

Workhorse or Precarity? Understanding the Contested Roles of Postdocs in Chinese Higher Education

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Abstract

With the increasing penetration of neoliberalism into higher education, the level of competition has intensified. Postdoctoral researchers (postdocs) have assumed increasingly significant roles within global higher education systems, contributing to scientific research, teaching, and societal service. However, instead of becoming the core force in research as intended, postdocs often face substantial challenges during their transition to tenured positions, including heavy research workloads, high stress, instability, and frequent mobility. These issues have contributed to the marginalisation of postdocs and led to severe distortions in their perception of their professional roles. In China, a focus on postdocs remains relatively scarce, with most studies concentrated at the macro level, particularly on postdoctoral policy. Drawing on role theory, this study conducts a comparative analysis of postdocs' self-perceived roles and policymakers' role expectations through semi-structured interviews and policy document analysis. The findings reveal a clear role conflict within the Chinese higher education system, characterised by the tension between being a "workhorse" and experiencing "precarity". Policymakers regard the postdoctoral system as a pipeline for developing early career researchers into mature scholars and consider postdocs a critical force in driving scientific advancement. However, postdocs themselves perceive their position as unstable and marginalised, and their academic labour within higher education as insecure, unsteady, and exploitative. Furthermore, such competitive role conflicts differ by gender and academic discipline, potentially contributing to educational inequality. This article concludes with a critical reflection on the current



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postdoctoral system in China and calls for increased attention and responsive measures to address the marginalisation of scholars.

Keywords: postdocs; role cognition; educational policy; workhorse; precarity

Introduction

In recent years, under the influence of neoliberal ideologies centred on performance, competition, efficiency, and market-oriented principles, market forces have increasingly penetrated the realm of higher education (Dougherty and Natow 2020). This shift has led to a restructuring of university governance models around the concept of academic capitalism, further enhancing the agency of universities as institutional actors. Against the backdrop of globalisation and the massification of higher education, the number of doctoral graduates continues to grow, while the availability of tenured academic positions—particularly within universities and similar institutions—remains relatively limited. This mismatch has intensified the global academic labour market’s competitiveness, selectivity, and high degree of professionalisation. To sustain development, competition, and rankings in higher education, temporary academic positions such as postdoctoral researchers (postdocs) have proliferated, becoming a vital component of academic labour forces across countries. The roots of postdoc training can be traced back to the 1870s in European research institutions, where apprenticeship models were introduced to support high-level talent by providing access to research funding and opportunities to engage in scientific enquiry. This form of apprenticeship is widely considered a precursor to the modern postdoctoral system (Powell and Solga 2010). The institutionalisation and formalisation of the postdoc position were further advanced at Johns Hopkins University in the United States. Organisations such as the U.S. National Science Foundation (Rodriguez Ott, Arbeit, and Falkenheim 2021) have since defined postdocs as “individuals holding a doctoral or equivalent degree who engage in temporary or fixed-term research or academic training under the supervision of a mentor, with the aim of enhancing the professional skills and independent research capabilities required for future careers in their respective fields”. This definition reflects the distinctive nature of the postdoc role within the academic hierarchy, marked by its temporary status, short duration, and dependency on academic authority.

In China, postdocs are entrusted with high expectations to improve the quality of higher education and promote scientific and technological innovation. A series of policy measures have been adopted to facilitate the development of postdocs. As a centrally governed country, the Chinese government has issued numerous policy documents specifically addressing the postdoctoral system, such as “The Opinions on Strengthening and Improving Postdoctoral Work in the New Era” (Ministry of Human Resources and Social Security of the People’s Republic of China 2022), “The Opinions on Promoting the Spirit of Educators and Strengthening the Construction of a High-Quality Professional Teaching Force in the New Era” (The Central People’s Government of the People’s Republic of China 2024), and “The National Plan for Building a Strong Education Nation (2024–2035)” (The Central People’s Government

of the People's Republic of China 2025). These documents explicitly recognise the significant contributions of postdocs to scientific innovation and socio-economic development, and the government encourages universities to consider postdocs as a vital talent pool for faculty recruitment. Within this context, the vast majority of Chinese universities now prioritise academic candidates with postdoctoral experience in their hiring processes. Among them, institutions authorised to host postdoc programmes have introduced the innovative concept of “faculty-track postdocs”, which combines postdoctoral training with faculty recruitment. This approach allows postdocs who conduct research within the institution to transition directly into faculty positions. It can be argued that faculty-track postdocs play an important role in strengthening research capacity, driving personnel system reforms, and optimising faculty structures in Chinese higher education institutions.

A considerable amount of research on postdocs has originated from technologically and educationally advanced countries and regions such as Europe (Chen, McAlpine, and Amundsen 2015; Main, Wang, and Tan 2021; Van Der Weijden and Teelken 2023) and North America (Cantwell and Taylor 2015; Hayter and Parker 2019; Knaub et al. 2018), where scholars have extensively examined the structure (De Haan, Shwartz, and Gómez-Baquero 2020), development (Main, Wang, and Tan 2021), benefits, and various factors (Ålund et al. 2020; McAlpine et al. 2017; Puljak and Sharif 2009; Schneider and van Leeuwen 2014; Yadav and Seals 2019) influencing the postdoctoral system. In China, research on postdocs has gradually emerged, with domestic scholars primarily focusing on the implementation and effectiveness of the postdoctoral system (Li and Shen 2024; Li, Wu, and Jiao 2021; Li and Xue 2022; Song, Hu, and Li 2025). Only a limited number of studies have explored the individual perceptions and experiences of postdocs from a micro-level perspective. An increasing number of researchers argue that postdocs are becoming marginalised scholars within the higher education system (Kerr 2022a; Li and Li 2019). However, in the context of Chinese academic literature, there remains a striking lack of attention to the roles, functions, and lived experiences of postdocs, particularly in terms of how they survive and position themselves within an intensely competitive academic environment.

To address this gap, drawing upon role theory, this study adopts a mixed-methods approach combining interviews and policy document analysis. We recruited postdocs with first-hand experience and administrators responsible for postdoc affairs in universities, while also collecting policy documents related to postdoctoral governance, thereby constructing a dataset capturing two contrasting role constructions of postdocs in China's higher education system. The analysis reveals a stark contradiction between these two role perspectives—namely, *workhorse* and *precarity*. Policymakers regard the postdoctoral system as a transitional pipeline facilitating the development of junior academics into mature researchers and believe that postdocs play a central role in advancing scientific research. In contrast, postdocs themselves often perceive their academic labour as precarious, insecure, and exploitative, and view themselves as marginalised scholars lacking recognition and long-term stability. Moreover, we further

explore how gender and disciplinary differences may amplify these role tensions. A critical perspective is adopted to examine the structural dilemmas facing postdocs in Chinese higher education, and several actionable suggestions are proposed to mitigate role conflicts and enhance the protection of postdocs' rights and interests. This research contributes to a deeper understanding of the evolving position of postdocs in Chinese higher education and offers insights relevant to its development under the continuing influence of neoliberal ideologies.

To explore these issues systematically, this study is guided by the following three research questions:

RQ1: What is the role of postdocs within China's academic system, from both national policy and individual perspectives?

RQ2: How do gender and academic discipline influence postdocs' perceptions of their role and their subsequent professional experiences?

RQ3: Based on the findings, what evidence-based policy recommendations can be proposed to improve the postdoctoral system and better support early career researchers?

Literature Review and Theoretical Foundations

What Is a Postdoc?

Although the postdoctoral system has gained increasing global attention (Cantwell and Taylor 2013; Spina et al. 2022), there remains no universally accepted definition of what constitutes a postdoc, nor a clear consensus on their responsibilities and obligations. The origins of the postdoctoral system can be traced back to the 1870s at Johns Hopkins University in the United States (Micoli and Wendell 2018). Australian scholars Scaffidi and Berman (2011) define postdocs as individuals holding a PhD or equivalent qualification who are engaged in temporary, research-intensive academic roles. Bazeley et al. (1999) conceptualise early career researchers as those employed in academic or research positions within five years of completing postdoctoral training, framing postdocs not as independent researchers but as pre-employment trainees who often lack adequate training, experience, and confidence. In Canada (National Research Council Canada 2024), the national postdoctoral system defines postdoctoral researchers as those holding a PhD and occupying temporary, low-paid research positions with the goal of establishing independent research careers. In the United States, the U.S. National Science Foundation (Rodriguez Ott, Arbeit, and Falkenheim 2021) identifies several common features of postdoctoral positions: They are typically held by recent PhD graduates or individuals with equivalent degrees; they are temporary and not considered practical training; they are full-time research or academic positions designed to prepare individuals for long-term academic research careers; they are conducted under the supervision of senior scholars or departments; and postdocs are expected and entitled to publish their research findings.

Due to the lack of a standardised definition, postdoctoral researchers are referred to by a variety of titles across institutions and countries, such as fellow, employee, trainee, associate, faculty, staff, employee-in-training, scholar, and visiting postdoctoral scholar, which further reflects the ambiguity and complexity surrounding the identity and expectations of postdocs.

Overall, in most cases, postdocs occupy a liminal position—they are neither students nor regular faculty or staff (Hlatshwayo 2024a, 2024b). This ambiguous status contributes to a sense of instability and insecurity among postdocs (Kerr 2022b). Typically, they are employed on a short-term basis (Herschberg, Benschop, and Van den Brink 2018), working under the supervision of a principal investigator or host supervisor to complete predetermined research tasks within a fixed timeframe. Due to variations in institutional settings and supervisory arrangements, the nature of postdoctoral work tends to be diverse and complex. As a result, postdocs often experience role conflict (Hlatshwayo 2024a, 2024b; Kerr 2022a, 2022b), stemming from unclear expectations and inconsistent responsibilities across different contexts.

Postdocs in Global Perspective

Under the influence of globalisation in education and neoliberal policy trends, the majority of countries around the world have adopted the postdoctoral system. This global proliferation of postdoctoral programmes has sparked widespread scholarly interest and debate. Most of the existing research has emerged from countries with advanced education and research infrastructures, such as the United States, European nations, and Australia (Cantwell and Taylor 2015; Chen, McAlpine, and Amundsen 2015; Hayter and Parker 2019; Knaub et al. 2018; Main, Wang, and Tan 2021; Van Der Weijden and Teelken 2023). These studies have explored the postdoctoral system from both macro and micro perspectives, offering in-depth analyses of its structure, implementation, and impact.

From a macro perspective, existing research has extensively examined the postdoctoral system at the organisational level, particularly focusing on national governments and higher education institutions. Scholars have paid significant attention to the implementation of postdoctoral policies (Price et al. 2021), evaluations of their effectiveness (Schneider and Van Leeuwen 2014; Su 2011), and strategies for policy optimisation (Andalib, Ghaffarzadegan, and Larson 2018; Peng and Ding 2013; Yang 2021). Previous studies have demonstrated that postdoctoral policies play a critical role in advancing scientific research at universities, enhancing institutional rankings, and promoting national innovation. The adoption of postdoctoral systems is often seen as a necessary response to the increasingly market-oriented nature of the academic landscape (Hlatshwayo 2024a, 2024b; Ortiga, Chou, and Wang 2020). For example, Holley et al. (2018), by examining postdoctoral experiences in Australia, Kazakhstan, the Netherlands, and South Africa, highlighted how the growing neoliberal logic has shaped and influenced the conceptualisation of the role of postdocs in higher education institutions. Meanwhile, other scholars have also pointed to challenges in implementing

postdoctoral policies (Gibb 2022; Li and Xue 2022; McAlpine and Amundsen 2015), noting that these challenges vary across countries depending on their institutional frameworks and academic environments. As a result, cross-national comparisons (Liu, Wang, Zhao 2023) of postdoctoral systems have naturally emerged as a research priority. For developing countries such as China (Ge, Fu, Zhao 2017; Liu, Wang, Zhao 2023; Xue 2012), learning from and adapting the experiences of more established postdoctoral systems has become an important strategy. In the Chinese context, researchers have primarily focused on institutional and policy dimensions (Peng and Ding 2013; Yang 2021), examining postdoctoral policies from the perspective of the government and emphasising how China can better cultivate and support postdocs in alignment with its goals of becoming a global leader in education and science and technology (Chang, Chen, and Liu 2021).

Focusing on postdoctoral researchers from a micro-level perspective is equally important, as they are the key agents in the implementation of postdoctoral systems (Liera and Ortega 2025). A wide body of research has examined postdocs' job satisfaction (Gater 2019), motivations (Miller 2012), roles (Åkerlind 2005), and the factors influencing their development (Ålund et al. 2020; McAlpine et al. 2017; Schneider and Van Leeuwen 2014). Why do individuals pursue postdoctoral positions? Are they satisfied with their postdoctoral work? What factors influence their career development? What is the value of undertaking a postdoc? While postdoctoral training is often seen as a critical stage that helps researchers transition into independent scholars (McAlpine et al. 2017; Yadav and Seals 2019), postdocs are still widely regarded as occupying unstable and precarious positions within the higher education system (Hlatshwayo 2024a, 2024b; Holley et al. 2018; Kerr 2022a). Supporters argue that postdoctoral positions can enhance researchers' academic capacity, broaden their academic capital, and facilitate future academic career advancement. Critics, however, contend that under the influence of neoliberalism and growing institutional autonomy, higher education has become increasingly market-driven. In this context, universities, aiming to improve their rankings with limited public funding, often rely heavily on temporary academic labour—postdocs (Cantwell 2009; Dirnagl 2022). As a result, postdocs are exposed to substantial instability, uncertainty, and pressure within academia (Hlatshwayo 2024a, 2024b; Kerr 2022a).

Postdocs in China

Based on the Central People's Government of the People's Republic of China (2023), the number of postdoctoral researchers in China has grown significantly—from just 2,904 in 2002 to over 33,000 in 2022. In the same year, the Chinese government (China Postdoctoral Science Foundation 2023) allocated approximately 1.178 billion RMB in regular funding to support postdoctoral research, benefiting a total of 6,101 individuals. Furthermore, 219.1 million RMB was dedicated to international exchange initiatives. These included funding for 73 scholars under the Postdoctoral International Exchange Programme (Outbound), 456 scholars through the Recruitment Programme, and 50 participants in academic exchange projects. Additionally, 50 postdocs were supported

by the Hong Kong Scholars Programme, 25 by the Macau Young Scholars Programme, and 30 by the Sino-German Postdoctoral Exchange Programme. These figures reflect the substantial efforts and commitment of the Chinese government and higher education authorities to the recruitment, support, and development of postdoctoral talent.

Nevertheless, the rapidly changing and increasingly market-oriented environment has posed significant challenges to China's postdoctoral policy within the higher education system, prompting scholars to critically re-evaluate the postdoctoral system. Jiang and Xun (2024) argue that the core controversies of China's postdoctoral system lie in the tension between uniform policies and diverse identities, leading to ambiguous roles for postdocs and risks during identity transformation. Jiang also proposes a series of policy optimisation strategies. However, studies that examine the postdoctoral role from both individual and organisational perspectives remain limited, highlighting a key gap that this study seeks to address.

Role Theory and Applicability

Role theory is an important theoretical framework in the fields of sociology and psychology (Biddle 1986). It emphasises the social positions individuals occupy and the expectations attached to those positions by society and institutions. Roles are not isolated; they are embedded in and shaped by interactions with other roles—both individual and organisational. The theory enables the depiction of role expectations and individuals' cognitive and behavioural responses to those expectations, thereby facilitating a deeper understanding and more effective navigation of one's roles. Widely cited by scholars, role theory has gradually expanded beyond its original disciplinary boundaries and found application in fields such as education (Walker and Shore 2015) and political studies (Cantir and Kaarbo 2012). Its strong explanatory power makes it a valuable tool for both theoretical enquiry and applied research.

Central to this study is the concept of role perception—the subjective interpretation individuals develop regarding their own roles (Biddle 1986). This perception is not a mere reflection of institutional expectations but is actively constructed through personal experience, social interactions, and individual agency. It is inherently multifaceted, shaped by a variety of factors including gender, disciplinary culture, and career stage. The potential misalignment between institutionally prescribed roles (as defined in policy documents) and individually perceived roles often leads to critical experiences such as role conflict (conflicting expectations) and role ambiguity (lack of clarity about the role). It is precisely at this juncture—the gap between policy mandate and lived experience—that role theory offers its greatest explanatory power. By framing this tension, the theory provides a robust lens for connecting macro-level policy analyses with micro-level individual narratives.

Therefore, the conceptual framework embedded within role theory offers a valuable lens for identifying and analysing the positioning and perception of postdoc roles, demonstrating strong theoretical alignment with this research. Drawing on multiple

perspectives, this study integrates the role theory framework to examine the postdoctoral experience within China's higher education system. It specifically investigates how postdoc roles are positioned by educational policies and institutions, as well as how these roles are perceived by postdocs themselves. Additionally, the study explores how gender and disciplinary backgrounds shape these perceptions and experiences. Based on this analysis, the study proposes feasible pathways to mitigate role conflict and promote a more coherent and supportive postdoctoral environment.

Research Design

Research Methodology

This study focuses on the role conflict experienced by postdoctoral researchers within the Chinese higher education system. To address this issue, two areas of investigation are undertaken. First, we examine how government agencies, policymakers, and postdoctoral administrative organisations conceptualise the role of postdocs. These perspectives are most clearly articulated in officially issued postdoctoral policy documents, making policy text analysis an appropriate method in this context. Second, we explore how postdocs themselves perceive their roles, and the most effective way to access these insights is through direct engagement with the individuals concerned. Therefore, in-depth interviews are employed to investigate the role perceptions of postdocs.

As a distinct form of text, policy serves as a vehicle for conveying policy intentions and presenting the instruments of policy implementation. Policy text analysis is a research method that utilises symbolic mediation to systematically analyse and compare the linguistic expressions embedded within policy documents, thereby uncovering their interpretive meanings and underlying intentions. This method has become an important approach in social science research, including the field of education, for extracting the embedded value of textual materials. Accordingly, this study adopts policy text analysis to examine postdoctoral policies in China.

The interview method refers to a fundamental psychological research approach in which the interviewer and the interviewee engage in face-to-face conversations to gain insights into the interviewee's thoughts and behaviours. Depending on the nature, objectives, or subjects of the research, interviews can take various forms. Based on the degree of standardisation in the interview process, interviews are generally categorised into structured, semi-structured, and unstructured formats. For the purposes of this study, a semi-structured interview method was adopted. This format allows the interviewer to make necessary adjustments according to the actual flow of the conversation. The interviewer has full discretion over the wording, order, response format, recording method, time, and location of the interview. Therefore, semi-structured interviews were conducted with postdoctoral researchers to collect data on their perceptions of their roles.

Data Collection

To collect postdoctoral policy documents, we obtained materials related to the recruitment, management, and training of postdocs from official government websites, postdoctoral foundations, and university portals. Our search covered the period from 1985 (the inception of China's postdoctoral system) to 2025 and utilised keywords such as “postdoctoral”, “recruitment”, and “system reform”. The selection criteria for policy documents were as follows: (1) issued by national-level ministries or commissions, postdoctoral foundations, or top universities; (2) directly pertaining to the establishment, management, evaluation, or support of the postdoctoral system; and (3) being the latest or definitive version if a policy had been updated. This process yielded a corpus of documents that collectively represent the core components of the national policy framework. These policy documents offer key perspectives and approaches from a national standpoint on how China attracts, develops, and trains postdoctoral researchers as the next generation of scholars. Specifically, the collected policies include the “Regulations on the Administration of Postdoctoral Work” (Ministry of Human Resources and Social Security of the People's Republic of China 2006), “Opinions on Reforming and Improving the Postdoctoral System” (Central People's Government of the People's Republic of China 2015), “Opinions on Strengthening and Improving Postdoctoral Work in the New Era” (Ministry of Human Resources and Social Security of the People's Republic of China 2022), “Opinions on Promoting the Spirit of Educators and Strengthening the Construction of a High-Quality Professionalised Teaching Force in the New Era” (Central People's Government of the People's Republic of China 2024), the *China Postdoctoral Science Foundation Funding Guidelines* (China Postdoctoral Science Foundation 2025), as well as various university-issued notices on postdoctoral recruitment.

To obtain detailed first-hand data, we employed a purposive sampling strategy to ensure a diverse range of perspectives. Participants included 14 postdoctoral researchers and three postdoctoral affairs administrators from China's higher education system. Postdoctoral researchers were selected to maximise variation across (1) academic discipline (e.g., STEM, humanities, social sciences), (2) gender, and (3) career stage. The management staff member was chosen to provide an administrative viewpoint from institutions. Recruitment was conducted through multiple channels, including referrals from academic networks, and snowball sampling. Each participant was interviewed for approximately one hour based on a pre-designed interview guide. The guide covered basic demographic information such as age, academic discipline, and duration of postdoctoral experience, as well as three key questions concerning their career development: (1) the tasks involved in their postdoctoral work, (2) the support provided by supervisors and institutions, and (3) the impact of uncertainty and temporariness of the position on their professional life. These three questions were designed to capture participants' role perceptions. To protect the rights and privacy of postdocs as marginalised scholars, anonymisation and coding were applied. A summary of participants' demographic information is provided in Table 1.

Table 1: Statistics on basic information of interviewees

Basic information	Classification	Numbers
Gender	Male	10
	Female	7
Age	<28 years old	1
	28–30 years old	3
	30–35 years old	9
	35–40 years old	3
	>40 years old	1
Duration of postdoctoral work	<1 year	3
	1–3 years	8
	>3 years	6
Discipline	STEM	8
	Non-STEM	9

Conflicting Findings

Workhorse: A Necessary Path to a Tenure-Track Academic Career

Based on role theory, this study identifies two conflicting narratives regarding the roles, functions, and contributions of postdocs in China. The first perspective portrays postdocs as the main research workforce—early career scholars who must pass through the postdoctoral stage in order to secure tenure-track positions in higher education, and who play a crucial role in advancing national scientific progress and socio-economic development. After completing postdoctoral research training, early career scholars reportedly improve significantly in research skills, academic competence, and personal attributes, facilitating their rapid growth into independent researchers. This study identifies three key pathways through which postdocs are positioned as the main research force: (1) Postdocs are recognised as China’s young scientific talent, contributing directly to technological innovation and socio-economic advancement; (2) postdoctoral research training serves as a critical phase for developing researchers’ skills and awareness, making it an essential step towards achieving tenure-track academic employment; and (3) the postdoctoral system helps alleviate institutional constraints in China’s higher education system, including limited staffing quotas, and functions as an effective mechanism for identifying individuals unsuitable for academic careers. These interpretations are reflected both in policy documents and in statements from administrators responsible for managing postdoctoral affairs, as can be seen below.

Postdoctoral researchers constitute an important part of China’s young scientific talent. The Central Committee of the Communist Party of China and the State Council attach great importance to postdoctoral work. Especially since the 18th National Congress of the Communist Party, the development of the postdoctoral system has made significant progress. A group of high-level, innovative young talents has been cultivated, and a number of important scientific achievements have been made, making positive

contributions to scientific and technological progress as well as to economic and social development. (Ministry of Human Resources and Social Security of the People's Republic of China 2022)

The postdoctoral system adopts a position-based contract system: the first term lasts for 2–3 years, and those who meet the renewal requirements may be offered a second term of 1–3 years. Postdocs who meet relevant criteria may participate in open recruitment for teaching and research (associate professor-level) positions and may be selected to join the university's full-time faculty. Outstanding postdocs who exceed work expectations, produce significant academic achievements, intend to join talent teams, or have the potential to qualify for national-level talent programs may apply for the university's Young Academic Leader positions in accordance with relevant procedures. For those selected into key postdoctoral programs such as the "Innovative Talent Promotion Plan" (Category A funded by the central government), the university will provide preferential support in terms of second-term renewal and career development. When competing for full-time faculty positions, these candidates will be given priority under equal conditions. (Nankai University 2024)

Now that the number of PhD students being admitted is increasing, and many scholars who earned their doctorates overseas are returning to China to look for jobs, tenure-track faculty positions at domestic universities—which were already limited—have become even more competitive. To recruit more specialised and outstanding scholars and to ease the pressure on faculty hiring, universities have adopted the postdoctoral system. This allows them to observe candidates over a short period and select the best ones for faculty positions. On the other hand, after 2–3 years of postdoctoral training, those who find themselves unsuited for academic research can realise their limitations and choose to leave academia for other industries. It's a win-win situation. (Interviewee 1, Postdoctoral Affairs Administrator)

As a public institution, our teacher recruitment is subject to a stringent government-mandated process with numerous restrictions. In contrast, the appointment of postdoctoral fellows falls under the sole purview of the university. This flexibility provides a crucial means to mitigate our staffing demands. (Interviewee 17, Postdoctoral Affairs Administrator)

Universities serve as the primary base for the recruitment, training, and utilisation of postdoctoral researchers. Postdocs play a significant role in optimising faculty structures and advancing the development of academic disciplines and research platforms. There is a natural alignment between postdoctoral recruitment and university faculty development in terms of talent cultivation and utilisation, which supports the orderly growth of academic staff teams. From a macro perspective, since the implementation of the postdoctoral policy in China (Central People's Government of the People's Republic of China 2023), a large number of postdocs have been recruited, contributing substantially to the nation's high-level research and innovation talent pool and empowering economic and social development.

Since the beginning of the 21st century, the pace of global scientific and technological innovation has accelerated, and science and talent have become key areas of international competition. Universities, whose primary missions include education, research, and social service, have expanded the use of temporary academic positions (Kahn and MacGarvie 2024)—postdocs—to drive technological innovation, cultivate talent, and improve institutional rankings in an increasingly competitive academic environment. Undeniably, postdocs have played a significant role in these areas. Therefore, both at the governmental and institutional levels, high expectations are placed on postdocs. They are expected to serve as the main force in scientific research, contributing to broader national and institutional goals, while also facilitating their transition into mature scholars.

Precarity: Intertwined Uncertainty and Instability

Although China's national policies and university-level regulations portray postdocs as the main force in scientific research, this sharply contrasts with the actual perceptions of Chinese postdocs regarding the instability of their roles and functions. In this study, most postdocs expressed anxiety, frustration, and a sense of exploitation when discussing their positions within the current higher education system (Hlatshwayo 2024a, 2024b; Kerr 2022a). Additionally, they worried that as the number of postdocs continues to grow—due to the government's ambition to make them a major source of academic staff—the oversupply of postdocs, combined with the limited availability of tenure-track positions in universities, would eventually force many to leave academia. Overall, postdocs themselves perceive their roles as unstable and temporary, their identities as ambiguous (caught between being students and teachers), and the future competition as unpredictable. Some participants articulated these concerns as follows:

My employment contract with the university is only for two years, and there's a high chance I won't be at this university after that. Right now, I'm basically like a part-time staff member. This job is too unstable—I don't even dare to buy a house or a car because that would mean taking out a loan. When my contract expires, I have no idea whether I'll still have a job or a salary to repay the loan. It's terrifying! (Interviewee 2)

I often wonder, what exactly is my identity right now? Am I a teacher or a student? If I'm a teacher, I'm expected to publish papers together with my postdoc supervisor, which feels just like when I was a graduate student. But if I'm a student, I still have to take on teaching responsibilities just like faculty members—I'm even required to serve as a class advisor and proctor exams, among other administrative tasks. So, what exactly is my role? I'm really confused. (Interviewee 8)

Although the university told me that if I perform excellently during my postdoc period, I might be able to stay, they never clearly defined what "excellent" means. Research output is what they value most. That means we have to win in the academic tournament in order to have a chance to stay. And you know, it's not just about your own achievements—you also have to compete with others. It's really brutal. (Interviewee 15)

From the above interview excerpts, we can clearly perceive the fear and uncertainty experienced by postdocs in their work, primarily caused by ambiguity in their roles, status, and future academic career prospects. The instability of the postdoctoral profession affects future income, and in China, most individuals obtain their PhDs around the age of 30. After completing a two-year postdoc, many still do not own a house or a car, yet they face life pressures such as marriage, having children, and supporting a family. The postdoc career brings them serious challenges. The dual identity—as both teacher and student—leaves many postdocs feeling lost. In such circumstances, balancing life and work becomes crucial. Moreover, the uncertainty of their academic career path raises concern: Is this really, as policymakers claim, a pipeline to an academic future (Kerr 2022a)?

Certainly, the instability of postdoctoral roles is not unique to China—it is also evident in countries such as South Africa. An increasing number of scholars have called for greater attention to the status and struggles of postdocs, especially as postdoctoral positions have become the “new normal” within the education system (Powell 2015). Under the influence of neoliberalism, the marketisation of higher education and the rise of academic competition inevitably compel universities to create more temporary and precarious academic positions, as noted by Dirnagl (2022) and Cantwell (2009). This trend has only worsened in the context of shrinking government funding and oversupply in the academic job market. As a result, postdocs have become the latest victims of neoliberalism and the market-driven higher education system (Hlatshwayo 2022).

Gender and Discipline: Inequalities in Postdoctoral Role Conflict

The expectation and perception of the postdoctoral role are inherently contradictory. Gender and disciplinary background may intensify these tensions, further contributing to inequalities in education and employment. This study further analyses the gender and disciplinary differences within the postdoctoral community.

The research findings indicate that gender differences do exist in the experience of postdoctoral role conflict. Female postdocs often find themselves at a life stage where they face both peak fertility and significant family responsibilities, requiring them to balance work and home life. Hlatshwayo (2024a, 2024b) also supports this view, arguing that female postdocs face greater inequalities within employment and education systems. Moreover, women in the mid-career stage of academia also encounter various pressures related to gender (Coate, Howson, and de St. Croix, 2015; Jones 2023). Gender disparities have long been a subject of attention (Fitzenberger and Schulze 2014), and the interviewees shared the following views:

I'm pregnant, and I don't know whether I should be happy or upset. On the one hand, I'm excited to become a mother, but on the other hand, pregnancy has brought me some difficult experiences. I've had very severe morning sickness. In addition, my research requires me to conduct experimental work, but I'm really worried that doing these experiments might negatively affect my baby. Should I give up this job? My contract is

only for two years, and I feel like I won't be able to complete my postdoctoral work. (Interviewee 11, female)

The pressure of being a postdoc is indeed quite high, but fortunately, my wife is very supportive, which allows me to fully dedicate myself to my research. Especially when I was applying for research funding, I often came home very late. I'm truly grateful! (Interviewee 12, male)

In China, it appears that women are often expected to assume greater responsibility for domestic duties. In my case, I am primarily responsible for household tasks and receive minimal assistance from my husband. For instance, I even need to help him pack when he prepares for business trips. As for myself, I hesitate to schedule any work-related travel outside the city, as I am currently breastfeeding our child and need to be available at home. (Interviewee 9, female)

Furthermore, disciplinary differences—particularly between fields such as science, technology, engineering, and mathematics (STEM) and those in the humanities and social sciences—may exacerbate the role conflicts experienced by postdoctoral researchers, thereby contributing to disparities in educational equity and academic career advancement. In the Chinese context, postdoctoral positions are generally categorised into two types: “mobile stations”, which are established at universities with the authority to confer doctoral degrees, and “workstations”, which are jointly operated by universities and enterprises and primarily cater to STEM-related disciplines. Compared to academic institutions, enterprises often possess greater financial resources and, as such, tend to offer more competitive compensation packages and adopt less stringent selection criteria to attract postdoctoral talent in STEM fields. This institutional differentiation, as evidenced in Moors, Malley, and Stewart (2014) and corroborated by participant narratives in this study, underscores the uneven landscape of postdoctoral training and career development opportunities across disciplines. The interviewees revealed the following:

My major was computer science. After graduation, I joined one of China's top internet companies, and we had already agreed on a specific compensation package. After I started, the company asked whether I would be willing to join their postdoctoral workstation to engage in R&D work. They told me that by entering the workstation, I could receive postdoctoral subsidies on top of my existing salary—these subsidies mainly come from local government incentives—and my workload would not increase. I thought this was a great opportunity, so I was more than happy to take on the postdoctoral position. (Interviewee 14, STEM)

This job is too unstable—I don't even dare to buy a house or a car because that would mean taking out a loan. ... The salary that the university pays me every month is just a little bit. ... This might be the predicament of engaging in academic work. If I can achieve remarkable results, things seem to be much better when I become a professor. But this will take a very long time. (Interviewee 2, non-STEM)

Overall, our study finds that there exists a significant discrepancy—and even a fundamental contradiction—in how the role of postdoctoral researchers is understood and positioned within China’s higher education system. From the perspective of national policies and universities, postdocs are envisioned as a workforce driving scientific research within the education system, with the expectation that their technical skills and academic capabilities will be significantly enhanced through postdoctoral training. However, from the perspective of the postdocs themselves, the role is perceived as highly unstable, marked by substantial career uncertainty and an unclear path towards long-term academic employment. Furthermore, our findings indicate that both gender and disciplinary background contribute to exacerbating these contradictions, potentially undermining educational equity and fairness in academic career development (Liera and Ortega 2025; Shi, Stachl, and Popova 2025).

A Critical Reflection on the Postdoctoral System in China: Origins, Current Conditions, and Future Prospects

In the sociology of education, merely investigating, understanding, and interpreting phenomena is no longer sufficient to respond to complex real-world issues. This article attempts to introduce a critical paradigm (Brigley 1990), reflecting on China’s postdoctoral system through the dimensions of “past–present–future” to uncover the underlying structural tensions and institutional contradictions.

State-Driven Origins: Postdocs as Policy Instruments and Academic Overflow

The institutional genesis of postdocs in China is deeply embedded in the country’s centralised governance structure. Unlike in many Western contexts where postdoctoral appointments are primarily designed and managed by academic institutions, in China the postdoc system is a top-down policy intervention. It has been strategically mobilised by the state to fulfil dual national goals: advancing innovation capacity and strengthening the talent pipeline for universities under the banner of becoming a “science and education powerhouse” (Li and Xue 2022). As such, postdocs are positioned not only as transient researchers but as critical reserves for the academic labour force, bearing disproportionate responsibilities that often exceed their contractual and professional status (Hlatshwayo 2024a, 2024b; Kerr 2022a; Liu, Wang, Zhao 2023).

Moreover, this system is reinforced by the oversupply of PhD graduates. In recent years, China has massively expanded its doctoral education, leading to increasing saturation in the academic labour market. The limited number of tenured or tenure-track positions cannot absorb the growing number of doctoral graduates, and the postdoc becomes a structural buffer zone—a necessary waiting room for early career researchers. In this sense, postdocs are not only state-driven actors but also the by-products of the academic overproduction cycle in Chinese higher education, reminiscent of what Bourdieu described as academic reproduction under structural constraint (Bourdieu and Passeron 1990).

Precarious Existence: Integration into Tenure-Track Systems and Structural Marginalisation

Despite their strategic importance, postdocs often experience a precarious and marginalised existence in university systems (Hlatshwayo 2024a, 2024b; Kerr 2022a; Liu, Wang, Zhao 2023). A major reason lies in how the postdoc role has been integrated into the broader reform of the academic employment system. In recent years, most Chinese universities have implemented the “pre-tenure to tenure” system, mirroring Western tenure-track models. However, within this framework, postdocs are often treated as “pre-pre-tenure”—an unofficial, unprotected status where they are expected to meet the same output expectations without receiving equivalent institutional support.

Such integration reinforces instability. Postdocs are subjected to short-term contracts, unclear career trajectories, and frequent pressure to deliver high-impact research. They remain outside the standard faculty system, neither classified as employees nor as students, lacking both institutional identity and representation. In effect, they occupy a grey zone, fulfilling critical academic functions while being institutionally disposable.

Our research also highlights structural disparities within this system. Gender remains a significant axis of inequality, with female postdocs often facing compounded challenges related to work-life balance, career progression, and implicit biases in evaluation criteria (Coate, Howson, and de St Croix 2015; Fitzenberger and Schulze 2014; Jones 2023). Disciplinary differences also matter (Moors, Malley, and Stewart 2014): Postdocs in STEM fields tend to have clearer funding pipelines and career pathways, while those in the humanities and social sciences face greater uncertainty due to longer publication cycles, lower funding availability, and weaker institutional recognition. These disparities call into question the fairness and inclusivity of the current postdoc framework (Haven et al. 2019; Shi, Stachl, and Popova 2025).

Towards an Inclusive Future: Rethinking the Role and System of Postdoctoral Research

To address these structural problems, China’s postdoc system must be reimagined not merely as a transition stage or labour pool, but as a legitimate and integral part of the academic research ecosystem. The redefinition of the postdoc role should emphasise its academic developmental function rather than its utilitarian value to institutions or national rankings.

First, at the policy level, the state should decouple the postdoc system from rigid workforce planning and instead invest in sustainable research careers by enhancing institutional autonomy and funding stability (Schneider and van Leeuwen 2014). Second, universities must implement inclusive and transparent evaluation systems that account for the diversity of disciplines, personal circumstances (e.g., gender, caregiving responsibilities), and long-term development goals (Haven et al. 2019). Mechanisms

such as structured mentoring, career planning services, and transition grants should be introduced to support postdocs beyond their temporary roles (McAlpine et al. 2017).

Then, and most critically, the postdoc should be granted professional recognition within academic institutions (Hamann and Velarde 2025). This includes not only fair compensation and employment rights but also participation in decision-making processes that affect their academic lives. Without such changes, the postdoctoral experience will continue to function as a space of deferred hope and institutional neglect.

In summary, while postdocs in China have become vital actors in the country's research and innovation strategy, their structural marginalisation, identity ambiguity, and institutional invisibility undermine the very goals they are meant to serve. A more critical and reflexive approach to postdoctoral policy and practice is necessary to ensure that this population can thrive as both researchers and academic citizens in the long term.

Conclusion

The postdoctoral system is a vital mechanism in China for cultivating and utilising high-level young talent, contributing significantly to the advancement of higher education and scientific innovation. This study examines the positioning and perception of the postdocs' role in China's higher education system from both institutional and individual perspectives. Our findings reveal a clear conflict in the construction of the postdocs identity: While national policies and universities frame postdocs as the backbone of academic research and a transitional force guiding early career researchers towards becoming independent scholars, postdocs themselves often perceive their role as unstable, insecure, and equivalent to that of temporary academic labour. This contradiction between institutional expectations and individual experiences poses significant challenges to the functionality and sustainability of the postdoc system in China. Moreover, our analysis highlights how gender and disciplinary differences further intensify these tensions. Female postdocs frequently struggle to reconcile research responsibilities with family obligations, and postdocs in STEM fields tend to receive more favourable treatment compared to those in non-STEM disciplines. Such disparities may exacerbate inequalities in academic career development and educational access. In the end, this study provides critical insights into the structural contradictions embedded in China's postdocs system and offers policy recommendations for reform. It calls for greater attention from scholars and education authorities to the precarious situation of postdocs, in hopes of informing more equitable and inclusive academic environments in China and beyond.

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References

- Åkerlind, G. S. 2005. "Postdoctoral Researchers: Roles, Functions and Career Prospects". *Higher Education Research and Development* 24 (1): 21–40. <https://doi.org/10.1080/0729436052000318550>.
- Ålund, M., N. Emery, B. J. M. Jarrett, K. J. MacLeod, H. F. McCreery, N. Mamoozadeh, J. G. Phillips, J. Schossau, A. W. Thompson, A. R. Warwick, K. M. Yule, E. R. Zylstra, and E. Gering. 2020. "Academic Ecosystems Must Evolve to Support a Sustainable Postdoc Workforce". *Nature Ecology and Evolution* 4 (6): 777–781. <https://doi.org/10.1038/s41559-020-1178-6>.
- Andalib, M. A., N. Ghaffarzadegan, and R. C. Larson. 2018. "The Postdoc Queue: A Labour Force in Waiting". *Systems Research and Behavioral Science* 35 (6): 675–686. <https://doi.org/10.1002/sres.2510>.
- Bazeley, P. 1999. "Continuing Research by PhD Graduates". *Higher Education Quarterly* 53 (4): 333–352. <https://doi.org/10.1111/1468-2273.00135>.
- Biddle, B. J. 1986. "Recent Developments in Role Theory". *Annual Review of Sociology* 12 (1): 67–92. <https://doi.org/10.1146/annurev.soc.12.1.67>.
- Bourdieu, P., and J.-C. Passeron. 1990. *Reproduction in Education, Society and Culture*. 2nd ed. Translated by R. Nice. Thousand Oaks: Sage Publications. <https://psycnet.apa.org/record/1990-98996-000>.
- Brigley, S. 1990. "Critical Paradigms: Some Problems of Implementation". *British Educational Research Journal* 16 (1): 29–40. <https://doi.org/10.1080/0141192900160103>.
- Cantir, C., and J. Kaarbo. 2012. "Contested Roles and Domestic Politics: Reflections on Role Theory in Foreign Policy Analysis and IR Theory". *Foreign Policy Analysis* 8 (1): 5–24. <https://doi.org/10.1111/j.1743-8594.2011.00156.x>.
- Cantwell, B. 2009. "International Postdocs: Educational Migration and Academic Production in a Global Market". PhD diss., The University of Arizona. <https://www.proquest.com/openview/2773d71a1c6b518da168eb1ce7bac086/1?cbl=18750&pq-origsite=gscholar>.
- Cantwell, B., and B. J. Taylor. 2013. "Internationalization of the Postdoctorate in the United States: Analyzing the Demand for International Postdoc Labor". *Higher Education* 66 (1): 551–567. <https://doi.org/10.1007/s10734-013-9621-0>.
- Cantwell, B., and B. J. Taylor. 2015. "Rise of the Science and Engineering Postdoctorate and the Restructuring of Academic Research". *The Journal of Higher Education* 86 (5): 667–696. <https://doi.org/10.1353/jhe.2015.0028>.

- Central People's Government of the People's Republic of China. 2015. "Opinions on Reforming and Improving the Postdoctoral System." [In Chinese.] December 3, 2015. https://www.gov.cn/zhengce/content/2015-12/03/content_10380.htm.
- Central People's Government of the People's Republic of China. 2023. "China Has Recruited Approximately 340,000 Postdoctoral Researchers in Total". [In Chinese.] June 29, 2023. https://www.gov.cn/zhengce/jiedu/tujie/202306/content_6889065.htm.
- Central People's Government of the People's Republic of China. 2024. "The Opinions on Promoting the Spirit of Educators and Strengthening the Construction of a High-Quality Professional Teaching Force in the New Era". [In Chinese.] August 6, 2024. https://www.gov.cn/gongbao/2024/issue_11566/202409/content_6973187.html.
- Central People's Government of the People's Republic of China. 2025. "The National Plan for Building a Strong Education Nation (2024–2035)". [In Chinese.] January 19, 2025. https://www.gov.cn/zhengce/202501/content_6999913.htm.
- Chang, G. C., C. Chen, J. H. Liu. 2021. "China's Recent 'Super Post-Doctoral Researcher Incentive Program': Its Rationale, Problems and Remedies". [In Chinese.] *Modern University Education* 37 (1): 92–100.
- Chen, S., L. McAlpine, and C. Amundsen. 2015. "Postdoctoral Positions as Preparation for Desired Careers: A Narrative Approach to Understanding Postdoctoral Experience". *Higher Education Research and Development* 34 (6): 1083–1096. <https://doi.org/10.1080/07294360.2015.1024633>.
- China Postdoctoral Science Foundation. 2023. "China Postdoctoral Work Annual Report 2022". [In Chinese.] Accessed November 1st, 2023. https://www.chinapostdoctor.org.cn/prod-api/profile/upload/2024/03/25/%E5%8D%9A%E5%A3%AB%E5%90%8E%E5%B7%A5%E4%BD%9C%E5%B9%B4%E6%8A%A5%EF%BC%882022%EF%BC%89_20240325145439A004.pdf.
- China Postdoctoral Science Foundation. 2025. *The China Postdoctoral Science Foundation Funding Guidelines*. [In Chinese.] Accessed October 11, 2025. <https://www.chinapostdoctor.org.cn/prod-api/profile/info/fujian/20250110/59bb88c5-14c8-483b-b72a-7a2c74f83371.pdf>.
- Coate, K. L., C. B. Kandiko Howson, and T. de St Croix. 2015. *Mid-Career Academic Women: Strategies, Choices and Motivation*. London: King's College London. <https://kclpure.kcl.ac.uk/portal/en/publications/mid-career-academic-women-strategies-choices-and-motivation>.
- De Haan, U., S. C. Shwartz, and F. Gómez-Baquero. 2020. "A Startup Postdoc Program as a Channel for University Technology Transfer: The Case of the Runway Startup Postdoc Program at the Jacobs Technion–Cornell Institute at Cornell Tech". *The Journal of Technology Transfer* 45 (6): 1611–1633. <https://doi.org/10.1007/s10961-019-09764-7>.

- Dirnagl, U. 2022. “#IchbinHannah and the Fight for Permanent Jobs for Postdocs: How a Fictitious Postdoc (Almost) Triggered a Fundamental Reform of German Academia”. *EMBO Reports* 23 (3): e54623. <https://doi.org/10.15252/embr.202254623>.
- Dougherty, K. J., and R. S. Natow. 2020. “Performance-Based Funding for Higher Education: How Well Does Neoliberal Theory Capture Neoliberal Practice?” *Higher Education* 80 (3): 457–478. <https://doi.org/10.1007/s10734-019-00491-4>.
- Fitzenberger, B., and U. Schulze. 2014. “Up or Out: Research Incentives and Career Prospects of Postdocs in Germany”. *German Economic Review* 15 (2): 287–328. <https://doi.org/10.1111/geer.12010>.
- Gater, C. L. 2019. “Postdoc Satisfaction Perceptions Regarding Mentoring, Professional Development, and the Work Environment”. DBA diss., Wilmington University (Delaware). https://www.fachportal-paedagogik.de/literatur/vollanzeige.html?FId=eric_ed597639.
- Ge, Y. Z., Y. Y. Fu, and W. H. Zhao. 2017. “Research on Grant Models of Postdoctoral of Domestic and Foreign Enterprises and the Features”. [In Chinese.] *Research in Higher Education of Engineering* 35 (4): 187–191.
- Gibb, C. 2022. “The Home-Based Postdoctoral Mother in the Neoliberal University”. *Gender, Place and Culture: A Journal of Feminist Geography* 29 (2): 248–272. <https://doi.org/10.1080/0966369X.2021.1975102>.
- Hamann, J., and K. S. Velarde. 2025. “Academic Socialization: On a Neglected Effect of Competition in Science”. *Higher Education* 90: 321–336. <https://doi.org/10.1007/s10734-024-01322-x>.
- Haven, T. L., J. K. Tjink, B. C. Martinson, and L. M. Bouter. 2019. “Perceptions of Research Integrity Climate Differ between Academic Ranks and Disciplinary Fields: Results from a Survey among Academic Researchers in Amsterdam”. *PLoS One* 14 (1): e0210599. <https://doi.org/10.1371/journal.pone.0210599>.
- Hayter, C. S., and M. A. Parker. 2019. “Factors That Influence the Transition of University Postdocs to Non-Academic Scientific Careers: An Exploratory Study”. *Research Policy* 48 (3): 556–570. <https://doi.org/10.1016/j.respol.2018.09.009>.
- Herschberg, C., Y. Benschop, and M. van den Brink. 2018. “Precarious Postdocs: A Comparative Study on Recruitment and Selection of Early-Career Researchers”. *Scandinavian Journal of Management* 34 (4): 303–310. <https://doi.org/10.1016/j.scaman.2018.10.001>.
- Hlatshwayo, M. N. 2022. “The Rise of the Neoliberal University in South Africa: Some Implications for Curriculum Imagination(s)”. *Education as Change* 26: 1–21. <https://doi.org/10.25159/1947-9417/11421>.

- Hlatshwayo, M. N. 2024a. "On Pipelines and Precarity: Competing Narratives on the Roles and Functions of Postdocs in South African Higher Education". *Education as Change* 28: 1–19. <https://doi.org/10.25159/1947-9417/16746>.
- Hlatshwayo, M. N. 2024b. "You're Brought in as a Workhorse and There's No Real Security Here! Postdocs, Precarity and the Neoliberal University in South Africa". *Psychology in Society* 66 (2): 26–44. <https://doi.org/10.57157/pins2024Vol66iss2a6331>.
- Holley, K., A. Kuzhabekova, N. Osbaldiston, F. Cannizzo, C. Mauri, S. Simmonds, C. Teelken, and I. van der Weijden. 2018. "Global Perspectives on the Postdoctoral Scholar Experience". In *The Postdoc Landscape: The Invisible Scholars*, edited by A. J. Jaeger and A. J. Dinin, 203–226. London: Academic Press. <https://doi.org/10.1016/B978-0-12-813169-5.00009-4>.
- Jiang, G. Y., and Y. Xun. 2024. "Breaking through Identity Barriers: The Evolution and Path Innovation of the Postdoctoral Institution in Universities". [In Chinese.] *Journal of Graduate Education* 39 (3): 54–61. <https://doi.org/10.19834/j.cnki.yjsjy2011.2024.03.08>.
- Jones, K. 2023. "Precarity of Post Doctorate Career Breaks: Does Gender Matter?" In "An International Exploration of Post-PhD Careers: Discussing the Issues of Employability and Intersectorial Mobility", edited by S. O'Shea and J. Jungblut, special issue, *Studies in Higher Education* 48 (10): 1576–1594. <https://doi.org/10.1080/03075079.2023.2245849>.
- Kahn, S., and M. MacGarvie. 2024. "New Evidence on International Postdocs in the US: Less Pay, Different Experiences". *Research Policy* 53 (9): 105077. <https://doi.org/10.1016/j.respol.2024.105077>.
- Kerr, P. 2022a. "Academic Pipeline or Academic Treadmill? Postdoctoral Fellowships and the Circular Logic of 'Development'". *South African Journal of Higher Education* 36 (3): 72–90. <https://doi.org/10.20853/36-3-5080>.
- Kerr, P. 2022b. "Career Development or Career Delay? Postdoctoral Fellowships and the De-Professionalizing of Academic Work in South African Universities". In "The Academic Precariat: Understanding Life and Labour in the Neoliberal Academy", edited by S. Burton and B. Bowman, special issue, *British Journal of Sociology of Education* 43 (4): 550–565. <https://doi.org/10.1080/01425692.2022.2045902>.
- Knaub, A. V., M. Jariwala, C. R. Henderson, and R. Khatri. 2018. "Experiences of Postdocs and Principal Investigators in Physics Education Research Postdoc Hiring". *Physical Review Physics Education Research* 14 (1): 010152. <https://doi.org/10.1103/PhysRevPhysEducRes.14.010152>.
- Li, J., and J. H. Li. 2019. "Teacher Postdoctoral under the 'Double-First-Class' Construction: 'Green Peppers' or 'Academic Temporary Workers'". [In Chinese.] *Research in Educational Development* 39 (23): 42–48. <https://doi.org/10.14121/j.cnki.1008-3855.2019.23.008>.

- Li, L. P., and W. Q. Shen. 2024. "Being Internationally Mobile While Keeping Domestic Social Capital: How Postdocs from China Manage Precarity". *Science and Public Policy* 51 (6): 1093–1103. <https://doi.org/10.1093/scipol/scae047>.
- Li Z., Y. Y. Wu, and L. Jiao. 2021. "The Transitional Logic of the Postdoctoral Training Policy and the Prospects Thereof: Based on the Perspective of Historical Institutionalism". [In Chinese.] *Journal of Graduate Education* 36 (4): 78–84. <https://doi.org/10.19834/j.cnki.yjsjy2011.2021.04.12>.
- Li, J., and E. Y. Xue. 2022. "'Sustainable or Unsustainable' in Higher Education Internationalization Development: Exploring the Post-Doctoral System in the Humanities and Social Sciences". *Sustainability* 14 (17): 11024. <https://doi.org/10.3390/su141711024>.
- Liera, R., and G. Ortega. 2025. "Postdoctoral Scholars of Color and Their Perceptions of Equity-Minded Mentoring Practices". *Journal of Diversity in Higher Education*. <https://doi.org/10.1037/dhe0000654>.
- Liu, X., S. Y. Wang, and S. K. Zhao. 2023. "'Reservoir' or 'Gold-Plated Store': An International Comparative Study of Postdoctoral System". [In Chinese.] *Tsinghua Journal of Education* 44 (1): 111–121. <https://doi.org/10.14138/j.1001-4519.2023.01.011111>.
- Main, J. B., Y. B. Wang, and L. Tan. 2021. "The Career Outlook of Engineering PhDs: Influence of Postdoctoral Research Positions on Early Career Salaries and the Attainment of Tenure-Track Faculty Positions". *Journal of Engineering Education* 110 (4): 977–1002. <https://doi.org/10.1002/jee.20416>.
- McAlpine, L., and C. Amundsen. 2015. "Early Career Researcher Challenges: Substantive and Methods-Based Insights". *Studies in Continuing Education* 37 (1): 1–17. <https://doi.org/10.1080/0158037X.2014.967344>.
- McAlpine, L., N. Wilson, G. Turner, S. Saunders, and B. Dunn. 2017. "How Might We Better Design Support for Postdocs?" *International Journal for Academic Development* 22 (4): 375–379. <https://doi.org/10.1080/1360144x.2017.1375414>.
- Micoli, K., and S. Wendell. 2018. "History and Evolution of the Postdoctoral Scholar in the United States". In *The Postdoc Landscape: The Invisible Scholars*, edited by A. J. Jaeger and A. J. Dinin, 1–13. London: Academic Press. <https://doi.org/10.1016/B978-0-12-813169-5.00001-X>.
- Miller, J. M. 2012. "Postdoctoral Appointments: Motivations, Markets, and Experiences". PhD diss., University of North Carolina. <https://core.ac.uk/download/210601867.pdf>.
- Ministry of Human Resources and Social Security of the People's Republic of China. 2006. "Regulations on the Administration of Postdoctoral Work". [In Chinese.] December 29, 2006. https://www.mohrss.gov.cn/xxgk2020/fdzdgknr/zcfg/gfxwj/rcrs/201407/t20140717_136298.html.

- Ministry of Human Resources and Social Security of the People's Republic of China. 2022. *The Opinions on Strengthening and Improving Postdoctoral Work in the New Era*. [In Chinese.] December 30, 2022. https://www.mohrss.gov.cn/xxgk2020/fdzdgknr/qt/gztz/202404/t20240423_517283.html.
- Moors, A. C., J. E. Malley, and A. J. Stewart. 2014. "My Family Matters: Gender and Perceived Support for Family Commitments and Satisfaction in Academia among Postdocs and Faculty in STEMM and Non-STEMM fields". *Psychology of Women Quarterly* 38 (4): 460–474. <https://doi.org/10.1177/0361684314542343>.
- Nankai University. 2024. "Nankai University 2024 Postdoctoral Recruitment Announcement". [In Chinese.] Accessed October 11, 2025. <https://rsc.nankai.edu.cn/2024/0409/c13662a539762/page.htm>.
- National Research Council Canada. 2024. "Postdoctoral Fellowship Program". Modified April 25, 2025. Accessed November 5, 2021. <https://nrc.canada.ca/en/corporate/careers/postdoctoral-fellowship-program>.
- Ortiga, Y. Y., M. H. Chou, and J. Wang. 2020. "Competing for Academic Labor: Research and Recruitment Outside the Academic Center". *Minerva* 58 (4): 607–624. <https://doi.org/10.1007/s11024-020-09412-7>.
- Peng, H. A., and X. C. Ding. 2013. "Plight and Optimization of the Implementation of China's Postdoctoral Education Policy". [In Chinese.] *Journal of Graduate Education* 28 (6): 25–28.
- Powell, K. 2015. "The Future of the Postdoc". *Nature* 520: 144–148. <https://doi.org/10.1038/520144a>.
- Powell, J. J., and H. Solga. 2010. "Analyzing the Nexus of Higher Education and Vocational Training in Europe: A Comparative-Institutional Framework". *Studies in Higher Education* 35 (6): 705–721. <https://doi.org/10.1080/03075070903295829>.
- Price, R. M., C. J. Self, W. C. Young, E. R. Klein, S. Al-Noori, E. Y. Ma, and A. DeMarais. 2021. "Brief Training and Intensive Mentoring Guide Postdoctoral Scholars to Student-Centered Instruction". *CBE—Life Sciences Education* 20 (4): ar64. <https://doi.org/10.1187/cbe.21-03-0083>.
- Puljak L., and W. D. Sharif. 2009. "Postdocs' Perceptions of Work Environment and Career Prospects at a US Academic Institution". *Research Evaluation* 18 (5): 411–415. <https://doi.org/10.3152/095820209x483064>.
- Rodriguez Ott, N., C. A. Arbeit, J. Falkenheim. 2021. "Defining Postdocs in the Survey of Graduate Students and Postdocs (GSS): Institution Responses to the Postdoc Definitional Questions in the GSS 2010-16". Alexandria: U.S. National Science Foundation. Accessed May 5, 2021. <https://nces.nsf.gov/pubs/nsf21327>.

- Scaffidi, A. K., and J. E. Berman. 2011. "A Positive Postdoctoral Experience Is Related to Quality Supervision and Career Mentoring, Collaborations, Networking and a Nurturing Research Environment". *Higher Education* 62: 685–698. <https://doi.org/10.1007/s10734-011-9407-1>.
- Schneider J. W., and T. N. van Leeuwen. 2014. "Analysing Robustness and Uncertainty Levels of Bibliometric Performance Statistics Supporting Science Policy. A Case Study Evaluating Danish Postdoctoral Funding". *Research Evaluation* 23 (4): 285–297. <https://doi.org/10.1093/reseval/rvu016>.
- Shi, L., C. N. Stachl, and M. Popova. 2025. "Linking Departmental Climate to the Sense of Belonging of Chemistry Graduate Students and Postdocs: Evaluation and Insights from the DCaDEI Survey". *Chemistry Education Research and Practice*. <https://doi.org/10.1039/D4RP00322E>.
- Song, H., A. Q. Hu, and X. Y. Li. 2025. "Mentor Support and Postdoctoral Sustainable Careers: Evidence from China". *Humanities and Social Sciences Communications* 12 (1): 505. <https://doi.org/10.1057/s41599-025-04835-7>.
- Spina, N., K. Smithers, J. Harris, and I. Mewburn. 2022. "Back to Zero? Precarious Employment in Academia amongst 'Older' Early Career Researchers, a Life-Course Approach". In "The Academic Precariat: Understanding Life and Labour in the Neoliberal Academy", edited by S. Burton and B. Bowman, special issue, *British Journal of Sociology of Education* 43 (4): 534–549. <https://doi.org/10.1080/01425692.2022.2057925>.
- Su, X. H. 2011. "Postdoctoral Training, Departmental Prestige and Scientists' Research Productivity". *The Journal of Technology Transfer* 36: 275–291. <https://doi.org/10.1007/s10961-009-9133-3>.
- Van Der Weijden, I., and C. Teelken. 2023. "Precarious Careers: Postdoctoral Researchers and Wellbeing at Work". In "An International Exploration of Post-PhD Careers. Discussing the Issues of Employability and Intersectorial Mobility", edited by S. O'Shea and J. Jungblut, special issue, *Studies in Higher Education* 48 (10): 1595–1607. <https://doi.org/10.1080/03075079.2023.2253833>.
- Walker, C. L., and B. M. Shore. 2015. "Understanding Classroom Roles in Inquiry Education: Linking Role Theory and Social Constructivism to the Concept of Role Diversification". *Sage Open* 5 (4): 2158244015607584. <https://doi.org/10.1177/2158244015607584>.
- Xue, E. Y. 2012. "Postdoctoral Fellowship Policy Comparative Analysis and Strategic Trend". [In Chinese.] *International and Comparative Education* 34 (11): 44–48. <https://doi.org/10.20013/j.cnki.ice.2012.11.010>.
- Yadav A., and C. D. Seals. 2019. "Taking the Next Step: Supporting Postdocs to Develop an Independent Path in Academia". *International Journal of Stem Education* 6: 15. <https://doi.org/10.1186/s40594-019-0168-1>.

Yang, G. Q. 2021. "China Needs Better Postdoctoral Policy". *Science* 371 (6534): 1116.
<https://doi.org/10.1126/science.abg6881>.