Survey on the Growth and Development of Global Early-Career Young Scientists 2025

(summary)

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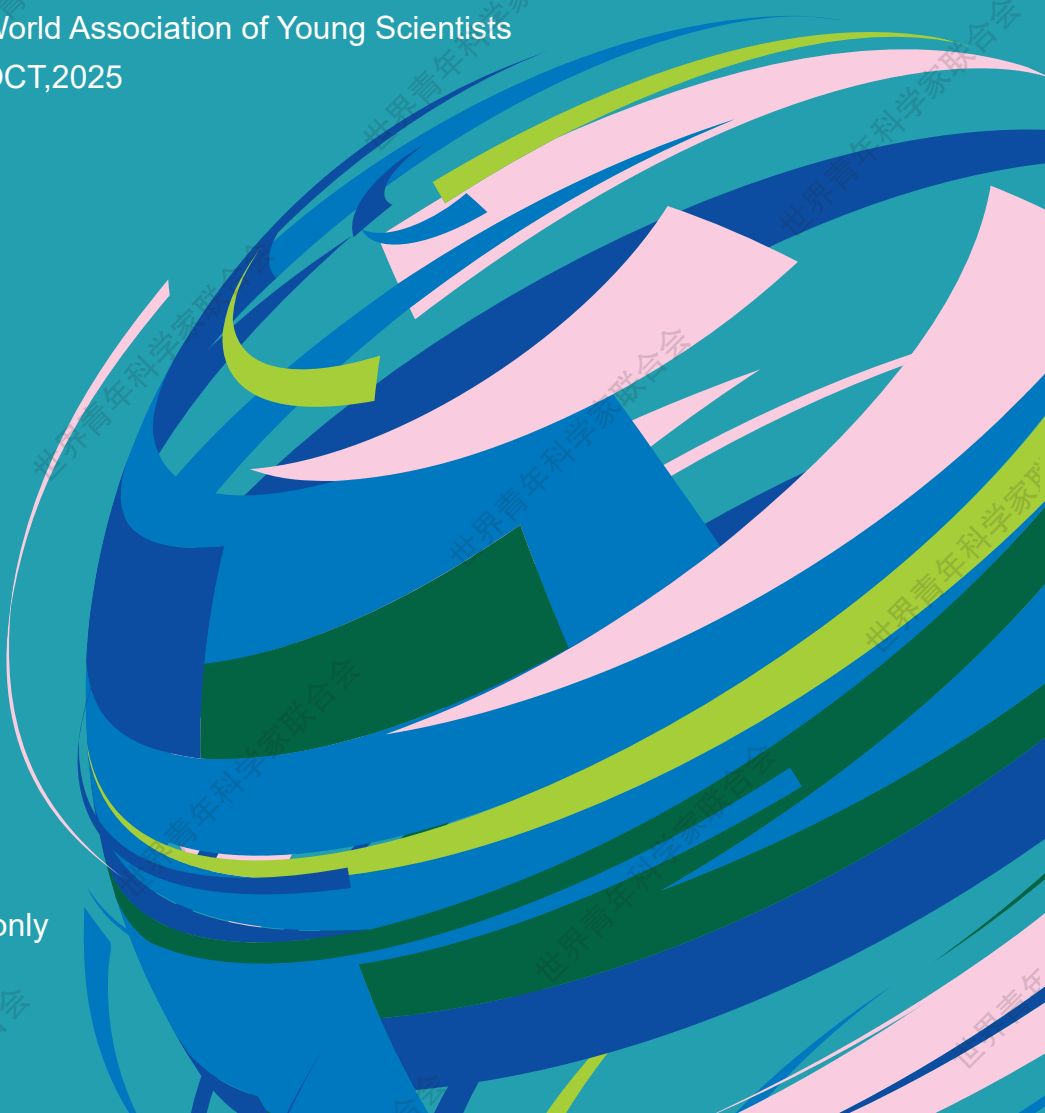

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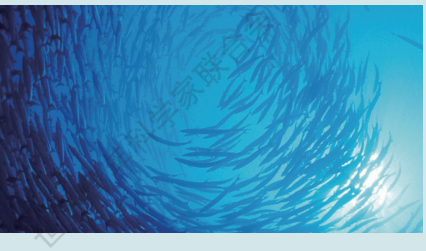

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Executive Summary

Young scientists are the backbone of global scientific and technological innovation. Despite being a large and highly valued group, they frequently encounter numerous difficulties during their development, particularly in the early stages of their careers. These challenges not only impede the unleashing of their innovative vitality and the healthy progression of their careers but also diminish the overall performance of the scientific and technological innovation system.

To gain deep insights into the realities faced by frontline researchers, the World Association of Young Scientists is launching this special survey for researchers worldwide. The purpose is to understand, at a micro-level, the current growth and development, challenges, and needs of early-career young scientists, providing the factual grounding and data essential for improving their professional growth environment.

This survey distributed bilingual (Chinese and English) questionnaires through various channels, including online platforms, email, and social media, ultimately collecting 3,065 valid responses. The sample distribution is as follows: respondents from China (including Hong Kong, Macao, and Taiwan) constituted 84.51%, with the remaining 15.49% from other countries. Regarding gender, male respondents accounted for 61.21%, female respondents for 37.26%, and 1.53% identify as "prefer not to say" or "other." In terms of age, 88.74% of respondents were under 45, with those under 35 collectively making up 54.71% of the total. The distribution of respondents by research field was: Biological Sciences 28.52%, Medical and Health Sciences 28.06%, Materials Science 11.48%, Engineering Sciences 9.59%, Chemical Sciences 7.41%, Management Sciences

3.78%, Information and Computer Sciences 3.43%, Earth Sciences 3.16%, Mathematical Sciences 2.77%, and Physical Sciences 1.79%.

This report delves into the initial motivations of early-career young scientists, proceeding to analyze their resource availability, professional growth, and key stressors. It concludes by examining the policy demands arising from these current situations. The survey indicates that early-career young scientists, though driven by dreams of scientific exploration, widely grapple with issues like funding shortages, administrative burdens, financial strain, and career uncertainty. Establishing a healthy research ecosystem that provides stable support, grants research autonomy, and reduces non-academic responsibilities is crucial for unleashing the potential of this vital force.

1 Career Motivation: Balancing Idealism and Pragmatism

Early-career young scientists' career choices are shaped by a combination of intrinsic interest and external factors related to job security. Based on an analysis of responses (4065) to "research motivation" options, "passion for scientific exploration" (40.26%) and "desire for a stable and respected profession" (39.65%) were the two dominant motivators, together accounting for 79.91%. The data indicates that the primary motivation for most scientists to pursue research stems from a love for science itself, while a stable and respected job also serves as a significant motivation based on practical considerations. See Figure 1-1 for details.

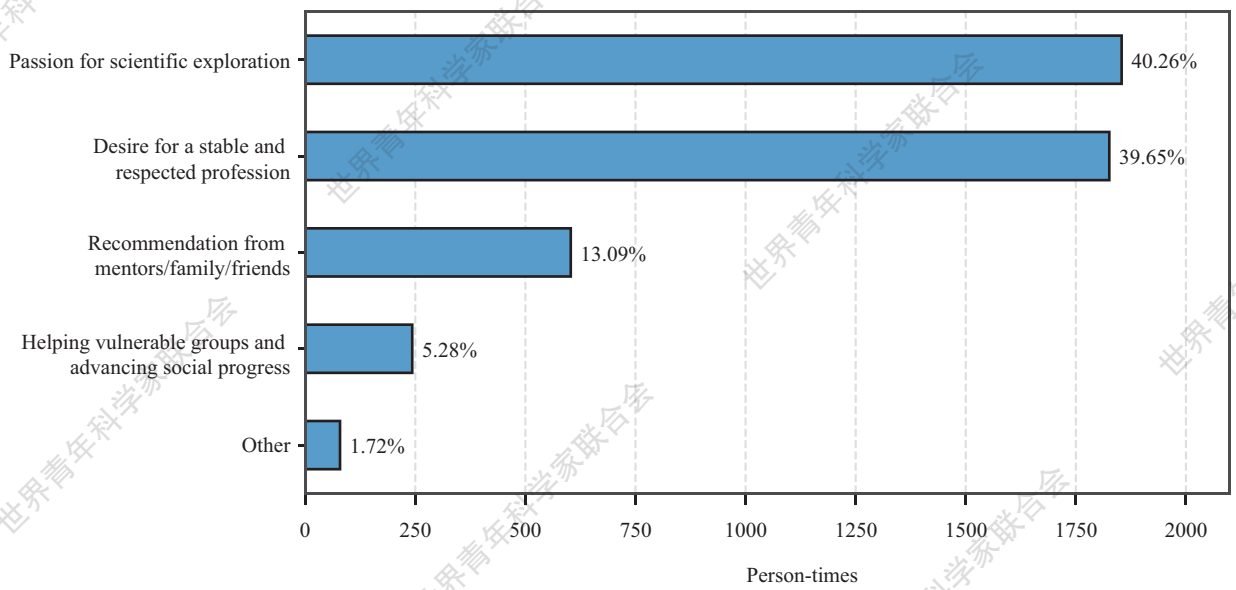


Figure 1-1 Distribution of Research Motivation

Career motivation choices exhibit group differences. Chinese respondents prioritize "desire for a stable and respected profession," while foreign respondents lean towards "helping vulnerable groups and promoting social progress." Male respondents are significantly driven by "passion for scientific exploration," whereas female respondents' motivations are relatively more diverse. Those in fields such as chemical sciences, materials science, and engineering sciences are more readily motivated by "passion for scientific exploration," while respondents in biological sciences, mathematical sciences, and physics sciences are more easily influenced by mentors, family, or friends.

2 Resource Status: Funding Pressure and Compact Team Structures

Funding shortages are a widespread problem for early-career young scientists. The survey reveals that 69.69% of respondents experienced either "insufficient" or "no" funding, compared to just 30.31% who felt their funding was "abundant." Funding shortages can hinder the launch, continuity, and scope of research for young scientists in the early stages of their careers, which may adversely affect their career confidence and future prospects. See Figure 2-1 for details.

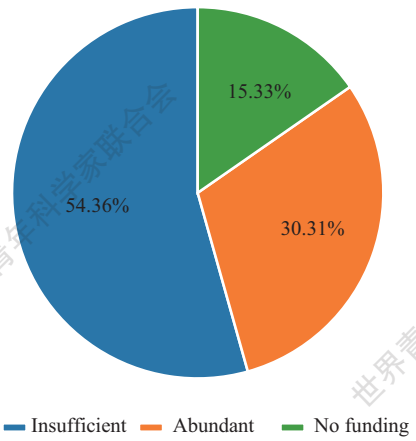


Figure 2-1 Sufficiency of Funding

A majority of early-career young scientists work in small teams comprising fewer than 10 members. More than eight out of ten (81.30%) respondents indicated their teams consist of fewer than 10 individuals. Of these, ultra-small teams (1~3 members) were the most prevalent (41.66%), followed by small teams (4~10 members) at 39.64%, while medium-to-large teams (11 or more members) constituted 18.70%. This data solely describes the observed work and collaboration models of the respondents and does not indicate any issues they might be experiencing. See Figure 2-2 for details.

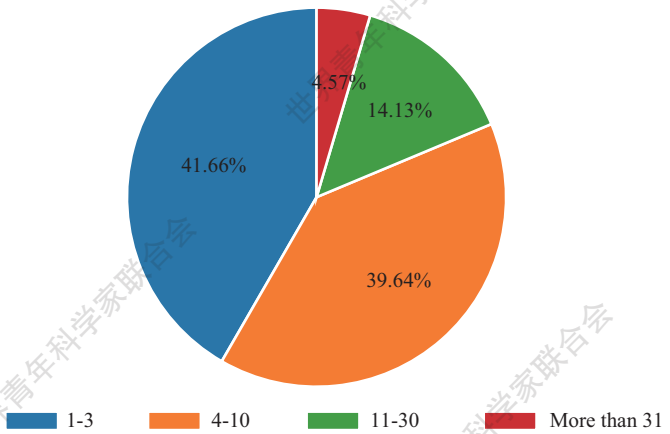


Figure 2-2 Distribution of Team Size

Team sizes vary across different demographic groups. The largest share of Chinese respondents was found in teams of 1~3 members. Conversely, as team size grew, the proportion of Chinese respondents decreased, and that of foreign respondents increased. Furthermore, as teams became larger, the percentage of respondents experiencing "insufficient" funding steadily dropped, meaning larger teams correlated with a higher proportion of individuals reporting "abundant" funding.

3 Career Growth: Optimal Age Range of 30~35 and Reliance on External Resources

Early-career young scientists typically obtain Principal Investigator status between the ages of 30 and 35. A significant majority, 82.90%, of the surveyed individuals have not yet attained PI positions in their early-career. Among those who have achieved PI status, 61.43% are concentrated between 30 and 35 years old, with 35 being the peak (16.50%). The data suggests that ages 30 to 35 may be the golden window for achieving academic independence, with 35 being a particularly critical age point. See Figure 3-1 for details.

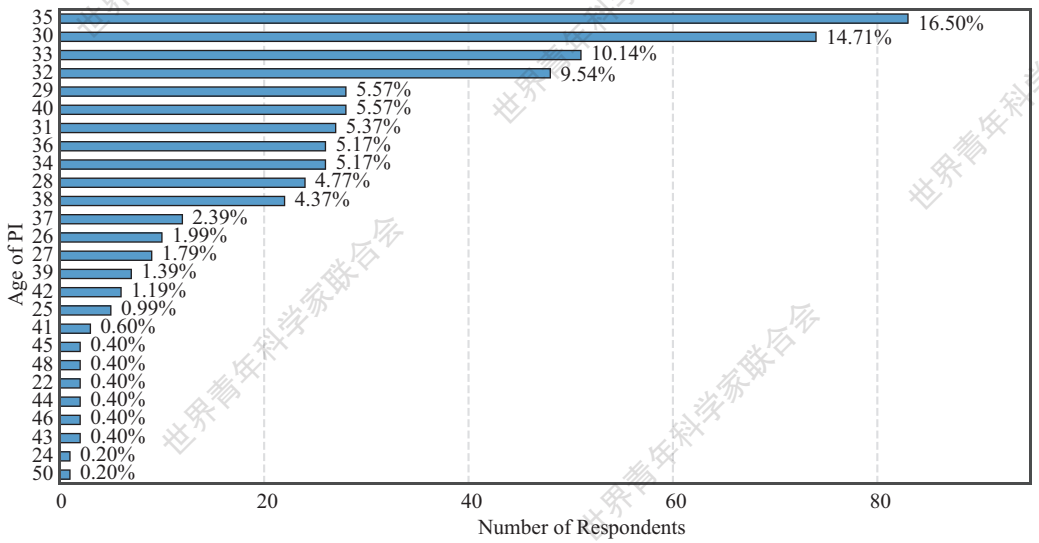


Figure 3-1 Age Distribution of PI Attainment

Quantitative publication metrics and honorary awards are key indicators for scientists seeking PI status. A proportional analysis of 5,503 responses regarding the "key indicators for obtaining PI qualification" revealed that "highly cited papers or high H-index" (39.63%) and "obtained academic awards/honors" (38.85%) were considered almost equally important, together accounting for nearly 80% of the total.

The professional development of early-career young scientists heavily relies on external resources and the institutional environment. A proportional analysis of 9,010 responses concerning "key growth factors" identified "access to world-class institutions for study and research" (20.90%), "adequate and stable funding support" (19.75%), and "mentorship from leading scientists" (14.85%) as the top three, collectively comprising over 55%. Notably, the importance of "open, inclusive, and ethical research environment" (13.18%) and "fair and reasonable evaluation and promotion systems" (10.93%) surpassed "relatively of low financial and living pressure" (7.73%), underscoring the significance of the research's "enabling environment." See Figure 3-2 for details.

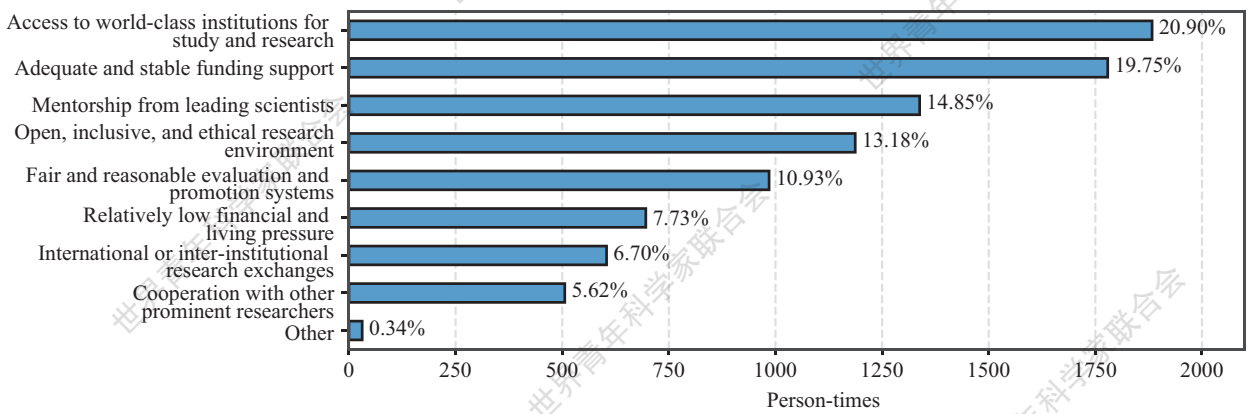


Figure 3-2 Distribution of Key Growth Factors

4 Pressures and Challenges: Financial Strain and Career Uncertainty Are Major Concerns

Financial strain and career uncertainty represent major sources of pressure for early-career young scientists. Based on an analysis of 6,253 responses within the "life stress" category, "low salary " (33.92%) and "job insecurity/lack of stable employment" (20.03%) are the top two stressors for respondents, with "interpersonal problems" (18.32%) ranking third. Concerns related to social security, including household registration, healthcare, and children's education, constitute a comparatively smaller share. These findings underscore the profound anxieties this demographic holds concerning financial security and career prospects. See Figure 4-1 for details.

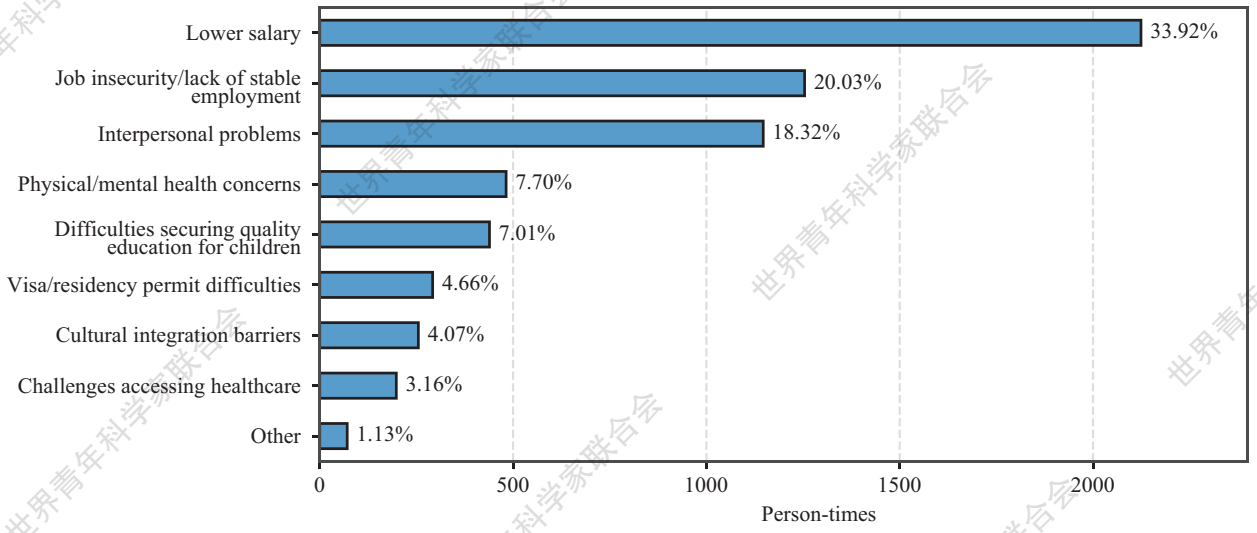


Figure 4-1 Distribution of Life Stress

Life stress is perceived differently across regions. Chinese respondents more distinctly reported "difficulties securing quality education for children," "low salary," and "interpersonal problems." In contrast, foreign respondents felt more strongly about issues related to "visa/residency permit difficulties," and "cultural integration barriers."

Early-career young scientists commonly struggle with time allocation challenges, such as excessive administrative tasks. Nearly seven out of ten respondents (68.25%) reported facing issues with time allocation. An analysis of the 3,901 responses concerning "time allocation issues" showed that the main problem were concentrated on "excessive time spent on administrative tasks" (32.79%) and "insufficient time for personal learning and improvement" (31.18%), jointly making up 63.97% of the total. Moreover, "heavy

teaching workloads" (18.15%) and "lack of time for leisure and entertainment activities" (16.72%) were also commonly cited. See Figure 4-2 for details.

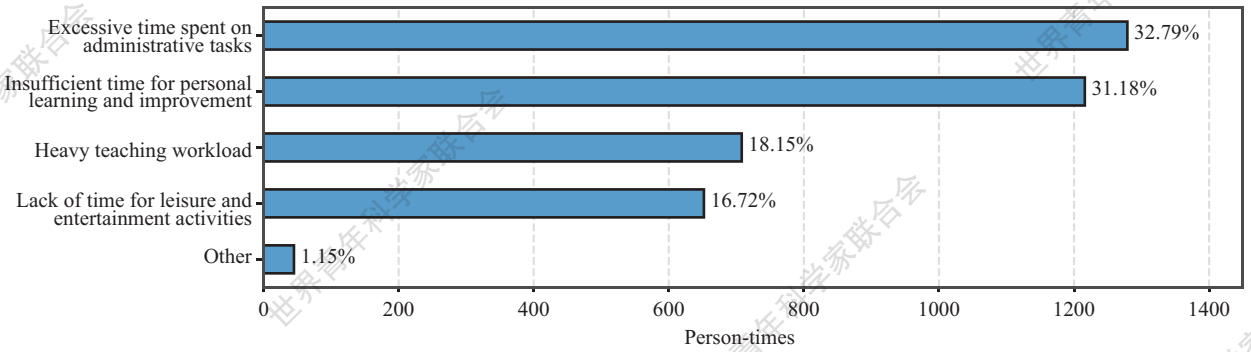


Figure 4-2 Distribution of Research Time Allocation Issues

5 Policy Demands: Funding Support, Research Autonomy, and Reduced Non-Academic Burden

Resource scarcity and evaluation pressure are the primary obstacles in early career development. An analysis of 7,991 responses to "obstacles to development" reveals three most prominent issues, collectively accounting for over 57%: "lack of opportunities/funding" (25.20%), "overly frequent evaluation that discourage innovative work" (16.55%), and "challenges in building research teams" (15.35%). See Figure 5-1 for details.

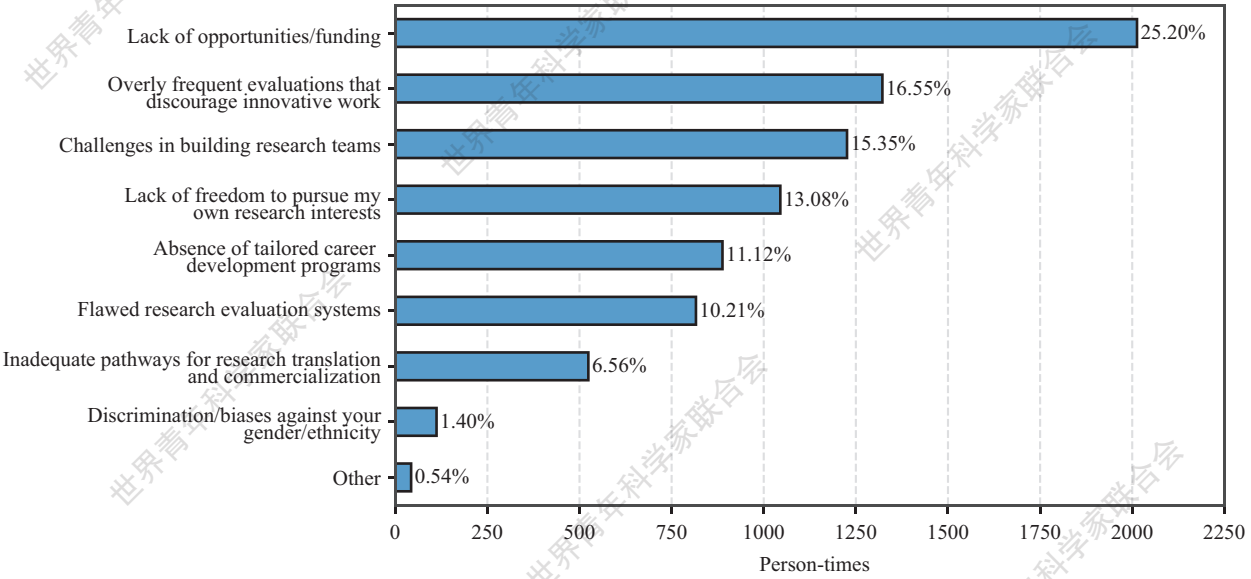


Figure 5-1 Distribution of Obstacles to Development

The policy demands of early-career young scientists are largely concentrated on funding support, academic autonomy, and control over their time. An analysis of 9,274 responses regarding "policy demands" reveals that "guaranteed stable research funding" (23.32%) is their foremost priority. "Research autonomy" (17.22%) and "reduced administration burdens" (15.81%) ranked second and third, respectively. "better salary/compensation (12.48%) reflects an aspiration for improved financial conditions. These demands directly address critical pain points in the current research ecosystem, including resources, autonomy, and rewards. See Figure 5-2 for details.

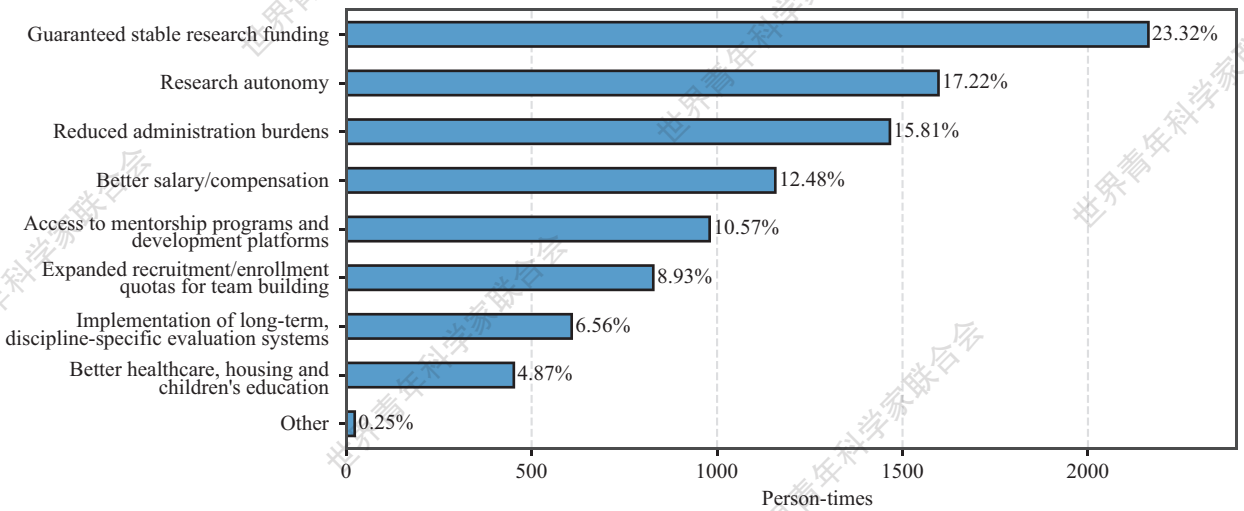
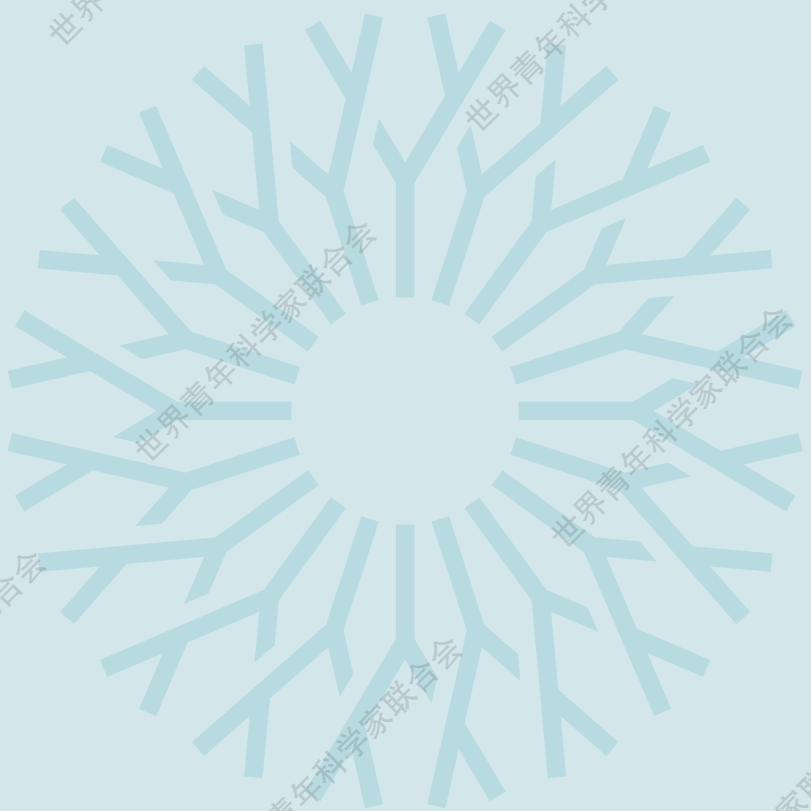


Figure 5-2 Distribution of Policy Demand



For detailed reports, please contact World Association of Young Scientists
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