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# Transcoding into Certainty:

# How Do Chinese Young Only-Child Women Make Their Career Transition Choice to Programming?

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## Abstract

This study delves into the intricate dance between profession and uncertainty, as experienced by young Chinese Gen-Z women embarking on a journey into the realm of programming. Utilizing qualitative methodologies, including semi-structured interviews and digital ethnography, this research unravels how structural uncertainties—rooted in economic, political, and familial dynamics—shape their career trajectories. The study illuminates how the professionalization of programming acts as a beacon of stability amidst the chaos, offering both concrete and intangible support systems that cultivate a sense of career security. Through this exploration, I uncover the nuanced ways in which these individuals carve out paths to certainty and control, navigating the labyrinth of career development in a perpetually shifting landscape.


**Key words:** Transcoding; Structural Uncertainties; Career Stability, Professionalization, Family and Gender.

# Acknowledgments

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This thesis marks my first venture into the realm of sociological inquiry, a courageous step from my roots in international relations. It is also my maiden effort in employing comprehensive qualitative research methods—from the inception of research design and IRB applications, conducting interviews, and engaging in digital ethnography, to the intricate art of thematic coding. Within the brief span of less than a year, this work would have been an impossibility without your teaching, guidance, and encouragement. In every moment spent with you, I have learned how to better position and navigate myself in a turbulent world. You have been the most fortunate variables in my life, and for that, I will be eternally grateful.

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# Introduction

> *Chinese people transitioning to coding is actually the most common path for Chinese people to immigrate to the United States. This has become an unspoken phenomenon. (Research Subject #18*[1]*)*

> *For me, risk is a constant, especially in the uncertain realm of coding…I chose a career as a programmer not only because it brings me inner peace and enthusiasm but also because it offers relatively high pay and career development opportunities. Even in the face of risks, I have multiple backup plans and strategies to help me find my way and peace of mind in this uncertain world. (RS #47)*

In recent decades, China has witnessed a dramatic transformation in its higher education landscape, characterized by a substantial increase in educational expenditure and a surge in university graduates (Feng and Jia 2024). Despite these advancements, the nation faces severe challenges related to youth unemployment and educational inflation. The number of university graduates soared from 1.14 million in 2001 to an astonishing 11.58 million in 2023, intensifying the competition in the job market. [2] The unemployment rate for young adults aged 16-24 peaked at a record high of 21.3% in June 2023, highlighting a critical mismatch between education and employment opportunities [3] The Ministry of Education's shift from reporting "employment rates" (就业率) to "post-graduation destination rates" (毕业去向落实率) reflects a broader range of outcomes, including entrepreneurship and further education.[4] This measure aims to make the employment rate appear more favorable, but even so, China stopped publishing unemployment data in 2023.

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[1] The following citation from the transcript will follow the format (RS #), indicating the research subject number.
[2] Ministry of Education of the People's Republic of China. "2022 National Education Development Statistical Bulletin (2022)." Accessed November 16, 2022. http://www.moe.gov.cn/jyb_xwfb/xw_zt/moe_357/jjyzt_2022/2022_zt18/mtbd/202211/t20221116_992995.html.
[3] "China's Youth Unemployment Crisis." New York Times. Last modified August 15, 2023. https://www.nytimes.com/2023/08/15/business/china-youth-unemployment.html.
[4] Hunan Provincial Department of Education. "Notice from the General Office of the Ministry of Education on Further Improving the Employment Statistics and Verification of General College Graduates." Last modified May 14, 2021. https://jyt.hunan.gov.cn/jyt/sjyt/bys/tzgg_1/202105/t20210514_16548110.html.

Amid this competitive job market, despite continuing education[5] and seeking opportunities overseas,[6] Chinese graduates still struggle to find jobs. Graduates with humanities (non-STEM ) backgrounds face even greater employment constraints (Xu 2013). Women in humanities are disproportionately affected by gender biases and limited job prospects. The humanities and social sciences, while enriching intellectually, often do not offer the same clear-cut career pathways or financial stability as STEM fields. Consequently, many female graduates find themselves at a significant disadvantage when seeking stable, lucrative employment.

In response to these challenges, a growing number of Chinese young women are turning to "transcoding"—a strategic career shift from non-STEM fields to programming. Despite extensive research on the topic of youth employment, women, and STEM (Michelmore and Sassler 2016; Dasuki and Quaye 2016; Adams and Kirchmaier 2016; Amuedo-Dorantes, Furtado, and Xu 2019; M. K. Ryan and Morgenroth 2024), little attention has been given to this specific transition group within the rising number of STEM students. In fact, transcoding is not merely a means to earn a higher income or a pathway to immigration; it is a strategic maneuver to navigate periods of uncertainty. This phenomenon is worth studying because it reflects a broader interplay of professional aspirations, economic pressures, and personal identities. It signifies a proactive adaptation to the volatile job market and the evolving economic landscape.

In addition, there is a puzzle underlying the transcoding decision. Despite its appeal, transcoding is not without its uncertainties. The tech industry, while promising high returns and job security, is also known for its volatility. Major tech companies have frequently undergone significant layoffs, as evidenced by recent data from the U.S.

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[5] "C9 Universities Undergraduate Teaching Quality Report for the 2022-2023 Academic Year." Sohu. Accessed June 2024. https://www.sohu.com/a/751733409_121124332#google_vignette. China has remained the largest source of international students in the United States for 15 consecutive years (Center for China and Globalization. " Development of Chinese Students Studying Abroad (2023-2024)." Accessed June 2024. http://www.ccg.org.cn/archives/84288).

[6] China has remained the largest source of international students in the United States for 15 consecutive years (Center for China and Globalization. "Development of Chinese Students Studying Abroad (2023-2024)." Accessed June 2024. http://www.ccg.org.cn/archives/84288.)

Bureau of Labor Statistics. This reality presents a puzzling scenario: Why do individuals perceive transcoding as a more stable career choice to navigate uncertainties? What underpins the perceived stability of a coding career? Is it purely economic, or are there deeper psychological and social factors at play? These questions compel us to explore the decision-making processes behind transcoding and the factors that influence perceptions of career stability. In a sentence: how do they make the choice of transcoding?

We need to delve into multiple layers of understanding concerning career development uncertainty:1) ***Structural Uncertainty***: What are the structural uncertainties that transcoders face? What aspects might we be overlooking? How do structural uncertainties impact career uncertainty? 2) ***Professionalization and Uncertainty***: How does the professionalization of programming deal with the career uncertainties?

To address these questions, this research employs a combination of qualitative methodologies, including semi-structured interviews and digital ethnography. Over sixty one-hour interviews were conducted with Chinese millennial and Gen-Z women who have pursued transcoding, most of whom are only children in their families. By deeply exploring the motivations, experiences, challenges, and concerns of these interviewees throughout their transcoding journeys, this study provides a nuanced portrait of the career transitions of Chinese only daughters facing structural pressures and uncertainties in an era of risk.

Through this portrait, the research aims to offer a comprehensive understanding of how structural, systemic, and individual factors contribute to career development uncertainty and how the professionalization of programming helps mitigate the career uncertainties they encounter. This work enhances our grasp of the intersections between technology, profession, family, gender, risk, and uncertainty in the modern era, shedding light on the factors shaping career trajectories and informing future research

on gender and profession. The structure of this thesis will follow the aforementioned research questions, with detailed methodological reflection in the Appendix.

# Literature Review

## Multiple Influences on Career Uncertainty

Career uncertainty, also referred to as career risk, is a significant issue in modern society, encompassing the numerous challenges individuals face in career choice and development. With the acceleration of globalization and technological change, career paths and employment opportunities have become increasingly complex and unpredictable. Various social theories on risk provide different perspectives that help analyze the factors contributing to uncertainty in career choice and development, thereby offering a more comprehensive understanding of the multiple sources of career uncertainty. Beck's risk society theory posits that the development of modern society is accompanied by new global and systemic risks, which stem not only from natural disasters but also from the uncertainties brought about by technological advancements and social changes (Beck 1992; 2009). Giddens' structuration theory emphasizes the bidirectional interaction between social structure and individual agency, highlighting that individuals are both constrained by social structures and able to influence them through their actions (Giddens 1984; 2003). Castells' network society theory explores how the information technology revolution has altered social structures and interpersonal relationships, bringing unprecedented uncertainties due to information asymmetry and rapid technological changes (Castells 2000).

Labor market segmentation theory examines the structural divisions within labor markets and the distribution of different occupational opportunities, where segmentation by race, gender, and social class often leads to career uncertainty (Doeringer and Piore 1985). Research indicates that labor market segmentation exacerbates occupational inequality, with gender and racial factors significantly

impacting career stability and promotion opportunities. Career development theory adopts a life-cycle perspective on career choice and development, noting that career uncertainty manifests differently at various stages of an individual's career. For instance, early career uncertainty regarding direction contrasts with mid-to-late career uncertainty concerning promotion paths (Super 1990; Greenhaus and Callanan 2013) Additionally, the career system is dynamic, with competition and interaction between different professions leading to fluctuations in occupational status. These fluctuations intensify career uncertainty as individuals must navigate their own development while also contending with broader changes within the career system (Abbott 1988; 1991).

## Professionalization and Career Stability

Professionalization theory explores the formation and development of professions, including professional standards, educational and training requirements, and occupational norms. Within this process, career uncertainty often reflects changes in professional standards and educational training requirements. Computer science serves as a typical example of a professionalized field, where its development illustrates the relationship between professionalization and career uncertainty. As computer technology has rapidly advanced, computer science has become an independent discipline with continuously elevated standards, educational, and training requirements (Ensmenger 2010). The professionalization of computer science contributes to enhanced career stability and employment opportunities, with high standards of professional training and clear occupational norms enabling practitioners to maintain relative stability in a rapidly changing labor market. Empirical research demonstrates that computer science graduates have significantly higher employment rates compared to other fields, with most securing stable employment early in their careers (National Center for Education Statistics, 2020).

## Certainty and Control in Contemporary Work Environments

The digital era, characterized by human-machine relationships, alters traditional social dynamics, influencing how individuals perceive certainty and control and amplifying this need. Certainty in work is closely tied to autonomy and control, where autonomy is the quality of being self-governing (Forbes and Jermier 2015) and workplace autonomy is essential for human accomplishment and well-being (Hackman and Oldham 1976). Karasek proposed that job control involves the authority to make decisions and use various skills (Karasek 1979). High job certainty and control positively affect workers, enhancing motivation and well-being through intrinsic motivation and the satisfaction of psychological needs—competence, autonomy, and relatedness (R. M. Ryan and Deci 2000). Conversely, losing job certainty can lead to "alienation," as described by Marx, involving a lack of power, control, and fulfillment in capitalist societies (Mukhopadhyay 2020).

In conclusion, this section discusses multiple influences on career uncertainty, highlighting how globalization, technological change, and labor market segmentation create complex and unpredictable career paths. It integrates theories from Beck, Giddens, and Castells to explore systemic risks, individual agency, and the impact of information technology on career development. The review also examines how race, gender, and social class influence career stability through labor market segmentation and career development theories. Professionalization theory is discussed to show how high professional standards and training can enhance career stability. Lastly, the importance of autonomy and control in work environments is emphasized for job satisfaction and well-being.

However, the current body of research has several limitations: there is insufficient exploration of the mechanisms through which structural risks impact career uncertainty, resulting in a lack of qualitative empirical evidence that captures these dynamics. Additionally, there is a need for more systematic descriptions and comprehensive frameworks that detail the dimensions of career uncertainty, which would help in

understanding its multifaceted nature. Furthermore, much of the existing literature is predominantly focused on Western labor markets, neglecting the unique cultural and economic contexts of East Asian countries. This Western-centric focus overlooks how family dynamics, social expectations, and local labor market conditions in East Asia shape perceptions of career uncertainty. Finally, there is a shortage of studies examining the relationship between professional skills and career uncertainty, particularly how evolving subjective perception of utilizing skills in professional fields contribute to stability or instability in career trajectories. This study aims to fill these gaps by examining career uncertainty within the context of East Asian cultures, providing a nuanced understanding of how structural risks and professionalization processes operate in this region.

# Methodology

This research employs a qualitative approach to investigate the complex dynamics of career transitions among young Chinese women in the context of transcoding. The methodological framework integrates semi-structured in-depth interviews and digital ethnography, both chosen for their capacity to reveal the intricate interplay between individual aspirations and broader societal structures.

Semi-structured interviews formed the cornerstone of data collection, totaling 61 interviews conducted between December 2023 and May 2024. Each interview, lasting at least one hour, was meticulously designed to capture participants' personal backgrounds, motivations for transcoding, familial influences, and perceptions of career uncertainties in a rapidly evolving job market.

Digital ethnography, although not explicitly demonstrating content analysis in this paper, played a significant role in supporting the interviews. The primary platforms included Xiaohongshu (Little Red Book), Weibo, and Yimu Sanfendi (1point3acres)

forums.[7] This method facilitated a deeper understanding of transcoding as a social phenomenon, uncovering latent trends, emergent patterns, and societal attitudes towards career transitions. Notably, discussions on those platforms elucidated nuanced perspectives on immigration strategies, gender biases within tech industries, and the role of intermediary firms like ICC (Indian Consulting Company) in facilitating professional transitions.[8] Secondly, it assisted in pre-emptively understanding interviewees' backgrounds, as many had shared detailed transcoding experiences online, facilitating targeted interview preparation.

The sample comprised predominantly of women (51 out of 61 participants) born after 1981, spanning both millennial and Gen-Z cohorts.[9] All participants held bachelor's degrees in humanities and social sciences, reflecting a deliberate focus on individuals navigating career transitions outside traditional STEM pathways. The inclusion of male participants (10 individuals) provided comparative insights into gendered experiences of career uncertainty, enriching the study's analytical depth. While family size among interviewees was not explicitly controlled, the predominance of single-child families among participants underscored broader societal trends towards nuclear family structures within contemporary China. This demographic insight contextualizes the familial and cultural pressures influencing career decisions among young adults.

Recruitment efforts leveraged social media platforms strategically to target relevant communities discussing transcoding and career transitions. Posts on platforms like Xiaohongshu and Weibo utilized targeted keywords and hashtags to attract potential participants interested in sharing their experiences. The snowball sampling

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[7] Yimu Sanfendi, known in English as 1point3acres, serves as a community platform for Chinese students and professionals in North America, discussing various topics including career opportunities and immigration strategies.

[8] These types of firms, despite their consulting facade, primarily engage in staffing operations, outsourcing employees to other companies in what is colloquially known as contract work. While this may appear conventional, the issue lies in their practice of recruiting individuals who undergo resume padding to inflate their work experience, often portraying them as having years of professional experience. Subsequently, these firms assist in the resume submission process, effectively "selling" these individuals to other companies.

[9] See Pew Research definition on the age range of millennials and Gen-Z: https://www.pewresearch.org/short-reads/2019/01/17/where-millennials-end-and-generation-z-begins/.

method further expanded the participant pool, ensuring diverse perspectives and mitigating biases inherent in self-selection.

This methodological approach is crucial for exploring the nuanced career uncertainties faced by humanities-educated, young Chinese only daughters transitioning into coding careers. Their experiences illuminate diverse pressures arising from professionalization, regional cultural norms, age, and gender. By focusing on extreme cases, this study reveals underlying motivations and pressures less visible in conventional career paths, thereby contributing to a deeper understanding of career trajectories and informing future research on gender dynamics and professional transitions.

# A Structural Play of Uncertainty

## Pandemic: Catalyst of Career Crossroads

The COVID-19 pandemic profoundly influenced career decisions, pushing many towards coding. Existing literature highlights how crises like COVID-19 reshape job stability and career trajectories. Scholars such as Kniffin et al. and Baker noted the heightened risks non-relocatable occupations faced during pandemics, steering individuals toward more stable employment options(Kniffin et al. 2021; Baker 2020). Restubog, Ocampo, and Wang emphasized the role of emotion regulation in vocational behavior (Restubog, Ocampo, and Wang 2020), while Probst highlighted the detrimental effects of job insecurity, advocating participative decision-making to mitigate these impacts (Probst 2005).

The pandemic led to a surge in people pursuing civil service exams for job stability. Interviewees noted that employment reports shifted dramatically towards civil service roles post-pandemic. Personal experiences, such as having family members in healthcare during the crisis, underscored the appeal of secure government jobs amidst

widespread uncertainty. For example, RS#56 highlighted how their perspective on job stability changed after witnessing the pandemic's impact on their family in Wuhan.

> *The pandemic had a huge impact on me because I was in Wuhan during that time. My mom works in healthcare and left for work on the fourth day of the Chinese New Year and didn't return until May. It was a long time without seeing her, and it was really tough…Everyone is chasing stability; the pandemic affected us all greatly…Being a civil servant is really a secure job. Although the salary isn't much, it's stable. Living in a government compound, you'll always have food and drink, and you won't starve. From that point on, everyone started becoming civil servants, and I found it really terrifying. (RS #56)*

## State: Navigating Policy Ripples and Political Tides

State policies and international relations significantly influence career decisions. Interview data revealed the intertwined nature of personal identity, political environment, and career choices. For instance, constitutional amendments and political events in China led some individuals to seek stable environments abroad. Geopolitical tensions and visa regulations also shape strategic choices, especially in fields like computer science. Interviewees described the need to navigate geopolitical tensions and the financial commitments required for higher education abroad.

State policy changes and international relations are primary channels through which the state influences individual career uncertainty. Policies like constitutional amendments directly impact personal beliefs and freedoms, compelling individuals to seek opportunities abroad. Fluctuations in international relations introduce additional complexity, requiring strategic planning to navigate geopolitical and visa challenges.

> *Regarding immigration, not everyone who switches to coding does it for immigration purposes…There were various reasons, the biggest being that I'm part of a minority group—I'm gay. In mainland China, there's no legal protection*

*for the LGBTQ+ community… Another reason is the political environment… like the constitutional amendment in 2016 and 2017, which left me feeling disappointed and wanting to escape…I felt the political environment would only worsen, not improve. So, I decided to immigrate early (RS #51)*

## Market: Rewriting Stability in Volatile Times

Market uncertainties, such as economic downturns, industry changes, and shifts in company recruitment policies, profoundly impact career decisions. Scholars like Probst et al.and Kalleberg highlighted how job insecurity and market volatility necessitate adaptive career strategies(Probst et al. 2007; Kalleberg 2009). The interview data illustrated these impacts vividly. The global economic downturn forced individuals to reassess their career paths, with many turning to more promising fields like coding due to the perceived decline of traditional industries.

*I noticed that the film industry began to decline after the pandemic. After the pandemic, the Cannes Film Festival collaborated with TikTok, which was a very shocking event for the entire film community. Cannes represents the pinnacle of film artistry, while TikTok represents mainstream popular culture. Their collaboration shook the entire film industry…I realized that the decline of the film industry was an irreversible trend...In the face of survival, ideals seem worthless. So I felt that the film industry was no longer viable and that I needed to choose another field. (RS #53)*

Emerging industries, while promising, also exhibit significant volatility. For example, an interviewee described the rapid hiring and subsequent layoffs in an AI project at a telecom firm. Company recruitment policy changes further exacerbate job market uncertainties, particularly for international students requiring visa sponsorship.

*People might think AI will change the world, but the reality is different. For instance, the company where I interned was a large telecom firm with tens of*

*thousands of employees. They wanted to develop their own large language model like ChatGPT. In late 2022, probably around September, they hired 5,000 data scientists to work on AI. However, within three months, they realized they couldn't achieve anything and laid them all off. It was a harsh reminder that dreams can be fleeting, and people's lives can't keep up with the rapid pace of change in the world. Everyone had high hopes, but for the company, it was just a decision or a number. They initiated a project, hired people, but when the project didn't generate revenue, it was back to square one. (RS #35)*

The contraction of job markets globally leads to intensified competition and higher application thresholds. Traditional strategies of applying to numerous positions or acquiring advanced degrees are less effective. The imbalance in labor market supply and demand and the timing of market changes disrupt conventional job-seeking mindsets.

*As a qualified job seeker, I did everything I was supposed to do…I submitted around 500 resumes, not all at once but in batches with a strategy…I still couldn't secure a satisfactory full-time job…I was stuck in a stubborn mindset, believing that if I submitted enough resumes, I would eventually find a job…If not for my friends holding me back, I might have ended up submitting over 2,000 resumes and still been jobless. (RS #36)*

*My thinking was that spending three years on education was fine because the market was booming, and no one anticipated that the situation would worsen in three years… If I had chosen a six-month bootcamp or a one-year college program back then, I might already be working at a big tech company. Instead, because I opted for a three-year program, I am now struggling to find my place in the job market. This experience…dispelling my previous student mentality and making me realize that the world is not within my control. Despite my efforts, market changes are beyond my control. (RS #35)*

# Gender and Implicit Milestones: Breaking Barriers and Redefining Success

Gender dynamics add complexity to professional landscapes, influencing career decisions and perceptions of stability. Gender-based barriers persist in job markets, with explicit discrimination still prevalent in sectors like finance and civil service. Implicit biases also influence career trajectories in environments where direct discrimination is less common. For instance, Asian women in the U.S. face stereotypes that require them to exert more effort for the same recognition as their peers.

> *Actually, there are Asian women in our team as well, but I can clearly see that their resumes include a PhD, paired with a Master's, all in STEM fields, and then a JD on top of that, just to be qualified to sit at the same table as the white males. Meanwhile, other racial males, such as Black and white individuals, might only have a graduate degree and a JD from an ordinary school to be considered qualified.. Even if I were to obtain a JD degree in the future, I have no idea how much more effort and hard work it would take for me to be recognized by these people compared to others. This makes me feel very frustrated. In the future planning of this career path, there seem to be many implicit milestones rather than clear goals. (RS #58)*

Navigating implicit milestones—unspoken societal expectations and professional norms—further complicates career paths. In traditional industries like law, finance, and academia, these implicit milestones create additional hurdles for women. Observing successful transitions highlights the importance of external support systems in mitigating these uncertainties.

# Family: the Magnifying Glass of Uncertainty

## Parents' Professional Experiences and Their Impact

Families act as magnifiers of economic and professional uncertainties, significantly influencing how individuals perceive their career paths. For instance, career uncertainties experienced by parents can intensify the pressure on children to pursue stable careers. An example includes an interviewee whose parents, both doctors, faced punitive measures during a government crackdown on corruption in the medical industry, leading to heightened family stress and influencing the interviewee's decision to stay abroad and transition into coding for a more stable future.

> *In August 2023, my parents experienced some events that made them quite angry, leading them to suggest that I stay abroad for my own development...around that time, the government was cracking down on corruption and embezzlement among doctors, resulting in hefty fines. In the medical industry, pharmaceutical companies often send representatives to collaborate with doctors to promote their drugs, which creates a gray area between legal and illegal activities…Both my parents are doctors, and they felt betrayed by this sudden policy change, as if their decades of grievances were all unleashed at once. They felt like mere pawns in a larger scheme. This became a pivotal moment for me to consider how I could stay abroad, which was related to my decision to transition into coding (RS #59)*

## Conflicting Expectations: Academic Brilliance vs. Career Stability

The transmission of career expectations from parents to children often involves two conflicting result-oriented systems: academic performance and career achievement. Parents desire both outstanding academic results and stable, non-grueling careers for their children. However, achieving high academic performance and graduating from prestigious universities often opens doors to broader career opportunities, which may

involve working far from home or in less traditional fields, leading to a conflict between parental expectations and children's career realities.

### *Professional Expectations: Stability Above All*

Parents, particularly in the current economic climate, emphasize the importance of stable and secure jobs. This is influenced by their own career paths and the socio-economic environment they experienced. For instance, parents working in public institutions often hope their children will find similar stable positions close to home, emphasizing security over passion or interest.

> *With the onset of the pandemic and the current economic situation in China, they see a lot of news online about people being laid off. This has reinforced their belief that having a stable and secure job is crucial. (RS #32)*

> *Mainly, they hoped I could find a stable job. My mom works in a public institution in China, and she hoped that through her connections, I could secure a position within such an institution. This would ensure a stable income and allow me to be close to them, taking care of them while leading a peaceful life. That was their expectation for me. (RS #53)*

> *My parents didn't want me to have a grueling job…They wanted me to have a more stable job. (RS #58)*

### *Academic Excellence: The Pressure of Perfection*

Families often place high expectations on academic performance, believing that excellence in education will lead to better career opportunities. However, the pressure to meet these expectations can be immense. Interviewees expressed feeling overestimated and pressured to live up to the educational investments made by their parents, resulting in significant stress and a feeling of inadequacy when career outcomes did not match parental expectations.

*In my family, I always felt like the "model child." Many of my younger siblings went to vocational high schools and have since graduated and settled into stable jobs. Now, as I face a career change and contemplate leaving my current job, I realize that even if I stay in my original profession, my salary might not match theirs. My job might seem more prestigious, but it doesn't pay as well as theirs. On one hand, this family pressure has made me feel that I've always been overestimated by others. The investment my parents made in my education doesn't match the money I'm earning after graduation. This disparity has indeed brought me a lot of pressure. (RS #53)*

*If I had the capability to score 650 but only scored 500, they would find it unacceptable, not because a 500-score school is bad, but because they couldn't swallow their pride…they described sending me to study abroad as an investment. This investment didn't mean whether I could repay them, but rather if my academic and work performance was enough to justify their investment. It was a very awkward feeling; they didn't want me to repay them, but the pressure they put on me was immense.(RS #18)*

## Generational Gaps in Dealing with Uncertainty

A generational gap in navigating modern economic uncertainties complicates the transmission of career guidance from parents to children. The older generation, having benefited from the stability of a planned economy, often lacks the skills to guide their children through contemporary economic challenges. This gap leaves parents ill-equipped to help their children balance conflicting academic and career expectations, exacerbating the child's perception of career uncertainty.

*My parents originally wanted me to become a university professor because, in their view, it's an easy, well-paid, and stable job. However, becoming a professor often requires a PhD, which they don't want me to pursue because they think women with PhDs won't get married. It's contradictory. Alternatively, they*

*suggested working in a company. I don't know if they had a specific career in mind for me; I never asked, and they never had explicit suggestions…On one hand, they want me to have a stable job, one without risk of being laid off. On the other hand, they want me to earn a lot of money, have plenty of free time to care for them, and achieve some career success. Combining all these expectations is impossible; there is no such job. (RS #32)*

## The One-Child Dilemma: Intensified Pressure in Nuclear Families

China's one-child policy intensifies the pressure on children, as they must meet both academic and career expectations single-handedly. In multi-child families, different children can fulfill different parental expectations, but in nuclear families, the dual burden falls on one child. This leads to increased pressure and heightened perceptions of career uncertainty, as children strive to excel in all areas to satisfy their parents' diverse expectations.

*My family is from Guangdong, and even though I stayed in the US after transitioning to a career in coding, my parents would prefer that I work closer to home so we can gather during the holidays. I have a younger brother who doesn't want to go abroad; his grades aren't great, and he just wants to find a job in Guangdong and live a simple life…Because of this, I feel a lot more at ease knowing my brother is nearby. If I were an only child, the pressure would certainly be much greater.I'm not entirely sure about their attitude, but I think having my brother close by makes my parents more accepting of the distance between me and them. If neither of us were around, they would probably be much more anxious. But with my brother close by, attending a nearby university and frequently visiting home, it surely gives them some peace of mind. (RS #28)*

*But the obstacles from parents in a one-child family are higher than in multi-child families…If I had siblings, my parents might prioritize others, treating me more like an investment. If I fail, they might pressure the next child. (RS #53)*

## Conditional Love: External Validation and Self-Worth

The concept of conditional love in East Asian families fosters a reliance on external validation for self-worth, rather than developing a strong sense of self-affirmation and certainty. This dynamic makes individuals more susceptible to career uncertainty, as they continually seek to meet high external standards. For instance, the clear metrics for self-assessment in coding, such as completing projects and solving problems, provide a tangible sense of accomplishment, mitigating the need for external validation and enhancing career certainty.

> *I believe that the love of East Asian parents is conditional. They want to see me doing well so they can tell others, "My daughter is doing great, she went abroad." They hope that eventually, I'll find a partner, live a stable life, and support the family in their old age. If I were in a different situation, such as struggling to find a job in China or living at home without a stable career, they wouldn't have the same attitude towards me. (RS #02)*

> *Transitioning...I am deeply grateful for this experience because I used to have a profound sense of inferiority. I believe this sense of inferiority stems from the lack of encouragement in the Chinese education system. Growing up, I didn't receive much encouragement, which always made me feel inadequate. I was desperate to prove myself, believing that I had to achieve perfection to feel okay and to allow myself a moment to breathe. My parents didn't provide much encouragement, so I grew up constantly guessing what they wanted from me. (RS #26)*

As a result, while family support can provide a safety net, it often comes with strings attached, deterring significant risk-taking and fostering a preference for stability. Parental financial backing enables risk-taking in career decisions, but the associated expectations can amplify stress and discourage pursuing uncertain or non-traditional career paths.

*Under these conditions of support and expectations, I feel immense pressure. I understand that they have high hopes for me and want me to have a bright future, but the sacrifices and responsibilities behind this make it difficult for me to take risks or pursue uncertain and unrewarding endeavors.* （RS #02）

Moreover, gender expectations add another layer of complexity, with higher and more nuanced expectations placed on women. This contributes to a more intricate perception of career uncertainty, as women navigate not only professional expectations but also societal and familial pressures related to gender roles.

In conclusion, the family's impact on individual perceptions of career uncertainty operates through amplifying economic and professional uncertainties, transmitting conflicting result-oriented expectations, and expressing conditional love that shapes self-worth and career value perceptions. This analysis highlights the intricate ways in which familial interactions and expectations shape career decisions and perceptions of stability, offering a comprehensive perspective on the role of family in navigating career uncertainty.

This section delves into the intricate interplay of structural uncertainties faced by transcoders, examining the multifaceted impacts of the COVID-19 pandemic, state policies, international relations, market dynamics, and family influences. It highlights how these factors collectively shape career decisions and perceptions of stability. The analysis underscores the nuanced ways in which individuals navigate their career paths amidst evolving uncertainties, revealing the crucial roles of economic conditions, political environments, societal expectations, and gender dynamics. By incorporating personal narratives and scholarly insights, this section provides a comprehensive understanding of the structural uncertainties that transcoders face, offering a detailed exploration of the challenges and strategies involved in managing career uncertainty.

# Perceived Certainty in the Professionalization of Programming

What makes a particular career choice emblematic of its time and how such trends capture the collective aspirations and anxieties of an era? The following analysis, drawing from rich interview data, will explain how programming has undergone a mature process of professionalization to mitigate transcoder's career uncertainty.

## The Objective Supporting System

### Career Direction and Adaptation in the Tech Landscape

Navigating career direction and adaptation uncertainty involves understanding the significant choices individuals face in their professional paths and how they integrate into new work environments. This dimension includes decisions about pursuing academic or non-academic careers, transitioning between industries, or changing job roles, and how these choices impact career trajectories. For many Chinese Gen-Z women, transcoding represents a strategic move from the ambiguous career paths in the humanities to the more structured and financially rewarding field of computer science. This shift highlights the importance of clear and attainable career directions in mitigating uncertainty and fostering professional growth.

Understanding career uncertainty through the lens of adaptation involves examining how individuals navigate and integrate into new professional environments. Adaptation is crucial for building a sense of belonging, which in turn enhances job satisfaction and stability. The tech industry, and specifically the field of programming, provides unique conditions that facilitate this adaptation process more effectively than many traditional industries.

The professionalization of programming enhances the ease of building a sense of belonging through several key aspects. Firstly, the tech industry naturally attracts

individuals with shared interests and common goals, such as a passion for technology, problem-solving, and innovation. These shared interests create a strong foundation for community-building. Secondly, the collaborative and inclusive work culture prevalent in tech companies promotes teamwork and continuous feedback, fostering a supportive environment where employees feel valued and included. These factors collectively create a conducive atmosphere for rapid and effective integration.

The interview data illustrates these points clearly. RS #58 compares their experience in a law firm with that in the tech industry, highlighting the challenges of integrating into a traditional professional environment:

> *I feel it's more about identity issues. For instance, when I was at the law firm, I was the only Asian woman born in the 90s on our team. There were no other Asians in our team of about ten people; there were two Black women, and the rest were all white. I got an early sense of the racial distribution in the American work environment and felt that I was definitely a minority there.*
>
> *When people chatted, they often talked about family, background, and life, which are closely related to race. In that environment, I didn't find many common or similar things with them. I put in a lot of effort to try to make friends with them. Initially, they might have had some stereotypes, but with my efforts, we gradually became good friends. Even though I've been away for so long, we still keep in touch.*
>
> *But I know that I put in a lot of time and effort for this. If I had been lazier, I might not have become close friends or colleagues with these people. I feel that this kind of deliberate effort isn't normal. I believe that if a group doesn't require much effort to integrate into, it means there are many shared commonalities, such as attending the same top 50 schools, having several internships at major companies, sharing a passion for technology, and having common interests and topics of*

*conversation. This makes it easy to quickly become part of that circle. However, at the law firm, I didn't feel like I was in such an environment.*

*There are indeed some invisible barriers in law firms that are hard to bridge quickly. After evaluating my situation, I realized that if I want to stay in the U.S. and continue living here without the exhausting efforts required in a law firm, while being able to integrate into a circle, I feel that the tech industry is the quickest way to achieve this. (RS #58)*

## Climbing the Code Ladder: Navigating Advancement and Mobility in Tech

Advancing in the Career Path (Advancement) encompasses the uncertainties related to career advancement and upward mobility within an organization or industry. This dimension covers ambiguous career advancement paths, intense industry competition, and the clarity of promotion routes, which can significantly affect an individual's career progression and motivation. The availability and replicability of resources necessary for career advancement, the presence of role models who exemplify successful career trajectories, and the opportunities for growth and promotion within the field are all critical factors. In the tech industry, clear career progression paths and abundant resources provide a roadmap for advancement, contrasting with the less structured paths in other fields. This clarity and support are vital for individuals seeking to navigate their careers with confidence and ambition.

Career advancement within the tech industry, specifically in programming, significantly mitigates individual career development uncertainties by providing clear pathways, diverse choices, and abundant opportunities for upward mobility. Unlike traditional fields, such as humanities, which are often fraught with limited job openings and intense competition, the tech sector offers a multitude of avenues for professional growth and stability.

### *Clear Pathways and Diverse Career Choices*

The professionalization of programming offers a variety of clear pathways and diverse career choices that help mitigate career uncertainties. In the field of humanities, individuals often face severe competition for a limited number of positions, which can be mentally and physically taxing. As RS #47 points out, the scarcity of job openings and the intense competition for these positions in the humanities create significant pressure:

> *Furthermore, there are relatively few job openings in the field of humanities. Just yesterday, I saw a post from a PhD in Comparative Literature at Harvard stating that this year, across all American universities, good or bad, there were only five job openings for modern literature, yet there are many PhDs in this field, making the competition extremely intense. (RS #47)*

In contrast, the tech industry, particularly computer science, presents a broader range of career options. Whether one chooses to work in large companies, start their own business, or remain in academia, the possibilities are more abundant and varied:

> *In the field of Computer Science (CS), even if you pursue a PhD, you can choose to work in mid to large-sized companies, start your own business, or stay in academia. Career options are more diverse and opportunities are more plentiful.( RS #47)*

This variety not only offers more opportunities for employment but also provides a sense of direction and motivation for individuals seeking professional growth.

### *Practical Skills and Job Security*

Programming professionalization equips individuals with practical skills that enhance their job security, thereby reducing career development uncertainties. Unlike

fields with less tangible skill sets, programming provides concrete and transferable skills that are in high demand across various industries. RS #47 underscores the importance of acquiring practical skills to ensure stable employment:

> *Transitioning into tech doesn't necessarily mean working at major companies or developing cutting-edge algorithms. It's about acquiring practical skills, like data management and basic programming languages, that I can list on my resume to secure relatively simple jobs.(RS #47)*

These practical skills ensure that individuals can maintain employability and earn a stable income, which is a significant factor in mitigating career-related uncertainties.

### *Opportunities for Continuous Growth and Upward Mobility*

The tech industry's dynamic nature and emphasis on continuous growth and skill enhancement further mitigate career development uncertainties. As technology evolves, so do the opportunities for professionals to advance and specialize in new areas. RS #37 highlights the potential for ongoing development and the ability to rise to higher positions within the tech field:

> *Although competition for entry-level positions is intense, there is still room for development as long as one continues to grow, accumulate experience, and enhance skills within this field. I can gradually advance to higher positions, using my background knowledge and skills to create work that AI cannot accomplish. (RS #37)*

Moreover, the ability to pivot within the tech industry provides additional security. For instance, RS #37 mentions the potential to transition from computer science to psychological counseling, using accumulated experience in tech to enhance their new career path. This flexibility allows individuals to adapt to changing market conditions and personal interests, further reducing career uncertainty.

*If I ever grow tired of computers, I can return to the field of psychological counseling, where this life experience will serve as a valuable resource and background for becoming a counselor.( RS #37)*

RS #30 also discusses the potential for becoming an independent developer and relocating to a less stressful environment, which highlights the flexibility and resilience offered by a career in programming:

*Professionally, if possible, after turning 35, I'd focus solely on projects that interest me. If there's no suitable company to join, I'd go solo... I could move to a less prominent city, leave Shanghai, and embrace a more pastoral lifestyle. (RS #37)*

This flexibility to adapt career paths based on personal and professional needs underscores the reduced risk of career stagnation and the enhanced ability to manage career transitions smoothly.

Additionally, the mature professionalization of programming provides clear role models for those entering the field. This visibility of success and the replicability of career paths enhance many individuals' sense of certainty regarding their career development：

*After transitioning, my path became very clear to me…while studying Chinese literature, I saw no such examples… (RS #27)*

RS #08 emphasizes the accessibility of successful role models in the tech industry, regardless of background, age, race, or gender. This visibility demonstrates the strong replicability of the career path in programming.

*There are many role models in this field, regardless of their backgrounds, and you can see them achieving what you desire. They may not necessarily be at an exceptionally high level or famous, but there are indeed successful examples,*

*demonstrating the strong replicability of this path. In fact, the replicability is so substantial that transitioning into coding does not restrict you based on your background, age, race, or gender. People from fields as diverse as political science, arts, and accounting have switched to coding. Last year, I read about someone nearing retirement who was also transitioning into this field on the forum One Acre Three Quarters.(RS #08)*

In summary, the professionalization of programming effectively mitigates career development uncertainties by providing clear pathways, diverse career choices, practical skills, replicable role model, and opportunities for continuous growth and upward mobility. These factors collectively create a supportive environment that addresses the various dimensions of career uncertainty, ensuring stability, direction, and resilience for individuals in the tech industry.

## Anchoring Futures: Economic and Immigration Stability of Tech Careers

Ensuring career stability is essential for mitigating uncertainties related to job security and the overall stability of one's career. Stability encompasses concerns such as visa and immigration issues, industry outlook, and the potential for job loss due to economic or technological changes. Stability is crucial for long-term career planning and personal well-being. For international students and professionals, steady employment and income, along with support for obtaining necessary work visas and permits, are essential. The tech industry's relative stability and growth potential provide a reassuring backdrop for individuals seeking to secure their professional futures amidst broader economic uncertainties.

### *Economic Returns and Job Market Dynamics*

Programming provides significant economic stability through high returns on investment and a strong job market. The transition into programming is often driven by the promise of substantial economic returns. RS #37 highlights the strategic choice of

computer science for its quick return on investment and high starting salaries, ensuring a basic standard of living and the ability to save money for future risks. This economic advantage extends beyond immediate financial gains to long-term security.

> *Choosing computer science is strategic because it offers a quick return on investment, with starting salaries often higher than those of many seasoned psychological counselors. This ensures a basic standard of living while also allowing me to save money, which will be a crucial tool for mitigating future risks.(RS #37)*

> *RS #48 underscores the economic rationale behind choosing a career in coding and adds that the favorable labor market conditions, including lower time costs and entry barriers, make coding a cost-effective career choice that supports economic stability.*

> *Transitioning into coding would take about two to two and a half years, including an internship. My tuition is approximately $17,000 per semester, adding up to $34,000 a year, and $68,000 over two years. During the internship, I could make $8,000 a month, totaling $24,000 for three months. That leaves $60,000 to cover. Most people's total compensation after graduation could range from $120,000 to $150,000 annually, or even higher. This means I could earn back the cost of my Master's degree in one year of work.*

> *...For me, at this stage, transitioning into coding seems like a good choice. One, it takes a shorter amount of time; two, it allows me to learn new things; and three, the market's entry barriers are relatively low, making it cost-effective. (RS #48)*

RS #08 reinforces this by comparing the higher income associated with software engineering to humanities jobs, providing a significant buffer against economic uncertainties. The job market for programming also demonstrates favorable conditions,

with relatively low entry barriers and high demand, making it an attractive option for those seeking stable employment opportunities.

> *From an economic perspective, transitioning into coding isn't as daunting. It's not about working ten years just to pay off student loans. Bending for a living is a very normal thing. The income of a software engineer is much higher compared to humanities jobs.(RS #08)*

### *Visa Support and Immigration Stability*

The tech industry's supportive stance on work visas and green card applications is another crucial factor contributing to career stability. For international professionals, visa support is a critical aspect of career stability. RS #38 vividly describes the immense pressure of immigration status and how transitioning into tech, with its abundant opportunities and visa-friendly nature, gradually alleviated this pressure.

> *However, by transitioning into tech, I gradually found a solution. This profession offers many opportunities and high salaries in the current job market, and is relatively friendly towards visas for foreigners. These factors combined have gradually given me a sense of security and resolved the immense pressure brought on by my immigration status.(RS #38)*

The tech industry's structured pathway to residency and career stability is further illustrated by RS #40, who discusses strategic decisions driven by immigration considerations. The ability to work for large companies experienced in processing green cards provides a stable, long-term career path for international professionals.

> *First and foremost, I needed to solve a significant life dilemma: I had just won the H1B work visa lottery. For the next six years, I would need to be in the queue to obtain a green card. Typically, larger companies are more experienced with processing green cards and are willing to do this for many employees. (RS #40)*

The structured pathway to residency and career stability in the tech industry is not only facilitated by companies with experienced processes and institutional safeguards but is also strongly supported by national immigration and talent programs, as described by RS #59.

> *Indeed, the greatest risk is the inability to stay permanently. I have planned some fallbacks for this scenario, such as the provincial nomination policy of Ontario I just mentioned. This is a provincial immigration program, and Canada also has a federal-level immigration program known as Express Entry (EE). If Ontario's nomination policy changes, I could apply through the EE program. The EE program requires that I work in Canada for a continuous year and then apply for immigration based on a scoring system. Although the score requirements are high, I can strive to find a job related to STEM, which increases the chances of being invited due to STEM-targeted invitations.(RS #59)*

In short, the professionalization of programming significantly mitigates career uncertainty by ensuring career stability through robust economic returns and comprehensive visa support. High salaries and favorable job market conditions provide economic security, while the tech industry's supportive visa policies offer a structured pathway to residency and long-term career stability. Although it does not offer the same level of stability as traditional civil service roles, this form of stability aligns subtly with traditional career expectations, successfully fulfilling Chinese parents' aspirations for their children's careers. This alignment reduces parental interference, thereby decreasing uncertainties in the job search process.

> *My parents didn't want me to have a grueling job. When I worked at a law firm, I often had to work overtime, which they found unreasonable and felt I was overworking myself and not taking care of my health. They wanted me to have a more stable job. In comparison, a programmer's job seemed more stable, with a more predictable income and additional company benefits. Unless one starts their*

*own business, the salary range for programmers is standardized, with each level corresponding to a specific salary range.(RS #58)*

These factors collectively create a stable and secure professional environment, allowing individuals to navigate and mitigate career uncertainties effectively. As such, the professionalization of programming serves as a vital mechanism for securing professional futures amidst broader economic and social uncertainties.

## Harmonizing the Hustle: Work-Life Balance through Tech Flexibility

Achieving work-life balance addresses the challenges of balancing work responsibilities with personal life. This dimension involves managing work pressure, mental health, and the coordination of work and personal life. Balancing these aspects is essential for maintaining overall life satisfaction and avoiding burnout. The tech industry's emphasis on flexible working conditions, supportive work environments, and professional satisfaction aligns well with individuals' desires for a balanced and fulfilling career. This balance is particularly important for those transitioning from fields that may have more rigid or demanding work structures.

### *Flexible Working Conditions and Personal Fulfillment*

Programming, as a profession, offers significant advantages in terms of work-life balance. The flexibility in working hours and the ability to work remotely are core aspects that contribute to this balance. RS #26 provides a compelling narrative on the importance of flexible working conditions. The respondent highlights that a toxic or uncomfortable work environment is unsustainable for long-term employment. Flexibility in working hours, especially the ability to avoid late-night meetings due to time differences, is crucial.

*When considering a job, my top priority is the work environment and the company culture. If the environment or the culture is particularly toxic or uncomfortable, I*

*feel I wouldn't be able to sustain long-term employment there. This is the most critical factor for me. Secondly, I value flexibility in working hours. I prefer not to have work obligations that require frequent late-night meetings, especially those that involve time differences with China or other countries. I aspire for a stable work schedule and daily routine; these are crucial for me.(RS #26)*

The respondent's background as a teacher, where time was meticulously scheduled and personal time was scarce, underscores the value of time flexibility. The ability to allocate more time for personal pursuits and maintain a stable work schedule is seen as more important than salary, emphasizing the significance of work-life balance in enhancing overall life satisfaction.

*Given my extensive experience as a teacher, time is very sensitive to me. My classes were scheduled down to the minute, starting promptly, with substantial preparation like an actor readying for the stage. I spent much of my time aiding others in their progress and growth, leaving little for myself. Therefore, I hope to allocate more time for personal pursuits in the future. Frankly, time is more important than salary. While money can bring a modicum of happiness, having control over your time allows you to create much more joy and fulfillment. Thus, I place a high value on the freedom of time.(RS #26)*

## *Supportive Work Environments and Mental Health*

The professionalization of programming also fosters supportive work environments that are crucial for mental health and reducing work pressure. The tech industry's focus on creating environments that promote professional satisfaction and personal well-being plays a significant role in achieving work-life balance. RS #26 reflects on the challenges of balancing free time in previous roles, where the typical nine-to-six workday did not allow for genuine rest. The pandemic brought an unexpected opportunity to experience more flexible working conditions, which the respondent found invaluable.

*In my previous roles, it was challenging to balance free time, as the typical nine-to-six workday doesn't really allow for genuine rest; any break is merely a pause before more work. During the pandemic, when most teaching shifted online, I suddenly found myself with more time to learn, rest, and pursue hobbies. This was an invaluable asset. Entering the field of computer science or technology, which offers flexibility in time and space, aligns perfectly with my vision for life.(RS #26)*

## Crafting the Coder's Identity: Self-Worth and Professional Recognition

Developing a Professional Identity and Self-Worth (Identity) captures the uncertainties related to professional identity and self-worth. This component includes the process of finding fulfillment in one's work, the struggle for professional recognition, and the development of a clear and valued professional identity. Objective evaluation and professional identity are crucial for personal satisfaction and motivation in one's career. In the context of transcoding, the tech industry's focus on skill mastery and tangible work outcomes enhances individuals' self-efficacy and professional identity, providing a solid foundation for their professional growth and development.

### *Objective Evaluation and Self-Recognition*

Developing a clear professional identity and self-recognition is crucial in mitigating career uncertainty. This involves receiving objective feedback and establishing a sense of self-worth and recognition in the professional field. RS #58 highlights the significant shift from feeling like an adjunct in a previous role to becoming a key contributor in the tech environment. This recognition allows individuals to see their value and feel a sense of accomplishment, enhancing their professional identity and self-worth.

*One major difference is that I'm no longer just an assistant; I'm one of the key contributors to the team. This recognition allows me to see my value and feel that*

*I am creating something, rather than being an adjunct to someone else as I felt at the law firm.(RS #58)*

The tech industry's focus on individual technical skills and tangible outcomes, as opposed to educational background or credentials, also plays a crucial role in fostering a strong professional identity. RS #26 contrasts the certainty and satisfaction derived from concrete answers in engineering with the ambiguity often found in humanities, highlighting the psychological need for definitive evaluations and clear results.

*I find it challenging to locate definitive answers in the humanities, where interpretations are often ambiguous. In engineering or sciences, the existence of concrete answers brings a certain joy. You don't have to spend time pondering whether you're correct or whether others might agree or appreciate your ideas more.(RS #26)*

## *Professional Identity and Self-Worth for Women in Tech*

For women in tech, professional identity development includes navigating gender-specific challenges and finding a sense of belonging and recognition within a predominantly male industry. RS #48 discusses how the intersection of identity as an East Asian woman and a tech professional becomes a driving force in career development, emphasizing the importance of representation and gender equality.

*The intersection of my identity as an East Asian woman with a tech background becomes a driving force and goal in my transition into coding, especially because I am a staunch feminist. Throughout my career planning, educational journey, and research, I emphasize the representation and treatment of women in tech, particularly at different stages of their careers.(RS #48)*

This approach deepens the understanding of unique challenges and opportunities for East Asian women in tech, motivating efforts towards greater equality and representation. The tech industry's emphasis on skill mastery and tangible outcomes

provides a platform where women can demonstrate their abilities and gain recognition, thus enhancing their professional identity and self-worth.

The development of a professional identity in tech also contributes to better mental health by providing a clear sense of value and purpose. RS #30 describes the shift from a role dependent on external validation to one where personal accomplishments and technical achievements define self-worth. This transition reduces reliance on others' performance and provides a more stable and satisfying sense of professional identity.

> *In contrast, in a research and development role, aside from whether the product succeeds or not, if I develop a feature and it's completed, it stands as done, irrespective of its ultimate utility or adoption. The sense of value and satisfaction in this job does not depend on others, which is why I find it more fulfilling.(RS #30)*

## Building a Supportive Network: Community and Resources

Leveraging Resources and Support Systems (Support) focuses on the availability and reliability of resources and support systems that aid career development. This dimension encompasses family and partner support, social networks, and professional relationships. These support systems provide essential resources and emotional backing that facilitate career growth and resilience. The tech industry's collaborative and supportive environment, along with the strong community networks and peer encouragement, plays a vital role in supporting individuals through their career transitions and professional challenges.

### *Community Support and Peer Encouragement*

The role of community and peer networks in providing support and encouragement during the transition to a new career is invaluable. These support systems offer essential resources and emotional backing that facilitate career growth and resilience. RS #41 highlights how North America has made significant efforts to

encourage women to enter the tech field, with numerous supportive organizations and programs aimed specifically at women in technology. This support has been instrumental in encouraging individuals like the respondent to pursue a career in tech.

> *I noticed that North America has made significant efforts to encourage women to enter the tech field, with numerous supportive organizations and programs aimed at women in technology. Whether for diversity or other reasons, there is substantial support for women transitioning into tech. For instance, our school offers scholarships specifically for women, which have encouraged me to pursue the tech field. (RS #41)*

## *Collective Identity and Career Resilience*

The development of a collective identity within the tech community further enhances career resilience. This collective identity is built on shared experiences, common goals, and mutual support. The tech industry's focus on skill mastery and tangible outcomes strengthens this collective identity, providing a stable foundation for professional growth and development.

RS #47 emphasizes the gratitude and appreciation for the efforts made to promote gender diversity and support women in tech. This collective effort fosters a sense of belonging and community, which is crucial for personal and professional growth.

> *Recognizing this, I felt grateful for the awareness and efforts being made by many to promote this cause. I also hope to contribute to the development of 'Women in Tech' in the future. However, my transition to coding wasn't driven by 'Women in Tech' per se; I genuinely enjoy coding and have a passion for it. Nevertheless, considering the challenges women face in this industry, I am grateful for the support available and hope to contribute back to this community in the future.(RS #47)*

The tech industry's emphasis on collaboration and peer networks extends beyond gender-specific support to encompass broader professional relationships. These networks provide essential resources for career development, including mentorship, professional advice, and opportunities for collaboration, as demonstrated by RS#47:

> *Initially, I didn't have a strong sense of identity regarding this aspect, even though I attended the Grace Hopper Celebration (GHC) primarily for job opportunities. However, I realized that some people genuinely engage in activities for the sake of diversity. For example, our school has its own clubs, and the institution supports us greatly. Many American girls have a strong awareness of this, often emphasizing the importance of women standing together and sharing relevant information. (RS #47)*

The supportive environment in tech fosters a sense of belonging and collective identity. These networks not only provide practical resources but also offer emotional and psychological support, which is vital for maintaining resilience in the face of professional challenges.

# The Subjective Feeling of Certainty in Programming

The technical proficiency and the micro-level interactions involved in writing code, providing a sense of subjective certainty. This section explores how the process of skill acquisition, market sustainability of skills, and the subjective experiences in skill utilization collectively contribute to reducing career uncertainty.

## Mastering the Craft

Skill acquisition highlights the relative ease or challenge of learning new skills and the time required to achieve proficiency. This dimension considers the complexity of the skills and the individual's learning curve. RS #46 addresses concerns about the

time investment required to transition into coding, reflecting on the importance of achieving a stable career direction.

> *Since it may take 2 to 3 years to transition into coding, I'm indeed somewhat concerned about my age. I'm currently around 27 years old and hope to have a stable career direction and job by the age of 35, so that job hunting no longer dominates my life. (RS #46)*

The accessibility of programming as a profession and the barriers to entry play a significant role in mitigating career uncertainty. Programming offers relatively low entry barriers compared to other high-skill professions, making it an attractive option for career transitions.

> *During my career transition process, I constantly tried applying for jobs. Originally, many people in the gaming and computer industries did not have matching professional backgrounds, but they managed to enter these fields. This also shows that the barriers to entry in these industries are relatively low, providing me with more opportunities. (RS #53)*

The process of acquiring programming skills, despite its challenges, provides individuals with a structured path to achieving proficiency, which is vividly described by RS #47 as analogous to cooking.

> *Coding imparts a sense of control, allowing you to manage processes through code modifications, which felt empowering…Coding also reminds me of cooking, another activity I enjoy. Cooking involves following recipes with steps that may lead to success or failure; if you fail, you simply try again and make improvements. Coding is similar; it often has a structure, you generally know how the code should be written, and you follow through step by step. While there's inherent uncertainty, the certainty of engaging in a tangible task is higher. (RS #47)*

This structured learning process, combined with the tangible outcomes of coding, contributes to a sense of control and predictability. RS #23 reflects on how coding's definitive nature offers a sense of stability and immediate feedback, contrasting with the ambiguities often found in other fields.

> *Coding offers a stable and secure feeling, providing control in a realm where life often feels unpredictable. There are countless opportunities to optimize and adjust; every problem has a solution, whereas life often does not. (RS #23)*

## Future-Proof Skills

The ongoing demand for programming skills in the labor market plays a crucial role in reducing career uncertainty. The tech industry's dynamic nature ensures that skills such as data management and basic programming remain relevant and valuable over time. RS #46 emphasizes the importance of acquiring skills that consistently secure stable employment.

> *I hope to possess genuine advantageous skills that can consistently secure stable employment and sustain me. For me, transitioning into tech doesn't necessarily mean joining big tech companies or working on cutting-edge algorithms. Rather, it's about acquiring certain skills, such as data management and basic programming languages. Having these skills on my resume would allow me to perform relatively simple jobs. These skills ensure that I can always have a job, with a salary that is acceptable. My aspirations aren't extremely high, but I do hope to have some skills that provide security. (RS #46)*

The sustainability of programming skills is further illustrated by RS #53, who highlights the versatility and potential of VR/AR skills in various industries, ensuring long-term career relevance.

*Although currently, about 80% of companies are focused on VR/AR gaming, I believe the potential of this field is vast. For instance, it could intersect with healthcare, real estate, or even sports broadcasting. (RS #53)*

## The Psychological Rewards

Subjective experiences in skill utilization delve into the personal and psychological dimensions of using acquired skills. The clarity and definitiveness of skill application in programming provide a sense of reliability and predictability, fostering subjective certainty. RS #26 contrasts the ambiguity of humanities with the concrete answers found in coding, which brings a sense of happiness and certainty.

*I find it challenging to locate definitive answers in the humanities, where interpretations are often ambiguous. In engineering or sciences, the existence of concrete answers brings a certain joy. You don't have to spend time pondering whether you're correct or whether others might agree or appreciate your ideas more. This sense of certainty brings me happiness… I need more definitive elements in my life. I want the work I do to have a correct answer, to show clear results, and to provide immediate feedback, which is hard to find in humanities. (RS #26)*

RS #55 also highlights the clear delineation of task completion in coding, which provides a sense of closure and accomplishment, reducing anxiety and enhancing professional fulfillment.

*Coding, however, is different. Once you finish writing code, it's done. If there are minor issues, we can defer them to another task list for future resolution. This ability to clearly discern what's important and what's not makes this work style very fulfilling, providing a strong sense of certainty and accomplishment.(RS #55)*

The sense of immediate feedback, the ability to identify and correct errors, and the uniform concrete results in coding contribute positively to mental health and a sense of accomplishment. RS #23 explains how the operational robustness of coding, combined with its aesthetic appeal, provides a stable and secure feeling:

> *Quantitative analysis involves taking a dataset, writing code, and running it—more straightforward and with a slightly higher barrier to entry but easier to grasp. The results are generally uniform, making it operationally robust…the immediate feedback it provides when errors are made, pinpointing exactly where the issues lie—a rarity in everyday life. You don't get instant feedback on mistakes in other activities with guidance on how to correct them. Coding offers a stable and secure feeling, providing control in a realm where life often feels unpredictable. There are countless opportunities to optimize and adjust; every problem has a solution, whereas life often does not. Those who study sociology know it's a discipline without definitive answers. From an aesthetic perspective, coding and quantitative analysis are intriguing. So, my shift to coding wasn't about financial motives—it was different from most. (RS #23)*

RS #47 emphasizes how the methodical process of debugging can help center attention and gradually calm the mind, enhancing focus and reducing anxiety.

> *Debugging—methodically checking each line and continuously running the code—helped center my attention and gradually calmed my mind, enhancing my focus.(RS #47)*

Additionally, the ability to engage in creative and innovative tasks through programming enhances job satisfaction and professional fulfillment. RS #58 reflects on the meaningfulness of creating something tangible in tech, contrasting it with previous roles that felt less fulfilling.

*My tech job makes me feel like I'm creating something meaningful, unlike my previous role at the law firm, where I felt like an accessory to others. If I make a mistake, I don't feel like a burden to others because it's normal for everyone involved in the creation process to encounter different issues.(RS #58)*

In short, certainty and control relate to the perception that one understand her environment and can predict or influence outcomes within it. Psychologically, these perceptions are supported by a sense of personal efficacy and a stable view of the environment, providing a buffer against anxiety and uncertainty. The desire for certainty and control is both an innate psychological drive and a response to environmental conditions, deeply rooted in the human need to predict and influence outcomes to ensure survival and reduce anxiety.

The professionalization of programming alleviates career uncertainty by providing a structured path to skill acquisition, ensuring the market sustainability of skills, and enhancing subjective experiences in skill utilization. The clarity, predictability, and immediate feedback inherent in programming foster a sense of subjective certainty and professional fulfillment. This, in turn, reduces the psychological and career-related uncertainties individuals face, creating a stable and secure professional environment. The dynamic nature of tech skills and the continuous opportunities for learning and innovation further reinforce this sense of stability and career resilience.

# Conclusion & Discussion

*I think a promising job is one that offers stable income, ample career development opportunities, and visible work outcomes. Coding is a great example because it not only provides a stable financial income but also allows me to see the tangible results of my efforts. This aligns with my current standard for a promising job. (RS #59)*

Transcoding is not merely a career transition choice; it encapsulates the intricate interplay of profession, uncertainty, and identity, deeply embedded within a specific cultural and temporal context. The structural and systemic uncertainties that individuals face in the context of transcoding are multi-dimensional, dynamic, interactive, and intertwined with various roles. These uncertainties are shaped by a complex web of factors, including state policies, market dynamics, family expectations, individual decisions, and uncontrollable natural forces, such as the pandemic. Each risk event comprises a fundamental risk structure formed by these elements. The richness of narratives amplifies the facets of risk perception, thereby intensifying the perceived risk or uncertainty of an event.

The analysis recognizes the often-overlooked role of family in shaping risk perception across various social roles. The increase in the number of actors, from the state to the individual, correlates with an intensified social interpretation of risk events, thereby amplifying perceived risk through this transmission pathway. The family is posited as a crucial agent in enhancing risk perception, with mechanisms through which family influences individual career risk perceptions thoroughly explored. For instance, the one-child policy in China has centralized and sustained economic support for children, enhancing their ability to mitigate risks. However, the pressure of filial piety expectations, concentrated on a single child, conflicts with career choices, thereby heightening individual risk perception. The influence of the one-child policy on parents' risk perceptions of their children is complex and multifaceted, shaped by factors such as family wealth, parental education levels, and job characteristics.

This paper also explores how the structured pathways, skill acquisition processes, and supportive environments within the tech industry contribute to a profound sense of perceived certainty among programmers. By examining both objective systems and subjective experiences, I delve into how professionalization in programming mitigates career uncertainties and fosters a stable professional identity. Drawing from rich interview data, this analysis reveals the intricate dynamics between the acquisition of

technical skills, the sustainability of these skills in the market, and the personal satisfaction derived from their application. Ultimately, this exploration not only highlights the structural supports that programming offers but also underscores the psychological comfort and professional fulfillment it provides, creating a comprehensive understanding of career certainty in the modern tech landscape.

# Future Research and Practical Recommendations

## Risk Perception

This paper offers a preliminary exploration of how family influences individual perceptions of career risk. However, the mechanisms underlying this influence warrant further investigation. The study highlights significant differences in how families with multiple children versus single-child families perceive career risks. The one-child policy has created a generation of only children, and the shift from multi-child to nuclear family structures has profoundly impacted risk perception across generations. How does this intergenerational change shape an entire generation's risk awareness? Future research should delve deeper into the mechanisms through which family influences risk perception, considering factors such as family structure, wealth, and parental education levels.

## Internalization of Professionalization

In terms of professionalization, it involves both external processes and internal cognitive transformations—essentially, the internalization of professionalization. How do individuals internalize and navigate the standards and expectations of their professions, and how does this internalization impact their career trajectories?

## Education and Employment Policy Practice

The research reflects a core issue within the Chinese education system: a disconnection between the career aspirations shaped by the educational environment and the realities of the job market. Despite ongoing reforms, China's education system struggles to adapt to evolving demands due to its sheer scale and significant regional differences between coastal and inland areas. Future research should investigate how to reshape career expectations within the current education system to better align with market realities, thereby fostering more objective job-seeking and employment outcomes. For employers and policymakers, beyond offering comprehensive welfare benefits, they should innovate work systems and alter workplace interactions to enhance perceived stability for employees. Implementing these subtle psychological insights from the study poses a challenge but promises significant improvements in employee well-being and retention.

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# Methodological Appendix

Before initiating the interviews, a comprehensive interview guide was developed, and approval was obtained from the Institutional Review Board (IRB). Semi-structured interviews were employed to flexibly explore participants' experiences, perspectives, motivations, challenges, and decision-making processes regarding transcoding and career transitions. Digital ethnography enabled observation and analysis of online communities and social interactions within coding forums, programming communities, and platforms such as Xiaohongshu, Douban, Weibo, and Yimu Sanfendi, enriching the cultural and social context of transcoding discussions. By combining personal narratives with broader group dynamics captured in these online spaces, detailed accounts were gathered to elucidate factors driving transcoding decisions and perceived risks and rewards. This methodological combination provides a comprehensive approach to exploring the complexities of transcoding and career transitions among non-STEM graduates in China, contributing to a nuanced understanding of the phenomenon.

Recruitment efforts targeted transcoding-related topics on social media platforms, leveraging a snowball sampling method. While this approach introduced limitations such as selection bias—favoring more proactive participants—it also benefited from platform algorithms and user demographics. To mitigate participant self-selection, at least 50% of interviewees were recruited through snowball sampling and direct invitations, ensuring a diverse sample. Studying user profiles across mainstream Chinese social media platforms facilitated balanced selections and accurate recruitment targeting, particularly advantageous for engaging young female audiences active on platforms like Xiaohongshu.

Initially focusing on Chinese mainland-born women born after 1981 with non-STEM high school and undergraduate backgrounds at any transcoding stage, interviews were conducted in three phases. Male interviewees were included in the second phase

for comparative insights. Although family size was not specified among interviewees, random sampling revealed a predominance of nuclear family structures among millennial and Gen-Z generations, enriching sample diversity.

Interviews were conducted online via Zoom without video to ensure participant comfort and anonymity, recorded, and transcribed. Participants selected pseudonyms to maintain confidentiality, with interviews conducted in Mandarin to facilitate authentic exchanges. Tailored interview protocols fostered deeper engagement, revealing unexpected facets of the transcoding process. Each interview, lasting 40 to 80 minutes, was conducted with participant consent.

Direct quotations were translated into English as needed to convey specific tones and cultural nuances, offering an intimate perspective on the opinions of the Chinese millennial generation. Data coding followed a constructed analytical framework, acknowledging subjective interpretation and translation influenced by cultural and personal backgrounds. Careful consideration is advised during data review due to these inherent subjective elements.