for their work life. Respondents further perceive their career opportunities as poor. Only 28.4% reported to be satisfied with their career opportunities. Slightly less than 50% are satisfied with opportunities to learn and enhance their competences. We observed fewer negative responses regarding opportunities to learn and enhance competences (44.4%), job security (54.5%), academic freedom (personal independence in research with 54.8% and personal independence in teaching with 67.7%). The majority of respondents were satisfied with how interesting their work is (74.8%).

Our data further suggests that respondents who would like to leave academia are driven mainly by uncertain job prospects (80% agreement) and salary (79% agreement), whereas other factors such as workload, working conditions (in terms of equipment, facilities, and availability of support staff) play a less important role.

The Lithuanian higher education system, a system that has been undergoing rapid transformation since the restoration of independence of Lithuania from the Soviet Union (Leišytė, Rose & Schimmelpfennig, 2018), moved from a focus on restoring academic freedom in the 1990s to the introduction of principles of NPM in the 2000s. In an earlier study (Želvys et al., forthcoming in 2021), we were able to confirm a shift towards a market-oriented paradigm in Lithuanian higher education. A vast majority of (70%) of Lithuanian academics perceive their universities as managerial. A majority of respondents (61%) reported a top-down management style, whereas only 22% of respondents reported that there is collegiality in decision-making and a good communication between managers and academics. Our data is thus indicative of a managerial governance style and a lack of academic self-governance.

We have found women to be significantly less likely than men to report that decision-making processes are collegial, and academics from the hard sciences tend to perceive universities as more managerial than academics from the soft sciences. However, further analysis needs to be conducted to investigate whether this is reflected in the work satisfaction of the respective groups.



While in-depth analysis has not yet been conducted, we would like to raise some points for a preliminary reflection on the role of NPM in academic work satisfaction. Academic freedom seems to be restricted to a degree leading to academic dissatisfaction. While slightly more than half of our respondents indicated that they are satisfied with their independence in research, significantly more respondents, namely 78.9%, indicated that personal independence in research is (highly) important to their work life. Contrary to suggestions in the existing literature, salary plays an important role in the dissatisfaction of Lithuanian academics. Our data have confirmed salary to be one of the biggest challenges for academics in Lithuanian universities. Yet, in the light of increasing institutional autonomy of universities coming along with NPM-inspired reforms, universities were granted the right to determine salaries autonomously, leading to an increase in academic salaries since 2015. NPM-inspired reforms thus seem to have a double-edged impact on academics' work and employment conditions.

It is noteworthy that 'interesting work' could be identified as the factor with the highest rate of agreement by our respondents, which supports Pritchard's (2005) assumption that professional ethos and dedication act as important drivers of academic satisfaction and might even mitigate the negative effects of market forces in universities.

Conclusion

Our study shows that Lithuanian academics both display high levels of dissatisfaction, especially regarding their salary and career prospects, and perceive high levels of managerialism at their universities. The relationship between NPM and the work satisfaction of Lithuanian academics does, however, seem to be double-edged. On the one hand, Lithuanian academics indicate dissatisfaction with regard to academic freedom, especially with regard to research. On the other hand, increased institutional autonomy and a decrease of state control as one of the indicators of NPM has granted universities the right to determine salaries independently, which has led to a rise in salaries in the university sector in the past five years. Further analysis, including an investigation of satisfaction by different strata (gender, academic rank, and academic discipline) will be conducted in the coming weeks, allowing for a more elaborated reflection on the impact of NPM on academic work satisfaction in Lithuanian universities at the EAIR Forum in Berlin in September.

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Predictors of job satisfaction in Swedish academia: the job demand resource model

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In the past few decades, universities worldwide have undergone significant changes, including massification, internationalization and the rising influence of university management, which have reshaped academic work and workplaces (Bentley et al., 2013; Teichler et al., 2013). Academic work is thus changing. Concerns have been raised that many academics are facing increasing workloads and longer working hours and job insecurity (e.g., Shin & Jung, 2014; Houston, Meyer & Paewai, 2006). Moreover, autonomy, societal prestige, and collegial support are decreasing (Fredman & Dougheney, 2012; Záborská et al., 2017).

University faculty typically work in environments that are characterised by high pressure and multifaceted demands. To help academics cope with such demands and perform to expectations, it is important that universities are able to provide supportive working condition, i.e., in the form of resources and rewards (Bland et al., 2005). Studies show that faculty stress combined with a lack of satisfaction with the working environment can lead to high rates of faculty turnover (Hagedorn, 2000; Rosser, 2004). Moreover, a lack of job satisfaction, even among those faculty still at the institution, has trickle-down effects for others (Ambrose, Huston & Norman, 2005). Understanding of how university faculty become satisfied and to what degree various resources contribute to their level of commitment and satisfaction, is really important to boosting their performance. Although, there have been numerous publications on job satisfaction in international context, there has been relatively little empirical data gathered on the working conditions and its influence on faculty job satisfaction in the Swedish higher education context. Moreover, while the academic working conditions and their impact on faculty well-being have been discussed considerably, there have been relatively few attempts to use comprehensive theoretical models to understand this relationship (Mudrak et al., 2018). In this study, we propose to investigate the influence of job resources and job demands on faculty job satisfaction within the framework of the Job Demand-Resource (JD-R) model in Swedish HEIs.

Job Demand Resource Model (J-DR)

The Job Demand Resource (JD-R) model provides a flexible theoretical tool for conceptualizing key aspects of the work environment, explaining and predicting a wide range of work-related outcomes, including stress, burnout, work engagement, organizational commitment and job satisfaction (Bakker, 2011). The JD-R model proposes two broad job characteristics that



relatively independently influence employee well-being: job demands (defined as job aspects that require sustained effort and that are associated with physiological and psychological costs) and job resources (defined as factors functional in achieving work goals, reducing job demands or stimulating personal growth and development) (Bakker & Demerouti, 2014). In a review study, Bakker and Demerouti (2007) suggested that job resources were located at four levels: 1) the organisation at large (e.g., pay, career opportunities, job security); 2) interpersonal and social relations (e.g., supervisor and co-worker support, team climate); 3) the organisation of work (e.g., role clarity, participation in decision making); and 4) tasks (e.g., skill variety, task identity, task significance, autonomy, performance feedback). Using the JD-R framework, the key job resources at academic workplaces have been conceptualized, for example, as organizational and social support, growth and career advancement opportunities, autonomy, role clarity or performance feedback, while job demands have included work overload, work-home interference or job insecurity (Bakker et al., 2005; Boyd et al., 2011).

Job demands and job resources have been found to influence aspects of occupational well-being through their effects on stress and work engagement, including job satisfaction (Hakanen et al., 2006; Schaufeli & Bakker, 2004). Therefore, application of the J-DR model to academic environments could provide a further and more detailed explanation of the psychological processes related to the ways in which academics experience and evaluate their work and work situations (e.g., Fredman & Doughney 2012; Winefield et al., 2003; Shin & Jung, 2014).

Academic workload and work pressure are examples of job demands (Wright & Hobfoll, 2004). Literature indicates that the increasing stress of university teachers has been widely reported due to increased demands on teaching and research. Teaching usually refers to activities related to students' learning, while research involves creative work to enhance human knowledge, such as developing theories, conducting experiments and verifying data. Overall, the teacher and researcher roles are both different and interdependent. It is inevitable for teachers in higher education to encounter 'conflict' in the roles and role conflicts can lead to a sense of uncertainty, stress and dissatisfaction (Xu, 2019). Moreover, the demands on university teachers have mainly been caused by pressure to adopt new teaching practices and technologies, the increased number of students and the transformation of teaching and learning approaches (Coaldrake, 1999). Hence, in this study, teaching workload and teaching and research conflicts have been included as a job demand because the tension between teaching and research has often been reported among university teachers (e.g., Kinchin & Hay, 2007; Lai, Du, & Li, 2014).

Job resources are those elements that assist when job demands become too much (Demerouti et al., 2001). Job resources initiate a motivational process that may lead to high work



engagement and performance (Bakker & Demerouti, 2007). Also, high job resources, such as social support and feedback, may reduce the effects of job demands (Demerouti et al., 2001).

For the purpose of this study, we categorised some items from the APIKS questionnaire as job resources: a) collegiality and communication (between leadership & academics) b) career support c) social support d) professional development e) job security f) academic mobility, and job demands a) work pressure, and b) workload. For instance, according to literature, controlling leadership and managerial culture (Fredman & Doughney 2012; Winefield et al., 2003), high workloads, job insecurity have been found as important drivers of job dissatisfaction in academia. On the other hand, positive attributes and behaviour of a leader, mentoring approach of supervisors can increase job satisfaction (Sharma & Jyoti, 2009). Thus, there is a positive association between the attitude of the senior supervisor or university leader and the job satisfaction of university faculty.

Methodology

Table 1 presents data characteristics of the sample in Sweden.

Table 1

Data characteristics

| Population 2017* | Organisational type | Sampling | N | RR % | Gender | Rank |
|------------------|---------------------|----------|------|------|--------------------------------|---------------------------------------|
| 10,057695 | All universities | Random | 2408 | 28.5 | Males (55 %) Females (45 %) | Senior (n = 1555) Junior (n = 848) |

Results

To examine the relationships between job resources and job demand variables and job satisfaction, (bivariate) Pearson's correlation coefficients were calculated. Table 2 shows correlation coefficients of the study variables. All job resources were positively correlated with job satisfaction, while both job demand variables were negatively correlated with job satisfaction.



Table 2

Job satisfaction, job resource and job demand variables, and their correlations

| <i>Variables</i> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|----------|
| 1. Collegiality & communication | 1 | | | | | | | | |
| 2. Career support | .479** | 1 | | | | | | | |
| 3. Social support | .448** | .579** | 1 | | | | | | |
| 4. Professional development | .210** | .385** | .391** | 1 | | | | | |
| 5. Job security | .138* | .161* | .136* | .248** | 1 | | | | |
| 6. Academic mobility | .335** | .322** | .314** | .261** | .142* | 1 | | | |
| 7. Work pressure | -.164** | -.175** | -.155* | -.192** | .021 | -.103** | 1 | | |
| 8. Workload/teaching | -.140** | -.091 | -.144 | .025 | .135 | -.087** | .236** | 1 | |
| 9. Job satisfaction | .364** | .489** | .535** | .416** | .335** | .221** | -.296** | -.191** | 1 |

* $p < .05$. ** $p < .01$.

An examination of correlations revealed job resource and demand variables to be associated with faculty job satisfaction. Therefore, a single stage multiple regression analysis was conducted to determine the strongest predictors of faculty job satisfaction. The results revealed that variables that are independently significantly predictive of job satisfaction are collegiality and communication, ($\beta = .186, p = .009$), career support ($\beta = .165, p = .033$), social support ($\beta = .273, p < .001$), professional development ($\beta = .144, p = .036$), and job security ($\beta = .218, p < .001$) in Swedish HEIs (see Table 3).

Table 3

Model summary of job-resources and job satisfaction

| Variables | Beta | t | p |
|--------------------------------|------------|-------|--------|
| Collegiality and Communication | .186 | 2.64 | .009 |
| Career Support | .165 | 2.15 | .033 |
| Social Support | .273 | 3.55 | < .001 |
| Professional Development | .144 | 2.11 | .036 |
| Job security | .218 | 3.51 | < .001 |
| Academic mobility | .068 | 1.08 | .282 |
| Work pressure | -.070 | -1.11 | .267 |
| Workload | -.058 | -.951 | .343 |
| R ² | .495 | | |
| Adj.R ² | .467 | | |
| F change | 17.85 | | |
| Sig. F | $p < .001$ | | |

Furthermore, an independent sample *t*-test was conducted to compare male and female faculty job satisfaction. The result demonstrated that there was a significant difference between the scores of male ($M = 3.35; SD = 1.15$) and female ($M = 3.25; SD = 1.07$) faculty members, $t(2371) = 2.19, p = .028$; with male faculty being more satisfied with their job compared to female.



Discussion and Conclusion

The working environment is significant because these environmental factors combined create a more holistic view of variables influencing faculty job satisfaction (Hagedorn, 2000). The preliminary findings of this study showed that all job resources were positively related with job satisfaction, while job demands were negatively related with faculty job satisfaction. Using the JD-R model, the influences of job resources and job demands on faculty job satisfaction are discussed.

The influence of job resources on faculty job satisfaction

The motivational process of the JD-R model claims that job resources are significant predictors of employee well-being. Our results demonstrated that job resources (e.g., social support) are the predictors of faculty job satisfaction. This finding replicated previous findings on the JD-R model among other occupational groups. Bakker and Geurts (2004) suggested that an environment providing more opportunities for employee development would foster a willingness in employees to dedicate their abilities to the tasks at hand and lead to positive outcomes. Teachers who have access to job resources such as support from organisations and colleagues, in addition to sufficient teaching resources, may become more vigorous and dedicated to their work and may feel more satisfied with their jobs (Han et al., 2020).

The influence of job demands on faculty job satisfaction

The result of this study showed that there is a negative correlation between work pressure and job satisfaction. High levels of job demands can evoke chronic stress, over-fatigue and emotional exhaustion, leading to decreased job satisfaction. This result resonates the study by Han et al., (2020) who found that job demands can lead to reduced job satisfaction by undermining university teachers' work engagement.

This study contributes to the literature with clear evidence supporting the applicability of the JD-R model among university faculty in Sweden, and the results of this study may have implications for improving the university working environment and job satisfaction of university faculty.

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March 3, session 4: Segmentation and stratification inside the career

Who participates where? Stratification in higher education and social and gender-related inequalities in the academic profession – comparative evidence from Germany and Austria

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Theoretical Framework

This study explores stratification within German and Austrian higher education (HE) according to social selectivity and gender-segregation of academic staff across different types of HE institutions (HEIs). The article investigates whether academics who cannot draw on a familial history in HE (i.e., those whose parents did not obtain a HE degree) and whether women are less likely to pursue an academic career at public universities opposed to universities of applied sciences (UAS). In both countries, there is a clear structural diversity between universities and UAS (Götze et al., 2021). UAS were institutionalised as practice- and teaching-oriented organisations in contrast to the more research-oriented universities (Teichler, 2008). We ask whether these different types of HEIs attract different types of academics in terms of social background and gender. Therefore, our aim is to illuminate social and gender-related inequalities in the academic profession along the binary divide between universities and UAS in Germany and Austria.

Historically, the massification of higher education and the increasing diversification of the study population has resulted, in some systems, in a horizontal differentiation of institutions with varying institutional missions and profiles (e.g., research universities vs. UAS), as well as a vertical differentiation of institutions, i.e., hierarchies based on prestige (OECD, 2021). Numerous studies show that these changes led to greater stratification within higher education systems (Ayalon and Mcdossi, 2018; Helland and Wiborg, 2018; Van de Werfhorst and Luijckx, 2010).

“Stratification of higher education refers to the degree of variation in selectivity, quality/prestige and labor market value of different courses, fields of study and institutions” (Triventi, 2013a pp. 48–49). Stratification tends to increase in high participation systems, as institutions compete with each other for status (i.e., reputation and prestige), which is primarily associated with



research achievements (Krücken, 2019). The increasing emphasis on research and innovation has led to an overarching research imperative. Given the unequal distribution of research funding, this research imperative has also resulted in a vertical differentiation of institutions in national HE systems (Schneijderberg et al., 2021).

In a highly stratified HE system, types of institutions are hierarchically ordered and access to them is strongly affected by social origin (Brown et al., 2013; Triventi et al., 2017). In this context, inequalities can manifest themselves at different levels (e.g., type of HEI, individual institutions of the same type, as well as in fields of study) (Lörz et al., 2011; Triventi, 2013b). One consequence for academic careers in this context has been the decoupling of teaching and research activities, also called the dissolution of the research-teaching nexus (Götze and Schneijderberg, 2022), as the long-term funding associated with core resource allocation has steadily been replaced by short-term project funding (OECD, 2021). The combination of the above factors is also leading to the rapid worsening of the working conditions of postdoctoral researchers in many places (Idem). This leads academics, especially from disadvantaged and marginalised groups, to opt for alternative careers outside of academia or at other types of HEIs (e.g., UAS) where they can more easily gain a permanent position.

Recent empirical studies illuminating stratification and its relation to social inequality in the academic profession have mainly investigated whether social and gender-related inequalities persist when students enter into and advance within the academic profession, showing that women and academics without familial history in HE are in general less likely to receive a position as full-professor (Helin et al., 2019; Möller, 2013; Schneijderberg and Götze, 2020). Regarding gender, one exception appears within political sciences and sociology, where Lutter and Schröder (2016) as well as Schröder et al. (2021) show that women in German HE are more likely to obtain a professorship when controlling for several variables. Regarding parental background, research shows that social inequalities at different educational stages, e.g., access to HE as well as the transition from bachelor's to master's degrees (Lörz, 2019; Lörz and Neugebauer, 2019) continue to persist: doctorate holders whose parents have a master's or a doctoral degree themselves are more likely to obtain a professorship and often at a younger age (OECD, 2021).

However, the relationship of stratification and social inequality according to types of HEIs and questions about whether social origin and gender influence the likelihood of pursuing an academic career at research-intensive HEI (i.e., public universities) compared to institutions that focus mainly on teaching (i.e., UAS) have been neglected so far (Kwiek, 2019). This paper



addresses this research gap by exploring stratification according to the social origin and the gender of academic staff along different types of HEIs.

Such questions are highly relevant since different types of HEIs are associated with differentiated rewards in the academic labour market and other beneficial outcomes (e.g., healthy and rewarding working conditions, memberships on editorial boards or opportunities for receiving research grants) (Musselin, 2013). In addition, there is a global tendency towards an increase in the number of academic workers with insecure and precarious working conditions (Carvalho and Diogo, 2018; OECD, 2021), which further aggravates the situation of academics in stratified HE systems. Exploring social and gender-related inequalities within the academic profession is even more crucial since recent research shows that elite sub-groups in academia are still contributing to the development of mechanisms of social closure and are working as gatekeepers (Forsberg et al., 2022) that highly affect academic careers, e.g., in terms of recruitment and progression processes (Musselin, 2013).

By focusing on country-specific differences between university-academics and UAS-academics regarding their social background and gender, this paper intends to contribute both to the literature of social inequality in the academic profession (Möller, 2013; Schneijderberg and Götze, 2020) and to the discussion on vertical stratification within HE (Kwiek, 2019) and the related binary divide between universities and UAS (Enders, 2019).

Methodology

We selected two countries for comparison that participated in the Academic Profession in Knowledge Societies (APIKS) survey. In Germany the survey was conducted from November 2017 until January 2018 and in Austria it was conducted from January 2021 until May 2021. We selected these countries according to the core similarity of a clear legally and historically anchored diversity between universities and UAS (see also Theoretical Framework).

The participants in the study include all academics who were employed more than 50% of a full-time equivalent. The German sample includes 4944 valid cases, the Austrian sample includes 1817 valid cases. In Germany, 44% of academics come from families with no history in HE (i.e., those whose parents did not obtain a HE degree). In Austria this share is 55%. In Germany 38% are women whereas in Austria the share is slightly higher (41%). Regarding caring responsibilities, 72% of academics in Germany and 70% in Austria stated that they have no children or other individuals to care for. According to the professional position, 19% in the German sample and 18% in the Austrian sample hold a professorship.



Besides descriptive statistics, we apply a logistic regression model for each country-specific sample to estimate factors determining career segmentation of academic staff with regard to the type of HEI and the social background and gender of academics. The dependent variable is binary and represents the type of HEI. The variable has two values: public universities ($Y=1$), universities for applied sciences form the reference group ($Y=0$). The first central independent variable (social background) is operationalised via the highest educational attainment of academics' parents (mother, father or both parents with a HE degree vs. neither parent with a HE degree). The second central independent variable (gender) is also coded as a binary variable (men vs. women).

We control for multiple categorical and metric variables, such as caring responsibilities (no, one person to care for, more than one person to care for), professional position (professorship vs. non-professorship), country of birth (domestic vs. foreign), fields of study (natural science, social science, engineering, and humanities), academic age (number of years working in HEI full- and part-time), and personal preferences towards teaching and research.

The findings report the coefficients' effect size as average marginal effects (AME). We compute AME since they are more appropriate for providing a realistic interpretation of estimation results of binary logistic regressions and they can make the results much more intuitive and easier to interpret (Bartus, 2005; Williams, 2012). AME allow us to compare effect sizes for similar models across samples (Mood, 2010), which is necessary in our study since we aim to compare the effects in two different countries. A positive effect is found when the AME is above zero, meaning that the probability of working at a public university increases with a change in the respective independent variable. A negative effect shows an AME below zero, meaning that the probability of working at a public university decreases with a change in the respective independent variable.

Data analysis discussion

The results show that social background of academics significantly influences the probability of working at a public university in both countries, Germany and Austria – even after controlling for gender, professional position, academic age, country of birth, personal preferences regarding research or teaching and fields of study. Academics with no familial history in HE are therefore less likely to work at a research-intensive institution (i.e., a public university) compared to academics whose parents did obtain a HE degree (Germany: $AME=-0.04^{***}$;



Austria: $AME=-0.06^{***}$)¹. This is in line with other research findings, which show that social background appears to be an important factor in research careers (OECD, 2021). This vertical segregation along the type of HEI according to the social background of academics might be partly explained by the fact that academics from backgrounds with no familial history in HE can less afford to endure a long period of precarity before attaining secure employment in research (Idem) and therefore might opt more frequently for positions at universities of applied sciences, which provide higher job security in terms of permanent (teaching) contracts. In addition, mechanisms of social closure of elite sub-groups in academia (Forsberg et al., 2022) influence academic careers e.g., in terms of recruitment and progression processes (Musselin, 2013), and therefore can foster social inequality. Qualitative research in this respect shows that the lack of diversity according to social background is the result of the often-discretionary recruitment practices for postdoctoral positions (OECD, 2021).

Regarding gender, we observe a significant negative effect in Germany, meaning that women are less likely to pursue a career at German public universities than men ($AME=-0.03^{**}$). In Austria, the effect is positive ($AME=0.03$) but not significant ($p=0.110$). Regarding the results in Germany, it can be argued that women might find it more challenging to pursue a career at a research-intensive institution compared to a more teaching oriented institution. For example, lengthy mobility periods, which are mostly required for gaining a career at research-oriented institutions, are often ruled out for women, especially early career researchers, not because women are not interested in them but due to family commitments (OECD, 2021; Nokkala et al., 2020). Women not only remain less likely to climb up the academic career ladder and hold a professorial position (Enders and Musselin, 2008; OECD, 2008), but they seem also to be affected by stratification, meaning that they are less likely to pursue a career at a prestigious institution in terms of type of HEI.

When interpreting the effect of the control variable 'caring responsibilities', we can see no significant effect in Germany ($AME=-0.00$, $p=0.930$). This means that taking care of children or other individuals does not influence whether someone pursues an academic career at a research-intensive (i.e., public) university or a teaching-intensive institution (i.e., university of applied sciences). On the contrary, in Austria having caring responsibilities for more than one person significantly decreases the likelihood of pursuing a career at a research-oriented institution ($AME=-0.04^*$). It appears that academics in Austria may find it harder to balance caring responsibilities and a research career. Further, they may find it more difficult to get the

¹ Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$



outputs that are considered necessary to access a permanent position at a public university, which might lead them to pursue a career at a UAS. Recent research shows that many postdocs, and a disproportionate number of women, move to part-time work, not necessarily of their own volition, and become “hidden researchers” in teaching-only positions (OECD, 2021). In this regard, our findings highlight that academic staff at Austrian universities should be supported more broadly in balancing a family life and a research career.

Regarding the other control variables, academic age shows a significantly positive effect in both countries, meaning that the longer someone works in academia the more likely they are to work at a public university (Germany: AME=0.003***; Austria: AME=0.006***). Whereas in Germany academics from abroad are not significantly more likely to work at research-intensive institutions than domestic academics (AME=0.02, p=0.10), academics in Austria who were born abroad are more likely to work at public universities than academics who were born in Austria (AME=0.11***). Regarding the professional position, professors are significantly more likely to work at universities of applied sciences than academics without a professorship (Germany: AME=-0.3***, Austria: AME=-0.1***). We expected this result since in both countries the share of professorial positions at universities of applied sciences is higher than at public universities. In addition, we controlled for whether the personal preferences lie primarily in research, teaching or both. As expected, those whose preference lies primarily in research have a higher likelihood of working at public universities than those whose primary interest lies in teaching, in both countries (Germany: AME=0.20***; Austria: AME=0.22***). With regard to fields of study, we observed varying effects between the two countries, but interpretation has been omitted due to constraints regarding the word limit of this section.

When evaluating which model best predicts the outcome, the model for Germany predicts the outcome better (Pseudo-R² of 0.34) compared with the model for Austria (Pseudo-R² of 0.18). It would be interesting to examine these differences in more detail.

Conclusions

This study explored stratification within German and Austrian HE according to social selectivity and gender-segregation of academic staff across different types of HEIs. The results show that those who cannot draw on a familial history in HE (i.e., those whose parents did not obtain a HE degree) are less likely to work at a research-intensive institution (i.e., public university). In addition, women in Germany are less likely to work at a research-oriented university than men, and individuals with caring responsibilities in Austria are also less likely to work at research-oriented institutions.



By illuminating this segregation according to social background and gender, our study contributes to existing literature that claims that more thorough analysis is needed in this matter (Kwiek, 2019). Several countries are concerned about the social inequality and the lack of diversity in their research workforce (OECD, 2021). Some have introduced policies to address the issue and, for example, are beginning to take into account periods of maternal and parental leave when judging academics' funding applications for research and project funding. However, policy initiatives remain fragmented and more strategic, long-term approaches are required (OECD, 2008). There is still not enough investigation on social diversity beyond gender in national contexts as well as in cross-national comparisons (OECD, 2021). Our study highlights that emphasis in this regard needs to be put, not only on the HE system as a whole, but on mechanisms – such as vertical stratification – where inequalities reproduce unseen and perpetuate the dominance of men in academia as well as academics from families with a familial history in HE.

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Academic engagement in a cha(lle)nging work environment: a comparative analysis across Europe

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Theoretical Framework

Over the past few decades, Higher Education Institutions (HEIs) have been introducing substantial reforms in their governance and management practices and policies. The New Public Management paradigm (or managerialism) inspired the integration of business-oriented rationales (Locke et al., 2011; Magalhães and Amaral, 2007; Deem and Brehony, 2007; Deem, Hillyard, and Reed, 2007). As a result, academics are nowadays subject to greater accountability and pressured by the monitoring of performance indicators, which led to an increase of the administrative workload (Enders, de Boer and Leišytė, 2009; Santiago and Carvalho, 2012).

The emergence of new governance models inevitably affected academic workplaces and conditions. On the one hand, academic freedom and autonomy have been challenged by the influence of external members in the governing bodies (Santiago, Carvalho, and Ferreira 2014). On the other hand, the academic work environment has become extremely competitive due to the pressure to publish and to the lack of financial resources resulting in the need to diversify research funding (Ferlie, Musselin, and Andresani, 2009). In this regard, one may wonder to what extent the deterioration of the academic work conditions may affect job satisfaction and, consequently, the academics' commitment to the universities' missions (Teichler et al., 2013).

The focus on efficiency is also mirrored by the increasing use of casual/sessional workers in HEIs (Bexley, Arkoudis, and James 2013). The fixed-term and part-time contracts became more and more common, to the detriment of tenured (permanent) ones, providing more flexibility and cost savings to the HEIs. It is also frequent to find academics experiencing several regular short-time contracts with the same institution. This trend has contributed to the precarity and job insecurity, especially among the early-career academics, more vulnerable to these types of contract arrangements.

In addition, facing lower salaries and a lack of career opportunities (Levin and Shaker 2011), younger academics are more anxious to increase research productivity to improve their chances to be promoted and get a permanent position.



In fact, the effects of managerial and market-oriented institutional practices are perceived differently by junior and senior academics. The job (in)stability experienced by academic professionals is pointed to as one of the factors promoting the segmentation within this professional group.

In this regard, one may also refer to the increasing diversification of academic roles (Novotny 2017), which contribute to the heterogeneity of the academic profession. Under the Knowledge Society narratives, the societal relevance of higher education has been placed at the center of the political discourse, especially in the European context. At the institutional level, academics are encouraged to diversify their tasks and to embrace an entrepreneurial attitude (EtzKowitz 2003; Teichler and Hohle 2013), contributing to the so-called third mission of the university. This trend has emphasized the economic value of knowledge production and its application through the commercialization of research and technology transfer to the industry (D'Este and Perkmann, 2011). As a matter of fact, the university-industry collaboration in the application of science and technology in products, services, and processes may be considered as an alternative to cope with the funding shortages.

However, empirical studies have demonstrated the low engagement rate of academics in commercialization activities. In this respect, Perkmann et al. (2013) evidence the existence of widely practiced mechanisms of academic engagement, which differ from the traditional commercial-oriented transfer of knowledge. It is worth underlining that academic engagement may be driven by social-oriented (and non-commercial) purposes, involving a wide range of partners from the civil society besides industry (Cavallini et al. 2016; Carayannis and Campbell 2018).

Taking this into account, the academic roles are thus more diverse and complex as the academics are expected to respond to different (sometimes competing) demands, which may be challenging to balance (Del Rosario Benavides and Ynalvez 2018).

Methodology and Hypotheses

As aforementioned, the changes in the academic profession and the diversification of the academic roles with the increasing relevance of societal engagement are two key trends in the context of the political and institutional transformations in Higher Education systems. However, the relationship between these two phenomena remains unexplored. This paper aims to fill this



gap by assessing the influence of the academics' work situation on the academic engagement and commercialization of knowledge activities.

Concerning the work situation, this study applies a conceptual framework that distinguishes the academics in a more stable employment situation from those with more precarious contractual arrangements. Specifically, we will consider five categories of contracting arrangements based on the academic rank, duration of the contract with the HEI, and employment status (part-time or full-time): (i) very stable; (ii) stable; (iii) on stable track; (iv) fragile full-time and (v) fragile part-time.

We intend to test the influence of the work situation on the development of both academic engagement and the commercialization of knowledge. We distinguish these two types of external activities following Perkmann et al. (2013) since literature has been demonstrating that the determinants that drive engagement and commercialization are different. More concretely, individual characteristics play a significant role in the academics' likelihood to engage.

Therefore, we argue that the academics in a more fragile work situation have a different motivation to engage in commercial-oriented activities than in other university-society collaborations, considering that the approach to the industry might provide an alternative way to diversify career and funding opportunities. Moreover, we argue that job insecurity negatively affects academic engagement. This may result from a lower commitment and satisfaction of the academics, more focused on improving research productivity measured by the number of scientific publications.

By contrast, more stable academics may be more satisfied and available to engage with a purely social purpose, aiming at valuing and sharing their knowledge.

The literature shows that the institutional and academic changes are taking place at a different pace in each Higher Education system. For this reason, we propose a cross-country analysis across European member-states. We apply a quantitative approach, using the data from a large-scale survey designed and delivered in the context of the APIKS Project. This international data basis allows for the creation of internationally comparable indicators. The sample (n=8911) includes the academics from the participating European countries (Croatia, Estonia, Finland, Germany, Lithuania, Portugal, Slovenia, and Sweden), that answered all the relevant questions.

We address our hypotheses using a logistic regression analysis which allows us to test the effect of the work situation defined variables, controlling for other factors that impact academic engagement, commonly referred to by the literature.



Data analysis discussion

The preliminary results show that academics with more stable contracts tend to be more involved in academic engagement, namely in the non-commercial activities considered in the study. This is in line with the literature as more stable academics tend to have a higher social recognition and network of contacts, facilitating collaboration with external partners.

However, there is no significant association between tenured academics and the development of commercial-oriented knowledge transfer activities. In this regard, a detailed analysis reveals different patterns of engagement regarding the work situation. For instance, more stable academics tend to be more involved in entrepreneurial activities such as patenting and spin-offs creations. In turn, academics on stable track evidence a higher engagement in the test of prototypes and in working in science incubators. This result may indicate the emergence of new career pathways among the younger academics.

Notwithstanding, the contract stability and job security still are determining factors to have the opportunity to engage as a relatively low percentage of full-time and part-time fragile academics report to have been involved in all types of external activities under analysis. These professionals are pressured to improve their academic curriculum, in order to increase the chances to find a permanent position. They are in general less satisfied and report higher levels of professional strain. Moreover, the job instability and uncertainty leave little room for societal engagement.

This trend is verified in all the countries analyzed, although to a different extent. The higher gaps between the engagement of the very stable and the fragile academics are verified in Germany, Finland, and Slovenia. In these countries, very stable academics tend also to be significantly more involved in the commercialization of knowledge.

On the other hand, academics with less stable contracts from Estonia and Portugal are more likely to collaborate with society, in comparison to other countries.



Conclusions

With this study, we intend to contribute to the debate on changes in the academic work conditions imposed by managerial-inspired practices, shedding light on its effects on academic engagement and the commercialization of knowledge. Work conditions, satisfaction, and job security are key determinants in fostering academic engagement, and their deterioration may undermine the academics' role in creating a knowledge society.

These findings have relevant policy implications, showing the need to consider the heterogeneity of the academic professional group in the context of the knowledge society. The stratification and career segmentation in the academic system, which varies across the countries, should be considered by the policy-makers that intend to promote academic engagement with society. Furthermore, the findings indicate the emergence of non-linear and less-traditional career pathways, involving a more active role in the markets.

This study calls for a reflection on the consequences of precarity among academics for their career development. In this regard, the political and institutional decision-makers should reflect upon the emergence of new academic roles in society and how the more vulnerable earlier-career academics contribute to this purpose. In other words, how do the higher education systems manage the existence of different groups of professionals within the same institution concerning their mission in society?



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Stratification and precarity inside academic careers in Portugal

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Introduction

The study of the academic profession, academic work, and academic careers, as well as changes in academics and academia's working conditions, have been receiving greater attention in higher education research (Parsons & Platt 1968; Jones 2013; Henkel 2007; Enders & Musselin 2008; Arrevaara 2010; Arimoto 2010; Carvalho 2012; 2017; Santiago, Carvalho & Cardoso 2015; Carvalho & Diogo 2018a; Finkelstein & Jones 2019). Much of this attention emerged from the political and social transformations at the macro-level (system), both internationally and nationally, and at the meso-level (organisation), namely the way New Public Management (NPM) has impacted and redefined higher education institutions' (HEIs) missions/core functions and their professionals' working conditions. Among the most (in)visible transformation in academics' work in the last years is the accelerated use of casual staff, which, in turn, reflects other changing dynamics of (national and international) academic labour markets (Musselin & Enders 2008; Musselin 2010). Some examples include the increasing demand for more teaching hours, mostly related to the system's growth, the expansion of doctoral education around the world, and the difficulties in entering and advancing in the academic career (Shin, Kehm, & Jones 2018; Yudkevich, Altbach & de Wit 2020; Cardoso, Tavares, Sin, & Carvalho 2020). As a result, precarious workers in academia are growing. According to some authors (e.g., Ylijoki, 2016), this is also a result of HEIs and scientific systems' governance and management models, based on the 'projectification of science'. In some countries, authors refer to a process of Uberisation of scientific work (Carvalho & Diogo, *in press*).

This scenario is not new nor exclusive to HEIs. In fact, in 2011, the International Labour Organization (ILO) claimed that "forms of precarity seem to be ever expanding, as employers constantly uncover new ways to circumvent or find loopholes in regulations to increase the profitability of their business at the expense of their employees" (2001: 5). The novelty is the expansion and intensive use of precarious labour in contemporary universities (Brown et al. 2011; Hall and Bowles 2016; National Tertiary Education Union 2018; Slaughter and Rhoades 2004).

Focusing on the Portuguese case, this paper aims to analyse the degree of 'precarisation' of academic careers in Portugal, by looking at the characteristics of the academic workers by



gender, age, parental education, and scientific area, as well as by type of working contract. To do so, the different typologies of working conditions have been operationalised in a framework, integrating five groups: tenure; tenure-track on a fixed contract; tenure-track on an experimental period; non-tenure track full-time; and non-tenure track part-time.

In order to achieve the aforementioned aim, a quantitative approach was used. We use the data from the large-scale Survey of Portuguese Academics that was conducted under the APIKS project in 2018. The survey was conducted with a representative sample of the academic population, with the following characteristics: employed on ongoing or fixed-term contracts; holding contracts corresponding to at least 25% of a full-time equivalent (FTE) workload; employed in HEIs awarding at least a bachelor's degree; and employed in an academic function involving primarily teaching and/or research. A total of 3199 responses were collected. Different groups of academics were identified according to the security of their contract characteristics with a Higher Education Institution, from the least to the most precarious.

Contextual background and operational framework

Since the 1980s, more or less intensively, HEIs around the world have been influenced by NPM reforms and subjected to efficiency, quality, accountability, and other business-oriented and corporatisation changes (Bleiklie 2018; Brunton 2017; Klenk and Reiter 2019). These reforms led to the marketization of higher education, with HEIs increasingly introducing private sector financial and managerial techniques and ideologies, often referred to as new managerialism (Deem and Brehony, 2007; Deem, Hillyard, and Reed, 2007). In fact, HEIs are increasingly required to monitor their efficiency, productivity and rankings through performance indicators. Being increasingly market-oriented and competitive, HEIs started to act like for-profit corporations (Becher and Trowler 2001; Mirza 2018), increasing fixed-term, zero-hours, non-standard employment, hourly-paid contracts, and part-time contracts rather than permanent ones (Courtois and O'Keefe 2015: 44) to supply more teaching and research with less money (Ivancheva 2015, p. 43). This led to the intensive use of precarious workers, sometimes even labelled as "profitable workers" (Angervall & Beach 2018), reinforcing the priority given to economic outcomes over social justice and equality (Dougherty and Natow 2019).

As mentioned earlier, the growth of insecurity in the world of work is one of the most important trends over the past decades (ILO 2011), and this is also the case in higher education and science. Precariousness is now a structural feature of work, and is increasingly more documented in



higher education research (Brown et al. 2011; Hall and Bowles 2016; National Tertiary Education Union 2018; Slaughter and Rhoades 2004).

Precariousness can be defined as imposed on people, as referred by the ILO (ILO 2019) in relation to decent work, i.e., centred on the individual. In this way, precariousness is directly or indirectly created, imposed, or incorporated by the scientific system through legal dynamics, funding flows (unpredictability of state funding, for example), lack of strategic and future vision or non-compliance with the legislation.

Clarifying what precariousness is and how it can be tackled, in a comparative perspective is necessary, as precarious work is a concept that does not have a universally accepted definition across Europe (EurWork 2018), and the state of precarity takes somewhat different forms depending on the country, regions and the economic and social structure of the political systems and labour markets (ILO 2011). These dimensions of analysis are thus particularly relevant because they allow us to identify clusters of academic labour markets, enhancing rational and data comparison. Nevertheless, there is a consensus in the literature (Duell 2004; Olsthoorn 2014; Nico 2021) and from international organizations (e.g., OIT; European Commission) that this is a complex, intersectional phenomenon, given its multifaceted (individual, collective and political) nature. As such, Olsthoorn (2014) distinguishes three intersecting components or characteristics of precarious employment:

- insecure employment (for example, fixed-term contracts and temporary agency work);
- unsupportive entitlements (i.e., few entitlements to income support when unemployed);
- vulnerable employees (i.e., few other means of subsistence, such as financial means or a partner with a significant income).

Precarious work thus comes in many forms (ILO 2011; Courtois & O'Keefe 2015), namely in terms of agency work; temporary work; contracting out; casual or 'on-call' work (casualisation); seasonal work; part-time, etc., providing the general idea that precarious workers are those who fill permanent job needs, but are denied permanent employee rights. In this sense, Nico (2021a; 2021b) draws attention to the use of the term *precarised* (workers in precarious situations), considering that it is not the individual who is precarious, but s/he is being *precarised* by someone else, whether this other is an individual figure or an organisational figure, as an HEI, research centre, or the "scientific market".



Precarity in academia is bounded by specific counters, as there are different degrees of 'precariousness', arising from 'structural features of employment (such as employment contract type, access to leave entitlements, labour market trends), as well as contextual/structural factors that affect the lives of workers (including their sense of security, housing options, effect on personal relationships)' (Bone 2019, p. 1219). Thus, precarity in academia is experienced differently in line with labour-related conditions. While some are dragged into precarious employment in the absence of other job opportunities, others normalise precarious employment to gain more experience in the field, earn extra money, and kick-start their careers (Ivancheva 2015, p. 43; Murray 2018, p. 166; Standing 2011, p. 59).

In Portugal, the academic profession has always been considered as a key profession, but it has been subjected to a long process of segmentation (Carvalho 2012; 2017). The academic career, which was in place for more than 30 years, was reconfigured with a new legal framework in 2009. Two different legal frameworks were defined: one for the university subsystem (Decree-Law 205-2009) and the other for the polytechnic subsystem (Decree-Law 207-2009). Both careers are defined by three ranks (auxiliary/assistant professor, associate professor and full professor in the university subsystem, and adjunct professor, coordinating professor and principal coordinating professor in the polytechnic subsystem). The minimum requirement to enter the career is to have a doctoral degree. A period of five years was defined as a probationary phase to get a permanent position. The permanent position was already considered highly secure and strongly embedded in the idea of full-time permanent academic status. Nevertheless, the new legal framework also introduced the tenure figure as a reinforcement of employment security for those in the two top positions (associate and full professors, and coordinating and principal coordinating professors). Adding to these formal ranks, in both legal frameworks, there is the possibility to invite individuals who have their main commitments outside academia but have an exceptional *curriculum*.

Additionally, the legal frameworks for both subsystems also contemplate monitors who can be recruited, by invitation, from among undergraduate or master's students from any higher education institution. Monitors are hired on a part-time basis, under the terms of the law and regulations to be approved by each higher education institution.

The legal framework for universities also includes readers, who can be recruited, by invitation, from among holders of higher qualifications, national or foreign, and with an adequate curriculum for teaching foreign languages. Readers are hired on a full-time or part-time basis, under the terms of the law and regulations to be approved by each higher education institution.

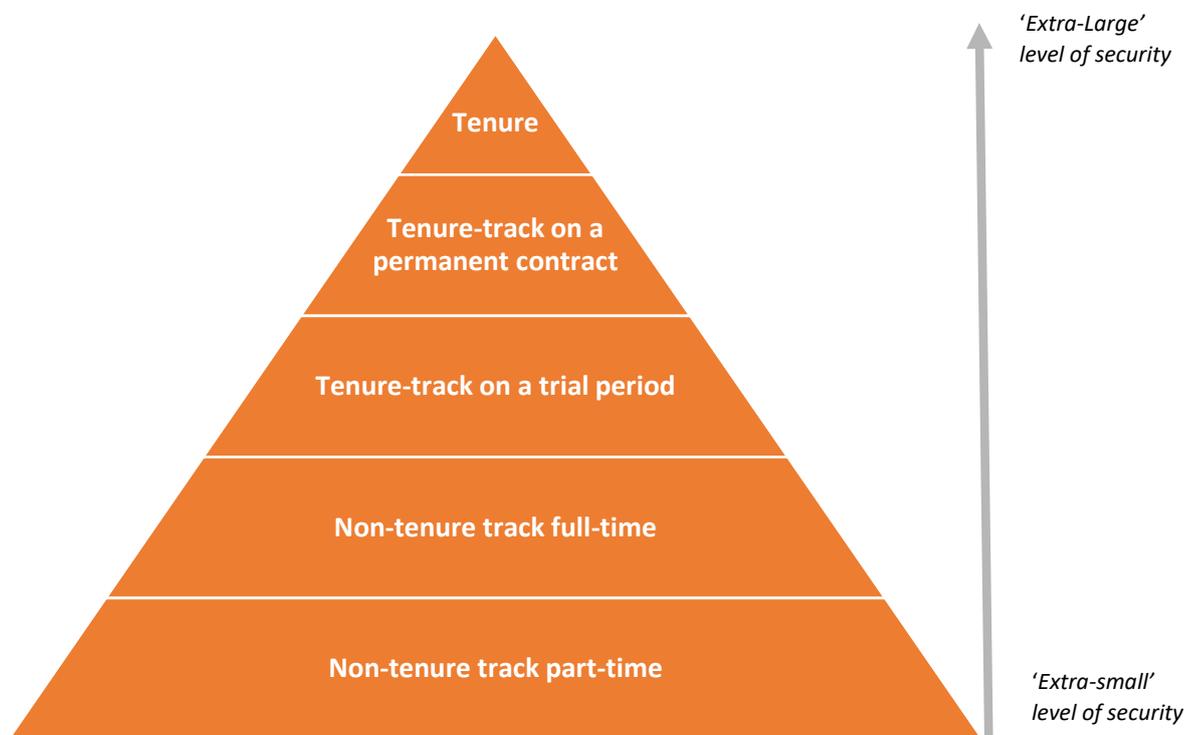


In a regime of exclusive dedication or full-time, the contract and its renewals cannot last longer than four years.

The problem is that HEIs have expanded the possibility to hire invited staff to include workers who, although having similar curriculums to others already in the career, could not be hired due to economic constraints. Although these workers tend to fulfil permanent staff needs, they do not have a permanent contract or the possibility to obtain a tenure position. Santiago and Carvalho (2008) defined it as a parallel career (Santiago and Carvalho, 2008).

Taking into account the current legal framework, within the scope of this paper, we have devised an operational framework, which integrates five different typologies of working conditions (Figure 1): i) tenure; ii) tenure-track on a permanent contract; iii) tenure-track on a trial period; iv) non-tenure-track full-time; and v) non-tenure-track part-time. These typologies vary in descending order in terms of degree of employment security (from 'Extra-Large' to 'Extra-Small').

Figure 1. Typologies of working conditions



The 'Tenure' typology (T1) incorporates all the academics in an indefinite academic appointment. The tenure statute guarantees the maintenance of the job, in the same category and career, even if in a different institution, namely in the case of reorganization of the higher education institution to which they belong. According to the Portuguese public university and polytechnic legal frameworks, this comprises the full professors and the associate professors, in the university subsystem, and the principal coordinating professors and the coordinating professors, in the polytechnic subsystem.

The 'Tenure-track on a permanent contract' typology (T2) incorporates academics on fixed-term contracts that have been evaluated and are currently on a permanent contract. According to the university and polytechnic legal frameworks, this comprises assistant professors in the university subsystem, and adjunct professors in the polytechnic subsystem (on permanent contracts).

The 'Tenure-track on a trial period' typology (T3) incorporates academics on fixed-term contracts who are hired for an indefinite period with a five-year trial period, after which, depending on the specific assessment of the activity carried out in accordance with criteria established by the institution's legally and statutorily competent body, the contract is maintained indefinitely, under the terms of the career statutes. According to the legal frameworks, this comprises assistant professors in the university subsystem, and adjunct professors in the polytechnic subsystem (on a trial period).

The 'Non-tenure track full-time' typology (T4) integrates academics hired on a fixed-term basis, under the terms of the law and regulations to be approved by each higher education institution.

According to the Portuguese university and polytechnic legal frameworks, this comprises invited professors² and invited assistants³ in both subsystems, and readers⁴ in the university subsystem, hired on a full-time basis.

² Invited professors are hired on a part-time basis. If, exceptionally, and under the terms of the respective regulation, they are hired on an exclusive or full-time basis, the contract and its renewals cannot last longer than four years, according to the statutes.

³ Invited assistants are hired on a full-time or part-time basis, under the terms of the law and regulations to be approved by each higher education institution. Hiring on a full-time or part-time basis, equal to or greater than 60%, can only take place when a job opening for a career category has been opened and it has not been possible to fill all the posts available, because there were not enough successful candidates to meet the conditions for admission. In a regime of exclusive dedication or full-time, the contract and its renewals cannot have a duration longer than four years, and a new contract cannot be signed in these regimes between the same higher education institution and the same person.

⁴ Readers are hired on a full-time or part-time basis, under the terms of the law and regulations to be approved by each higher education institution. In a regime of exclusive dedication or full-time, the contract and its renewals cannot last longer than four years.



The 'Non-tenure track part-time' typology (T5) integrates academics hired on a fixed-term basis, under the terms of the law and regulations to be approved by each higher education institution. According to the Portuguese university and polytechnic legal frameworks, this comprises invited professors, invited assistants, and monitors⁵ in both subsystems, and readers in the university subsystem, hired on a part-time basis.

The higher levels of the pyramid integrate the typologies which offer higher security to the academics who integrate them. On the other hand, the lower levels of the pyramid integrate the typologies that offer less security; that is, precarious academics.

Data and methods

Methodologically, a quantitative approach was used in this paper to characterize the different groups of workers that are identified in the Portuguese version of the APIKS dataset. Firstly, the groups were formed based on the literature and legal framework of the academic career in Portugal, as explained in the previous section. Rather than building groups with the information contained in the dataset (e.g., using a cluster analysis), the groups have been organized according to the literature to accommodate for specificities within the Portuguese contract arrangements. The participants were grouped according to their set of answers following the logics of Table 1. It is believed that this classification can be comparable across different countries, once country specificities have been addressed and adapted on the APIKS survey.

⁵ Monitors are hired on a part-time basis, under the terms of the law and regulations to be approved by each higher education institution.



Table 1. Group-Forming based on typologies of working conditions (rated according to job security)

| Group | Variables |
|---------------------------|--|
| T1 – Extra-Large Security | Full Professor, Associate Professor |
| T2 – Large Security | Assistant Professor, Adjunct Professor AND Have passed the 5-year Trial Period |
| T3 – Medium Security | Assistant Professor, Adjunct Professor AND Are in the 5-year Trial Period |
| T4 – Small Security | FULL-TIME Employed AND Neither on Tenure OR on Tenure-Track |
| T5 – Extra-Small Security | PART-TIME Employed AND Neither on Tenure OR on Tenure-Track |

Data analysis

General descriptive statistics are provided on who the participants in each of these groups are. For the Portuguese dataset, and out of 2941 valid answers, most respondents fall into the two most secure groups. Nonetheless, there is still a huge percentage of respondents (37.9%) that fall into the less secure typologies. Considering just typologies 4 and 5, which integrate academics in more precarious positions, meaning that they have no prospect of permanent employment, the percentage is 29.8% (Table 2).

This reveals that there is still a significant number of workers who do not have a secure position, reinforcing the idea that precarious work is a structural feature at contemporaneous HEIs.

Our preliminary analysis of the data shows that these less secure positions (T4 and T5) are relatively more concentrated in younger academics (less than 40 years old) and in foreign workers; and in specific scientific areas. Relative to the scientific areas, there seems to be a prominence of non-tenured part-time workers (T5) in the areas of ‘Medical Sciences’ (23.4%), ‘Business and Administration, Economics’ (13.5%), ‘Humanities and Arts’ (13.2%), and ‘Social and Behavioural Sciences’ (12%). Relative to the non-tenured full-time workers (T4), the following scientific areas are prominent: ‘Social and Behavioural Sciences’ (13.7%); ‘Medical Sciences’ (11.9%); ‘Engineering, M&C, Architecture’ (10.6%); and ‘Humanities and Arts’ (10.4%).



Table 2. Descriptive statistics per typology

| | G1 | G2 | G3 | G4 | G5 |
|--|----------------|----------------|----------------|----------------|----------------|
| Frequencies | 936 | 894 | 237 | 540 | 334 |
| % of Total | 31.8% | 30.4% | 8.1% | 18.4% | 11.4% |
| Variables | % of G1 | % of G2 | % of G3 | % of G4 | % of G5 |
| AGE | | | | | |
| Less than 40 Years Old | 4.3% | 6.3% | 18.6% | 21.9% | 34.4% |
| GENDER | | | | | |
| Female | 44.3% | 59.2% | 50.6% | 51.3% | 49.3% |
| PARENTAL EDUCATION | | | | | |
| Father with HE | 32.1% | 28.0% | 28.3% | 30.0% | 31.4% |
| Mother with HE | 24.1% | 27.1% | 32.7% | 27.6% | 27.9% |
| NATIONALITY | | | | | |
| Not Portuguese | 2.3% | 1.2% | 2.5% | 4.2% | 3.2% |
| AREA | | | | | |
| Teacher Training and Education Science | 6.9% | 7.1% | 8.0% | 6.7% | 5.4% |
| Humanities and Arts | 12.8% | 14.1% | 17.7% | 10.4% | 13.2% |
| Social and Behavioural Sciences | 14.0% | 12.3% | 11.4% | 13.7% | 12.0% |
| Business and Administration, Economics | 6.9% | 8.7% | 11.8% | 7.0% | 13.5% |
| Law | 2.3% | 1.0% | 2.1% | 2.0% | 4.5% |
| Life Sciences | 7.0% | 6.3% | 6.3% | 7.4% | 2.7% |
| Physical Sciences, Mathematics | 4.0% | 6.3% | 3.8% | 7.4% | 1.8% |
| Chemistry | 3.9% | 2.9% | 2.1% | 3.0% | 0.6% |
| Computer Sciences | 4.4% | 4.3% | 5.1% | 7.0% | 3.9% |
| Engineering, M&C, Architecture | 10.0% | 12.1% | 6.3% | 10.6% | 8.1% |
| Agriculture, Forestry | 1.9% | 2.8% | 0.4% | 2.6% | 0.3% |
| Medical Sciences | 16.7% | 14.0% | 11.0% | 11.9% | 23.4% |
| Social Work and Services | 0.4% | 0.4% | 0.8% | 1.3% | 1.2% |
| Personal Services, Transport Services | 0.1% | 0.0% | 0.0% | 0.4% | 0.6% |
| Other | 8.7% | 7.6% | 13.1% | 8.7% | 8.7% |
| COUNTRY OF PhD | | | | | |
| Not Portuguese | 25.9% | 15.2% | 13.6% | 16.2% | 19.7% |



Preliminary conclusions and further work

Preliminary results show that there are still many precarious contracts in Portuguese academia. The probability of being an academic with small or extra-small security jobs is higher for younger people (less than 40 years old), and higher if the academic is not Portuguese. In terms of scientific areas, the extra-small security jobs (T5) are relatively more concentrated in the areas of 'Medical Sciences', 'Business and Administration, Economics', 'Humanities and Arts', and 'Social and Behavioural Sciences'. For T4, the same happens in the areas of 'Social and Behavioural Sciences', 'Medical Sciences', 'Engineering, M&C, Architecture', and 'Humanities and Arts'.

Although it is not surprising to find academics in non-tenured positions in the areas of 'Medical Sciences', 'Business and Administration, Economics', and 'Engineering, M&C, Architecture', given that many courses in these areas are frequently taught by professionals who have their main job outside of academia, the same does not happen in the other areas, such as 'Humanities and Arts' and 'Social and Behavioural Sciences', where precarity seems to be a more permanent issue.

Given that the differences between typologies were not that evident with the univariate analysis conducted, namely in relation to some of the variables (e.g., gender), a multivariate analysis will be conducted in the future. Our goal is to use linear regression models to estimate the probability of a worker being in each of these typologies, according to their characteristics (as displayed in Table 2). The main advantage of using a regression model is that it is a multivariate technique, and therefore the effect of a given explanatory variable of predicting the workers' contracting arrangements is controlled for the existence of other explanatory variables. In other words, with this method, we aim to understand whether a change in a given variable (e.g., being a female) affects the probability of being in a different group, assuming that all other variables are kept constant. Therefore, we aim to identify if there are personal characteristics that influence the probability of being in a certain group.

Such an approach allows for comparability between different countries belonging to APIKS. Once the groups are created in each country, it is possible to examine whether different sets of factors have similar or dissimilar effects in explaining each country's rate of precarity. We believe identifying those factors, coupled with the existing results in the literature, would allow an expansion of the knowledge regarding precarity, by diagnosing who are the workers that are more subject to the phenomenon.



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March 4, session 1: relationships among different missions

Relationships between research expectations, external activities, and social service contributions in Taiwan

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Theoretical Framework

Higher education institutions (HEIs) are considered as the social learning junctions where people with divergent interests, expectancies, values, goals, and reality constructs congregate and create an environment for meaningful learning (Heffernan et al., 2018). There are two important factors, the university and the academic profession within the institutions of higher education, which in combination may lead to novel solutions to the accelerating sustainability issues (Mok, 2015). The goals of the university are generalized - the pursuit of research and transmission of knowledge - and are given substance by each member of the academic profession, while the university employs more specific means to achieve the goal of adapting the university to a shifting and heterogeneous environment (Kwiek, 2017). Therefore, in order to understand the academic profession (teaching, research, campus operations, outreach activities and social contributions), it is vital to develop more sound and perfect institutional governance.

Over the past century, many psychologists have posited that individuals' expectancies and task values are critical for understanding why they choose to pursue the activities that they do (Higgins, 2007; Meyer, 2016; Rokeach, 1973). Meyer (2016) highlighted that individuals with high self-expectations possess higher task values and are more concerned about social activities. Both expectancies and task values are stable dispositions and influence a wide range of beliefs, attitudes, norms, intentions and behaviours among institutional members and other members of society (Higgins, 2007; Rokeach 1973). Eccles and colleagues' (1983) expectancy-value theory (EVT) of achievement motivation provides a framework for understanding how individuals' perceptions of themselves, how others see them, and aspects of their learning environment subsequently impact their task choices, aspirations, and achievement. The EVT theory defined expectancies for success and individuals' beliefs about how well they will perform on future achievement tasks. The EVT theory considered task value as comprising three components: intrinsic value, attainment value, and utility value (Eccles-Parsons et al., 1983; Eccles, 2007; Wigfield et al., 2016). Intrinsic value refers to the extent to which a person enjoys completing a task or the consequences of completing a task. Attainment value concerns the extent to which



a person finds a task to be personally meaningful or important. Utility value describes the extent to which a person believes a task will be useful for current environments or future goals.

The EVT theory has been applied to a number of studies related to students' learning motivations and outcomes (Bong et al., 2014; Wigfield et al., 2015). Surprisingly, the author(s) did not find extant research on academics' expectancy and task value orientations predicting their willingness to participate in external activities and social contributions. Thus, the present research will adopt EVT theory to explore the relationships between research expectations, external activities, and social service contribution in Taiwanese higher education institutions. Furthermore, in a recent study on major trends in higher education research, 'diversity' was identified as one of the most persistent issues in the discourse on higher education for a period of about five decades (Brennan et al., 2008). Geschwind and Broström (2015) pointed out that research-oriented professors receive more funds from external sources, and provide more academic contributions on the national or international level focusing on interdisciplinary research. Zacher et al. (2011) further indicated that younger university professors may spend much more time on research and teaching in their academic life than older ones. For gender differences, it has also been found that female professors are often strongly devoted to external activities and participate in more social service contributions than their male counterparts (Kwiek & Roszka, 2021). Further findings also showed that there is more industry-university cooperation, and commercially-oriented research expectations in private universities (Khalid, 2012). Therefore, in this study, personal and institutional characteristics (such as gender, age, academic rank, academic field, academic preference and institutional type) will also be analyzed to compare the differences in academics' research expectations, external activities, and social service contributions. In connection with the theoretical contribution, the study adds new insights to enrich the extant prior literature of the academic profession, particularly in the Taiwanese higher education institutions.

The following research questions (RQs) guided the study:

RQ1: Are there significant differences in academics' individual research expectations, institutional research expectations, external activities and social service contributions by different individual factors?

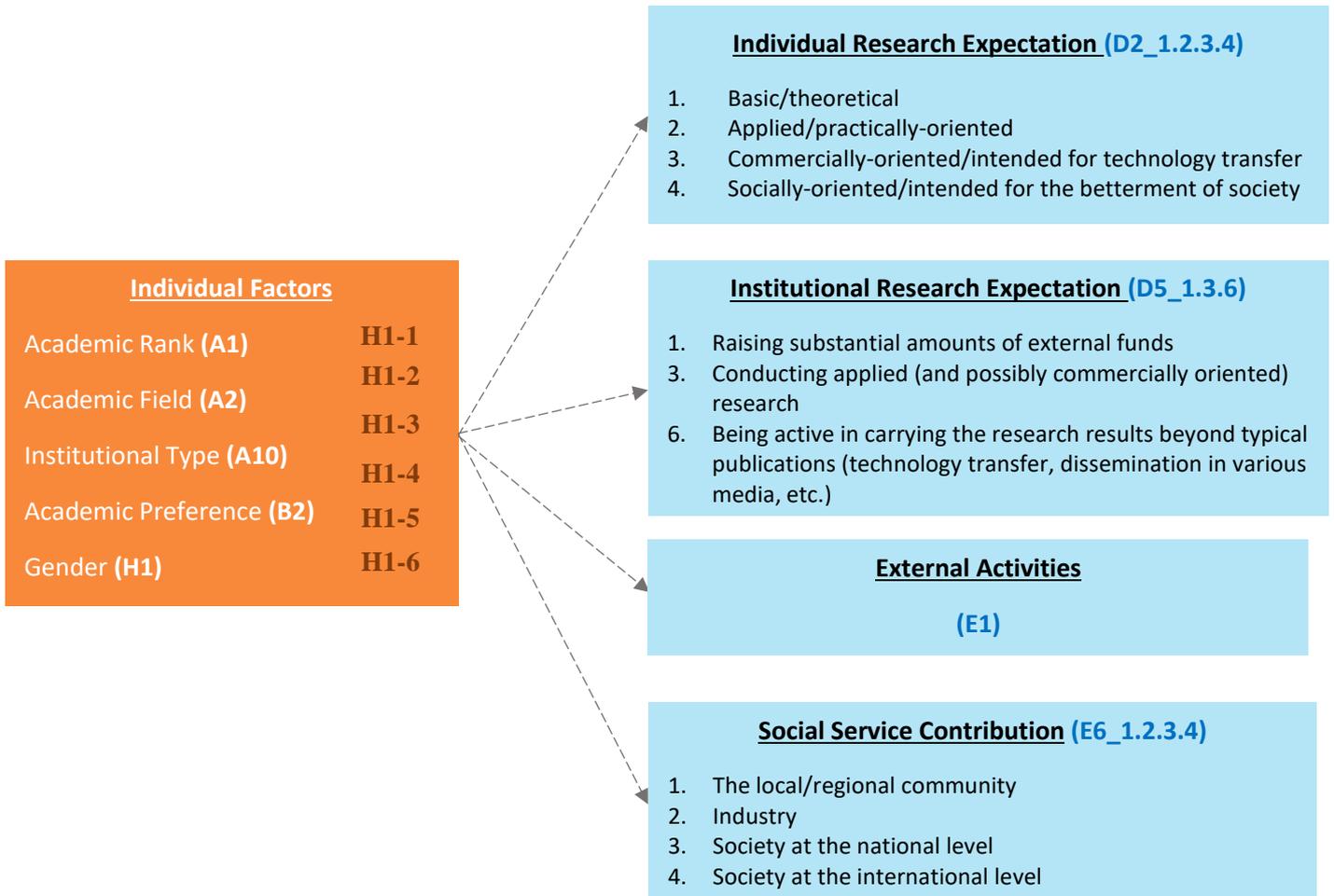
RQ2: What are the relationships between academics' research expectations, external activities, and social service contributions in Taiwanese higher education institutions?

Methodology– Definition of Hypothesis:



According to the research purpose, the study proposed three research frameworks and research hypotheses, presented below:

Figure 1. Research Framework & Research Hypotheses 1



H1-1: There are significant differences in academics' individual research expectations, institutional research expectations, external activities, and social service contributions by academic rank.

H1-2: There are significant differences in academics' individual research expectations, institutional research expectations, external activities, and social service contributions by academic field.

H1-3: There are significant differences in academics' individual research expectations, institutional research expectations, external activities, and social service contributions by institutional type.

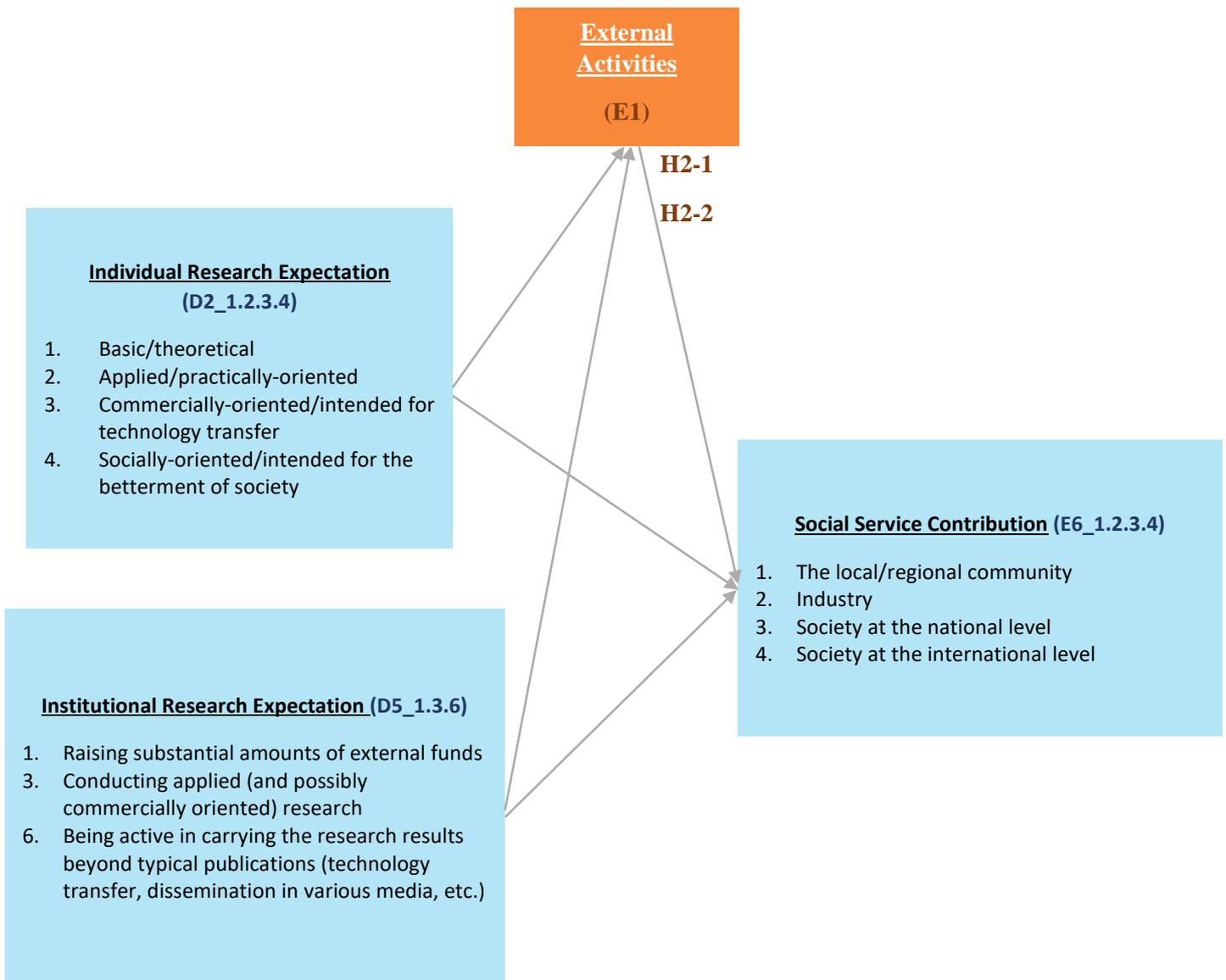


H1-4: There are significant differences in academics' individual research expectations, institutional research expectations, external activities, and social service contributions by academic preference.

H1-5: There are significant differences in academics' individual research expectations, institutional research expectations, external activities, and social service contributions by gender.

H1-6: There are significant differences in academics' individual research expectations, institutional research expectations, external activities, and social service contributions by age.

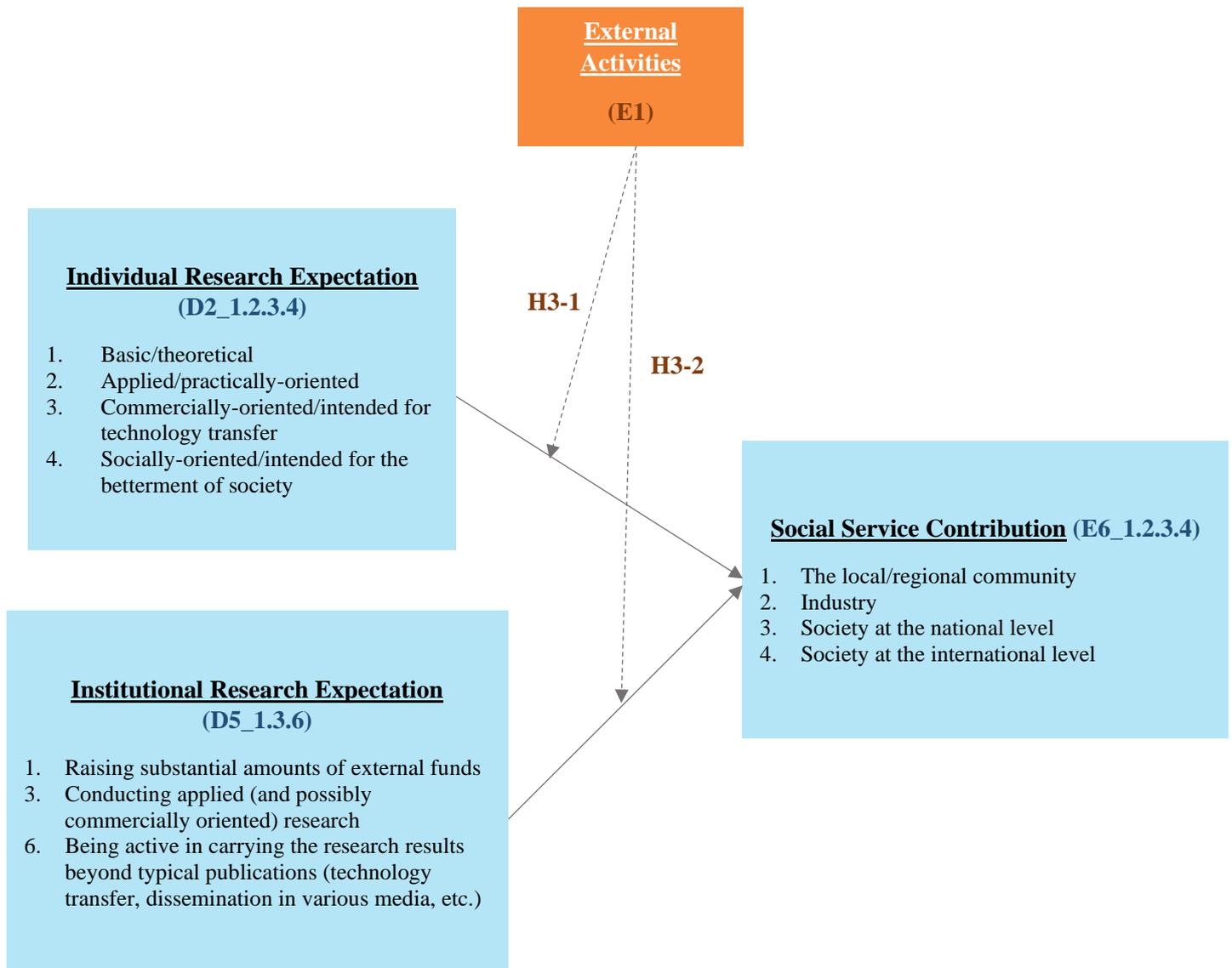
Figure 2. Research Framework & Research Hypotheses 2



H2-1: Academics' external activities play a mediating role in the relationships between individual research expectations and social service contributions.

H2-2: Academics' external activities play a mediating role in the relationships between institutional research expectations and social service contributions.

Figure 3. Research Framework & Research Hypotheses 3



H3-1: Academics' external activities will interfere with the relationships between their individual research expectations and social service contributions.

H3-2: Academics' external activities will interfere with the relationships between their institutional research expectations and social service contributions.



To examine our empirical model, an online survey, *Academic Profession in the Knowledge-based Society* (APIKS) was conducted in 2019 to collect the data from Taiwanese higher education institutions. To test the conceptual framework, a set of statistical analyses i.e., independent t test, Analysis of Variance (ANOVA), Structural Equation Modeling (SEM), and multiple hierarchical regression were done. Independent t test and ANOVA were adopted to compare the differences in academics' research expectations, external activities, and social service contributions by different individual factors. SEM was used to explore the mediating effect of external activities on the relationships between research expectations and social service contributions. Finally, multiple hierarchical regression was performed to examine the moderating effect of external activities on the relationships between research expectations and social service contributions.

Data analysis discussion:

The research indicated three important findings: first, there were significant differences in academics' individual research expectations, institutional research expectations, external activities, and social service contributions by different individual factors. For different academic ranks (including professor, associate professor, assistant professor, and others), professors participated in much more external activities than other academic ranks ($p < .001$). For different academic fields (including social science and natural science), social science academics had a much higher score on basic/theoretical individual research expectations ($p = .001$), socially-oriented individual research expectations ($p < .001$), and local/regional community social service contributions ($p = .018$) than natural science academics; natural science academics had a much higher score on technology transfer institutional research expectations than social science academics ($p = .001$). For different institutional types (including private, and public), private institution academics had a higher score on technology transfer institutional research expectations ($p = .004$) and industry social service contributions ($p = .042$) than public institution academics. For different academic preferences (including teaching-oriented, and research-oriented), research-oriented academics had a higher score on applied/practically-oriented individual research expectations ($p = .002$) and society at the international level social service contributions ($p < .001$) than teaching-oriented academics. For different genders (including male, female, and others), there was no significant difference in academics' individual research expectations, institutional research expectations, external activities, and social service



contributions. For different ages (including middle, senior, and golden), middle age academics had a higher score on commercially oriented institutional research expectations ($p = .047$) and society at the international level social service contributions ($p = .006$) than golden age academics; senior age academics had a higher score on technology transfer institutional research expectations ($p = .036$) than golden age academics; golden age academics had higher score on socially-oriented individual research expectations ($p = .015$) than middle age academics.

Second, academics' individual research expectations can positively and significantly influence external activities ($\beta = 0.21^{***}$), external activities can positively and significantly influence social service contributions ($\beta = 0.22^{***}$), and individual research expectations can positively and significantly influence social service contributions (direct effect: $\beta = 0.22^{***}$; indirect effect: $\beta = 0.05^*$). On the whole, academics' external activities play a mediating role in the relationships between individual research expectations and social service contributions.

Last, there was moderating effect of external activities on the relationships between academics' socially-oriented individual research expectations and local/regional community social service contributions ($\beta = .289$); the relationships between commercially-oriented individual research expectations and industry social service contributions ($\beta = .232$); the relationships between industry-university cooperation institutional research expectations and industry social service contributions ($\beta = .287$).

According to the above results, our research contributes to knowledge about the relationships between Taiwanese academics' research expectations, external activities, and social service contributions in three primary ways. First, our research contributes to a better understanding of the differences in academics' individual and institutional research expectations, external activities, and social service contributions by individual factors. The findings of past research have shown that there was diversity in the academic profession: academic rank, academic field, age, gender, and institutional type (Geschwind & Broström, 2015; Khalid, 2012; Kwiek & Roszka, 2021; Zacher et al., 2011), but there has been little research comparing the differences of individual factors on academics' individual and institutional research expectations, external activities, and social service contributions in Taiwanese higher education institutions. Our research therefore contributes to provide empirical evidence on current Taiwanese academics' research expectations, external activities, and social service contributions. Next, theoretically, we drew on EVT (Eccles, 1983) to explain the importance of the link between Taiwanese academics' research expectations, external activities, and social service contributions. This finding echoes the work of Meyer (2016) who found that individuals with high self-expectations



possess higher task values and are more concerned about social activities. The research extended the previous research value with the mediating effect of academics' external activity participation on their research expectations and social service contributions. Finally, based on our research, external activity participation has a significantly influential effect on social service contributions. Our research also sheds light on the existing literature about the EVT (Wigfield et al., 2016) by indicating that academics' external activity participation also has a significant moderating role on the relationships between Taiwanese academics' research expectations and their social service contributions. We anticipate the findings may have the added benefit of promoting academics' achievement and performance, as well as sustainable institutional governance.

Conclusions

The EVT theory successfully explains the relationships between academics' research expectations, external activities, and social service contributions in Taiwanese higher education institutions. The findings indicate that academics' individual research expectations and external activities significantly foster their social service contributions, accounting for a 27% variance in mediation results. Moreover, the analysis of moderation effects of external activities also provides valuable insights into the prediction of academics' individual and institutional research expectations on their social service contributions. Academics of Taiwanese HEIs have significant diversity in their academic profession. Therefore, HEIs must try to understand the expectancy and task value of the academics and provide suitable support and encouragement to promote their external activity engagements and social service contributions. If the common vision of the present society is a more sustainable future, HEIs must take initiatives to manifest and encourage all the education partners to develop achievement behavior.

In sum, the paper sheds light on a clear understanding of the differences and relationships between academics' research expectations, external activities, and social service contributions that can be used as a reference to promote better institutional governance and sustainable development of Taiwanese higher education.



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