

The Effects of Cognitive and Non-Cognitive Abilities on Labor's Income in China

Guo, Yujun¹ & Adenan, Ayob²

¹City University, Petaling Jaya, Malaysia

²City University, Petaling Jaya, Malaysia

*Corresponding Author: 564413688@qq.com

To Cite This Article:

Guo, Y., & Adenan, A. (2025). The Effects of Cognitive and Non-Cognitive Abilities on Labor's Income in China. *ICCCM Journal of Social Sciences and Humanities*, 4(1), 26–32. <https://doi.org/10.53797/iccmjssh.v4i1.5.2025>

Abstract: Income, as a core indicator for workers to enhance their personal income levels, is crucial for improving one's life and realizing personal value. Previous research has mostly focused on the impact of traditional factors such as education and health, as well as cognitive skills like mathematical and logical abilities and intelligence levels, on wage income, while neglecting the role of non-cognitive skills such as workers' psychology and personality. Based on classic human capital theory and new human capital theory, this paper reviews relevant literature on human capital, cognitive abilities, and the income effects of non-cognitive abilities, and analyzes from a theoretical perspective the channels through which cognitive and non-cognitive abilities influence wage income. The study finds that both cognitive and non-cognitive abilities of workers have a significant positive effect on their wage income levels.

Keywords: Cognitive abilities; non-cognitive abilities; income effect

1. Introduction

In recent years, the relationship between Chinese workers' human capital, particularly their employment qualities and abilities, and their income has become a hotly debated topic in the field of labor economics. Against the backdrop of rapid changes in the era, generations of intellectuals have continually pursued self-improvement, striving to become outstanding talents who not only meet the demands of the times but also possess composite skills. They are not only committed to accumulating human capital but also expect to obtain higher labor returns through this path, thereby realizing their aspirations for a better life. Lai & Su, (2020), based on human capital theory, deeply analyzed the importance of improving the efficiency of human capital allocation and promoting higher-quality employment, emphasizing that this is a key path to meeting people's ever-growing needs for a better life.

As society's demand for high-quality workers increases, competition for high-salary positions intensifies, leading to a nationwide surge in learning enthusiasm and a significant improvement in scientific and cultural cognitive levels. However, while "knowledge quality" continues to rise, the issue of a lack of "ability quality" has become increasingly prominent. This situation compels us to reexamine the degree of match and stability between Chinese workers' on-the-job skills and their income. The actual utility of quality education in terms of income premiums still requires further verification from the labor market. The research results of (Shi & Ding, 2017) revealed that when the human capital of college graduates is subdivided into academic human capital and practical human capital, the impact of academic human capital on income is significantly greater than that of practical human capital, further highlighting the importance of ability quality.

To address the challenges of industrial transformation and upgrading, the "Opinions of the State Council on Implementing a Lifelong Vocational Skills Training System" clearly state that strengthening the training of skilled workers is a crucial path for workers to seek career advancement and increase their income. When determining salary levels, both workers' professional knowledge and their abilities to solve practical problems should be considered. Furthermore, the newly revised "Vocational Education Law of the People's Republic of China" in 2022 emphasizes the comprehensive requirements for workers' integrated abilities in high-salary technical occupations. In addition to cognitive skills such as professional competence and methodological competence, workers also need to possess non-cognitive

abilities such as social skills and personal abilities to form the comprehensive occupational abilities required by their positions, further enhancing workers' overall "ability quality."

In light of this, the consideration and measurement of the connotation of Chinese workers' human capital urgently require in-depth exploration. The feedback performance of various abilities encompassed by human capital on workers' income needs to be supported by empirical analysis based on relevant data. Currently, there is no clear conclusion regarding the specific contribution differences between knowledge-based cognitive abilities and quality-based non-cognitive abilities to workers' income levels, providing ample room for exploration in this study.

1.1 Research Objectives

This paper aims to deeply integrate the research findings on the income effects of core cognitive and non-cognitive abilities within the framework of the new human capital theory. From a theoretical perspective, it delves into the intrinsic mechanisms and transmission paths through which cognitive and non-cognitive abilities influence income. Through this analytical process, we hope to reveal new directions for the training and enhancement of workers' abilities in the future, providing theoretical support and practical suggestions for workers to achieve ability-based wage premiums through indirect paths. This will help workers attain better development and returns in their careers

1.2 Significance for the Study

This study will bring a new dimension of thinking to the determination mechanism of human capital wages for Chinese workers by analyzing the core essence of traditional and new human capital theories. Traditional theory focuses on discussing subjective factors that influence human capital investment, such as investment duration, return on investment cycle, and personal preference rates. However, in the new human capital theory, cognitive and non-cognitive abilities, as embedded human capital elements within individuals, play a decisive role in determining wage levels throughout workers' careers due to their characteristics that are difficult to surpass in the short term. The continuous evolution of these abilities indicates the long-term continuation of this advantage effect. This suggests that the contributions of cognitive and non-cognitive abilities to workers' income returns cannot be overlooked.

By analyzing the impact of different ability factors on workers' wage income, this study provides an objective evaluation framework based on the ability perspective for the theory of human capital wage determination. This research is not only significant for understanding individual income disparities but also highlights the importance of comprehensively enhancing workers' personal abilities for promoting the overall development of the labor market and social progress. It provides robust decision-making support for workers, helping them make career choices and development plans that are more conducive to increasing their income. Simultaneously, the research findings will offer policy recommendations and theoretical bases for constructing a more scientific and reasonable social talent cultivation system.

1.3 Definition of Key Terms

Human capital theory divides human abilities into two major categories: innate abilities and acquired abilities. Innate abilities primarily refer to basic capabilities determined by an individual's familial background, genetic factors, skin color, race, and other innate conditions. These abilities stem from an individual's origin and are generally regarded as exogenous factors. Conversely, acquired abilities mainly refer to capabilities formed under the influence of socioeconomic factors such as environment, culture, education, and economic development level. These abilities are not only influenced by the socioeconomic environment but also significantly exert a reverse impact on it, thus they are considered endogenous and constitute an important aspect of economic activities. Building upon the theoretical foundation of the formation of human abilities, scholars further subdivide human abilities into cognitive abilities and non-cognitive abilities.

1.3.1 Cognitive Ability

Cognitive abilities, a pivotal concept in the field of psychology, refer to the human brain's capacity to process, store, and manipulate information. They can also be understood as an individual's intelligence and problem-solving capabilities. This ability is often measured by scores on tasks such as reading, data analysis, and mathematical tests. It not only embodies an individual's wisdom and potential but also serves as a key indicator of their adaptability and creativity in complex and changing environments (Yin, 2020).

The formation of cognitive abilities is a complex process influenced by both innate factors and acquired environments. According to an in-depth analysis of Human Capital Theory, human abilities are categorized into innate and acquired abilities. Innate abilities, such as genetic traits and family background, provide a foundational framework for the development of cognitive abilities. However, these factors are often regarded as exogenous variables, whose influence, although significant, is not determinative. In contrast, acquired abilities are largely shaped by factors such as environment, culture, education, and economic development levels, exhibiting strong endogenous characteristics (Nye et al., 2022).

According to the research summary by Zhang et al., (2023), cognitive abilities extend beyond the traditional scope of intelligence and are more extensive and complex. They encompass both physiological basic abilities determined by an

individual's innate endowments, such as logical reasoning and mechanical memory, which are often referred to as Fluid Intelligence. These abilities, grounded in neurophysiology, are heavily influenced by genetic factors and tend to increase and then decrease with age. Fluid intelligence primarily reflects an individual's ability to learn new knowledge and solve new problems, with mathematical reasoning ability being a typical example. On the other hand, cognitive abilities also include Crystallized Intelligence formed through acquired education, learning, and experience accumulation.

Crystallized Intelligence encompasses a broad range of knowledge reserves, language skills, writing abilities, and problem-solving strategies. These abilities are closely related to the sociocultural environment and can continue to develop throughout an individual's lifetime. The enhancement of crystallized intelligence not only relies on individual learning efforts but is also influenced by multiple factors such as family, education, and socioeconomic development levels

1.3.2 Non-cognitive Ability

In 2010, Heckman hosted a seminar at the University of Chicago titled "Human Capabilities," which delved into the concept of "capabilities," research methodologies, and empirical findings, with a particular emphasis on the significant role of non-cognitive abilities in individual development. This perspective was later elaborated by Eric Hanushek in the Handbook of the Economics of Education, where he proposed that a "new human capital" research agenda based on capabilities should be established to better understand and predict individuals' socioeconomic performance, with non-cognitive abilities occupying a central position (Le & Hu, 2017).

Non-cognitive abilities refer to personal traits that, distinct from cognitive abilities, also influence an individual's economic and social performance. Non-cognitive abilities encompass various dimensions such as personality traits, emotional dispositions, and social skills. Although these abilities are difficult to quantify directly, they have a profound impact on individuals' behavioral patterns and life trajectories (Tan, 2023).

According to Hu (2017), research on non-cognitive abilities primarily focuses on two aspects. One is the impact of non-cognitive abilities on individual development, including their influence on income and job performance. A study utilizing data from the National Child Development Survey in the UK demonstrates that a comprehensive assessment of non-cognitive abilities is significantly meaningful for predicting a range of important life trajectories, including educational continuity (such as continuing education after age 16 and obtaining a degree before age 42), career development (such as employment status at age 42, work experience accumulation and wage levels between ages 23 and 42), and health and social behavior (such as smoking, truancy, expulsion, teenage pregnancy, criminal tendencies during adolescence, and even health status in adulthood). The other aspect is the formation process of non-cognitive abilities. Anger (2012) specifically point out that the ages of 5 and 7 are critical periods for the development of both cognitive and non-cognitive abilities, with adolescence being a particularly crucial time for the formation of non-cognitive abilities.

2. Literature Review

2.1 Human Capital Theory and the Relationship Between Ability and Income

The development of human capital theory has undergone three stages, each deepening the interpretation of the concept of "abilities." During the classical and neoclassical political economy periods, abilities primarily focused on workers' productive "capabilities," namely cognitive abilities acquired through apprenticeships, vocational training, or formal education, such as knowledge, skills, and proficiency, while non-cognitive abilities received insufficient attention. Subsequently, modern human capital theory emerged, with scholars like Schultz, Mincer, and Becker delving into the economic effects of human capital investment within the "investment-return" framework. Although they emphasized the central role of education, they somewhat diluted the concept of abilities, concentrating more on quantifiable educational achievements (Yin, 2020).

Entering the era of "new" human capital theory, the research framework shifted to center on "abilities," with cognitive and non-cognitive abilities together constituting a new scope of abilities. Studies by Heckman et al. (2006) and other scholars revealed that education not only enhances cognitive abilities but also significantly impacts non-cognitive abilities, both jointly influencing individual wage levels. This discovery prompted the academic community to reexamine human capital theory, incorporating non-cognitive abilities into the research core.

The continuous evolution of human capital theory has deepened the understanding of the complex relationships among abilities, education, and income. Education, as a pivotal force driving theoretical development, connects students' employment prospects with the development of knowledge and abilities (Jackson & Bridgstock, 2021), establishing a close link between human capital theory, wage income, and individual abilities. In the modern human capital theory stage, education is regarded as the primary means of enhancing cognitive abilities. Through educational investment, individuals accumulate knowledge and skills, thereby improving productivity and wage levels (Zhao, 2022). However, the proposal of "new" human capital theory reveals education's significant impact on non-cognitive abilities, and non-cognitive abilities partly explain differences in educational attainment and lifelong income, indicating that measuring human capital levels solely by education is one-sided. Individual abilities are influenced by multiple factors, including innate talent, family background, and social environment.

Human capital theory emphasizes that wage differences among individuals mainly stem from systematic differences in productive skills, forming the core framework for analyzing wage disparities. These productive skills, as a crucial component of human capital, encompass both innate talents and skills acquired through education, training, and work experience. These skills directly participate in production, becoming key factors determining individuals' labor value. For example, individuals with strong responsibility and perseverance are more likely to attain high-level positions, high salaries, and professional achievements. The market assesses the value of these traits and sets equilibrium market prices for different combinations of skills and traits, thereby determining individuals' wage income. Even when controlling for cognitive abilities, non-cognitive abilities still have a significant impact on individuals' wage income (Gensowski, 2018), highlighting their economic value in the labor market that cannot be ignored.

2.2 Human Capital and Income

In the 1960s, the concept of human capital investment was first proposed by the American economist Theodore Schultz, who explicitly pointed out that education and training are the core of human capital investment, capable of enhancing labor productivity and indirectly increasing workers' labor remuneration. This groundbreaking idea immediately attracted widespread attention in the academic community. Concurrently, Gary Becker's research made significant contributions to the practice of evaluating the returns to education and delved into the relationship between human capital investment and income distribution. Subsequently, the human capital earnings model proposed by Jacob Mincer provided a solid econometric foundation for studying wage income issues (Zheng et al., 2024).

As research deepened, macro-level human capital issues gradually became the focus, with the core still centered on the economic benefits brought by knowledge, skills, and technological progress. However, at the beginning of this century, James Heckman and Tim Kautz, in their article "Hard Evidence on Soft Skills," groundbreakingly discussed the value of non-cognitive abilities in human capital, drawing scholars' attention to both cognitive and non-cognitive skills. This shift in perspective not only enriched the connotation of human capital theory but also provided new directions for subsequent research (Holzer, 2021).

In China, scholars have also conducted in-depth research on the relationship between human capital and wage income. Among these, the impact of rural labor's human capital level on their wage income has become a focal point. Sociologists and economists have pointed out that due to the lack of education and skills, rural labor often finds itself at a disadvantage in the urban labor market, struggling to compete with urban labor. This situation is directly reflected in their employment status and wage income (Li, Tu & Peng, 2019). Simultaneously, through empirical research, scholars have also found that education and training have a significant effect on improving rural labor's wage levels, especially on-the-job training provided by enterprises, which has a more pronounced effect on increasing rural residents' wage income (Li & Hui, 2021). Furthermore, the fundamental role of education in determining migrant workers' wage levels has been reaffirmed. These studies undoubtedly reveal the importance of human capital investment in enhancing workers' wage income.

However, the income disparity issue arising from different levels of human capital cannot be ignored. In a segmented and discriminatory labor market, rural labor with lower levels of human capital often faces more significant wage differentials. These differences are not only reflected in gender and age but also in household registration and region. More severely, the widening wage gap can, in turn, inhibit the incentive for labor to invest in human capital, creating a vicious cycle (Shan & Jiang, 2020).

Additionally, research on human capital theory in the field of labor remuneration has exhibited trends of cyclicity and specialization. Scholars have found that human capital investment plays a crucial role in the individual life cycle of workers, especially the non-cognitive abilities advocated by new human capital theory, whose development spans a longer life cycle, ultimately bringing lifelong economic value to workers. At the enterprise level, the high-quality employment utility and wage income premium effect of specialized human capital far exceed those of general human capital.

2.3 Income Effects of Cognitive Abilities

Cognitive abilities, as the core competencies of the human brain for processing information, have increasingly prominent income effects in the labor market, becoming a focus of attention across various sectors of society.

Firstly, the role of cognitive abilities in enhancing employment and wages cannot be ignored. The research by Zhang & Shi (2020) provides strong evidence that cognitive ability training can facilitate the "upward" mobility of workers in employment, thereby increasing wage levels, with this effect being particularly significant in rural areas. Additionally, cognitive abilities are a crucial driver of entrepreneurial success. A systematic review by Ozawa et al. (2022) further emphasizes the central role of cognitive skills in shaping economic outcomes, playing a pivotal role in both promoting entrepreneurial choices and increasing entrepreneurial income.

Education, as the primary channel for enhancing cognitive abilities, is crucial in influencing the income effect of cognitive abilities. The study by He & Wang (2017) reveals that educational cognitive gaps between genders and between urban and rural areas, particularly in numerical and mathematical abilities, significantly constrain the full realization of the income effect of cognitive abilities. The research by Yang & Zhang (2020) uncovers the transmission path through which cognitive abilities lead to high returns through intermediary mechanisms. Furthermore, in-depth research by Gu (2022) finds that cognitive abilities mediate the impact of mental health on family income, with a contribution rate as

high as 16.96%, and there are differences in cognitive abilities across different income levels. The study by Bastani et al. (2024) explicitly points out that the link between cognitive abilities and income from capital markets is particularly close, highlighting the important role of cognitive abilities in enhancing workers' income.

It is worth mentioning that language ability, as a vital component of cognitive abilities, has an increasingly prominent effect on wage income. The research by (Tan et al., 2017) indicates that proficiency in English significantly increases wage levels, with this effect being particularly pronounced among young employees and university graduates. Meanwhile, the introduction of international evaluation indicator systems such as the Programme for the International Assessment of Adult Competencies (PIAAC) provides important references for assessing the cognitive ability levels of workers (Wang et al., 2020). The study by Palczyńska (2021) further emphasizes that strong cognitive skills not only enhance employee productivity but also help them learn new things and adapt to changing work requirements, thereby further increasing wage levels.

In summary, the impact of cognitive abilities on workers' income is multidimensional and comprehensive. They not only promote employment and increase entrepreneurial income but also influence non-wage income and exert a wage premium effect through language abilities. Therefore, we must attach greater importance to the enhancement and cultivation of cognitive abilities, continuously improving workers' cognitive ability levels through various means such as education and training, to fully leverage their positive role in workers' income.

2.4 Income Effects of Non-cognitive Abilities

The impact of non-cognitive abilities on labor compensation is a complex and multidimensional issue, closely linked to individual traits, market conditions, and societal development trends. Existing research has clearly revealed that non-cognitive abilities play a crucial role in determining workers' income, a finding that has been validated across multiple countries, with its influence being significant.

Firstly, numerous empirical studies, such as the analysis by Yu et al., (2017) using CEES data, and the research by Huang and Xie (2017), indicate that the impact of non-cognitive abilities on wages is generally greater than that of cognitive abilities, particularly among male skilled workers. The study by Yin (2020) further points out that after controlling for traditional human capital factors like education and health, non-cognitive abilities emerge as a key determinant of workers' income, with increases in non-cognitive ability coefficients directly associated with significant rises in income levels. The analysis by Palczyńska (2021) of the working-age population in Poland also supports the positive impact of non-cognitive abilities on wages, albeit with differences in the direction of impact among various non-cognitive traits.

Non-cognitive skills not only directly affect wages but also exert a profound influence on the wages of informal employees by improving health status, reducing the likelihood of overeducation, and increasing social capital. The research by Genli & Liang (2022), even after considering endogeneity and robustness, still confirms the significant positive impact of non-cognitive abilities on the wages of employed individuals, especially white-collar informal workers. The study by Tan (2023) further refines the dimensions of non-cognitive abilities, noting that workers with high conscientiousness and openness have clear advantages in education advancement and income increase, and that the role of non-cognitive abilities in enhancing income levels becomes more prominent in the mid-to-late stages of their careers.

More importantly, non-cognitive abilities play a pivotal role in the process of individuals' career choices, thereby influencing their income levels. The research by Yin (2020) finds that workers with innovative thinking and a strong sense of responsibility are more likely to enter high-income industries, while non-cognitive abilities such as emotional stability and agreeableness significantly promote entry into white-collar professions. The study by Yao et al. (2021) also emphasizes the importance of non-cognitive abilities like communication, cooperation, and emotion management in individuals' career development, influencing not only career choices but also career success. Furthermore, non-cognitive abilities influence the entrepreneurial intentions of college students, further demonstrating their long-term impact on individuals' income potential. Traits such as openness, conscientiousness, extraversion, and emotional stability have a significant positive impact on college students' entrepreneurial intentions, encouraging them to pursue their entrepreneurial dreams and maximize their personal value (Si et al., 2022).

Synthesizing the above findings, the impact of non-cognitive abilities on workers' wage income is multifaceted and deep-seated. It not only directly correlates with wage levels but also indirectly shapes workers' income trajectories by influencing career choices, health status, social capital, and other pathways. Therefore, the role of non-cognitive abilities cannot be ignored when discussing income disparities among workers.

3. Discussion

The theory of human capital has evolved through three stages, with a deepening interpretation of the concept of "abilities." It initially focused on productive capabilities, then modern human capital theory emphasized the central role of education, and the "new" human capital theory expanded to include non-cognitive abilities within its research scope. This broadening of the theoretical framework provides us with a more comprehensive perspective to understand the relationship between abilities and income. As the core of human capital investment, education not only enhances cognitive abilities but also significantly influences non-cognitive abilities, both of which jointly determine an individual's wage level.

In research on human capital and income, scholars have empirically demonstrated the importance of education and training in raising rural labor's wage levels and highlighted the income disparities arising from differences in human capital levels. These studies have not only enriched the connotation of human capital theory but also provided a solid basis for policy formulation. Furthermore, the trends of cyclical and specialized human capital investment offer new research directions, emphasizing the long-term economic value of non-cognitive abilities throughout an individual's lifecycle and the role of specialized human capital in high-quality employment and wage premiums.

The impact of cognitive abilities on income has garnered widespread attention. Research indicates that cognitive ability training can promote employment, increase entrepreneurial income, and exert wage premium effects through specific dimensions such as language skills. These findings underscore the central role of cognitive abilities in determining workers' income and provide effective pathways to enhance workers' earnings.

The influence of non-cognitive abilities on labor compensation is equally significant. Existing research reveals that non-cognitive abilities generally have a greater impact on wages than cognitive abilities and affect workers' income trajectories through multiple pathways. Non-cognitive abilities not only directly influence wage levels but also exert a profound impact on the wages of informal employees by improving health status and increasing social capital. Additionally, non-cognitive abilities play a crucial role in the process of career choice, thereby influencing workers' income levels.

Conclusion

In summary, the development of human capital theory provides us with a framework for deeply understanding the relationship between abilities and income. As the core of human capital investment, education significantly enhances both cognitive and non-cognitive abilities, which jointly influence an individual's wage level. Cognitive abilities play a crucial role in promoting employment, increasing entrepreneurial income, and exerting wage premium effects, while non-cognitive abilities affect workers' income trajectories through multiple pathways, with their influence sometimes even surpassing that of cognitive abilities.

Therefore, when exploring income disparities among workers, we must consider the roles of both cognitive and non-cognitive abilities. Policymakers should value the role of education and training in enhancing workers' cognitive abilities and also pay attention to the cultivation of non-cognitive abilities, such as improving workers' sense of responsibility, perseverance, communication, and cooperation skills through vocational education and psychological counseling. Moreover, enterprises should focus on developing and utilizing employees' non-cognitive abilities to fully harness their potential in improving production efficiency and employees' wage levels. Future research should further explore the interaction mechanisms between cognitive and non-cognitive abilities and their specific impacts across different industries and employment forms, providing more precise guidance for policy formulation and corporate practice.

References

- Anger, S. (2012). The intergenerational transmission of cognitive and non-cognitive skills during adolescence and young adulthood.
- Bastani, S., Karlsson, K., Kolsrud, J., & Waldenström, D. (2024). *The Capital Advantage: Comparing Returns to Ability in the Labor and Capital Markets*. Institutionen för nationalekonomi och statistik, Linnéuniversitetet.
- Genli, L., & Liang, Y. (2022). The impact of non-cognitive skills on wages of informal workers. *Journal of Finance and Economics*, 48(03), 124-138.
- Gensowski, M. (2018). Personality, IQ, and lifetime earnings. *Labour Economics*, 51, 170-183.
- Gu, Y. (2022). Mental Health, Cognitive Ability and Family Income—Empirical Analysis Based on the Follow-up Survey of Chinese Households. In *MATEC Web of Conferences* (Vol. 359, p. 01034). EDP Scienc
- He, J & Wang, X. (2017). Returns to education for cognitive and non-cognitive abilities - An empirical study based on the International Adult Competency Assessment Programme. *Economic and Management Research* (05), 66-74. doi:10.13502/j.cnki.issn1000-7636.2017.05.007.
- Heckman, James, Jora Stixrud & Sergio Urzua (2006) . The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior. *Journal of Labor Economics*, 24 (3) , 411 – 482.
- Jackson, D., & Bridgstock, R. (2021). What actually works to enhance graduate employability? The relative value of curricular, co-curricular, and extra-curricular learning and paid work. *Higher Education*, 81(4), 723-739.
- Holzer, H. J. (2021). V Noncognitive Skills and Labor Market Outcomes: What Do We Really Know?. *AEI Paper & Studies*, 93-108.
- Hu, B. W.. (2017). The impact of non-cognitive ability on workers' income: mechanism exploration and empirical analysis (Doctoral dissertation, Zhejiang University). <https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CDFDLAST2017&filename=1017257339.nh>
- Huang, G. Y. & Xie, Y.. (2017). The effects of cognitive and non-cognitive abilities on youth labour income returns. *China Youth Research* (02), 56-64+97. doi:10.19633/j.cnki.11-2579/d.2017.02.009.
- Lai, D. S. & Su, L. F.. (2020). Contribution of human capital theory to labour market research in China. *Peking University Education Review* (01), 80-89+190. doi:CNKI:SUN:BJPL.0.2020-01-007.

- Le, J & Hu, B. (2017). The impact of non-cognitive ability on labour wage income. *China Population Science* (04), 66-76+127. doi:CNKI:SUN:ZKRR.0.2017-04-007.
- Li, M & Hui, Y. (2021). A study on the impact of education on the wage income of migrant population. *Journal of Population* (06), 28-40. doi:10.16405/j.cnki.1004-129X.2021.06.003.
- Li, X, Tu W & Peng S. (2019). Why do low and middle-skilled labourers earn higher incomes? --Based on the new human capital perspective. *Population and Economics* (01), 110-122. doi:CNKI:SUN:RKJJ.0.2019-01-009.
- Nye, C. D., Ma, J., & Wee, S. (2022). Cognitive ability and job performance: Meta-analytic evidence for the validity of narrow cognitive abilities. *Journal of Business and Psychology*, 37(6), 1119-1139.
- Ozawa, S., Laing, S. K., Higgins, C. R., Yemeke, T. T., Park, C. C., Carlson, R., ... & Omer, S. B. (2022). Educational and economic returns to cognitive ability in low-and middle-income countries: A systematic review. *World development*, 149, 105668.
- Palczyńska, M. (2021). Wage premia for skills: the complementarity of cognitive and non-cognitive skills. *International Journal of Manpower*, 42(4), 556-580.
- Shan J & Jiang D. (2020). Labour Skills Training, Human Capital Investment and Differences in Income Effects - An Examination Based on CLDS Micro Panel Data and PSM-DID. *Industrial Economics Review* (05), 78-88. doi:10.14007/j.cnki.cjpl.2020.05.005.
- Shi, H & Ding, Y. (2017). Human capital, social capital and employment quality of college graduates. *Population and Economy* (03), 90-97. doi:CNKI:SUN:RKJJ.0.2017-03-009.
- Si, W., Yan, Q., Wang, W., Meng, L., & Zhang, M. (2022). Research on the influence of non-cognitive ability and social support perception on college students' entrepreneurial intention. *International Journal of Environmental Research and Public Health*, 19(19), 11981.
- Tan X. (2023). Research on the Influence of Non-cognitive Abilities on the Employment Quality of Labourers (Doctoral dissertation, Jiangxi University of Finance and Economics).DOI:10.27175/d.cnki.gjxcu.2023.001823.
- Tan, Y, Wang, T & Zhou, Y. (2017). The effect of English listening and speaking skills on gender differences in employment - Empirical evidence from CGSS2013. *Financial Science* (10), 122-132. doi:CNKI:SUN:CJKX.0.2017-10-012.
- Wang G, Tang H & Fei X. 2011 A new species of the genus *Pseudourostyla* (Hymenoptera, Staphylinidae) from China. (2020). Human Capital Differences and Income Inequality in the Age of Digital Economy - Based on PIAAC Microdata. *Social Science Research* (05), 97-107. doi:CNKI:SUN:SHYJ.0.2020-05-013.
- Yang, H & Zhang, K. (2020). Cognitive Ability, Social Interaction Style and Household Asset Choice - An Empirical Analysis Based on Chinese Family Tracking Survey (CFPS) Data. *Investment Research* (05), 67-81. doi:CNKI:SUN:TZYJ.0.2020-05-006.
- Yao, X., Shao, J., Wang, L., Zhang, J., Zhang, C., & Lin, Y. (2021). Does workplace violence, empathy, and communication influence occupational stress among mental health nurses?. *International journal of mental health nursing*, 30(1), 177-188.
- Yin, Z. (2020). Research on the income effect of workers' cognitive and non-cognitive abilities under the human capital perspective (Doctoral dissertation, Capital University of Economics and Business).DOI:10.27338/d.cnki.gsjmu.2020.000039.
- Yu, F., Wang, C., Shen, J., Shi, Y., & Li, T. (2017). Effect of cognitive abilities and non-cognitive abilities on labor wages: empirical evidence from the Chinese Employer-Employee Survey. *China Economic Journal*, 10(1), 76-89. <https://doi.org/10.1080/17538963.2016.1274005>
- Zhang, A & Shi, C. (2020). Higher education, personal competence and employment quality. *Chinese Population Science* (04), 98-112+128. doi:CNKI:SUN:ZKRR.0.2020-04-009.
- Zhang, Z. L., Liu, F. H., Lu, H. L., Ma, X. Y. & Zhu, X. Xia. (2023). Research progress of cognitive ability assessment tools. *Occupational and Health* (05), 715-720. doi:10.13329/j.cnki.zyyjk.2023.0125.
- Zhao, Y. (2022). *The Effects of Education and Cognitive Skills on Employability and Earnings for Labor Market Entrants: Evidence from Large-Scale Worldwide Survey Data* (Doctoral dissertation, City University of New York).
- Zheng, Q., Zhan, J., & Xu, X. (2024). Platform Training and Learning by Doing and Gig Workers' Incomes: Empirical Evidence From China's Food Delivery Riders. *Sage Open*, 14(3). <https://doi.org/10.1177/21582440241284555>