IMPACTS OF WORK CONNECTIVITY DURING NON-OFFICE HOURS ON EMPLOYEE'S ATTITUDES AND BEHAVIORS: A COMPARATIVE CASE BETWEEN GENERAL STAFFS AND EXECUTIVES IN EDUCATIONAL INSTITUTIONS IN SHANDONG PROVINCE, CHINA

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A dissertation submitted in partial fulfillment of the requirements for the degree of

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DECLARATION

I, Chen Xiangzhi, hereby certify that the work embodied in this dissertation entitled “Impacts of Work Connectivity during Non-Office Hours on Employee’s Attitudes and Behaviors: A Comparative Case between General Staffs and Executives in Educational Institutions in Shandong Province, China” is result of original research and has not been submitted for a higher degree to any other university or institution.

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ABSTRACT

Title : Impacts of Work Connectivity during Non-Office Hours on Employee's Attitudes and Behaviors: A Comparative Case between General Staffs and Executives in Educational Institutions in Shandong Province, China

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This study explores the effects of work connectivity outside office hours on the attitudes and behaviors of general staff and executives in educational institutions in Shandong Province, China. With a foundation defined by the Conservation of Resources (COR) theory and the Job Demand-Resource (JD-R) model, the research examines how digital connectivity impacts role overload, quality of work life, employee engagement, and counterproductive work behaviors. The researcher gathered data through a survey with 626 valid responses and then analyzed it using social science research software.

Findings reveal that work connectivity outside office hours increases role overload and counterproductive work behaviors while diminishing the quality of work life and employee engagement for both staff and executives. These effects were more pronounced among general staff. Differences were also noted in how information technology usage and identity awareness influenced work connectivity for the two groups. The results indicate that work connectivity is often unavoidable, and managing its impact is essential to mitigate adverse outcomes on employee well-being and

organizational productivity. These results can aid policymakers and leaders in facing the implications of work connectivity beyond regular hours to foster a healthier work environment.

Keyword: work connectivity, employee attitudes, employee behavior, non-office hours

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CHAPTER 1
INTRODUCTION

1.1 Background of the Study

With the development of modern industry, the forms and requirements of work have changed in new ways, and work has produced more significant changes for individuals (Kanter, 1977; Giddens, 1991). As a result, the academic community has become a new research hotspot regarding the segmentation of personal life, i.e., the segmentation of the work domain from the non-work domain.

With the development of mobile internet technology and socio-economic pressures, more and more employees use mobile phones and computers to liaise with their colleagues on work matters during their breaks, which brings convenient conditions for employees to advance their work and challenges at the same time.

Due to the simultaneous permeability and resilience of work and non-work boundaries (Hall et al., 1988), early studies focused more on the factors that make employees willing to stay in touch with their work after work. It was found that employees with a deeper sense of identification with their work and those with stronger career ambitions (Fenner, 2004) were more likely to stay in touch with colleagues for work after work (Desrochers, 2010). However, with the advancement of internet technology and the popularity of mobile phones and computers, more and more people have started to use electronic devices to deal with work-related matters after work, for example, people may receive calls from work while eating, check their emails while on holiday, and message their colleagues when they are on break in case of an emergency, etc., a phenomenon that Fenner and Renn (2004) refer to as "technology-assisted supplementary work", arguing that the use of technology makes it possible for employees to stay in touch with colleagues over work at any time and place. From an employer's perspective, removing time and space barriers through technology can simplify the collaboration process and increase employee productivity (Lyytinen & Yoo, 2002). Conversely, from the employee's perspective, the advent of such technology has allowed the traditional concept of clear temporal and spatial boundaries separating work and non-work to fade away. The disappearance of such boundaries has both advantages

and disadvantages: the absence of clear boundaries means that employees can stay connected to their work at all times, which may be beneficial for those seeking flexible working arrangements or those who need to be in communication with off-site partners around the clock, but for the majority of employees, it can make them feel as if they are always "on call" (Sophie Watt, 2013).

In order to specifically examine the consequences of this behaviour, Richardson and Benbunan (2012) proposed the concept of work-connectivity behaviour after hours. Subsequently, the scholar Zhang Guanglei (2018), after integrating the previous concepts, formally proposed the concept of Electronic Communication during Non-Work Time in order to emphasise that this connectivity is generated by relying on modern electronic information technology, arguing that electronic communication during non-work time is the use of mobile phones, computers, and other information and communication technologies during non-work time to conducted work-related electronic communication. Ye Meng (2018) describes the nature of this behaviour in detail as "behaviour that occurs during non-work time, outside the workplace in the traditional sense, using advanced information and communication technologies to perform role-assigned tasks. It is not bound by formal contracts or compensation agreements and does not replace tasks performed in the traditional workplace, but rather complements them."

Digital Work Connectivity, the use of digital technologies to work away from the usual workplace or working hours, has been introduced in a recent study by Chadee et al. (2021). However, the use of these digital technologies is also inseparable from intelligent terminals such as computers and mobile phones, so in terms of functionality and operability, Digital Work Connectivity is also only more advanced work connectivity during non-office hours

Regarding the current state of research, the academic community is still divided on the conceptual definition of individuals' use of mobile communication devices to deal with work-related matters during non-office hours. Not all of them agree with "work connectivity during non-office hours." For example, Park et al. (2011) adopted the 'Communication Technology Use at Home,' which refers to work connectivity during non-office hours but limits the office's location to the home. On the other hand, Van Zoonen et al. (2020) restrict the type of communication device to smartphones,

using the expression' Smartphone Use After Hours'. In addition, several scholars have adopted the definition of 'Work-Related Use of Information and Communication Technologies after Hours' (e.g., Huo et al., 2022; Wang et al., 2022; Wang et al., 2022). Wang et al., 2022; Ye Meng et al., 2018). The natural objects targeted by these concepts are very close to each other. However, the specific expressions of the concepts are pretty different, which undoubtedly adds considerable difficulties to the integration and development of this research field.

Ma Li and Tang Qiuyao (2022) broke through the limitations of the previous single perspective. They divided work connectivity during non-office hours into two dimensions, active and passive, to explore the impact of work connectivity under different willingnesss on employees' creativity. Work connectivity during non-office hours brings many benefits but is not the only way to improve employees' creativity. Office hours bring many benefits, such as employees can complete urgent tasks at home without returning to the company to work overtime, which gives employees more flexibility and autonomy, improves work efficiency, and increases job satisfaction and engagement (Cheng et al., 2023). However, it also gives rise to some problems, such as disturbing employees' everyday family life, exacerbating work-family conflicts, stimulating their stress perception and emotional exhaustion, and triggering more counterproductive behaviors, etc. (Wu Jieqian et al., 2018; He et al., 2020). This means that work connectivity during non-office hours is a critical and realistic issue, and its impact on employees' work and life deserves in-depth study.

In this research, work connectivity during non-office hours refers to the fact that with the rapid development of information and communication technology, organizational staffs are commonly use communication devices (e.g., cell phones, computers) and application software to work at home. This application of technology has completely changed the traditional way of sitting in an office work situation in which employees can be more flexible and comfortable in dealing with the relationships between work and life as well as their work autonomy has been significantly improved. Nevertheless, the boundary between the work domain and non-work domain is gradually becoming blurred as employees feel that their private lives are constantly "invaded" by work. These two contrasting experiences raise the question of whether technology is improving our lives, liberating our work autonomy or its simply

abducting human personal life. As a product of modern technology, work connectivity during non-office hours is becoming increasingly frequent in the daily lives of employees. However, this topic has yet to be recognized and empirically studied in the circle of Chinese professional academia of management major (Desrochers, 2010).

The increased competitive pressure in the modern workplaces and the improvement of information and communication technology have led to the fact that general staffs still have to answer work-related phone calls, deal with work-related emails, receive and respond to work on social software after work hours. As the work connectivity during non-office hours has become widespread, scholars are beginning to realize that work and non-work are interpenetrating and that there is a complementary and mutually influential relationship between the two domains (Kanter, 1977; Pleck, 1977). At the same time, it has been confirmed in studies that the conflict and balance between work and non-work can also have noticeable impact on the personal lives of both the general staff and the executives in modern organization (Kanter, 1977; Giddens, 1991) The potential implication from the change of life and work styles have received wide attention and causing debate throughout society, posing new challenges to individual and corporate performance. For example, Deutsche Telekom has started to implement a strict management system to restrict the company from keeping employees connected via smartphones even after work hours; Volkswagen has specified that no work-based emails are allowed to be sent to regular employees other than executives and paid overtime employees between 7:00 p.m. and 6:15 a.m. each day (Derks etal., 2014).

In this context, the issue of discussing and comparing how general staffs and executives deal with the relationship between work and non-work and the different effects of work connectivity during non-office hours on these two groups, as they are striving to achieve a balance in their personal lives, has attracted widespread attention. Scholars have proposed and researched work-family boundary theory, role boundary theory, and work / non-work boundary management strategies in the past few decades. Although these results have made essential theoretical contributions on explaining the boundary between work and non-work, general staff and executives still face the dilemma of low work-life balance, especially with the development of technology and modern day economy. As the work characteristics and work styles shifted to the new

trends, the imperative of general staffs and executives to conduct work / non-work boundary balance management becomes more of significant challenges (Valcour & Hunter, 2005; Kossek & Lambert, 2005; Poelmans, 2005a).

According to Resource Conservation Theory, when perceiving a reduction in their resources or facing the threat of resource loss, individuals will engage in further defensive behaviors and attempt to make up for their losses (Hobfoll E, 1989). To relieve stress and replace lost resources, employees are likely to choose a range of work withdrawal behaviors to avoid work. Individuals playing other roles in non-work domains are often forced to interrupt work connectivity during non-office hours due to the interference of work connectivity during non-office hours, in which case the individual perceives the stress caused by multiple roles in one (Ma Li et al., 2021). DERKS et al. (2014) showed that work connectivity during non-office hours is a high work demand that causes emotional and energy depletion. This kind of 'invisible overtime' seriously depletes the resources of individuals, which leads to insufficient resources for employees to face other volitional activities and makes them more likely to engage in some negative coping behaviors.

Work connectivity during non-office hours is far away from the direct supervision of the organization. The assessment of the employees is mostly result-oriented, which may make the employees pay more attention to the speed and quantity of the work done and potentially increase the reinforcement of the employees' work during non-office hours, thus accelerating the loss of the employees' resources. (RAFFERTY, 2004) In order to further reduce resource loss, employees will intentionally reduce the resources invested in their work and implement some negative behaviors.

This research addresses the growing interplay between work and non-work and the different aspirations of general staff and executives for managing work and non-work boundaries. It explores the impact of work connectivity during non-office hours on general staff and executives of modern organization of Chinese context and examines how the relationships between work and non-work can be moderated through the use of different boundary management strategies, addressing the impact of different management strategies on the outcome variables related to the work and non-work domains.

The issue to be noted in the study is that the current definition of work-nonwork boundaries by general staff and executives in China can be explained by looking at different situations from other countries in a particular cultural context entirely different from that of other countries. For example, in Chinese context, as far as a temporal boundary concerns, the general staffs and the executives define working and non-working time differently. Moreover, as far as the matter of physical boundaries involved, general staff and executives also define workplace and non-workplace quite differently. Additionally, for psychological boundaries, general staff and executives also have different definitions of work and non-work behaviors.

Since most of the management theories come from the researches generated in Western context of academia overlooking the different of cross-cultural aspects people attitudes and behaviors in organization, it is necessary to focus more on the impact of culture on experimental data and the analysis results of this study.

In this research, the organizations representing the education industry in Shandong Province, China are chosen as the unit of analysis. The study aims to empirically investigate the impact of work connectivity during non-office hours on people's attitudes and behaviors as a comparative study between general staff and executives in educational institutions in Shandong Province, China. The research questions to be addressed here include: 1) Is there a general pattern that can be found for the educational industry group proposed to be studied in this paper? 2) Do they show any specificity from their professional characteristics? 3) If such specificity exists, how should the relationship between work and non-work be balanced for general staff and executives, etc. For this series of enquiry, the preliminary hypothetical argument address that the education industry, due to its strong professional and technical nature, high work requirements, and relatively flexible work flexibility, presents a different relationships between work and non-work no different than other industry groups. By comparing to other industries, employees in the education industry have more accessible working hours and locations and can switch roles more easily. Accordingly, work connectivity during non-office hours seems to be less troublesome and not causing much uneasiness for education professionals. However, an in-depth and comprehensive understanding of education professionals' work and family situations reveals that work connectivity during non-office hours can also cause problems for those who work in

the non-executive level (Daantje & Hellen, 2014).

As China's education industry has moved from high-speed development to a healthy and rapid development path led by quality, and the competition for development quality is very intense. In this competitive context, employees in the education industry are burdened with heavy teaching and research tasks. At the same time, organization staffs have to deal with the pressure of promotion and tenure assessment, and working around the clock seems to become the norm. The intertwining of stress and anxiety at work leads to counterproductive work behavior and has a negative impact on employee loyalty and engagement to the organization. This research will compare the effects of work connectivity during non-office hours on the attitudes and behaviors of general staffs and executives by using theoretical tools and frameworks such as the Job Demands-Resources model and Conservation of Resources Theory, etc.

1.2 Research Questions

The research questions to be investigated by using quantitative research method are:

(1) What are the impacts of work connectivity during non-office hours on the work perception, attitude and behavior of the general staffs and executive staffs of educational institutions in Shandong, China?

(2) What are the similarities and differences between the general staffs and executive staffs' attitude and behavior toward work connectivity during non-office hours?

(3) How can we practically and constructively manage these workplace circumstances and challenges in the context of educational organization?

1.3 Significance of the Study

In today's rapidly developing economy, people's demand for work is to provide for their families and pursue happiness and well-being, which is becoming increasingly important in modern people's work goal system. With the rapid development of communication technology and the emergence of new work styles such as telecommuting, mobile work, and virtual teams, the link between general staffs and

executives is becoming looser and looser. Happiness at work has become an effective glue to motivate and retain high-quality staff and can effectively improve management efficiency (Fisher. 2010). Higher job well-being is not only practical to improving staffer's individual job role performance and reducing staffer's willingness to leave but also to improving organizational performance (Bakker&Bal,2010). In recent years, more and more researchers have begun to focus on the relationship between work-based communication tool use and staff's work well-being and found that both negative and positive effects of work-based communication tool use on staff's work well-being are reflected in the management process (Diaz et al., 2012; Ma et al, 2016).

On the basis of this study, for the different identities of general staffs and executives, the education industry can establish a management policy that is compatible with them, and at the same time, the individuals can also adopt the corresponding individual boundary management strategies based on the results of this study. Through the new management policy, the negative impact of work and non-work conflicts can be minimise, making it an effective tool to improve work efficiency and satisfaction in the education industry. In addition, this study is valuable for issues such as general staffs and executives relationship management.

Firstly, this study examines the differential responses that employees may have to the demands of "24/7 connectivity" for work communication in the new context of "24/7 connectivity" at work. When exploring work connectivity during non-office hours, a boundary crossing between work and non-work, most of the studies focus on the possible negative impacts on the family and work of a single group of people, while fewer studies compare the impacts on the work domains of both general staffs and executives, especially the possible impacts on the workplace of both groups. of comparative studies, especially the possible negative impacts. By focusing here on the possible positive and negative effects of work connectivity during non-office hours on the attitudes and behaviours of both general staffs and executives, this study contributes to a more comprehensive understanding of the current unavoidable effects of work connectivity during non-office hours on individual work domains and its underlying mechanisms, in order to better respond positively to the effects of work connectivity during non-office hours.

Second, in today's society, work is an essential part of many people's lives, and work significantly impacts individuals' attitudes and behaviors. Especially in the current organizational context of rapid change and high work pressure, work connectivity during non-office hours may affect the attitudes and behaviors of general staff and executives in different ways.Therefore, there is an urgent need for employees to acquire new ways of managing work connectivity during non-office hours in the organization, and the proper management of work connectivity during non-office hours is vital for the survival and development of the organization, which positively affects individual performance (Spreitzer & Porath, 2012). This comparative study can help guide improved employee practices for managing work connectivity during non-office hours, thereby contributing to positive work outcomes.

Most importantly, China is currently the world's major economic entity and has a very large population base of over 1.4 billion people, and work relationships in the Chinese context have characteristics that differ from those in the West. According to Huang Guangguo's (1991) "human face model," interpersonal relationships in the workplace are mixed, with both instrumental components (working together to accomplish work tasks) and emotional components (arising from interactions on and off the job). The development of supervisor-subordinate guanxi (SSG) in the Chinese context also arises from interactions on and off the job. In this context, examining the impact of work connectivity during non-office hours under China's unique traditional culture and social values is of great academic value.

This study was conducted to increase the attention of managers in the education sector on work connectivity during non-office hours. It seems that it has become the norm for employees to stay connected to their work through the use of mobile communication tools during non-office hours, and this behaviour can sometimes have a positive impact, but it can also have a significant negative impact, and if work connectivity during non-office hours does not work as expected by managers, or even has a negative effect, the loss will outweigh the gain. If employees' work connectivity during non-office hours is not improved over time and the organisation does not provide appropriate help, employees will develop negative feelings, which will eventually lead to a series of problems and may have a greater impact on the organisation's performance. This study can improve managers' thinking about work connectivity during non-office

hours, and schools can provide appropriate organisational support to develop strategies to reduce irrelevant work connectivity during non-office hours and the many negative impacts it brings.

This study discusses general staff's and executives' different attitudes and behaviors toward work connectivity during non-office hours from a new theoretical perspective. While most studies have analyzed executives or general staff separately, with relatively independent and separate studies, this study integrates theory and research through the different attitudes and behaviors of the two groups to better develop management strategies for the education industry.

In the modern world, work connectivity during non-office hours is unavoidable, and it is important for both organisations and employees to try to avoid the negative effects of this seemingly convenient behaviour. Organisations need to be aware that prolonged work-life separation can be psychologically burdensome for employees, and even more detrimental to the long-term health of their teams and organisations.

It is important to analyse the different reactions of general staffs and executives to work connectivity during non-office hours due to their different identities, and to formulate corresponding coping strategies. Because of their different identities, general staffs may be more prone to negative emotions than executives when facing work connectivity during non-office hours. Managers need to realise that instructing employees to complete work during non-office hours for a long period of time or at a high frequency will not only fail to improve team performance, but will also devour the employees' work status. Both managers and employees must have better time management strategies. In particular, managers need to take the initiative to prompt employees to task nodes, control the team's work time rhythm, so that the work as much as possible in the work time to deal with good, so that employees can relax physically and mentally in non-work time.

Therefore, executives should try to reduce the non-working time temporary arrangement of work tasks for subordinates; general staffs also need to correctly look at the non-work area for "hidden overtime", reasonable arrangement of work and life rhythm, so as to strengthen their own sense of control over the work.

In addition, this study can provide theoretical support for human capital management in the education industry. Only a little attention has been paid to work

connectivity during non-office hours in management practice in the education industry, and relevant theoretical studies are scarce. This study proposes and examines the different attitudes and behaviors of general staffs and executives during work connectivity during non-office hours in the context of China's unique traditional culture and social values and explores the construction of organizational support policies that are consistent with the work characteristics and personality traits of the education industry in China, mainly to provide a reference for human resource policies.

This study suggests that the education industry should pay attention to the negative effects of employee work connectivity during non-office hours. Nowadays, employee work connectivity during non-office hours should be a growing concern for managers in the education industry, as the negative effects are detrimental to both the industry and employees, especially when employees experience long periods of work connectivity during non-office hours. The negative effects can be detrimental to both the industry and employees, especially when employees experience long periods of work connectivity during non-office hours. Therefore, schools should take appropriate measures against such behaviours as appropriate in order to reduce the present phenomenon that the negative effects of work connectivity during non-office hours are detrimental to the development of the industry.

This study will provide organisations with suggestions on how to deal with general staffs and executives facing the effects of work connectivity during non-office hours respectively. When employees experience prolonged work connectivity during non-office hours, the university should provide necessary support and resources in a timely manner. When employees feel that the university cares about and values them, negative emotions and negative impacts can be reduced, which is conducive to achieving a win-win situation for the industry and employees.

In conclusion, this study further enriches the theoretical understanding of the field. It provides valuable insight into how employees can mitigate a range of adverse effects from work connectivity during non-office hours while helping to reconcile the conflicting findings of work connectivity during non-office hours. It provides a valuable new direction for research.

1.4 Objectives of the Study

(1) To study the impacts of work connectivity during the non-office hours on the attitude and behavior of general staffs and executives in educational institutions in Shandong Province, China.

(2) To conduct a comparative analysis on the attitude and behavior of general staffs and executives on the work connectivity during non-office hours.

(3) To provide guidelines for the general staffs and executives in educational institutions on managing the impacts of work connectivity during the non-office hours.

1.5 Limitation of the Study

There are inevitably some weaknesses and limitations which can be sorted out and summarized:

(1) The measurement scales of the variables involved in this study partly use mature foreign scales, individual use of domestic empirically tested, more widely used scales, and the measurement of the general group has a solid universal type. In order to make the survey more in line with the actual characteristics of the research subjects, this study has made revisions in the presentation of some of the questions. However, such revisions have yet to be validated by top scholars and need to try to adapt to the Chinese socio-cultural background and personality traits. The localization of the scale needs to be strengthened to enhance the scale's local adaptability and occupational relevance.

(2) Although much preparatory work was done to obtain the data, some batches of questionnaires were distributed and collected mainly by telephone contact and email, and it was not easy to control the degree of understanding and response of the sample to the questionnaires.

(3) This study could not precisely infer the causal relationship between work connectivity during non-office hours and the attitudes and behaviors of staff in the education system. Although this study explored the influence of work communication tool use on attitudes and behaviors in conjunction with a significant sample survey level, both methods were more or less subject to retrospective bias. They could not conclusively infer the causal relationship between work communication tool use and attitudes and behaviors. Future research can further test the findings of this study using

experimental, quasi-experimental, and experience sampling methods.

1.6 Structure of Chapter

This paper is written in academic paper format with several sections such as abstract, acknowledgement, table of contents, and figure of contents before the main text to set the overall tone of the paper.

The main body of the paper will describe the problem under study in five chapters.

The first chapter is an introduction, which is an overview of the study, including the background of the study, problems of the study, objectives of the study, significance of the Study, scope of the study, research method, and the study's background: study, research method, benefit of research, limitation of the study, structure of chapter.

The second chapter is the Literature Review, which briefly overviews the literature. A detailed review of the relevant literature explains the theory of the relationship between the independent and dependent variables using the relevant literature, introduces the relevant theory, and explains the relevant reasons for the choice of the theory used after completing the summary and introduction of the theory, I will construct a theoretical framework diagram through the existing theory, and this chapter will conclude with an explanation and definition of the relevant academic terms involved in the study.

The third chapter is Research Methodology, which will focus on the research methodology and hypotheses. First, I will introduce the composition and measurement of the independent and mediating variables and dependent variable scale items. Then, I will propose the corresponding research hypotheses for the independent and mediating variables. After the above work is completed, the sample, sampling method, data collection method, data analysis method, and the significance of the indicators used in the study are introduced, and finally, the reliability of the scale is analyzed in this chapter.

The fourth chapter is Result of the Study, which summarizes all the study data and describes the statistical variables in detail, completes the descriptive and inferential statistical analysis of all the variables, and produces the analysis results.

Chapter 5 is Conclusion and Recommendation, which summarizes the study's

findings, discusses the conclusions, finalizes the findings, and reflects on the study's shortcomings. In addition, recommendations will be made for the relevant research groups to deal with work connectivity during non-office hours, and future research directions for this issue will be elaborated.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

This section will introduce the theories and models used in this study including the variables of non-working time work connectivity behavior that directly impacts employees' attitudes and behaviors. Apart from the discussion on independent variable, other mediating and dependent variables includes job performance employee engagement and counterproductive work behavior. In addition, this chapter will focus on these two aspects as the primary measurement directions and the measurement of employee perceive role overload and quality of work life.

This section explains the relationship between communication technology and non-working time work connectivity behavior, the concept of office and non-office hours and the review of literatures on the Conservation of Resources Theory and the Job Demand-Resource model. The concepts of perceive role overload, quality of work life, employee engagement and counterproductive work behavior will be discussed.

2.2 Theoretical Framework

2.2.1 Conservation of Resources Theory

Conservation of Resources Theory (COR) is an essential branch of stress research, which was first proposed by Hobfoll (1989) to explain the behavior of individuals in stressful situations based on the perspective of resource gain and loss, reflecting the process of resource interaction between individuals and the social environment. Hobfoll (1989) defines resources as "individual characteristics, conditions, energy, and other things that individuals find valuable or ways to obtain them." As a result, resources in the social environment can be divided into five primary types: material resources, condition resources, personality trait resources, energy

resources, and supportive resources. Among them, material resources refer to particular goods that individuals own, such as land, property, furniture, food, cars, etc.; conditional resources refer to resources that individuals have and can guarantee or create conditions for obtaining valuable resources for themselves, such as marriage, occupation, work experience, education, etc.; personality traits are traits formed by individuals based on their worldview, which are Energy resources refer to the resources that individuals need to have in order to obtain the previous three types of resources, such as physical fitness, time, energy, knowledge, etc. Supportive resources are the external guarantee conditions for individuals to create or maintain valuable resources, including supportive relationships with superiors and subordinates, good organizational culture, unified team goals and values, etc.

Resource conservation theory assumes that people actively acquire and strive to maintain and protect critical resources. According to the core view of the theory, the more resources individuals have, the less likely they are to suffer from attacks or threats of resource loss and the more capable they are of acquiring resources (Cao Xia & Qu Jiaojiao, 2014). At the same time, the theory also reflects the core driver of work-family gain generation - resource synergy. In a specific time range, individuals' resources are limited in quantity, and the distribution of different kinds of resources in different domains always follows a relatively stable ratio. If this ratio changes significantly, it can disrupt the balance of resource allocation between different domains, such as work and family, and may cause role conflict. For example, suppose an individual works overtime for a long time. In that case, it will significantly reduce his or her commitment to family matters, thus causing a work-to-family conflict. Resource conservation theory also emphasizes that different types of resources can compensate and migrate with each other. In other words, individuals strive to balance resources between work and family. Once the balance is broken, people will use more resources in one area to compensate for the lack of resources in other areas. For example, individuals who have received a

promotion and a raise for their hard work can hire others to perform household chores that they do not have time for, compensating to some extent for the lack of time and energy they devote to their family roles.

Resource conservation theory was initially used in stress research and then gradually expanded from the field of psychology to the field of management. In this century, significantly since 2014, Chinese scholars have gradually increased their research on resource conservation theory, mainly applied to work-family conflict (Zhao Fuqiang et al., 2016; Wang Ying et al., 2016), intention to leave (Gao Zhonghua et al., 2012; Liu Yingbin & Han Caixin, 2016), constructive behavior (Duan Jinyun, 2012; Li Yanping et al., 2017), work engagement (Yuan Ling, 2014; Cheng Yanyuan et al. 2015; Yin Kui, 2017), and burnout (Chen Jing, 2009; Zhuo Qun, 2015; Liao Huahua et al., 2016; Li Yuhui, 2017) in studies.

2.2.2 Job Demand-Resource Model

The Job Demand-Resource model (JD-R) provides a theoretical explanation of the pathways through which work connectivity during non-office hours affects the attitudes and behaviors of general staff and executives from the perspective of resource gains and losses. On the one hand, work connectivity during non-office hours affects the attitude and behavior of General Staff and Executives. On the one hand, work connectivity during non-office hours enhances employees' perceptions of autonomous decision-making and discretion in their work (Fujimoto Y, Ferdous A S, Sekiguchi T, et al. 2016), which can be seen as an increase in resources that enhances positive perceptions of work, which is a path to promote employee prosperity. On the other hand, work connectivity during non-office hours leads to a gradual blurring of the boundary between work and life (Wang X. C., Xu N. Z., Liu J., et al. 2019), and employees have to be tired of responding to calls that may come from the work domain at any time. It is difficult to detach physically and mentally from work on time (Park Y A, Fritz C. Jex

S M. Relationships, 2011), it is difficult to have a restorative experience, and resources are constantly depleted and not replenished promptly, creating a negative perception of work, which is a path that hinders employees' prosperity.

Previous studies have used the Job Demand-Resource model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) to explain the impact of work-based communication tools on employees' work roles and the mechanism of their effects. Job demands refer to "aspects of work that require continuous physical and psychological effort, including physical, social, and organizational demands on the employee"; job resources refer to "factors at work that contribute to the achievement of work goals, help reduce stress caused by job demands, and help motivate personal growth and development factors, including physical, psychological, social, organizational and other factors related to the resources." The work demand and work resources together form the working conditions of employees. The work demand-resource model suggests that an individual's work environment can affect the performance of employees' work roles through two different processes: health impairment due to excessive work demands and work motivation impairment due to depletion of work resources. (Demerouti et al., 2001). Therefore, reducing work demands or increasing work resources can effectively improve employees' job role performance.

In an earlier study, Richardson and Thompson (2012) found that work connectivity during non-office hours can activate work resources' acquisition and attrition spiral, ultimately affecting employees' work-family conflict experiences. Specifically, on the one hand, work connectivity during non-office hours makes it difficult for employees to disengage from work situations, which in turn does not allow employees to recover physically and mentally and ultimately exacerbates their work-family conflict experiences; on the other hand, work connectivity during non-office hours work connectivity during non-office hours allows employees to gain more control over their work time and place (a vital work resource), which in turn reduces their work-

family conflict experience.

On this basis, Ter Hoeven, van Zoonen, and Fonner (2016) introduced the Job Demand-Resource model to study work connectivity during non-office hours. Previous qualitative and quantitative studies have shown that work connectivity during non-office hours increases employees' sense of job competency and control (Cavazotte, Heloisa Lemos, & Villadsen, 2014). Moreover, the ability of employees to handle work matters promptly is also essential to other employees and is a sign of being a competent, flexible, and committed employee (Mazmanian et al., 2013). Recent studies have shown that work connectivity during non-office hours is associated with employee job satisfaction (Diaz et al., 2012), job effectiveness (Chesley, 2010), and job engagement (Ten Brummelhuis, Bakker, Hetland, & Keulemans, 2012) were positively correlated. Based on the above analysis, Ter Hoeven et al. (2016) concluded that work connectivity during non-office hours has the characteristics of a work resource.

At the same time, previous studies have shown that work connectivity during non-office hours has two fundamental demands unpredictability and interruptions (Cavazotte et al., 2014; Chesley, 2014; Former & Roloff, 2012; Jarvenpaa& Lang, 2005; Matusik& Mickel, 2011; Mazmanian et al., 2013; Perlow, 2012; Rennecker & Godwin, 2005; Thomas et al., 2006). Work connectivity during non-office hours allows for immediate information exchange and consultation, which is unpredictable and increases recipient workload (Jarvenpaa & Lang, 2005; Perlow, 2012; Thomas et al., 2006). Because of this unpredictability, people often experience interruptions in work connectivity during non-office hours in two ways: work interruptions (e.g., Derks & Bakker, 2014) and non-work-life interruptions (Cavazotte et al., 2014). These interruption experiences can add to employees' work stress (Former & Roloff, 2012), feeling overwhelmed by work and thus experiencing physical and psychological complaints (Chesley, 2014). Based on the above research, Ter Hoeven et al. (2016) argue that work resources and specific communication tool-related work demands

characterize work connectivity during non-office hours. Ter Hoeven et al. (2016) conducted a study with 663 Finnish employees on the ideas mentioned above, which were tested. The study showed that work connectivity during non-office hours was positively associated with contactability, communication effectiveness, unpredictability, and interruptions.

Similarly, Ragsdale and Hoover (2016) argue that work resources and demands characterize work connectivity during non-office hours. Specifically, they argue that we can understand work connectivity during non-office hours as characterized by work demands in three ways: first, it provides a gateway into non-work life for work demands. Second, work connectivity during non-office hours provides a gateway to work-related information, which causes people to spend more time working and thinking about work-related issues, which is harmful to both family and work; third, it makes some organizations raise expectations or norms for employees to continue working during non-work hours. Third, it causes some organizations to raise expectations or norms for employees to continue working during non-work hours. Meanwhile, work connectivity during non-office hours is a resource for employees with high work role perceptions. Ragsdale and Hoover (2016), through a study of 313 full-time employees, showed that work-based cell phone use during non-work hours and cell phone attachment was positively associated with work engagement.

Overall, the existing research broadly supports the characterization of work connectivity during non-office hours as both a work demand and a work resource.

2.3 Interrelationship Between the Variables

2.3.1 Office Hour and Non-Office Hour

In recent studies on work and non-work, related scholars tend to directly use the terms “work” and “non-work” for the definition of work and non-work domains and make specific remarks on them. Non-office hour is a new definition and has yet to be

clearly stated as authoritative definition of this term in academia. In the past decades, teachers' work would generally be done in the office or classroom. However, because of the rapid development of new communication technologies, especially under the strict control policies in China during the epidemic from the beginning of 2020 to the beginning of 2023, most schools conducted online teaching for more than one year, thus making the boundary between office hour and non-office hour disappeared. (i.e. attending meetings, trainings, giving lessons and answering students' academic questions through online tools like Ding talk, zoom, WeChat, etc). After the epidemic ended, the education industry became more interested in various online social platforms such as Ding Talk, Zoom, WeChat, etc. The use of and reliance on online tools such as Zoom, WeChat, etc., has not weakened, which has led to a large amount of work that teachers still need to deal with during non-office hours, so it is necessary to propose a new concept for the education sector, namely office hour and non-office hour.

2.3.1.1 The concepts of work and non-work

As socially viable individuals, the content of people's lives is usually divided into the work and non-work domains. In studies on the relationship between work and non-work, the work domain is more uniformly defined because it is based on the division of labor in industrial societies. Therefore, the work domain is defined in most studies as the activities related to obtaining wages. Geurts and Demerouti define work as "a set of tasks performed when an individual occupies a position in an organization" (Geurts & Demerouti, 2003). In the definition of the work domain, where and how work is done is also an important issue as Zedeck has defined work as "a set of tasks that are accomplished when there is a goal" (Zedeck, 1992).

Unlike Geurts and Demerouti’s, Zedeck’s definition of work extends beyond the constraints of a specific physical location and places more emphasis on the individual's subjective definition of work. Some individuals may define tasks performed to achieve

goals as work. In contrast, others may not consider them a work activity, and such differences may lead to different perceptions of the relationship between work and non-work.

In contrast to the uniformity of work definitions, work and non-work-related research defines the non-work domain more broadly, including family life, personal life and life out of the work place context. In early work-non-work related studies, the non-work domain was mainly identified as family life. Thus, early related studies also mainly discussed the work-family relationship, in which the family was defined as the basic unit of society that included two adults and children. The work-family relationship also primarily discusses how parents with jobs can fulfill their work tasks while assuming family-related responsibilities (Poelmans, 2005). Such studies have limitations, such as overemphasizing the individual's family responsibilities as a parent and neglecting the rest of the individual's family life.

In addition, the work-family is often replaced by the work-home. This definition overemphasizes the physical spatiality of work and family life, where work is often limited to a fixed location, such as an office or a factory. However, new trends in work characteristics and styles have emerged with the development of technology and the economy. For example, the massive use of computers, smartphones, and other communication tools has made it more convenient for employees to work or handle personal matters in different settings with new distance working methods, such as working from home. These enable employees to the possibility and conditions of arranging their working time and place according to their situations, as this trends blur the physical boundaries between work and non-work (Desrochers S and Sargent L D, 2004).

Work and non-work sites increasingly appear to be overlapping and permeating, with employees being able to engage in matters outside of work at the workplace more conveniently and vice versa. In this context, the relationship between the two is

becoming increasingly challenging regarding physical space. Another widely used concept of the non-work domain is "life," which has been defined as work-life and has been studied under a wide range of topics, including work-life balance, work-life conflict, and work-life integration (Duxbury & Higgins, 2001; Kossek & Lambert, 2005; Milliken & DDunn-Jensen, 2005). However, such a definition has its flaws. First, the definition makes a complete distinction between work and life, considering them as two separate or even opposing domains, and work often brings significant effects to an individual's life (Kossek & Lambert, 2005). In fact, for real-life individuals, work is often a part of their personal life. On the one hand, due to changes in work hours and occasions, traditional work tasks are often already performed at the time and place of one's life. On the other hand, not only work may affect one's health and psychological factors, but also one's life is often affected by completing one's work (Watson, 1995; Duxbury & Higgins, 2001). Therefore, work and life should not be two opposing sides but rather two parts of an individual's life.

2.3.1.2 The relationship between work and non-work

At different stages of research on the relationship between work and non-work, scholars have different views on the relationship between the two domains. Most of the traditional views consider work and non-work as either/or opposed to each other, i.e., an individual's work domain and non-work domain are relatively independent or even opposed (Branett R C, 1998), because they compete for limited resources such as time and energy, thus giving rise to concepts such as work-life conflict (Voydanoff P, 2001; Greenhaus J H and Powell G N., 2006). Nevertheless, as research progressed, scholars realized that work and non-work were still interpenetrating even within a given boundary. Thus, work and non-work are gradually considered as two complementary and mutually influencing domains (Pleck J H., 1977).

(1) Conflicting Work and Non-Work Relationships

Due to the temporal and spatial incompatibility between the roles and tasks that individuals play in the work domain and the non-work domain (Barnett, 1993), inter-role conflicts between the two domains arise (Barnett, 1993; Edward & Rothbard, 2000). For example, work-family conflict is "an inter-role conflict arising from the incompatibility of some aspects of role pressures from work and family (Greenhuas & Beutell, 1985)". In addition, work-family conflict has been divided into three categories: time-based conflict, stress-based conflict, and behavior-based conflict. When time is spent in one of these domains, the resulting stress and corresponding behaviors may result in completing roles in the other domain. Moreover, the conflict between the work and family domains could be symmetrical. For example, conflicts that arise from the work domain toward the family domain do not necessarily correspond to conflicts that arise from the family domain toward the work domain.

Research on work-family conflict generally focuses on the causes, mediating, and regulating mechanisms of that conflict and the outcomes that follow it (Geurts & Demerouti, 2003). Such studies have yielded rich findings, including identifying different causes of conflict, such as time, stress, behavior, or excessive role embeddedness. These causes are not only directed to work and life conditions but also to the way work is organized and oriented, including variables such as individual personality traits, work characteristics, family characteristics, and attitudes related to role centrality (Frone. et al., 1997; Elloy & Smith, 2003; Geurts & Demerouti, 2003). In addition, the results of the effects of work-family conflict include mainly the effects on the physical and mental health status of individuals (Frone. et al., 1997) and the effects on attitudinal variables such as job or life satisfaction (Rice. et al., 1992; Frone. et al., 1997; Kossek & Ozeki, 1998). In summary, such studies on the effects of work-family conflict have focused on the negative work and non-work relationship, leading to concerns about work and non-work balance and subsequent related research.

(2) Work and Non-Work Gaining Relationship

As representing the reverse interaction between work and non-work domains, there is a gaining relationship between work and non-work. Whether the previous conflict or the balanced relationship exists, there is an implicit assumption that one side always hurts the other between the work and non-work domains. Accordingly, a positive relationship exists between work and non-work (Pedersen D E, Minnotte K L. and Kiger G. et al., 2009). The concepts often mentioned in such studies include "gain," "enhancement," or "facilitation." Gain refers to the idea that an individual's role in one domain somehow enhances his or her role in another and that resources are not limited. Thus, individuals can accomplish multiple tasks simultaneously by increasing their energy or other resources (Greenhaus & Powell, 2006; O'Driscoll, 2006; Hil. et al., 2010).

First, the experience of work life and the experience of family life can have a positive impact on an individual's health (Barnett & Hyde, 2001), especially when both are high-quality experiences (Perry-Jenkins et al., 2000). In addition, satisfaction from work and family enhances individuals' feelings of happiness, life satisfaction, and perceived quality of life (Rice, Frone, and McFarlin, 1992; Rice, McFarlin, Hunt, and Near, 1985). Second, playing a work or family role can help individuals relieve the stress from another role. For example, individuals with more job experience and job satisfaction experience lower stress levels from the family role (Barnett, Marshall, and Sayer, 1992; Voydanoff & Donnelly, 1999). Similarly, individuals with higher levels of family satisfaction also experience lower stress levels from their work roles (Barnett, Marshall, and Pleck, 1992). In addition, experiences in one role can be used in another role. For example, resources individuals acquire in one social relationship can be reinvested in another role (Sieber, 1974).

(3) Balanced Work and Non-Work Relationships

A balanced relationship between work and non-work often implies the absence of conflict between the two, usually in the sense that the individual invests equal time and effort in both work and non-work domains. For example, work-family balance has been defined as "individuals who invest equally in their work and family and are equally satisfied with their work and family roles" (Greenhaus, Collins, and Shaw, 2003). However, research findings suggest that absolute equality is rare and unequal inputs between the two domains do not necessarily lead to individual dissatisfaction. Investing different amounts of time and effort in different domains is a prerequisite for higher satisfaction (Khristense, 2000; Clark, 2000). Based on the revised perception of absolute equality, later scholars repositioned the work-non-work balance as "the effectiveness and satisfaction of individuals in fulfilling work and family roles that are compatible with their orientation toward priorities in life".

Greenhaus (2000) noted that work-family balance has three manifestations, including the balance of time, the balance of commitment, and the balance of satisfaction. According to his perspective balance is a subjective evaluation of an individual's situation and an assessment of whether the individual's life goals match his or her satisfaction and fulfillment in each area. Grzywacz and Carlson (2007) suggest that Greenhaus' definition is too centered on the individual's feelings and ignores the influence of the social environment in which the individual lives, and thus has theoretical flaws and biases for practical guidance.

Alternatively Grzywacz and Carlson define balance as an individual's ability to negotiate and share responsibilities with partners in the work and family spheres to fulfill the responsibilities assigned by the work and family roles (Grzywacz & Carlson, 2007). Nevertheless, these two above opposing definitions complement each other by jointly considering balance as an individual's subjective evaluation of the effectiveness and satisfaction of work and non-work roles and by stating that these evaluations are

socially constructed because individuals fulfill these roles and tasks by communicating and sharing them with other individuals in their environment (Jean-Charles Langulaire, 2009).

2.3.1.3 The Concepts of Office Hour and Non-Office Hour

Mainstream scholars use the terms work and non-work directly and define them specifically for the definitions of work and non-work spheres. Jean-Charles Langulaire gives a more situational definition, defining work on the one hand as a set of tasks performed by an employee in a situation where the employer and the employee reach an agreement, e.g., work done on the premise that the employee and the organization share organizational goals. On the other hand, Langulaire defines non-work as a set of activities outside the employment relationship that occur in a context where the individual and the other party agree to share a common goal, where the other party can include everyone related to the individual's life, such as a spouse or children (Jean-Charles Langulaire, 2009). This definition emphasizes that the relationship between work and non-work is mainly based on the existence of an employment relationship, transcending the physical limits of working hours and workplace, and considering both work and non-work as part of life. The definition of office hours and non-office hours in this paper mainly draws on this view.

The international approach to recognizing working hours is broadly divided into two categories. One category is the way of recognition in some countries represented by China, which emphasizes the actual control of the employer and the delivery of regular labor-intensive work as the recognition elements. In contrast, some EU countries represented by Germany emphasize the actual dominion over time in recognizing working hours without considering whether there is actual labor payment. Chinese scholars propose using the drinking test to prove whether the worker is "liberated from labor" to confirm the dominant power over time in reverse. In other

words, if the worker has the right to drink alcohol during that period, it means that this time is at the employee's disposal and does not fall under the employer's control, and is not counted as working time (Wang Tianyu, 2021).

Laborers in the new era are more concerned about equality, self-esteem, and personal rights (Guangping Li, Yuang Chen, 2022). They no longer see work as the whole of life and have a growing need for work-family balance (J. M. Twenge, S. M. Campbell, B. J. Hoffman, C. E. Lance, 2010). They have a stronger claim to limit the intrusion of work into the non-work domain. The frequent intrusion of work into non-work areas that generate "invisible hours" will likely be more controversial. Therefore, it is crucial to identify, regulate, and manage the time when work intrudes into non-work areas. Such "invisible working hours" have not received sufficient attention from labor relations parties and academics. Further exploration of this problem's causes and harms will help draw the attention of labor relations parties to this problem and suggest better solutions.

In 2004, Sonnentag proposed the concept of "psychological disengagement" to describe the extent to which work intrudes into the non-work sphere. Psychological disengagement is the cessation of all work-related activities and thinking during non-work time and place. Low psychological disengagement implies a higher degree of work intrusion into non-work areas. As mentioned earlier, the benefits of globalization and information technology development are undeniable. However, increased global competition has made work increasingly stressful, and the ease of communication technology has made it increasingly common for work to spill over into the non-work domain. Employees have to receive work-related phone calls and emails during off-hours and have to think about or deal with work-related matters, which prevents them from genuinely achieving psychological detachment. Being occupied by work during non-work hours, physically and mentally, may increase employees' fatigue.

For the definition of office hours and non-office hours, in addition to the division of workplace, working hours, and employment relationship, there is also the psychological boundary of employees' work content beyond regular working hours, i.e., the situation in which employees think they should be away from all work-related activities and thinking beyond regular working hours is non-office hour. Non-office hours will focus more on employees' work behavior within the employment relationship but outside the time and place of work as specified in the employment contract and as perceived by the employees themselves. This paper argues that the time spent on work-related matters and performing actual work duties during the free time not at the employer's disposal is "invisible work time," which will continuously consume employees' physical energy and effort and increase employees' self-consumption may give rise to counterproductive work behavior and reduce employee engagement.

2.3.2 The Relationship Between Communication Technology and Work Connectivity During Non-Office Hours

As early as 1919, when the International Labor Organization was established, hours of work were included in labor standards to protect the fundamental rights of workers. After continuous additions and improvements, the current labor standards on work hours mainly cover working hours, weekly rest time, paid holidays, part-time work, and night work protection. Among them, the standard of working time is in the essential position. The Hours of Work (Industry) Convention, 1919, adopted by the International Labor Organization, provides a system of working hours of eight hours per day and 48 hours per week. After the Second World War, Initiative 116 of 1962 advanced the 40-hour Working Week Convention of 1935 in which considered the traditional 48 hours the maximum. The International Labor Organization (ILO) recommended that governments should gradually promote shorter working hours systems, considering their national and industrial conditions. The traditional 48-hour

working system is still widely adopted worldwide and the standard of working hours varies according to the situation of each country. Based on the ILO conventions' restrictions and considering their actual conditions, national governments enact relevant laws to agree on working hour standards and clarify the boundaries of working hours. (Yu,2022)

On January 22, 2019, the International Labor Organization pointed out in its new declaration, "Working for a Better Future," that new challenges have emerged in the world of work with new changes in the labor market, such as population growth and technological changes. To address these changes and challenges, it is vital to establish labor standards compatible with new technologies and forms of economic growth while ensuring economic growth and decent work.

The globalization of the economy and the development of communication technologies have given rise to a new way of labor: conducting work-related business outside traditional working hours and outside the workplaces by responding to work-related emails and messages and answering work-related phone calls. This invisible prolongation of working hours due to work intrusion into non-work areas is very common.

Technological innovation and information technology development support global integration but also bring some problems. On the one hand, technological developments have replaced some of the old jobs, possibly replacing some regular employees with non-regular employees and increasing the competitive pressure in the workplace. On the other hand, the development of information technology and changes in communication technology have broken down physical boundaries, and employees have become more flexible in how, when, and where they work (Qi, Ding, Liu, 2022; Tang & Hu, 2018), causing the boundaries between work and non-work to become increasingly blurred. While technology enhances efficiency, it also makes it easier for work to invade non-work areas, leading to invisible work hour extensions.

Consequently, the definition of "invisible working hours," where work invades non-work areas, becomes another main focus of this study.

Due to the rapid development of information technology, smartphones and social software, the cost and efficiency of corporate communication have been greatly optimized. People's work patterns have changed, so the traditional perception of the boundary between work time and private time has blurred or even disappeared. (Derks D, Mierlo H, Schmitz, 2014).

The phenomenon of "using communication tools for work during non-working hours" has emerged as well as the "out-of-hours use of communication tools for work" has thus created. Out-of-hours use of communication tools for work is a leadership behavior in which leaders use various means to assign work tasks to employees after work hours or during holidays in order to obtain more employee value by squeezing employees' non-work time are commonly observed' (Butts M M, Becker W J, Boswell W R, 2015) Nevertheless, as this behavior does not necessarily require employees to complete the corresponding additional work in the office, it is difficult to protect the fundamental rights and interests of workers in terms of pay setting and remuneration.

According to the Human Rights reports by relevant organizations, most Chinese schools are keen on forcing teachers to work after work hours by squeezing them out of work and more than half of them are not compensated for overtime work. (Lanaj et al., 2014) However, for employees, the use of communication tools to handle their work during non-working hours completely confuses their work-life boundaries, which in turn brings a series of adverse effects (Butts M M, Becker W J, Boswell W R, 2015). An in-depth study on using communication tools for word processing during non-working hours is necessary for theoretical exploration and to guide management practice.

Although there are several existing studies on employees' use of communication tools for word processing during non-working hours (Boswell & Olson-Buchanan,

2007; Fenner & Renn, 2004), previous scholars have usually considered it as an agreed-upon, at-a-glance concept, measured mainly through epidemiological surveys, and have not been clearly and explicitly defined (Boswell & Olson-Buchanan, 2007). Until recently, Xie Julan (2014) constructed the concept of "system usage" based on the three elements (user, system/tool, and task) of Burton-Jones and Straub (2006) and defined the concept of "work-based communication tool usage." Firstly, the users of work communication tools are employees with regular commuting time, excluding those with irregular commuting time, because it is difficult for them to distinguish when it is working time and when it is not. Secondly, the "system/tool" involved in the use of work communication tools includes communication devices and the systems carried by them. Thirdly, there exists the "task" of work communication tools that being used in work matters, finally, the use of work communication tools occurs during the non-working hours and it is not limited by space or location. (Schlachter，McDowall，2017)

Subsequently, those colleagues explicitly proposed in their study that work-related use of communication tools refers to "work-related use of information and communication technologies during non-work time" (Ma et al. technologies" (Ma Hongyu et al., 2016). In order to better explain the connotation and characteristics of work-related use of communication tools during non-working hours, the three related concepts of "telecommuting," "mobile working," and "overtime work" are being compared. “Telecommuting” refers to a way of work in which employees complete all or part of their work tasks outside the regular workplace, mainly through the use of communication technology to achieve work-related communication and exchange. “Mobile working” refers specifically to a way of work in which employees often need to change from one place to another to complete their work, and do not have a fixed workplace. Mobile work refers to a way of working that requires frequent changes from one place to another to complete work without a fixed workplace (Yun, Kettinger, &

Lee, 2012). In mobile work situations, individuals often need to use communication technologies (especially mobile communication technologies) to achieve work-related exchanges and communication. There is a commonality between these two concepts and the use of work-related communication tools, i.e., both involve the use of communication tools to a greater or lesser extent. The difference is that both telecommuting and mobile work are defined based on the characteristics of the workplace. Both emphasize completing work tasks outside the traditional regular workplace, except that telecommuting may have a relatively fixed workplace, while mobile work often does not have a relatively fixed workplace.

On the other hand, work-based communication tool use is mainly defined based on working hours' characteristics, specifically when work is handled outside the regular working hours specified by the company (after work, weekends, holidays, etc.). The common point between work communication tool use and “overtime work” is that both occur during non-working hours (after work, weekends, holidays, etc.); the difference is that overtime work usually occurs at the workplace, while work communication tool use does not place particular emphasis on the workplace, and to some extent, work communication tool use can be considered to have the nature of additional or supplementary work in nature. (Schieman & Young, 2013)

In a comprehensive analysis, work-based communication tools have three characteristics: cross-border, connectedness, and contextual. Cross-border refers to the fact that work communication tool use is a kind of work behavior that occurs in the home domain and has the characteristics of home-work cross-border behavior. Connectedness refers to the fact that work communication tool use breaks through the traditional boundaries of work time and place so that employees can continue to keep in touch with work-related people and information during non-work time and non-workplace. Contextuality refers to the specific content (what types of work matters are handled), and manner (what communication tools are used, when and where work

matters are handled) of work-based communication tool use that changes with the changing needs of the context. Among them, cross-border attributes is a fundamental attribute of work-based communication tool use.

As referring to an emerging work behavior in the information age, the use of work-based communication tools has a wide range of effects on people's lives including their physical and mental health. Many previous studies have examined the impact of work-based communication tool used on employees' physical and mental health from different aspects (Arlinghaus & Nachreiner, 2013, 2014). For example, Arlinghaus and Nachreiner (2013) found, through a survey of 23,760 European employees, that employees who occasionally or frequently kept in touch with work-related people via cell phone or email during non-work hours were more likely to experience health problems than those who never kept in touch with work-related people via cell phone or email during non-work hours:

Subsequently, another large sample conducted by them (2014) showed that even a tiny amount of complementary work done through communication tools during non-work hours can still increase the risk of health problems, Lanaj et al. (2014) conducted two studies using an empirical sampling method and showed that working with smartphones at night can increase the risk of health problems by reducing sleep quality and thus increasing attrition the following day. An extensive sample survey conducted by Schieman and Young (2013) in Canada found that contact with work during non-working hours increased employees' feelings of sadness and reduced sleep quality.

Overall, the existing studies on the effects of work-based communication tool use on people's physical and mental health have found that work-based communication tool use can impair employees' physical and mental health. These findings suggest that managers and companies should scientifically manage the use of workplace communication tools by their employees. (Kinicki & Vecchio, 1994)

2.3.3 Effect of Identity Awareness of General Staffs and Executives on Peoples

Many sociologists have elaborated on identity from the perspective of identity awareness. Identity awareness is a self-recognition and determination of identity, which is the manifestation of identity at the psychological level. In this study, identity awareness is distinct from the recognition of identity. According to Albert, Ashforth, and Dutton (2000), identity indicates the degree to which an individual is embedded in the identity in question. The social identity theory proposed by Tajfel defines social and individual identities, respectively. Social identity is "an individual's recognition that he belongs to a particular social group, and also the emotional and value significance that being a member of the group brings to him." Social identity is "an individual's recognition that he belongs to a particular social group and also recognizes the emotional and value significance that being a member of the group brings to him."

In contrast, personal identity is "a person's distinctive perception of self" (Postures & Jetten, 2006), a collection of many traits, including characteristics, abilities, and interests. From the above definition of awareness, awareness focuses on describing the relationship between the individual and the object in question. It is concerned with understanding the exact situation of the individual and a particular identity from different perspectives of the relationship.

The study of Identity awareness is closely related to the socio-cultural environment. The conceptual connotations of identity awareness in different cultural environments may vary significantly. Identity awareness is the psychological outcome of the Chinese people's experience of identity life. It summarizes the knowledge about the relationship between superior and subordinate, relatives, colleagues, and friends, and the fundamental experience of the operating principles of the organization where they live. Identity awareness is also the psychological outcome of the experience of the natural and relevant objects, which focuses on understanding the same situation of an

individual and a specific identity from different perspectives of the relationship. Awareness is also the primary basis for understanding and implementing natural and future organizational life. The knowledge and experiences it contains are internalized into the psychological components of human beings, which provide a stable psychological foundation for individuals to deal with all kinds of interpersonal relationships in the organization and interpret and construct new experiences of organizational life. Traditional Chinese rituals influence Chinese people's sense of identity and contain the difference between superior and subordinate levels in organizations, the pursuit of names, and the importance of rank order. Guo Yujin analyzes Chinese identity awareness and describes several prominent forms: emphasis on hierarchy, differential order consciousness, personal attachment, and the pursuit of the name. Attaching importance to rank people attach importance to the difference in rank and order in the upper and lower vertical positions, the extent to which people allocate power and respect and obey according to rank and order, and generally have the motivation to pursue high rank and order. Differential order consciousness divides the affinity distance between people, that is, the horizontal distance between people for the affinity of the arrangement of the affinity of the distance between people, for different identities of people to show a different attitude of closeness, and the strength of the work will be different; division of the interpersonal distance makes interpersonal trust costs can be controlled, close interpersonal interaction of the trust cost is low, but the rules of behavior may be beyond the other social rules, or even higher than the law, which may make the organizational goals compromised. Positioning of personhood refers to the positioning of human qualities, such as gentleman, villain, good person, wrong person, etc.; society indoctrinates people to be gentlemen and to get along with gentlemen, but at the same time considers villainous people to be unaffordable, which often makes it a dilemma for people to choose whether to be a gentleman or a villain. Personality attachment refers to the attitudes and behaviors of low-status people

catering to high-status people, such as the attitudes and behaviors of sucking up to and attaching to the leaders (or the relatives of the leaders), etc. (Yang Guoshu, 1998). The pursuit of identity name refers to people's lifelong pursuit of high positions, in which positions serve as social identifiers to distinguish others; positions give order to social interactions without confusion, which makes many people pursue higher positions throughout their lives.

Some studies state that identity awareness is group awareness based on individual psychology. This type of research argues that identity-oriented cognitive-emotional and behavioral tendencies are internalized in the individual personality structure and reflected in the individual's psychological and behavioral processes. Individual identity awareness becomes embodied in the group psyche when individual identity awareness in the group reflects consistency and similarity. Embodied in the measurement of identity awareness, although reflected through the individual's psychological structure, many options reflect group consciousness, such as "Generally speaking, a person sees his leader or general coworkers with different attitudes when greeting them." In the people around me, people tend to behave in a way that flatters their leaders", and "People usually think it is much better to be a division chief than a college teacher." Therefore, whether the concept of identity awareness is group-level identity awareness or individual-level identity awareness in a specific context needs to be differentiated in different research scenarios.

Specifically, in this study, the identity awareness of general staff and executives needs to be determined before making comparisons, and it can be better measured by previous research using questionnaires The questionnaire can be used to better measure the identity awareness of general staff and executives through previous studies.

2.3.4 Effect of Work Connectivity during Non-Office Hours on Perceive Role Overload

Perceive role overload is a perception of role stress that arises when individuals lack sufficient resources to complete the various role requirements they undertake (Peterson et al., 1995; Qinglei Li & Huaiyong Wang, 2018). Being in a perceive role overload state for a long time means that employees need help to balance their multiple roles. Work connectivity during non-office hours means that work-to-non-work boundaries are crossed, often causing employees to have difficulty taking care of their families, i.e., work interferes with family roles, which may lead to dissatisfaction with their jobs. French et al. (2020) stated that work-family conflict occurs when the demands of work and family are incompatible, and individuals have difficulty meeting or completing the activities expected of both roles. Work-family conflict events deplete psychological resources and can leave individuals feeling exhausted. The accumulation of work-family conflict events reduces the individual's chances of recovering and returning to normal levels of functioning. It is evident that as work connectivity during non-office hours increases, individuals may lack effective recovery, resulting in a sense of perceive role overload.

When individuals are in a stressful situation, they will first assess the challenges or threats that this stressful situation or event may bring them and then generate the corresponding emotional and attitudinal responses (Lazarus & Folkman, 1984; Li et al., 2018). For work connectivity during non-office hours, individuals may have negative emotional reactions if they evaluate it as a threat or detriment to their goals or interests. French et al. (2020) emphasized that work connectivity during non-office hours may create conflicting work and family demands for employees, making it difficult for them to meet or complete the expected activities of work and family roles, creating work-family conflict. Individuals' attempts to meet the conflicting demands of work and family roles may lead them to a poor state and to make decisions about whether and

how to cross work-family boundaries (Ashforth et al., 2000), all of which require effort and are time-consuming, emotional, or energy-based resources (Edwards & Rothbard, 2000). Research has noted that work connectivity during non-office hours often causes employees to feel overloaded (Rosen et al., 2019). For example, employees reading and responding to emails of a work nature and refocusing their attention to previous activities afterward require cognitive effort. As far as employees are concerned timely receipt and response to work-related The sense of self-control over email is low because the "asynchronous" nature of email allows messages to be posted at any time, which is a potentially intrusive communication requirement for message recipients that cannot be easily ignored and can occur at any time, creating additional work (Barley et al., 2011), and because of this, individuals experience a sense of overload to the prevalence of work connectivity during non-office hours.

It has been suggested that post-work activities allow employees to replenish their energy and cognitive resources and to rejuvenate for subsequent work (Van Hooff et al., 2006). However, work connectivity during non-office hours prevents employees from effectively recovering even after work. Rosen et al. (2019) noted that managers felt more accomplished when experiencing higher email demands compared to no email distractions, as reading and responding to emails distracts and requires diverting resources from other activities. In this light, work connectivity during non-office hours causes employees to experience resource diversion and distraction, to experience more to do, and to shift their attention back to their original non-work activities, which also requires resources (Pan, Qingquan, and Wei, Huimin, 2017), and thus are more likely to experience perceive role overload.

Perceive role overload may significantly impact individuals' work-related attitudes and behaviors (Wei, Huimin, and Lu, 2017). Quah (2014) found that perceive role overload perceptions can reduce well-being. One study found that for employees, email overload is a stressor that may affect individuals' well-being (Brown et al., 2014).

The time it takes for individuals whose tasks are interrupted by email to recover and refocus their attention on the original task may be detrimental to employees' well-being (Russell et al., 2017). Empirical studies also found that individuals who can disconnect from work during non-work time have higher well-being (Sonnentag & Fritz, 2007). Work connectivity during non-office hours may cause employees to feel overloaded, affecting their well-being. Following this logic, the cognitive appraisal theory of emotions states that individuals make cognitive assessments of stressful situations in primary and secondary stages (Li et al., 2018). In the primary appraisal stage, individuals assess out-of-hours work electronic communication from leaders as a detriment or threat to themselves, generating a sense of perceive role overload, further influencing the secondary appraisal stage. Individuals who perceive that they do not have sufficient resources and abilities to cope with this situation in the sub-assessment stage have increased negative or decreased positive emotions, such as decreased happiness at work.

2.3.5 Effect of Work Connectivity during Non-Office Hours on Quality of Work Life

For every teacher, work is undoubtedly an essential part of life, which determines what we think and think about every day, our daily schedule, our commitment to other areas of life such as family, recreation, and social interaction, and a large extent, it influences how we feel about our lives as a whole. The study of the quality of work-life can improve the quality of people's survival and development in the workplace, which is necessary both for the workers themselves and the organizations that provide the work.

The emergence of the concept of quality of work life can be traced back to the findings of Mayo's study of the Hawthorne factory in 1933, which suggested the social environment and psychological factors affecting the performance of workers and which

led to the realization by business owners of the importance of humanizing the working conditions of their employees. After the Second World War, the service industry in Western countries, represented by the United States, emerged widely and gradually occupied a dominant position in the social economy. However, for the management of the service industry, most of the enterprises are still based on the traditional Taylor-style management model, which ignores human nature, and the service industry emphasizes that the characteristics of the main body of the human being are not compatible, which breeds many contradictions between the employer and the employee. Against this background, the change of humanized management (humanized management) gradually emerged in Western countries (Davis & Cherns, 1975).

In the 1960s, in Europe, the Swedish government was the first to introduce a social democratization policy, advocating that enterprises create a working environment conducive to employees' physical and mental health. Furthermore, this movement was supported by Swedish trade unions, many employers, and mainstream political groups (Davis & Cherns, 1975). In other European countries, such as the Netherlands, Denmark, France, Ireland, the United Kingdom, and Norway, the business community acted accordingly despite no government-sponsored movement to humanize management (Cherns & Davis, 1975). This trend of management change in Europe also spread to the United States. In the late 1960s, Irving Bluestone, the union leader of the United Automobile Workers Union in charge of General Motors, first introduced the concept of "Quality of Work Life" (Goode, 1989). In response to workers' demands for QWL, a series of initiatives to improve the working environment, welfare, health, and participation in management have emerged in the U.S. corporate world.

Since the early 1970s, Western scholars have defined the concept and connotation of QWL from different research perspectives, which can be summarized as follows.

(1) Definition around the activities unfolding within the organization. For example, Mitchell and James (1992) believe that the quality of work life refers to the efforts of trade unions and management to promote the participation of employees in the organization's daily decision-making; the American Society for Training and Development (ASTD) defines QWL as follows: QWL is a process for the work organization. QWL for work organizations is a process that enables the organization to actively involve members at all levels in creating the organizational environment, shaping the organizational model, and producing organizational results. This basic process is based on two twin goals: increasing organizational effectiveness and improving the quality of employees' work lives (Skrovan, 1983).

(2) Definitions around "job satisfaction". For example, Igbaria and Siegel (1992) argue that quality of work life refers to the various perceptual conditions experienced by employees in the workplace; Sirgy et al. (2001) argue that QWL refers to the job satisfaction that employees experience in the workplace through the availability of resources, activities, and the results of those activities.

(3) Emphasizing the interplay between people, work, organizations, and society, Nadler and Lawler (1983) and Kerce and Boot-Kewley (1993) consider QWL as a way of thinking about people, work, and organizations as a whole, emphasizing the simultaneous focus on the impact of work on both employee and organizational performance.

(4) Emphasizing the systemic dynamics of QWL, Jean and Gilles (2006) argue that QWL reflects the fact that in a certain period, an individual, in the process of achieving his or her work goals, has a positive impact on the individual's overall quality of life, the organization's performance, and the society because of a continuous narrowing of the distance between him or her and the ideal conditions of work.

Chinese scholars began to engage in QWL research in the 1990s. Generally speaking, it is pretty fragmented, and through the organization of the literature, it can

be seen that Chinese scholars have different views on the definition of QWL in the following three aspects.

(1) The "quality of work and life split." According to Feng Ying (2004) and Kanhua et al. (2007), quality of work-life refers to an individual's holistic assessment of his/her quality of work and life based on specific criteria.

(2) "Degree of need fulfillment." Liu, Hailing (2006) believes that the quality of work life is the extent to which an employee's experience in an organization is achieved through the work environment, job characteristics, leadership, and management system functioning to satisfy his or her personal needs. According to this understanding, the quality of the work life of organizational members depends on the extent to which needs are met, and the higher the extent to which needs are met, the higher the quality of work life. This aligns with Western scholars who define QWL from the perspective of job satisfaction.

(3) "Individual and organization win-win." Cheng Shen (1994) believes that the quality of work life is a comprehensive indicator that focuses on human beings and puts human beings and the environment in an extensive system to examine the benefits of corporate activities. Quality of work life is a synthesis of individual, society, psychology, and environment, and the coordinated development of the four factors is the main symbol of the quality of work life in a society. Jia Haiwei et al. (2003) believe that quality of work life refers to the process in which an organization achieves efficient completion of organizational goals by satisfying the material and spiritual needs of its employees, prompting them to give more play to their creativity, enhancing their sense of responsibility and ownership, and obtaining a sense of satisfaction in a higher realm.

The scholars' conceptual definition of QWL shows that with the rise and development of the QWL movement, the scholars' definition of QWL has been gradually improved. From the initial emphasis on a variety of humane improvement activities within the organization and in-depth psychological feelings of individual

employees to the development of the definition of QWL from the perspective of the organization and the social system, the connotation of QWL is constantly expanding. However, the existing concepts need to provide a unified understanding of QWL.

In this study, QWL essentially refers to a variety of work-related characteristics, which can bring different experiences to workers, and the combined effect of these experiences determines the degree of well-being that employees obtain at work. Employee work experience is closely related to the organization's various management measures.

2.3.6 Effect of Work Connectivity during Non-Office Hours on Employee Engagement

2.3.6.1 Connotation of Employee Engagement

Motivating employees to be engaged is a critical issue in management research (Rothbard, 2001), and there is a massive gap between the proportion of engaged employees in average organizations and world-class organizations. Gallup estimates that the cost of employee disengagement to U.S. companies is as high as $300 billion. Gallup proposes to improve employee engagement, a core strategy of management practice to help organizations grow. According to Bakker and Schaufeli (2008), a search for "employee engagement" brings up 2 million web pages, while in contrast, a search for this keyword in Psych Info has 61 academic literature. Bakker and Schaufeli (2008) further suggest a large gap between corporate interest in employee engagement and academic research.

From a practical perspective, employee engagement research originated with the world-renowned Gallup Organization, which specializes in scientifically measuring and analyzing the opinions, attitudes, and behaviors of constituents, consumers, and employees and provides marketing and management consulting to clients based on this approach. Through nearly 40 years of research on the interrelationship of the elements

of health business success, Gallup has developed the "Gallup Pathway" model, which describes the pathway between individual employee performance and the company's ultimate business performance and value-added. According to Gallup, employee engagement is based on creating a positive environment for employees and building on their strengths to create a sense of belonging and "ownership and responsibility."

From a theoretical perspective, Kahn (1990) was the first scholar to propose employee engagement (Avery & McKay, 2007). Kahn's (1990) hypothesis of employee engagement is based on the premise that people can regulate their energy at work, both by giving much of their energy Kahn (1990) proposed the premise that people can regulate their energy at work and can give a lot of their energy to work, but at the same time, they can also give only a tiny amount of their energy to work. Based on this assumption, Kahn (1990) proposed two academic concepts: employee engagement and disengagement at work, the former corresponding to the pole of releasing more personal energies, and the latter corresponding to the pole of reducing contributed energies, constituting two aspects of the same problem. This understanding is consistent with the traditional Chinese understanding of dedication: dedicated employees can put more energy into their work; disengaged or insufficiently dedicated employees do the opposite. Dedicated and disengaged, dedicated enough and not dedicated enough are all on the axis of employee engagement and disengagement.

Specifically, Kahn (1990) defines employee engagement as the extent to which employees can devote their energy to their work roles. Based on the connotation of energy, there are three specific dimensions: employees are physically engaged in their work role, cognitively engaged in their work role, and emotionally engaged in their work role. The critical insight of this definition is that employees have control over their energy. They are employing (using) themselves (Self-employment), and whether they are engaged or not is an expression of their energy (Self-expression). On the contrary, the employee's lack of dedication refers to the lack of effective linkage between the

employee's energy and the work role, and the employee cannot put more of his energy into the work role, and the corresponding physical, cognitive and emotional inputs are insufficient or negative. This is an ineffective use of energy in terms of organizational task performance.

Maslach et al. (2001) enriched the concept of employee engagement, which includes energy input and effectiveness, both of which are indispensable. Maslach et al. (2001) have a more Chinese meaning of "Jingzhong", meaning that employees are dedicated to their work. On the one hand, they have to be "loyal," and on the other hand, they have to be "Jingye," that is, the standard of employees' dedication is not only to work hard but also to do their work well.

In a proximate sense, employee engagement and organizational commitment, job satisfaction, job engagement, and organizational identity are close in meaning (Maslach et al., 2001; Rothbard, 2001). Some scholars even argue that employee engagement refers to job engagement or employee satisfaction in a broad sense (Wefald & Downey, 2009). The fundamental similarity of these concepts is that they are all directions in which organizations motivate their employees but differ specifically for each concept. First, in terms of the concepts themselves, Maslach et al. (2001) argue that organizational commitment refers to employees' allegiance to the organization and that the focus of commitment is on the organization, whereas the focus of employee engagement is on the job itself; job satisfaction refers to the extent to which the job meets employees' needs as a source of their material and achievement needs, which also does not refer to the employee's relationship with the job itself; job engagement is similar to employee engagement, but in terms of connotation, employee engagement is more prosperous, and employee engagement includes the dimensions of energy input as well as effectiveness. Second, regarding conceptual relationships, Rothbard (2001) argues that organizational identity and commitment are why employees are psychologically committed to their jobs. Such reasons determine whether or not

employees are committed to their jobs, the degree of commitment to their jobs, and, in a broader sense, the distribution of a person's commitment in different roles.

There are two perspectives on the distinction between employee engagement and organizational citizenship behavior. One view is that employee engagement can be considered an organizational commitment and extra-role behavior when the concept is balanced for the connotation of organizational commitment and citizenship behavior (Bakker & Schaufeli, 2008). Under this view, employee engagement can be considered either as an attitude, similar to organizational commitment, or as a behavior, similar to organizational citizenship behavior, or a behavior connoted by mindfulness. At this point, in terms of attributes (Bakker et al., 2005; Bakker & Schaufeli, 2008; Bakker & Demerouti, 2008), employee engagement belongs to an active organizational behavior (POB-construct) (Luthans & Youssef, 2007; Avey et al., 2010). Regarding connotation (Bakker & Demerouti, 2008), employee engagement refers to an active and fulfilling work state of mind (State of Mind). Another view is that employee engagement is neither an attitude nor an extra-role behavior; it is a behavior but a behavior within the task role, and at the same time, employee engagement can lead to organizational citizenship behavior (Saks, 2006). Both perspectives have their validity, and despite some differences, both agree that employee engagement is a positive expression of employees at work.

In addition, it is essential to note that there is a difference between employee engagement and other levels of engagement. In other words, employee engagement is part of, but not the same as, engagement. Rothbard (2001) suggests two dimensions of engagement depending on the role one plays. One is Engagement in Work, i.e., employee engagement, and the other is Engagement in Family Roles, as a person has the status of a family member in addition to being an employee. Therefore, employee engagement is a part of engagement, and the former corresponds to a career or occupation, while the latter corresponds to a family occupation. Based on this

understanding, there is also "schooling" in the "industry" of engagement, and students in school can also be engaged in engagement, which Skinner et al. (1990) call "engagement in school." Skinner et al. (1990) call this "Engagement in School".

In the opposite sense, employee disengagement, or career exhaustion, is the opposite concept of employee engagement (Kahn, 1990; Maslach et al., 2001; Gonzalez-Roma et al., 2006; Langelaan et al., 2006; Macey & Schneider, 2008; Kahn (1990) introduced the concept of employee engagement and disengagement, which are two opposed directions on the engagement axis, and he also refers to employee disengagement as career exhaustion. Maslach et al. (2001) point out that under occupational exhaustion, energy input becomes exhaustion, effectiveness becomes ineffectiveness, and employees need to be dedicated to their work. Dedication and burnout constitute two directions of the same dimension.

Based on this relationship, Gonzalez-Roma et al. (2006) positioned employee engagement and career exhaustion at the poles of the energy dimension (Bipolar Dimensions). Maslach and Leiter (2008) measured employee engagement and career depletion with the help of a single instrument, which formed a continuum of the instrument, i.e., for each item, the two represented the scores of each end. For example, for the item "I am confident that I can do my job well," a higher score means higher employee engagement and a lower score means higher burnout. The term "Positive Energy" is often mentioned in current management practices (Orloff, 2004; Wiseman, 2012; Lin, 2012), and its opposite is "Negative Energy, "according to the connotation and relationship between employee engagement and career depletion, employee engagement tends to be an expression of positive energy, while employee disengagement, career depletion or job burnout is more of a negative energy.

2.3.6.2 The Main Impact of Employee Engagement

The impact of employee engagement is mainly in terms of performance. In terms of organizational performance, employee engagement can positively impact the financial performance of an organization (Xanthopoulou et al., 2009), and Gallup's study shows that employee engagement can lead to 3.9 times higher earnings per share for world-class organizations than for average organizations. In addition, employee engagement can also lead to significant improvements in several metrics, including absenteeism, turnover, energy loss, safety incidents, product quality, customer loyalty, productivity, and profitability.

The impact of employee engagement on employee performance is highlighted by behavioral performance. Employee engagement is an intrinsic motivator for positive employee behavior (Salanova & Schaufeli, 2008). salanova et al. (2005) studied the relationship between organizational resources and employees. Saks (2006) showed that employee engagement can positively affect organizational citizenship behavior. Saks (2006) showed that employee engagement positively affects organizational citizenship behavior.

Bakker and Demerouti (2008) explain four reasons why engaged employees perform better than unengaged employees:

Engaged employees have a more positive mindset, reflected in their happiness and enthusiasm.

Dedicated employees are healthier than disengaged employees. Compared to dedicated employees, disengaged employees are full of complaints and negative emotions about their work all day, which is not beneficial to a healthy body.

Dedicated employees can get more resources for their work, which is a solid guarantee for producing work performance.

Dedicated employees can pass on their dedication; they can influence their dedication to other colleagues, and the spread of this dedication makes individuals

improve team performance while also helping to improve their performance.

The above illustrates several positive effects of employee engagement on performance, and the presence of these positive effects makes employee engagement receive the attention of theory and practice. Nonetheless, while it creates performance for the organization and employees at work, it can also have adverse effects. halbesleben et al. (2009) state that organizations are most attracted to dedicated employees who can devote themselves to their work, and while there have been many studies that have demonstrated the positive effects of employee engagement, their study found that employee engagement may need to be more balanced.

Specifically, Halbesleben et al. (2009) confirmed the positive impact of employee engagement on employees' extra-role work behavior on the one hand. They concluded that excessive employee engagement can hurt employees' family well-being. This is because a person's energy is limited, and when he or she invests too much energy in his or her career and work, although he or she will achieve good work performance, at the same time, it may come at the cost of his or her family matters. Nevertheless, this adverse effect is not absolute. The moderating effect of personality is also confirmed by Halbesleben et al. (2009), who showed that the Big Five personality component of responsibility plays a moderating role and that employees who are more responsible are better able to balance their work and family, thus achieving career and family.

2.3.7 Effect of Work Connectivity during Non-Office Hours on Counterproductive Work Behavior

Organizations can exist because of behaviors that contribute to organizational goals (Barnard, 1948); therefore, an important issue studied in organizational behavior is matching individual behaviors with organizational goals. Along this issue, the conceptual system of organizational behavior can be divided into two different subsystems: behaviors that match organizational goals (behaviors that drive toward

organizational goals) and behaviors that do not match organizational goals (behaviors that deviate from organizational goals), and the ultimate goal of the study of both types of behaviors is to match individual behaviors with organizational goals to improve organizational performance. The concepts of Organizational Citizenship Behavior (OCB), Organizational Spontaneity, and Pro-social Organizational Behavior (PSOB) belong to the former. At the same time, Counterproductive Work Behavior (CWB), Deviant Behavior, and Anti-social Behavior (ASB) are among the former concepts. At the same time, Counterproductive Work Behavior (CWB), Deviant Behavior, and Anti-social Behavior (ASB) are among the latter concepts.

The "willingness to cooperate" proposed by Barnard (1938), the founder of social systems theory, is regarded as the germ of organizational citizenship behavior, which was proposed by Bateman and Organ (1983) and Organ (1988). They defined organizational citizenship behavior as "an individual behavior that is not identified in the organization's formal compensation system, but that is unconditional and contributes to the effective functioning of the organization as a whole." Organizational commitment and pro-social behavior were introduced by George and Brief (1992) and Brief and Motowidlo (1986), respectively, both of which express the same meaning as organizational citizenship behavior (Dyne et al., 1994).

Taylor (1911), the founder of scientific management theory, studied the problem of how to improve factory productivity, and his description of the deliberate slacking of workers in steel mills and the coercion of co-workers to slack together is typical of counterproductive work behavior and transgressive and anti-social behaviors are considered to be the same as counterproductive work behavior (Lau et al., 2003), which Robinson and Bennett (1995) define as "deliberate behavior that violates the primary rules of the organization to the point of threatening the interests of the organization and its members." Sackett and Devore (2001) developed the definition to refer to counterproductive work behavior as "intentional behavior by employees that is contrary

to the organization's goals from the organization's perspective." This definition provides an essential perspective on counterproductive work behavior - the organization.

The American psychologist Argyris (1957) pointed out that there is a phenomenon in organizations in which a person may be exhausted at work but energetic at the ballpark or the concert hall after work, which reveals a vital issue that is easily overlooked. From an individual's point of view, a person may show exceptional energy outside of work and be able to take the initiative to create productivity for himself, but from the organization's point of view, he may not be able to perform so well at work, or even his behavior is intentionally antagonistic to the organization's rules and organizational goals, which will destroy the organization's productivity. The organization should focus on whether the individual's behavior at work can bring the organization. When evaluating individuals, organizations should focus on whether their behavior at work can bring productivity to the organization, not their behavior outside of work, and not be oriented to individual interests. Therefore, counterproductive work behavior is a kind of individual behavior on the surface. However, it needs to be understood from the organization's perspective, and if organizational goals do not measure it, it loses its meaning. Therefore, counterproductive work behavior is not only an individual behavior but also an organizational evaluation, and its fundamental attribute is the behavior of an individual deviating from organizational goals.

There are three types of approaches to the study of behavioral dimensions and types, one is to start from the root cause and decompose the subcategories layer by layer according to the combination of dimensions, which belongs to the deductive approach, with the advantage of high efficiency and the disadvantage that subjectivity will be more robust; second is to start from numerous behavioral phenomena and categorize them layer by layer, with the generalization increasing step by step until the basic broad categories or dimensional combinations can be formed; Third, it is to adopt a combination of deduction and induction, with the improvement of research skills and

the accumulation of research results, this method has been applied by more researchers, Robinson and Bennett's (1995) research is to first arrange numerous scattered behaviors in the defined dimensional range, and then categorize these scattered behaviors, and finally put the categorized categories into the corresponding positions To develop their research results, Gruys and Sackett (2003) borrowed and innovated Robinson and Bennett's (1995) general framework, put their generalized categories into this framework, and conducted a more comprehensive analysis by Multi-Dimensional Scaling (MDS) than Robinson and Bennett (1995), Rotundo and Xie (2008), who studied counterproductive work behavior in China, drew on Gruys and Sackett's (2003) research framework to lay out the generalized categories to form the local research results in China.

Robinson and Bennett (1995) constructed two dimensions of counterproductive work behavior. One is the "organizational-interpersonal" dimension based on the target of the behavior, including the organization-oriented counterproductive work behavior and the individual-oriented counterproductive work behavior. Based on the combination of the two dimensions, counterproductive work behavior was classified into four major categories and 16 subcategories were placed in the four quadrants.

Gruys (1999) grouped 87 categories of counterproductive work behavior into 11 categories: theft and related behaviors, including stealing cash and property, taking products, misusing employee discounts; destruction of property; information abuse, including leaking confidential information, fabricating records; misuse of time and resources, including wasting time, modifying timecards, working on personal matters during unsafe behavior, including failure to learn and follow safety procedures; absenteeism, including unexcused absences or tardiness, abuse of sick leave; poor quality of work, deliberate slowing down of work and rash response to work; alcohol abuse, including drinking on the job and going to work drunk; drug use, including possession, use and sale of drugs on the job; inappropriate language, including arguing

with customers and verbally abusing co-workers; and conduct Inappropriate behavior, including assault and harassment of co-workers.

After classifying counterproductive work behavior into 11 categories, Gruys and Sackett (2003) drew on Robinson and Bennett's (1995) "organizational-interpersonal" dimension. However, they did not follow the behavioral severity dimension. However, they constructed a task relevance dimension. Behaviors that fall into the positive part of the task relevance dimension are considered task-relevant in the work situation, where employees are generally expected to work on time, use time and resources wisely, produce high-quality work, and refrain from activities that put themselves and others at risk, including alcohol and drug use. In contrast, behaviors that fall into the negative part of the task relevance dimension are considered task-irrelevant in the work situation. Bowling and Gruys (2009) argue that counterproductive work behavior based on task relevance will be the focus of future research.

In conclusion, counterproductive work behavior deviates from organizational goals and manifests as behaviors that harm colleagues and the organization. These behaviors start with initial aggressive behaviors, summarized by Chen et al. (1992) as aggression, hostility, theft, sabotage, and absenteeism, and then continue to develop to the more systematic content described above.

The essence of counterproductive work behavior is performance, expressed as a set of behaviors contrary to organizational goals. As mentioned above, counterproductive work behavior usually manifests in organization- and individual-oriented ways. The concept of counterproductive work behavior itself includes its adverse effects on the organization, and therefore, research is usually concerned with how counterproductive work behavior is generated.

2.4 Conceptual Framework

A literature review allows this study's framework to be defined.

Firstly, a questionnaire survey is needed to understand the impact of the development of information technology on educational institutions and to identify the attitudes of practitioners in the education sector towards the impact of information technology on work connectivity during non-office hours.

Subsequently, questionnaires were administered to general staff and executives to identify the identity of these two groups of people and thus confirm their different perceptions of work connectivity during non-office hours.

Next, the questionnaire will examine the perceive role overload, quality of work life, employee engagement, and counterproductive workload of general staff and executives during work connectivity during non-office hours: employee engagement and counterproductive work behavior.

The above tests will use age, education, years of working experience, married or not, personal housing or not, children or not, and elderly as control variables to obtain more detailed results.

By testing and analyzing each variable, the different effects of work connectivity during non-office hours on the attitudes and behaviors of general staff and executives will eventually be measured.

This paper will ultimately propose solutions to reduce the perceive role overload and counterproductive work behavior of employees, improve the quality of work life and employee engagement, and ultimately improve organizational performance.

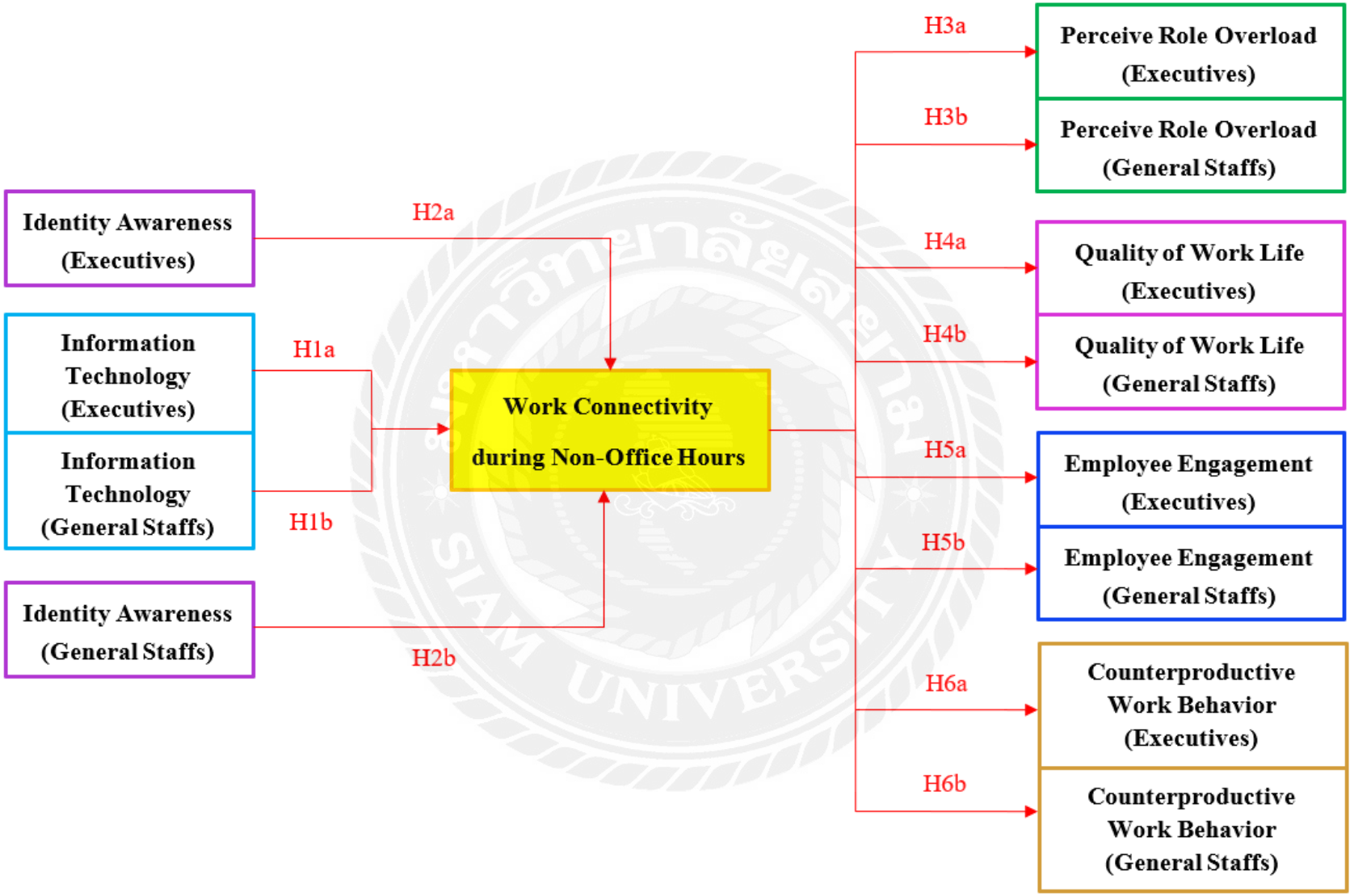


Figure 2.1 An Analytical Model

Table 2.1 The Summary of the Hypothesis

No.	Hypothesis
H1a	Information technology positively affects executives' work contact during non-office hours
H1b	Information technology positively affects general staff's work contact during non-office hours
H2a	High identity awareness can positively influence executives' work connectivity during non-office hours
H2b	High identity awareness can negatively influence general staff's work connectivity during non-office hours
H3a	Work contact during non-office hours positively affects executives' perceive role overload
H3b	Work contact during non-office hours positively affects general staff's perceive role overload
H4a	Work connectivity during non-office hours inversely affects executives' quality of work life
H4b	Work connectivity during non-office hours inversely affects general staff's quality of work life
H5a	Work connectivity during non-office hours inversely affects executives' employee engagement
H5b	Work connectivity during non-office hours inversely affects general staff's employee engagement
H6a	Work connectivity during non-office hours positively influences executives' counterproductive work behavior
H6b	Work connectivity during non-office hours positively influences general staff's counterproductive work behavior

2.5 Conclusion

This chapter reviews the Conservation of Resources Theory and the Job Demand-Resource model, which provide the theoretical basis for this study. The authors then define Work connectivity during non-office hours through past literature.

Next, the authors describe the impact of communication technology and identity awareness of general staff and executives on Work connectivity during non-office hours.

The chapter reviews the effects of work connectivity during non-office hours on general staff and executives' perceive role overload, quality of work life, employee engagement, and counterproductive work behavior. Counterproductive work behavior, respectively.

Based on the literature review, Work connectivity during non-office hours may positively affect people's perceive role overload and counterproductive work behavior. It may negatively affect the quality of work life and employee engagement. However, it would be interesting to see how the conclusions may differ due to the different identity awareness of general staff and executives.

The literature response reveals less literature related to this type of comparative study, which can be used to explore the different management strategies required by different identity groups in the same industry.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter discusses the methods used, aggregate and sampling methods, data collection, Operationalization of variables, analytical models, and statistical analysis methods.

3.1 Introduction

This study examines the impact of work connectivity during non-office hours on the attitudes and behaviors of general staff and employees of educational institutions in Shandong Province in the context of more significant development of information technology.

In order to achieve the objectives of this study, the quantitative research method is considered most appropriate. Consequently, data collection of this study is done through questionnaires. The questionnaire designed in the study is based on the classic scale designed by related scholars and modified through reliability analysis. The data will finally be analyzed through SPSS and Amos.

The Independent variables in this study are information technology and identity awareness. Due to the different status and psychological state, when measuring identity awareness, this study set up different questionnaires for general staffs and executives in order to achieve the best measurement results.

The Mediating Variables in this study are work connectivity during non-office hours.

The Dependent variable in this study is divided into four dimensions: perceive role overload, quality of work life, employee engagement, and counterproductive work behaviour.

Through the study, the mechanisms of both positive and negative impacts of work connectivity during non-office hours will eventually be explored to provide theoretical and practical supports for the management of educational institutions in Shandong Province, China.

3.2 Population and Sampling Method

This study is based on in-service employees in the education industry in Shandong Province. There are 281,000, 468,000, 317,000, and 162,000 full-time teachers in preschool education, primary education, junior high school education, and general high school education in Shandong Province, respectively. There are 56,000 full-time teachers in secondary vocational schools and 136,000 full-time teachers in general higher schools. The total is 1.42 million people (2022 Statistical Bulletin on National Economic and Social Development of Shandong Province, Shandong Provincial Bureau of Statistics, 2 March 2023).

In this research, general staffs and executives are defined as teachers with only teaching tasks and teachers with administrative tasks, respectively. If the teacher has both teaching and administrative tasks, he or she is classified as an executive.

Table 3.1 Population of Educational Institutions in Shandong Province, China

Category	Number of Population
Full-time Teachers in Preschool Education	281,000
Full-time Teachers in Elementary Education	468,000
Full-time Teachers in Middle School Teachers	317,000
Full-time Teachers in General High School Education	162,000
Full-time Teachers in Secondary Vocational School	56,000
Full-time Teachers in General Higher Education Schools	136,000
Total	**1,420,000**

The sample size required for this study can be derived from the following sampling estimation formula (Yamane, 1967):

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n signifies the sample size

N signifies the population under study

e signifies the margin error

Sample size for ±5% Precision Levels Where Confidence Level is 95% and P=0.5：

$$n = \frac{1420000}{1 + 1420000 \times (0.05)^2} \approx 400$$

So, the sample is expected to be more than 400.

After visiting schools in Shandong Province, it can be concluded that the population ratio of general staff and executives in the educational institutions in Shandong Province is roughly 2:1, and the number of questionnaires to be distributed was formulated from this data.

Regarding the sample size of the questionnaire, Loehlin (2004), after counting 72 SEM papers, found that the median sample size of the paper data was 198; Barrett (2007) argued that the sample size should be greater than 200, but the paper also suggested that since the SEM is generally executed using the built-in maximum likelihood method, the method will result in a poor model fit if the sample size is more significant than 500, and the chi-square value will be severely inflated, resulting in a poor model fit; SEM authority Zhang Weihao (2020) suggested in his monograph that if the maximum likelihood method is used, the sample size should be controlled between 200 and 500. Therefore, the sample size collected by the questionnaire in this study meets the requirements. In summary, based on the number of employees in the education industry in Shandong Province and the comparison of the number of general staff and executives, In this study, 700questionnaires were distributed, including 450to general staff and 250 to executives, and 400 were expected to be returned to general staff and 200 to executives.

In order to be rigorous and accurate and to ensure a more opportunistic and randomized selection of the samples, this questionnaire will be proportionally

distributed to the staff and executives of each group in the population of Educational Institutions in Shandong Province, China, and the allocation of the sample size is shown in Table 3.2.

Table 3.2 Shareholding and Sample Size of Educational Institutions in Shandong Province, China

Category	Number of Population	Proportion	Sample Size of General Staff	Sample Size of Executives
Full-time Teachers in Preschool Education	281,000	19.78 %	79	39
Full-time Teachers in Elementary Education	468,000	32.95 %	131	66
Full-time Teachers in Middle School Teachers	317,000	22.32 %	89	45
Full-time Teachers in General High School Education	162,000	11.40 %	45	22
Full-time Teachers in Secondary Vocational School	56,000	3.94 %	16	8
Full-time Teachers in General Higher Education Schools	136,000	9.57 %	40	20
Total	**1,420,000**	**100%**	**400**	**200**

This study adopted a current status survey methodology using random sampling using both online and offline methods to sample six categories of education industry practitioner groups at the same time. The respondents are required to have fixed working hours and work units. The target population was full-time employees. The questionnaires were completed anonymously, with changes in the order of the items and reverse scoring of some items to avoid homoscedasticity.

Before the data collection, most study participants were pre-interviewed or communicated with through relevant local government agencies to explain the purpose of the study and obtain informed consent, and then self-administered questionnaires

were distributed. Participants completed the questionnaire anonymously according to their own circumstances.

Most of the questionnaires were measured on a 5-point Likert scale from 1 to 5, ranging from "strongly disagree" to "strongly agree"

In addition, due to the small sample size, this study will use Bootstrapping to recreate a new sample representative of the parent sample distribution by sampling the limited sample data with multiple repetitions.

3.3 Item Analysis Analyzed the Quality of the Measurement Tool

In this study, pre-testing was carried out. Firstly, five experts were invited to review the questionnaire, make changes to the questions, and delete the questions that were not applicable to this study. Then, 40 people were randomly selected as a sample, and reliability and validity were tested and concluded, respectively.

3.3.1 Validity Testing

Validity is the degree to which a measurement tool or instrument can accurately measure what is to be measured, and the more the measurement result matches the content to be examined, the higher the Validity; on the contrary, the lower the Validity. (Wu, 2010)

There are two major indicators in all the factor analysis results regarding validity analysis.

The first one is the KMO coefficient, which ranges from 0 to 1; the closer to 1, the better the structural Validity of the questionnaire; the primary purpose of the KMO index is to verify the existence of a correlation between measurement items to judge whether there is a common factor and it is suitable to be used for factor analysis (Zhang Wentong, 2004). Generally speaking, a KMO value of less than 0.5 indicates that the items tested are unsuitable for factor analysis. In contrast, a KMO value above 0.5 indicates that the items tested are eligible for factor analysis.

The second one is the significance of Bartlett's test of sphericity which is used to determine the suitability of the measurement entries used to do factor analysis (Kaiser, 1974); if it is less than 0.05, we can also consider that the questionnaire has excellent structural Validity.

By completing the above mentioned task, the researcher tested the conceptual and representational correctness and completeness of all items at the practical level. After the pre-test, the researcher adjusted all items and deleted some words that did not have content validity.

In addition, the researcher invited five experts, Xiliang Li (Big et al.), Yingjie Song (Policy Finance and Public Economic Policy), Qiang Sun (Quantitative Economics), Feipeng Wang (Human Resources and Social Security), and Qihua Liang (Marketing Management) to evaluate the logical Validity of each item.The researcher adjusted all the items by deleting inappropriate words and adding suitable words in the things as suggested by these experts with the Item Objective Congruence Index (OC) or Content Validity Ratio (CVR).

Table 3.3 Information of Experts

Name	School	Title	Major
Xiliang Li	Shandong Technology and Business University	Professor	Big et al.
Yingjie Song	Shandong Technology and Business University	Professor	Policy Finance and Public Economic Policy
Feipeng Wang	Shandong Technology and Business University	Professor	Human Resources and Social Security
Qihua Liang	Shandong Technology and Business University	Professor	Marketing Management
Qiang Sun	North China University of Technology	Associate Professor	Quantitative Economics

3.3.2 Reliability Testing

Reliability refers to the degree of consistency of the results obtained when the same method is used to measure the same object repeatedly.

Reliability refers to the consistency of the results of a test and is generally expressed in terms of internal consistency. The higher the reliability coefficient, the more consistent, stable, and reliable the test results are, and vice versa. (Wu, 2010)

Systematic errors generally do not affect the reliability. The system measures values similarly and has the same effect on the measured values, so there is generally no systematic error affecting reliability. However, it is essential to note that random errors can lead to inconsistency thus reducing reliability. (Wu, 2010)

This study analyzed the questionnaires of 40 subjects using SPSS 27.0 to conclude that:

For the variable Information Technology, the Cronbach's alpha coefficient is 0.931. Identity awareness has a Cronbach's alpha coefficient of 0.923. Work connectivity during non-office hours has a Cronbach's alpha coefficient is 0.862. The Cronbach's alpha value for Perceive role overload is 0.914. The Cronbach's alpha value for Quality of Work Life is 0.897. The Cronbach's α for employee engagement is 0.903.The Cronbach's α for counterproductive work behavior is 0.872.

Table 3.4 Cronbach's α for the Scale of the Variables

Variable	Number of Questions	Cronbach’s α
Information Technology	9	0.931
Identity Awareness	8	0.923
Work Connectivity During Non-Office Hours	10	0.862
Perceive role overload	5	0.914
Quality of Work Life	5	0.897
Employee Engagement	5	0.903
Counterproductive Work Behavior	5	0.872

Cronbach's alpha coefficient worth range and the effect of reliability: 0.80 to 0.90 is excellent, 0.70 to 0.80 is quite good, 0.65 to 0.70 is the minimum acceptable value, and 0.60 to 0.65 is best not to. So, from the above table, the questionnaire's reliability is quite good.

3.4 Operationalization of Variables

3.4.1 Independent Variables

The Independent Variables in this research is Information Technology and Identity Awareness.

3.4.1.1 Information Technology

This variable scale is based on existing literature sources. The situation measurement scale of the impact of Information technology on employees' work connectivity during non-office hours was adapted from the study by Ferguson, Green and Vaswani (2013). The scale was primarily used to measure the frequency employees use information technology to communicate, ask questions, share documents, and perform work-related activities. This scale consists of 9 questions.

A five-point Likert scale was used to score each item: never, seldom, sometimes, often, and all the time, with each answer representing a score of 1-5. The higher the score, the more information technology the employee used; the lower the score, the less information technology the employee used.

3.4.1.2 Identity Awareness

The measure of identity awareness was adapted from Kirstin Goth, Pamela Foelsch and Susanne Schluter-Muller (2012). In this scale, Executives and General Staffs used different questions with 8 questions each to test the identity awareness of both. In addition to the extraction of the entries, the adaptation has been semantically transformed and linguistically modified. The first is the semantic conversion, it needs to be semantically converted to the individual level perception problem. Secondly, there

is a linguistic modification, where the terms are changed to standard terms with similar meanings (Yang et al., 2006) to be more easily understood.

A five-point Likert scale was used to score each item: never, seldom, sometimes, often, and all the time, with each answer representing a score of 1-5. The higher the score, the stronger identity awareness the employee is; the lower the score, the weaker identity awareness the employee is.

3.4.2 Mediating Variables

The scale measuring work connectivity during non-office hours was adapted from Fenner & Renn (2010) and consists of 10 questions.

A five-point Likert scale was used to score each item: never, seldom, sometimes, often, and all the time, with each answer representing a score of 1-5. The higher the score, the more work connectivity during non-office hours the employee is; the lower the score, the less work connectivity during non-office hours the employee have.

3.4.3 Dependent Variables

The dependent variable was modified from the work of some prior researchers, and some tools were modified by discussions between the researchers' advisors and thesis committee members.

3.4.3.1 Perceive Role Overload

In measuring the effect of work connectivity during non-office hours on perceive role overload, this study used the Perceive role overload Scale developed by Peterson, Smith and Akande (1995). The scale is filled out directly by the teacher, and measures the teacher's perceive role overload through 5 questions. This study used a Likert scale to score the scale, with scores ranging from 1 to 5, with higher scores implying a higher degree of perceive role overload.

3.4.3.2 Quality of Work Life

The Quality of Work-Life Scale was adapted from Tao Qing (2010), which consists of five questions that measure five dimensions: job significance, development opportunities, employee respect, social status, and physical and mental health.Quality of work life in the context of work connectivity during non-office hours situation, this study used a Likert scale for scoring from 1 to 5, where a higher score means a higher degree of quality of work life.

3.4.3.3 Employee Engagement

In this paper, employee engagement is defined as a work-related, positive, fulfilling, and intact emotional and cognitive state, and the scale to measure employee engagement was adapted from the simple and reliable scale UWES developed by Schaufeli (2003), which consists of five questions.The scale is scored on a five-point Likert scale, with employees choosing to answer each question: strongly disagree, disagree, generally agree, agree, and strongly agree, with each of the five answers representing a score of 1-5. The higher the score, the higher the level of employee engagement; the lower the score, the lower the level of employee engagement.

3.4.3.4 Counterproductive Work Behaviour

The scale used to measure counterproductive work behavior was adapted from Yang & Diefendorff' (2009) scale, which is divided into five dimensions: employee misappropriation of organisational property, sabotage, passive slacking behaviors, work detachment behaviors, and interpersonal aggression. There are five questions in this scale.A five-point Likert scale was used to score each item: never, seldom, sometimes, often, and all the time, with each answer representing a score of 1-5. The higher the score, the more counterproductive the employee is; the lower the score, the less counterproductive the employee is.

3.4.4 Control Variables

The control variables in this study consisted of two components: demographic variables and job characteristic variables. Demographic variables include age, gender (male, female),education level (college, bachelor's degree, master's degree, doctoral degree),Job characteristic variables included length of service, title (assistant professor, lecturer, associate professor, professor), status (full-time faculty member, faculty member but also administrator, full-time administrator), monthly income (less than ¥4,000, ¥4,000 to ¥8,000, ¥8,000 to ¥12,000, and more than ¥12,000), and weekly working hours (40 hours and less, and more than 40 hours).

3.5 Questionnaire Pretest

Regarding Validity, the first version of the questionnaire was proposed to the advisory committee. After verification by the committee, the questionnaire will be sent back to the researcher for further revision.

The revised questionnaire will enter the pretest process by sending it to forty informants in a private university. Then, the research will use the SPSS program for reliability testing. In general, Cronbach’s Alpha Coefficient is used to test the internal consistency and reliability of the question. This calculation was applied to measure the internal consistency of the measurement items and revealed that each item was reliable since the reliability value must be higher than 0.7, which designated the standard of reliability for the instrument.

Table 3.5 The Measurement of the Research Variables

Variable	Descriptions	Author(s)	Question numbers
Independent Variables			
Information Technology	The frequency with which employees use information technology during work connectivity during non-office hours to communicate, ask questions, share documents, and perform work-related activities.	Ferguson, Green and Vaswani (2013)	1-9(9items)
Identity Awareness	A self-recognition and determination of identity, which is the manifestation of identity on a psychological level. 1st version : How executive see themselves and themselves vis-à-vis ordinary staffs 2rd version How employees/staffs see themselves and themselves vis-à-vis the executives	Kirstin Goth, Pamela Foelsch and Susanne Schluter-Muller (2012)	10-17(8items)
Mediating Variables			
Work Connectivity During Non-Office Hours	Work activities that occurs outside of the workplace, work hours, and the severance of the employment relationship and as the employee continues to work beyond the regular work hours, particularly in a situation where it is deemed appropriate to be away from all work-related activities and thinking.	Fenner & Renn (2010)	18-27(10items)
Dependent Variables			
Perceive Role Overload	A perception of role stress that arises when employees in the education sector lack sufficient resources to successfully fulfil the demands of the various roles they undertake during Work Connectivity during Non-Office Hours.	Peterson,Smith and Akande(1995)	28-32 (5items)

Variable	Descriptions	Author(s)	Question numbers
Quality of Work Life	Holistic Assessment of the Quality of Work and Quality of Life of Employees in the Education Sector at Work Connectivity during Non-Office Hours	Tao Qing (2010)	33-37 (5items)
Employee Engagement	Work Connectivity during Non-Office Hours for Employees in the Education Sector The extent to which employees can invest their energy in their work roles and the effectiveness of that investment.	Schaufeli (2003)	38-42 (5items)
Counterproductive Work Behavior	Work Connectivity during Non-Office Hours in the education sector is a series of behaviors done by employees that go against the organisation's objectives.	Yang & Diefendorff' (2009)	43-47 (5items)

3.6 Hypotheses

This study will use the Conservation of Resources Theory and the Job Demand-Resource model as its theoretical basis.

The development of information technology and changes in communication technology have broken down physical boundaries, and employees have become more flexible in how, when, and where they are to work (Qi, Ding, Liu2022; Tang&Hu, 2018), and the boundaries between work and non-work have become increasingly blurred. While technology enhances efficiency, it also makes it easier for work to intrude into the non-work realm, leading to an invisible lengthening of working hours.

Hypothesis 1a: Information technology positively affects executives' work contact during non-office hours

Hypothesis 1b: Information technology positively affects general staff's work contact during non-office hours

Hypothesis 2a: High identity awareness can positively influence executives' work connectivity during non-office hours

Hypothesis 2b: High identity awareness can negatively influence general staff's work connectivity during non-office hours

Rationales and Explanations:

According to the Job Demand-Resource model, job-related factors can be classified into two categories, job resources and job requirements, based on their increasing or decreasing impact on individual resources (Wang & Zhang, 2016). Adequate resources are the basis for individual work commitment and initiative, and adequate resources can stimulate employees' intrinsic motivation, thus keep them constantly energized and help them with career growth and develop the self-learning. On the other hand, excessive work requirements will deplete the various resources owned by individuals, causing resource tension, bringing too much negative perception to employees, affecting the energy and stamina of individuals to devote themselves to

work and study, and causing negative emotions and attitudes towards work (Demerouti et al., 2001).

Conservation of Resources Theory suggests that resources refer broadly to any object that can help an individual to achieve his or her goals. When faced with an external event, people's resources go through the three scenarios of gain, actual loss and threat of loss (Halbesleben et al., 2014; Hobfoll, 1989, 2001) Resource acquisition will make people increase their inputs to preserve and enrich the resources; while actual loss or threat of loss of resources will put individuals into a state of tension and discomfort. By comparing with actual loss, the fear of losing resources will cause a more significant psychological burden on people and seriously impairs job performance (Niessen & Jimmieson, 2016).

For this reason, work connectivity during non-office hours may have complex effects on teachers' attitudes and behaviors, based on the Job Demand-Resource model and the multipath model of resource gain, loss, and the threat of resource conservation theory.

In the resource loss pathway, work connectivity during non-office hours may cost teachers many resources. The rapid development of communication technology has made instant communication the norm, and many teachers enjoy the convenience of it while developing the feeling of being "electronically bound" (Fender, 2004). According to the theory of resource conservation (Hobfoll, 1989), when resources are continuously consumed and cannot be replenished promptly, it will cause individuals to experience stress and increase negative emotions.

In the resource threat path, work connectivity during non-office hours can make teachers feel that their personal reputation resources are threatened and generate reputation concerns. When a resource is threatened to be lost, individuals shift more attention to the income and expenditure of that resource and mobilize other resources to prevent the loss of that resource. Such mobilization may prevent further loss of the resource. However, in the short term, it can lead to a depletion of other resources

(Hobfoll & Shirom, 2001), which can exacerbate negative emotions.

Hypothesis 3a: Work contact during non-office hours positively affects executives' perceive role overload

Hypothesis 3b: Work contact during non-office hours positively affects general staff's perceive role overload

Rationales and Explanations:

In the resource benefit pathway, work connectivity during non-office hours will allow teachers to affirm their competence and value as members of the organization, increase the level of organizational self-esteem, and enhance the individual's beliefs about their self-worth and competence as members of the organization, which can enhance positive emotions. (Bowlinget al., 2010) This type of positive information serves as an essential source of resource supplementation for individuals and can help them to increase their organizational self-esteem, a critical personal resource.

Hypothesis 4a: Work connectivity during non-office hours inversely affects executives' quality of work life

Hypothesis 4b: Work connectivity during non-office hours inversely affects general staff's quality of work life

Rationales and Explanations:

Work connectivity during non-office hours meets the basic need for employee autonomy, contributes to the formation of teachers' psychological resources, and is a "free path" that facilitates teachers' progress toward prosperity at work, which manifests itself in an increase in teachers' vitality and learning experience, and thus in their employee engagement.

Hypothesis 5a: Work connectivity during non-office hours inversely affects executives' employee engagement

Hypothesis 5b: Work connectivity during non-office hours inversely affects general staff's employee engagement

Hypotheses 6a: Work connectivity during non-office hours positively influences executives' counterproductive work behavior

Hypotheses 6b: Work connectivity during non-office hours positively influences general staff's counterproductive work behavior

Rationales and Explanations:

Work connectivity during non-office hours, as an additional requirement during regular working hours, increases the difficulty of psychologically disengaging from work, causes further depletion of individual resources, and is a 'path of bondage' that prevents teachers from achieving prosperity, manifesting itself as a decrease in vitality towards work and the learning experience, which in turn develops into counterproductive work behavior.

Therefore, the hypotheses related to the conceptual model are summarized as follows.

Table 3.6 The Summary of the Hypothesis

No.	Hypothesis
H1a	Information technology positively affects executives' work contact during non-office hours
H1b	Information technology positively affects general staff's work contact during non-office hours
H2a	High identity awareness can positively influence executives' work connectivity during non-office hours
H2b	High identity awareness can negatively influence general staff's work connectivity during non-office hours
H3a	Work contact during non-office hours positively affects executives' perceive role overload
H3b	Work contact during non-office hours positively affects general staff's perceive role overload
H4a	Work connectivity during non-office hours inversely affects executives' quality of work life

No.	Hypothesis
H4b	Work connectivity during non-office hours inversely affects general staff's quality of work life
H5a	Work connectivity during non-office hours inversely affects executives' employee engagement
H5b	Work connectivity during non-office hours inversely affects general staff's employee engagement
H6a	Work connectivity during non-office hours positively influences executives' counterproductive work behavior
H6b	Work connectivity during non-office hours positively influences general staff's counterproductive work behavior

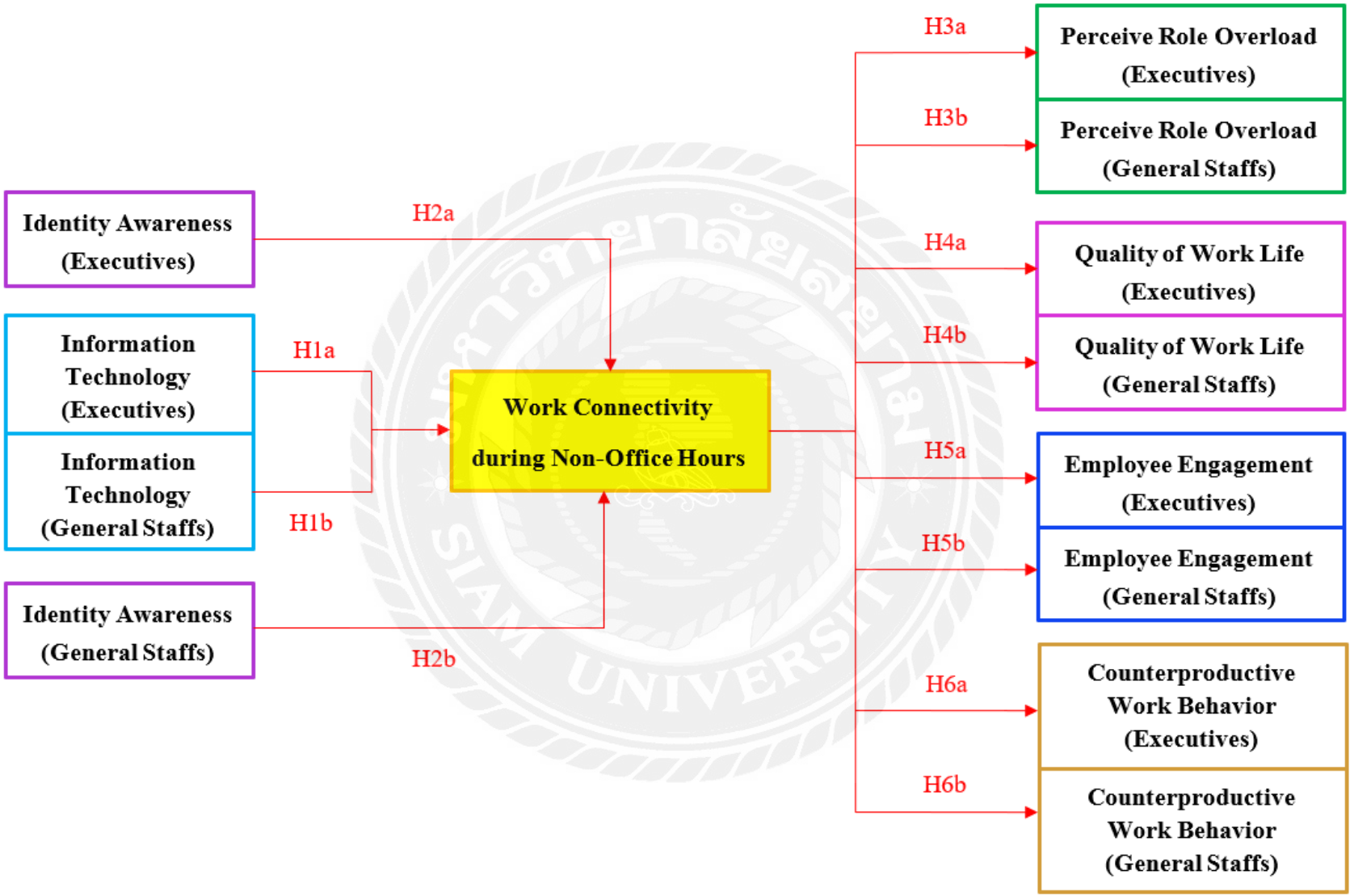


Figure 3.1 An Analytical Model

3.7 Statistical Method of Analysis

After collecting the data, it needs to be analyzed, and the process is as follows:

3.8.1 Descriptive statistics, including frequency, percentage, mean, and standard deviation to describe the sample of the study.

3.8.2 Confirmatory factor analysis: This model starts with the analysis of the measurement construct correlation validity by using the value of factor loading—it has been tested and confirmed of the data validity before analyzing the structural equation model.

3.8.3 Two regression analyses were carried out on the variables of the antecedent study and the primary study, respectively, to verify the significance of the hypotheses based on the data, analyze the study results, and finally present the study's conclusions.

3.9 Questions for In-depth Interview

For executives	For Employees
1. Pros and cons of having non-work time connectivity via mobile phone apps.	1. Pros and cons of having non-work time connectivity via mobile phone apps. How it's effect you?
2. Do you regularly use mobile devices to connect to your staffs on job matters during the non-work time? If yes, do you anticipate any drawbacks on employee work morale?	2. Does work connectivity during the non-office hours effect you? Causing perceive role overload and QWL? Why? How?
3. Do you think that contacting your staffs during the non-office hours via mobile phone apps will lead to less employee engagement and increase counter-productive work behavior?	3. Do you think that contacting your staffs during the non-office hours via mobile phone apps will lead to less employee engagement and increase counter-productive work behavior?

For executives	For Employees
4. Some constructive and practical policy and management advices? : for a win-win situation for you, staffs and organization.	4. Some constructive and practical policy and management advices? : for a win-win situation for you, staffs and organization.

CHAPTER 4

RESEARCH RESULT

Collect data through survey questionnaires and analyze the collected data, based on Conservation of Resources Theory，Job Demand-Resource model. Explore information technology，identity awareness，work connectivity during non-office hours，role overload, quality of work life, Employee engagement, and counterproductive work behaviour relationship between various variables, using SPSS and AMOS software during data analysis.

The analytical process in this study included Confirmatory Factor Analysis, correlation testing, structural equation construction, and multi-cluster comparisons. After the data passes the reliability and validity tests, correlation analysis and structural equation modeling are performed. The construction of structural equation models requires verifying the fit of the model, which should refer to indicators such as GFI, NFI, CFI, AGFI, RMSEA, etc. in data analysis. The model fit must meet the requirements through data analysis. Revise the model based on indicators. Ensure that the model matches the standards appropriately. Finally, perform path analysis on each variable to verify hypotheses and draw conclusions.

4.1 Sample Characterization

A total of 626 valid questionnaires were collected in this study, out of which executives collected 202 questionnaires and 414 questionnaires were collected by general staff.

In this study, the demographic description is categorized into gender, age, highest level of education, length of service, title, monthly income, and weekly working hours, with a total of 7 dimensions.

Out of the sample collected, the number of valid questionnaires for Executives

was 202. Among them are 49 males (24.3%) and 153 females (75.7%). In the age variable survey, 26-35 years old is 97 (48%), 36-45 years old is 71 (35.1%), 46-55 years old is 29 (14.4%), and over 56 years old is 29 (14.4%). 14.4 percent, over 56 years old for 5 people, accounting for 2.5 percent. In the highest level of education variable survey, College and below for 1 person, accounting for 0.5 percent, and Bachelor's degree for 21 people, accounting for 10.4 percent. Master's degree for 162 people, accounting for 80.2%, Doctoral degree for 18 people, accounting for 8.9%. In the length of service variable survey, within 1 year for 1 person, accounting for 0.5%, 1-5 years for 25 people, accounting for 12.4%, 6-10 years for 112 people, accounting for 55.4%, 11-15 years for 44 people, accounting for 21.8%, and more than 16 years for 20 people, accounting for 9.9%.In the title variable survey, Assistant Professor was 75 people, accounting for Assistant Professor 75 persons, accounting for 37.1%; lecturer 108 persons, accounting for 53.5%; Associate Professor 16 persons, accounting for 7.9%; Professor 3 persons, accounting for 1.5%. In the monthly income variable survey, less than ¥4,000 is 0 people, ¥4,000 to ¥8,000 is 72 people, accounting for 36.6%, ¥8,000 to ¥12,000 is 75 people, accounting for 37.1%, More than ¥12,000 is 53 people, accounting for 26.2%. In the weekly working hours variable survey, 40 hours and less were 18 people, accounting for 8.9 percent, and more than 40 hours were 184 people, accounting for 91.1 percent.

Table 4.1 Sample Feature Description of Executives

Variable	Options	Frequency	Percent
1. Gender	Male	49	24.3%
	Female	153	75.7%
2. Age	Under 25 years old	0	0%
	26-35 years old	97	48%
	36-45 years old	71	35.1%
	46-55 years old	29	14.4%
	Over 56 years' old	5	2.5%
3. Education	College and below	1	0.5%
	Bachelor's degree	21	10.4%

Variable	Options	Frequency	Percent
	Master's degree	162	80.2%
	Doctoral degree	18	8.9%
4. Length of Service	Within 1-year	1	0.5%
	1-5 years	25	12.4%
	6-10 years	112	55.4%
	11-15 years	44	21.8%
	More than 16 years	20	9.9%
5. Title	Lecturer	108	53.5%
	Assistant Professor	75	37.1%
	Associate Professor	16	7.9%
	Professor	3	1.5%
6. Income	Less than ¥4,000	0	0%
	¥4,000 to ¥8,000	72	36.6%
	¥8,000 to ¥12,000	75	37.1%
	More than ¥12,000	53	26.2%
7. Weekly Working Hours	40 hours and less	18	8.9%
	More than 40 hours	184	91.1%
Total		**202**	**100**

Of the sample collected, the number of valid questionnaires for General Staff was 414. Among them, 192 were male, accounting for 46.4 percent, and 222 were female, accounting for 53.6 percent. In the age variable survey, 8 were under 25 years old, accounting for 1.9 percent; 170 were 26-35 years old, accounting for 41.1 percent; 167 were 36-45 years old, accounting for 40.3 percent; 50 were 46-55 years old, accounting for 12.1 percent, and 19 were over 56 years old, accounting for 12.1 percent. In the highest level of education variable survey, College and below is 25 people, accounting for 6 percent; Bachelor's degree is 20 people, accounting for 1.9 percent; 26-35 years old is 170 people, accounting for 41.1 percent, 36-45 years old is 167 people, accounting for 1.9 percent, 46-55 years old is 50 people, accounting for 1.2 percent, and over 56 years old is 19 people, accounting for 4.6 percent. Bachelor's degree was 204 people, accounting for 49.3%, Master's degree was 139 people, accounting for 33.6%, and Doctoral degree was 46 people, accounting for 11.1%.In the length of service variable survey, within 1- years was 84, accounting for 20.3%, 1-5

years was 116, accounting for 28%, 6-10 years was 124, accounting for 30%, 11-15 years was 82, accounting for 19.8%, and more than 16 years was 8, accounting for 1.9%.In the title variable In the title variable survey, there were 149 Assistant professors, accounting for 36%; 222 lecturers, accounting for 53.6%; 40 Associate professors, accounting for 9.7%; and 3 Professors, accounting for 0.7%. In the monthly income variable survey, less than ¥4,000 is 60 people, accounting for 14.5%, ¥4,000 to ¥8,000 is 215 people, accounting for 51.9%, ¥8,000 to ¥12,000 is 134 people, accounting for 32.4%, More than ¥12,000 is five people, accounting for 1.2%. In the weekly working hours variable survey, 41 people were working 40 hours and less, accounting for 9.9 percent, and 373 people working more than 40 hours, accounting for 90.1 percent.

Table 4.2 Sample Feature Description of General Staffs

Variable	Options	Frequency	Percent
1. Gender	Male	192	46.4%
	Female	222	53.6%
2. Age	Under 25 years old	8	1.9%
	26-35 years old	170	41.1%
	36-45 years old	167	40.3%
	46-55 years old	50	12.1%
	Over 56 years' old	19	4.6%
3. Education	College and below	25	6%
	Bachelor's degree	204	49.3%
	Master's degree	139	33.6%
	Doctoral degree	46	11.1%
4. Length of Service	Within 1-year	84	20.3%
	1-5 years	116	28%
	6-10 years	124	30%
	11-15 years	82	19.8%
	More than 16 years	8	1.9%
5. Title	Lecturer	222	53.6%
	Assistant Professor	149	36%
	Associate Professor	40	9.7%
	Professor	3	0.7%

Variable	Options	Frequency	Percent
6. Income	Less than ¥4,000	60	14.5%
	¥4,000 to ¥8,000	215	51.9%
	¥8,000 to ¥12,000	134	32.4%
	More than ¥12,000	5	1.2%
7. Weekly Working Hours	40 hours and less	41	9.9%
	More than 40 hours	373	90.1%
Total		**414**	**100**

4.2 Confirmatory Factor Analysis

Confirmatory factor analysis mainly has the following measurement indicators in the validation process: average variance extracted (AVE), composite validity (CR), and path coefficient, which are used to test convergent and aggregation validity. At the same time, each item must be different, so a discriminant validity test is required. The role of discriminant validity is determined based on the relationship between the square root of the AVE value and the standardized coefficient. According to relevant research and standards, a minimum AVE value of 0.5 (Hair, Black, Babin, &Anderson, 2010) and a minimum CR value of 0.7 (Fornell & Larcker, 1981) are required to demonstrate good convergent validity and composite reliability. The SEM method was used in the study to construct a structural equation model.

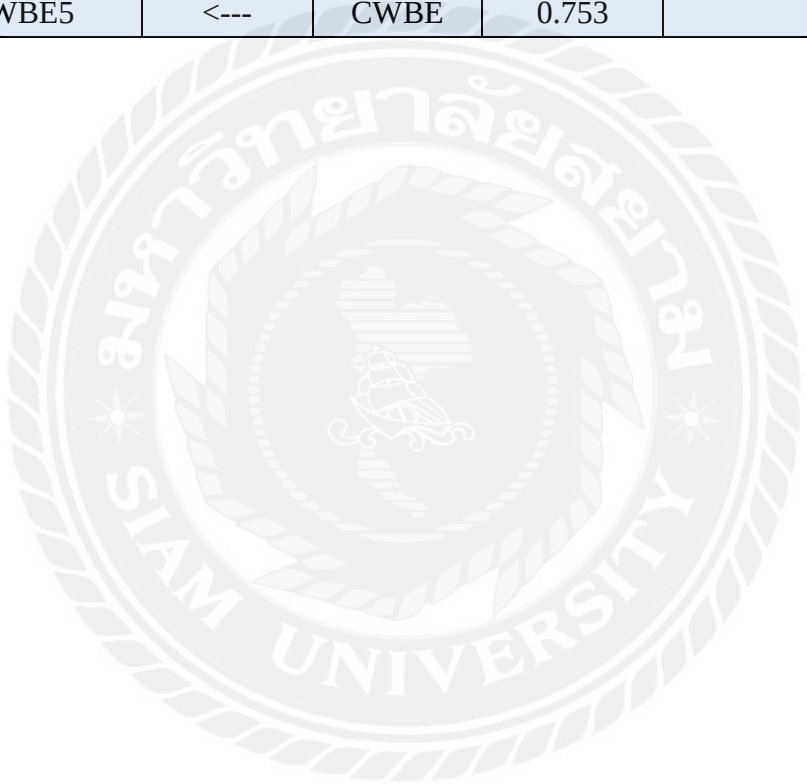
4.2.1 Confirmatory Factor Analysis of Executives

According to the results of the structural equation model, the coefficient of each item is more significant than 0.7, which meets the requirements. At the same time, the average variance extracted (AVE) and the combined validity (CR) are calculated. The AVE value of each dimension is higher than 0.5, and the combined validity (CR) is higher than 0.7. Therefore, the validity of the executive's sample questionnaire is good.

Table 4.3 AVE and CR of Executives

Path Relationship			Estimate	AVE	CR
IDAE1	<---	IDAE	0.803	0.6387	0.9338
IDAE2	<---	IDAE	0.881		
IDAE3	<---	IDAE	0.756		
IDAE4	<---	IDAE	0.812		
IDAE5	<---	IDAE	0.766		
IDAE6	<---	IDAE	0.819		
IDAEI7	<---	IDAE	0.742		
AI8	<---	IDAE	0.806		
ITE1	<---	ITE	0.818	0.6551	0.9446
ITE2	<---	ITE	0.819		
ITE3	<---	ITE	0.76		
ITE4	<---	ITE	0.819		
ITE5	<---	ITE	0.814		
ITE6	<---	ITE	0.831		
ITE7	<---	ITE	0.738		
ITE8	<---	ITE	0.845		
ITE9	<---	ITE	0.834		
WCNOHE1	<---	WCNOHE	0.804	0.6274	0.9439
WCNOHE2	<---	WCNOHE	0.801		
WCNOHE3	<---	WCNOHE	0.803		
WCNOHE4	<---	WCNOHE	0.801		
WCNOHE5	<---	WCNOHE	0.792		
WCNOHE6	<---	WCNOHE	0.787		
WCNOHE7	<---	WCNOHE	0.781		
WCNOHE8	<---	WCNOHE	0.778		
WCNOHE9	<---	WCNOHE	0.804		
WCNOHE10	<---	WCNOHE	0.769		
ROE1	<---	ROE	0.807	0.5938	0.8794
ROE2	<---	ROE	0.748		
ROE3	<---	ROE	0.768		
ROE4	<---	ROE	0.809		
ROE5	<---	ROE	0.717		
QWLE1	<---	QWLE	0.798	0.599	0.8818
QWLE2	<---	QWLE	0.794		
QWLE3	<---	QWLE	0.775		
QWLE4	<---	QWLE	0.77		
QWLE5	<---	QWLE	0.731		

Path Relationship			Estimate	AVE	CR
EEE1	<---	EEE	0.75	0.5989	0.8818
EEE2	<---	EEE	0.795		
EEE3	<---	EEE	0.734		
EEE4	<---	EEE	0.777		
EEE5	<---	EEE	0.811		
CWBE1	<---	CWBE	0.719	0.5981	0.8811
CWBE2	<---	CWBE	0.727		
CWBE3	<---	CWBE	0.837		
CWBE4	<---	CWBE	0.823		
CWBE5	<---	CWBE	0.753		



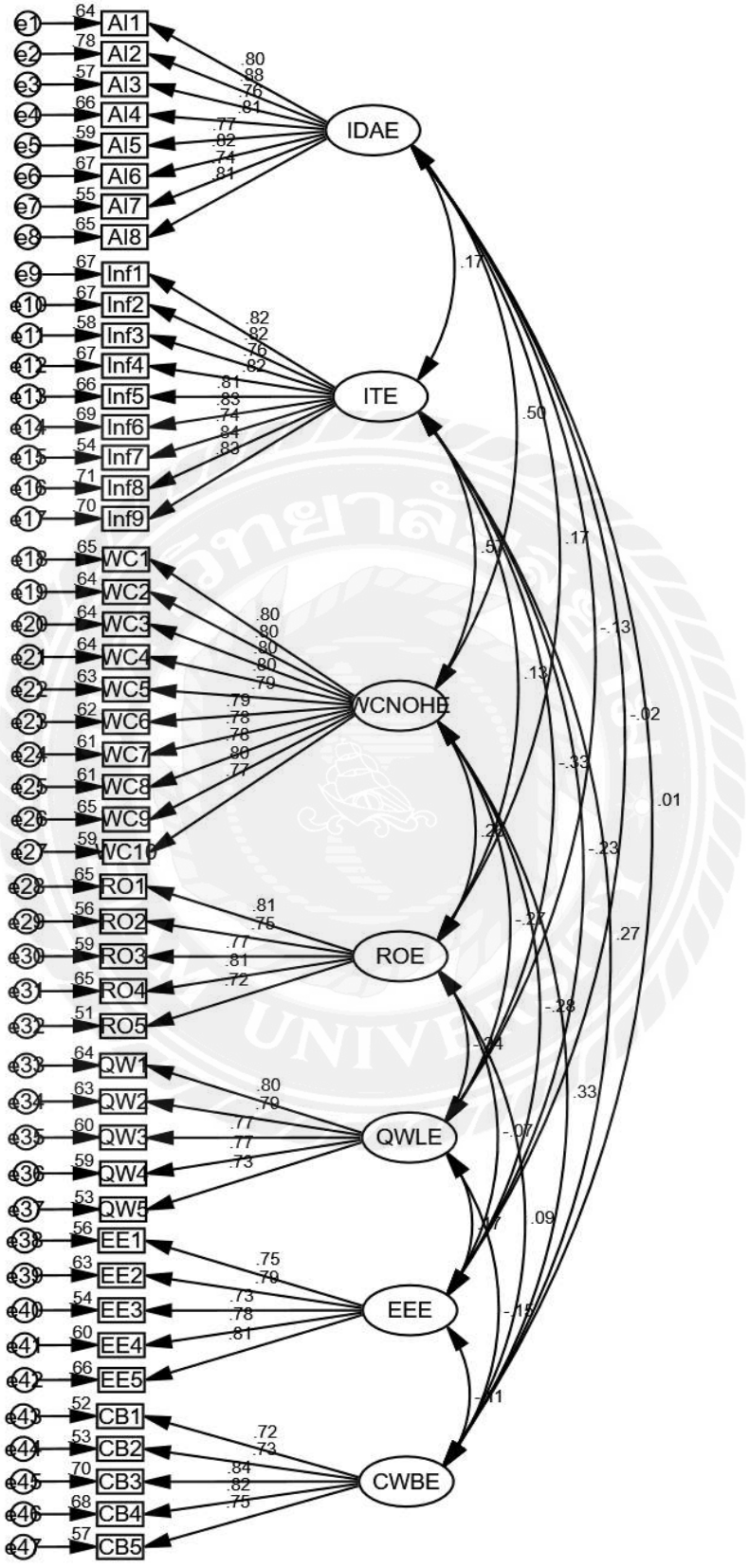


Figure 4.1 Confirmatory Factor Analysis of Executives

4.2.2 Confirmatory Factor Analysis of General Staffs

According to the results of the structural equation model, the coefficient of each item is more significant than 0.7, which meets the requirements. At the same time, the average variance extracted (AVE) and the combined validity (CR) are calculated. The AVE value of each dimension is higher than 0.5, and the combined validity (CR) is higher than 0.7. Therefore, the validity of the General Staff's sample questionnaire is good.

Table 4.4 AVE and CR of General Staff

Path Relationship			Estimate	AVE	CR
IDAGS1	<---	IDAGS	0.843	0.6558	0.9384
IDAGS2	<---	IDAGS	0.847		
IDAGS3	<---	IDAGS	0.797		
IDAGS4	<---	IDAGS	0.774		
IDAGS5	<---	IDAGS	0.809		
IDAGS6	<---	IDAGS	0.847		
IDAGS7	<---	IDAGS	0.767		
IDAGS8	<---	IDAGS	0.79		
ITGS1	<---	ITGS	0.783	0.6176	0.9356
ITGS2	<---	ITGS	0.782		
ITGS3	<---	ITGS	0.79		
ITGS4	<---	ITGS	0.794		
ITGS5	<---	ITGS	0.8		
ITGS6	<---	ITGS	0.761		
ITGS7	<---	ITGS	0.783		
ITGS8	<---	ITGS	0.738		
ITGS9	<---	ITGS	0.838		
WCNOHGS1	<---	WCNOHGS	0.747	0.6044	0.9076
WCNOHGS2	<---	WCNOHGS	0.78		
WCNOHGS3	<---	WCNOHGS	0.768		
WCNOHGS4	<---	WCNOHGS	0.788		
WCNOHGS5	<---	WCNOHGS	0.806		
WCNOHGS6	<---	WCNOHGS	0.808		
WCNOHGS7	<---	WCNOHGS	0.779		
WCNOHGS8	<---	WCNOHGS	0.774		
WCNOHGS9	<---	WCNOHGS	0.753		
WCNOHGS10	<---	WCNOHGS	0.769		

Path Relationship			Estimate	AVE	CR
ROGS1	<---	ROGS	0.82	0.5996	0.8821
ROGS2	<---	ROGS	0.754		
ROGS3	<---	ROGS	0.769		
ROGS4	<---	ROGS	0.758		
ROGS5	<---	ROGS	0.769		
QWLGS1	<---	QWLGS	0.789	0.596	0.8806
QWLGS2	<---	QWLGS	0.761		
QWLGS3	<---	QWLGS	0.742		
QWLGS4	<---	QWLGS	0.772		
QWLGS5	<---	QWLGS	0.795		
EEGS1	<---	EEGS	0.773	0.5865	0.8764
EEGS2	<---	EEGS	0.77		
EEGS3	<---	EEGS	0.76		
EEGS4	<---	EEGS	0.751		
EEGS5	<---	EEGS	0.775		
CWBGS1	<---	CWBGS	0.773	0.582	0.8743
CWBGS2	<---	CWBGS	0.736		
CWBGS3	<---	CWBGS	0.79		
CWBGS4	<---	CWBGS	0.741		
CWBGS5	<---	CWBGS	0.773		

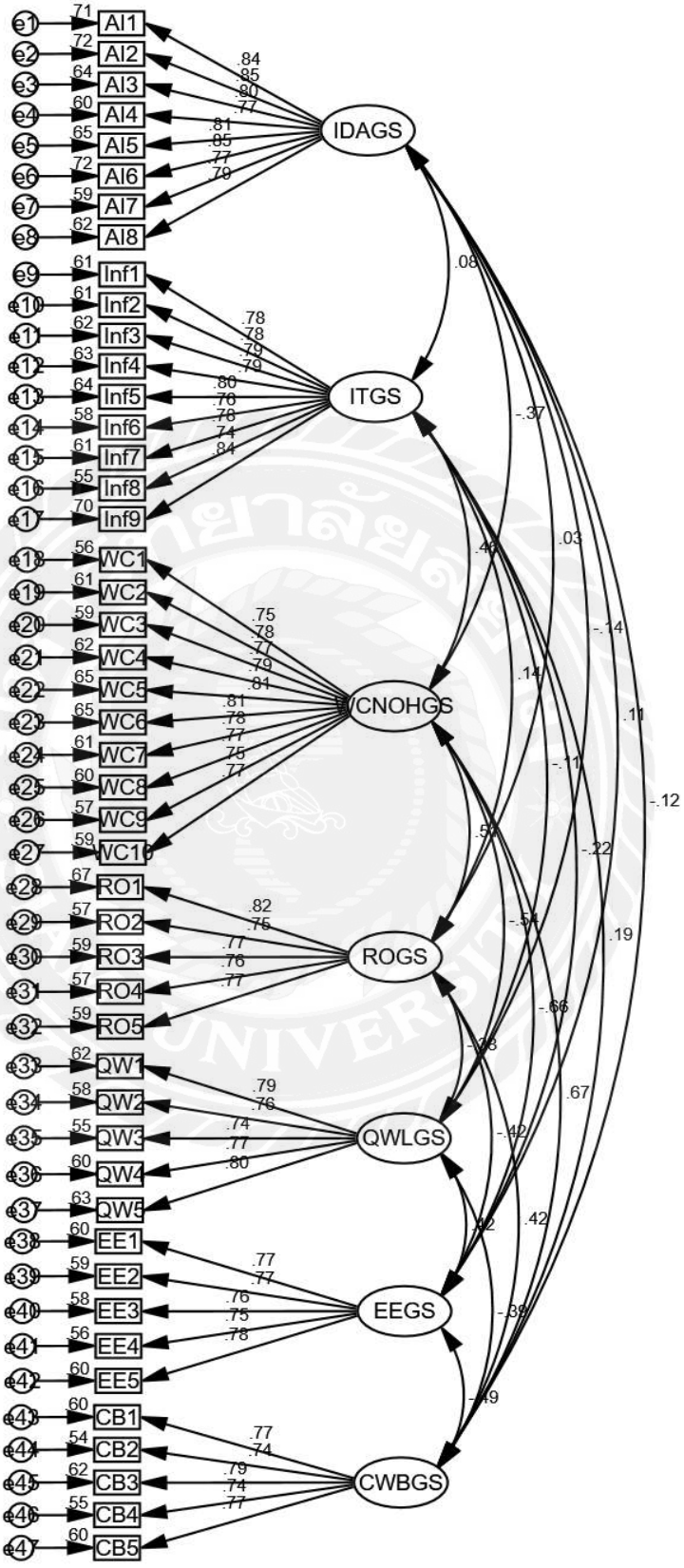


Figure 4.2 Confirmatory Factor Analysis of General Staff

4.3 Correlation Analysis

4.3.1 Correlation Analysis of Executives

In this study, the correlation analysis of the dimensions of each variable was carried out using the correlation analysis method. The discriminant validity of the survey data was determined by comparing the correlation coefficient with the square root of AVE. When the absolute value of the square root of AVE is always more significant than the correlation coefficient, it means that the item has good discriminant validity. Through data analysis, it can be concluded that the correlation coefficient of each variable is less than the absolute value of the square root of AVE.

At the same time, according to the results shown in the table, the correlation coefficient does not exceed 0.9, indicating that there is no collinearity problem and meets the requirements. Structural equation model analysis and research can be carried out.

Table 4.5 Results of Pearson's correlation analysis for each dimension of General Staff

	√AVE	IDAE	ITE	WCNOHE	ROE	QWLE	EEE	CBE
IDAE	0.810							
ITE	0.786	.170*	0.786					
WCNOHE	0.777	.472**	.539**	0.777				
ROE	0.774	.169*	0.119	.246**	0.774			
QWLE	0.772	-0.126	-.307**	-.252**	-.209**	0.772		
EEE	0.766	-0.026	-.213**	-.255**	-0.071	.152*	0.766	
CBE	0.763	0.007	.247**	.301**	0.072	-0.138	-0.108	0.763

NOTE: * p<0.05 ** p<0.01 *** p<0.001

4.3.2 Correlation Analysis of General Staffs

In this study, the correlation analysis of the dimensions of each variable was carried out using the correlation analysis method. The discriminant validity of the survey data was determined by comparing the correlation coefficient with the square root of AVE. When the absolute value of the square root of AVE is always more significant than the correlation coefficient, it means that the item has good discriminant

validity. Through data analysis, it can be concluded that the correlation coefficient of each variable is less than the absolute value of the square root of AVE.

At the same time, according to the results shown in the table, the correlation coefficient does not exceed 0.9, indicating that there is no collinearity problem and meets the requirements. Structural equation model analysis and research can be carried out.

Table 4.6 Results of Pearson's correlation analysis for each dimension of General Staff

	√AVE	IDAGS	ITGS	WCNOHGS	ROGS	QWLGS	EEGS	CBGS
IDAGS	0.799							
ITGS	0.809	0.77	0.809					
WCNOHGS	0.792	-.351**	.428**	0.792				
ROGS	0.771	0.027	.132**	.463**	0.771			
QWLGS	0.771	-.126*	-0.096	-.484**	-.340**	0.771		
EEGS	0.774	0.096	-.195**	-.594**	-.368**	.369**	0.774	
CBGS	0.774	-.108*	.177**	.613**	.369**	-.342**	-.429**	0.774

NOTE: * p<0.05 ** p<0.01 *** p<0.001

4.4 The Structural Equation Models and Multigroup Analysis

4.4.1 The Structural Equation Models

Chi-square=\cmin df=\df

Chi-square/df=\cmindf p=\p

GFI=\gfi AGFI=\agfi

CFI=\cfi RMSEA=\rmsea

Based on the above data and index analysis, this study found that the research data meets the requirements for constructing the structural equation model. The structural equation model is constructed using AMOS software, and the relationship between variables is explained to verify whether the hypothesis is established. The structural equation model needs to test the model fit. Chi-square/df must be less than 3 to meet the research standards. At the same time, GFI, AGIF, and CFI need to be greater

than 0.9 for excellent, more significant than 0.7, and less than or equal to 0.9 for acceptable, and RMSEA needs to be less than 0.08 to meet the model fit index requirements.

4.4.1.1 The Structural Equation models of Executives

According to the AMOS output results, it can be concluded that:

The impact path coefficient (Estimate) of IDAE on WCNOHE is 0.426. The standard error (S.E.) of the estimated value of regression weight is about 0.067. The estimated value (C.R.) of regression weight is more significant than zero, 6.370, and the standard error P<0.001.

The impact path coefficient (Estimate) of ITE on WCNOHE is 0.533. The standard error (S.E.) of the estimated value of regression weight is about 0.070. The estimated value (C.R.) of regression weight is more significant than zero, which is 7.586, and the standard error P<0.001.

The impact path coefficient (Estimate) of WCNOHE on ROE is 0.230. The standard error (S.E.) of the estimated value of regression weight is about 0.067. The estimated value (C.R.) of regression weight is more significant than zero, which is 3.411, and the standard error P<0.001.

The path coefficient (Estimate) of the impact of WCNOHE on QWLE is -0.284. The standard error (S.E.) of the estimated value of regression weight is about 0.076. The estimated value (C.R.) of regression weight is more significant than zero, which is -3.725, and the standard error P<0.001.

The path coefficient (Estimate) of the impact of WCNOHE on EEE is -0.298. The standard error (S.E.) of the estimated value of regression weight is about 0.083. The estimated value (C.R.) of regression weight is more significant than zero, which is -3.603, and the standard error P<0.001.

The path coefficient (Estimate) of the impact of WCNOHE on CWBE is 0.274. The standard error (S.E.) of the estimated value of regression weight is about 0.065.

The estimated value (C.R.) of regression weight is more significant than zero, which is 4.200, and the standard error P<0.001.

Table 4.7 Results of Structural Equation Modeling of Executives

Path relationship			Estimate	S.E.	C.R.	P
WCNOHE	<---	IDAE	0.426	0.067	6.370	***
WCNOHE	<---	ITE	0.533	0.070	7.586	***
ROE	<---	WCNOHE	0.230	0.067	3.411	***
QWLE	<---	WCNOHE	-0.284	0.076	-3.725	***
EEE	<---	WCNOHE	-0.298	0.083	-3.603	***
CWBE	<---	WCNOHE	0.274	0.065	4.200	***

NOTE: * p<0.05 ** p<0.01 *** p<0.001

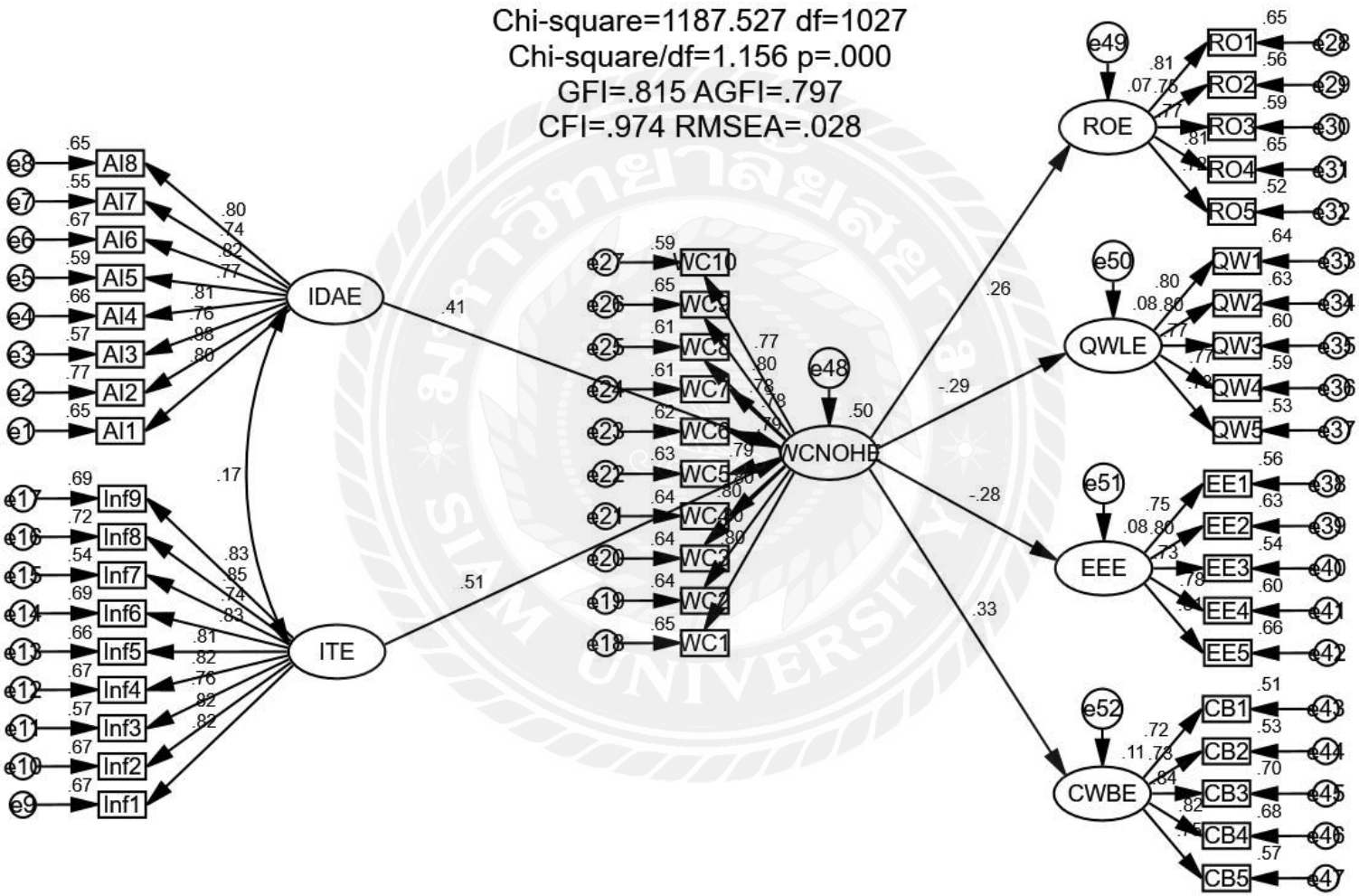


Figure 4.3 The Modified Structural Equation Model of Executive

4.4.1.2 The Structural Equation models of General Staffs

According to the AMOS output results, it can be concluded that:

The impact path coefficient (Estimate) of IDAGS on WCNOHGS is -0.376. The regression weight estimate's standard error (S.E.) is about 0.048. The regression weight estimate (C.R.) is greater than zero, which is -7.784, and the standard error P<0.001.

The impact path coefficient (Estimate) of ITGS on WCNOHGS is 0.469. The regression weight estimate's standard error (S.E.) is about 0.052. The regression weight estimate (C.R.) is greater than zero, which is 9.010, and the standard error P<0.001.

The impact path coefficient (Estimate) of WCNOHGS on ROGS is 0.563. The regression weight estimate's standard error (S.E.) is about 0.060. The regression weight estimate (C.R.) is greater than zero, which is 9.334, and the standard error P<0.001.

The path coefficient (Estimate) of the impact of WCNOHGS on QWLGS is -0.557. The standard error (S.E.) of the estimated value of regression weight is about 0.059. The estimated value (C.R.) of regression weight is more significant than zero, which is -9.453, and the standard error P<0.001.

The path coefficient (Estimate) of the impact of WCNOHGS on EEGS is -0.784. The standard error (S.E.) of the estimated value of regression weight is about 0.069. The estimated value (C.R.) of regression weight is more significant than zero, which is -11.412, and the standard error P<0.001.

The path coefficient (Estimate) of the impact of WCNOHGS on CWBGS is 0.709. The standard error (S.E.) of the estimated value of regression weight is about 0.060. The estimated value (C.R.) of regression weight is more significant than zero, which is 11.724, and the standard error P<0.001.

Table 4.8 Results of Structural Equation Modeling of General Staff

Path relationship			Estimate	S.E.	C.R.	P
WCNOHGS	<---	IDAGS	-0.376	0.048	-7.784	***
WCNOHGS	<---	ITGS	0.469	0.052	9.010	***
ROGS	<---	WCNOHGS	0.563	0.060	9.334	***
QWLGS	<---	WCNOHGS	-0.557	0.059	-9.453	***
EEGS	<---	WCNOHGS	-0.784	0.069	-11.412	***
CWBGS	<---	WCNOHGS	0.709	0.060	11.724	***

NOTE: * p<0.05 ** p<0.01 *** p<0.001

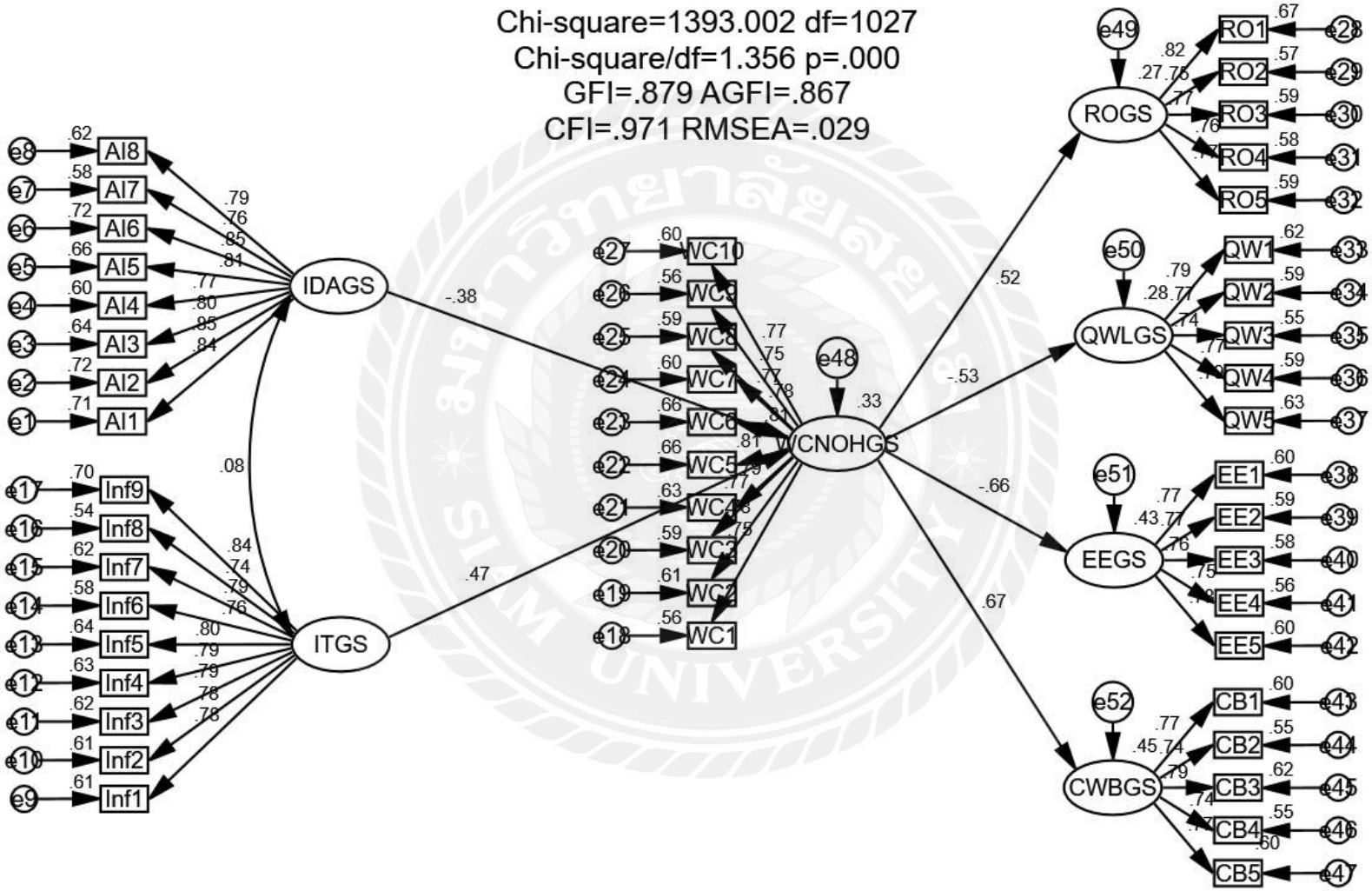


Figure 4.4 The Modified Structural Equation Model of General Staff

4.4.2 Multigroup Analysis

In order to study whether there is a significant difference in the influence of leaders and employees on the six paths, a multi-group structural equation model was used for comparative analysis, a restrictive model that set the six paths to be equal, and an unrestricted model that did not set it, compare, if the chi-square difference reaches significance, it means that the models are not equal, that is to say, there is a significant difference in the path influence between the leader and the employee. Further, each path is tested for differences to obtain the specific path with differences. , the specific results are as follows:

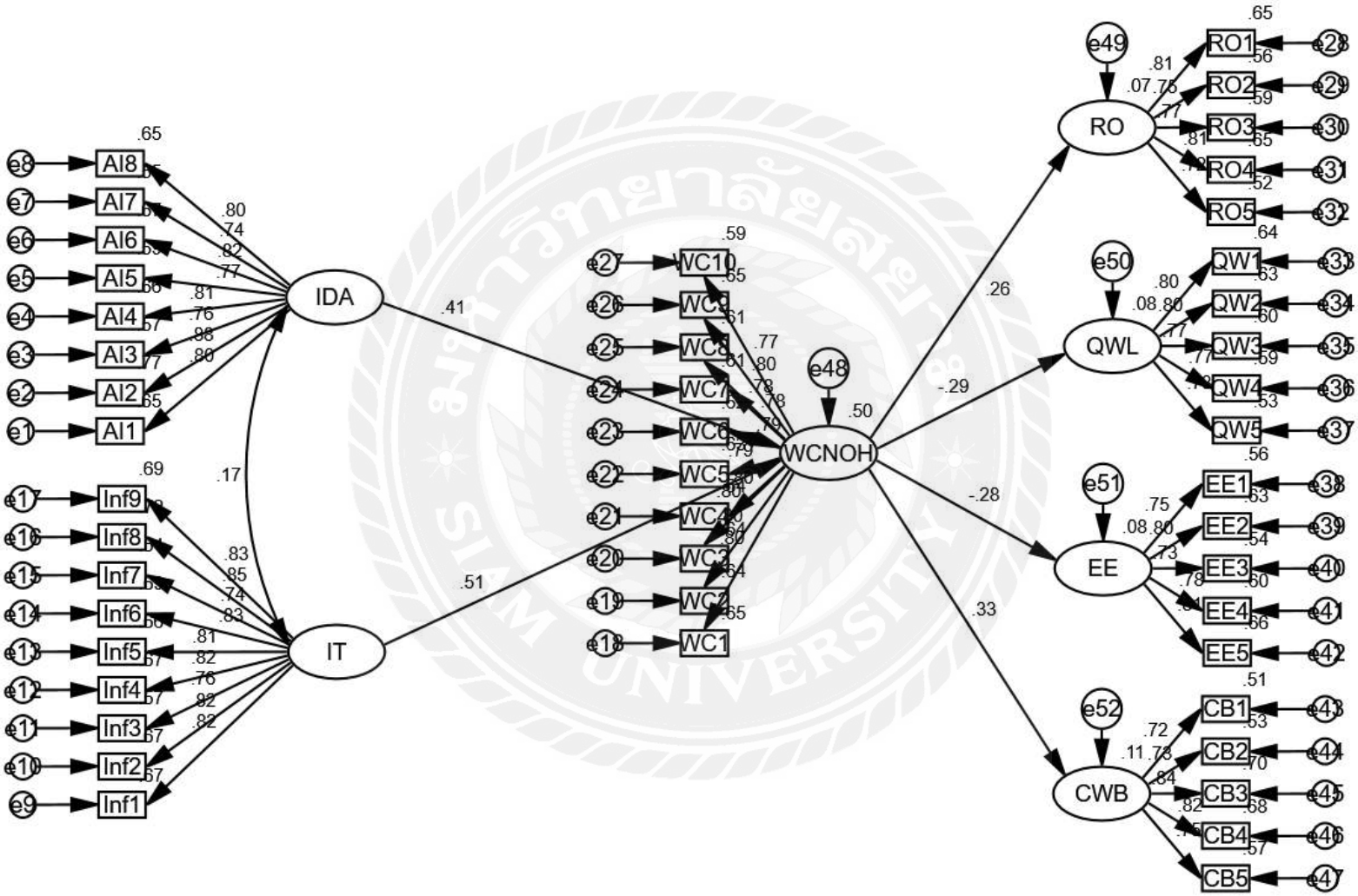


Figure 4.5 The Multigroup Analysis of Executives

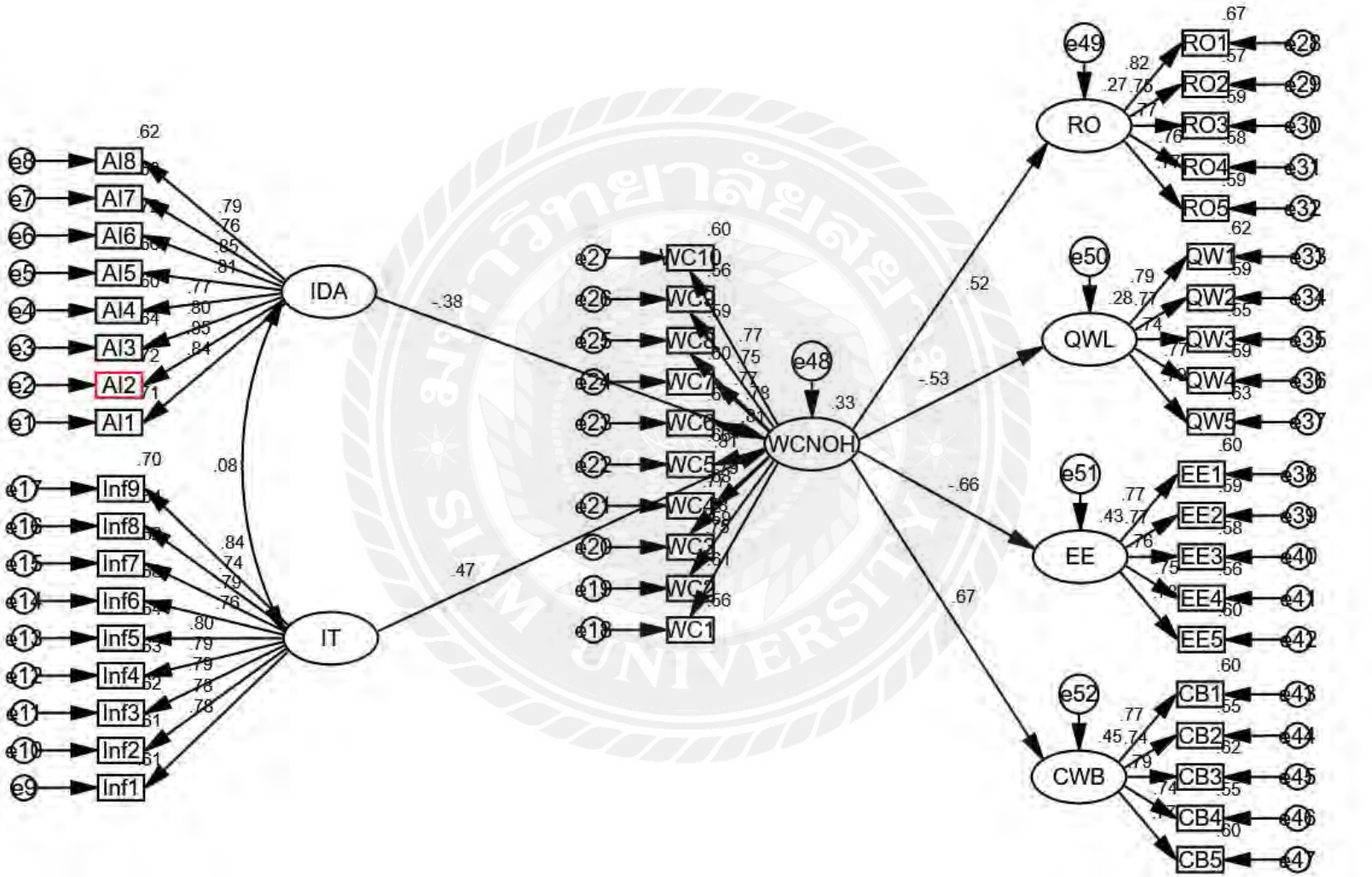


Figure 4.6 The Multigroup Analysis of General Staff

Table 4.9 Constrained and Unconstrained Fit Indices

Statistical Test	Unconstrained	Saturated Model	χ2 Change	DF Change	P
χ2	2581.402	2734.474	153.072	6	0.000
DF	2054	2060			

The table above shows that the chi-square difference between the restrictive and unrestricted models is 153.072, and the degree of freedom difference is 6. The corresponding P is 0.000, which is significant, indicating that there is a significant difference between the two models; that is, It is said that there are differences between executives and general staff among these six paths. Let us further analyze the differences for each path:

Table 4.10 Path Difference Analysis

			Group1 Executives				Group2 General Staff				Contradistinction	
			β	Standard Error	t	P	β	Standard Error	t	P	Coefficient Difference	T Absolute Value＞ 1.96
WCNOH	<---	IDA	0.408	0.067	6.375	***	-0.377	0.048	-7.781	***	-0.785	-9.725
WCNOH	<---	IT	0.508	0.07	7.593	***	0.468	0.052	9.006	***	-0.04	-0.730
RO	<---	WCNOH	0.264	0.067	3.414	***	0.515	0.06	9.33	***	0.251	3.687
QWL	<---	WCNOH	-0.288	0.076	-3.728	***	-0.53	0.059	-9.449	***	-0.242	-2.841
EE	<---	WCNOH	-0.281	0.083	-3.606	***	-0.658	0.069	-11.408	***	-0.377	-4.519
CWB	<---	WCNOH	0.33	0.065	4.204	***	0.673	0.06	11.719	***	0.343	4.894

Comparing the Executives group and the General Staff group, we can find six differences between the two models. After analyzing each path, it was found that every path in the Executives group is significant and meets the hypothesis requirements. Every path in the General Staff group is consistent. The difference between the two must be noticeable. The difference in T value is greater than 1.96, which is significant, and the comparison shows that there is a difference.

4.5 Hypotheses Testing

Through the analysis of the data collected in this study, the hypotheses were tested and the following conclusions were drawn.

Table 4.11 Hypotheses Testing

No.	Hypothesis	Result
H1a	Information technology positively affects executives' work contact during non-office hours	Supported
H1b	Information technology positively affects general staff's work contact during non-office hours	Supported
H2a	High identity awareness can positively influence executives' work connectivity during non-office hours	Supported
H2b	High identity awareness can negatively influence general staff's work connectivity during non-office hours	Supported
H3a	Work contact during non-office hours positively affects executives' role overload	Supported
H3b	Work contact during non-office hours positively affects general staff's role overload	Supported
H4a	Work connectivity during non-office hours inversely affects executives' quality of work life	Supported
H4b	Work connectivity during non-office hours inversely affects general staff's quality of work life	Supported
H5a	Work connectivity during non-office hours inversely affects executives' employee engagement	Supported
H5b	Work connectivity during non-office hours inversely affects general staff's employee engagement	Supported
H6a	Work connectivity during non-office hours positively influences executives' counterproductive work behavior	Supported
H6b	Work connectivity during non-office hours positively influences general staff's counterproductive work behavior	Supported

According to the research results, verify the hypothesis relationship between variables, as shown in Table 4.11. Explain each hypothesis based on the analysis results.

Hypothesis 1a: Information technology positively affects executives' work contact during non-office hours (Accepted Hypothesis)

Hypothesis 1b: Information technology positively affects general staff's work contact during non-office hours (Accepted Hypothesis)

Hypothesis 2a: High identity awareness can positively influence executives' work connectivity during non-office hours (Accepted Hypothesis)

Hypothesis 2b: High identity awareness can negatively influence general staff's work connectivity during non-office hours (Accepted Hypothesis)

Hypothesis 3a: Work contact during non-office hours positively affects executives' role overload (Accepted Hypothesis)

Hypothesis 3b: Work contact during non-office hours positively affects general staff's role overload (Accepted Hypothesis)

Hypothesis 4a: Work connectivity during non-office hours inversely affects executives' quality of work life (Accepted Hypothesis)

Hypothesis 4b: Work connectivity during non-office hours inversely affects general staff's quality of work life (Accepted Hypothesis)

Hypothesis5a: Work connectivity during non-office hours inversely affects executives' employee engagement (Accepted Hypothesis)

Hypothesis5b: Work connectivity during non-office hours inversely affects general staff's employee engagement (Accepted Hypothesis)

Hypotheses6a: Work connectivity during non-office hours positively influences executives' counterproductive work behavior (Accepted Hypothesis)

Hypotheses6b: Work connectivity during non-office hours positively influences general staff's counterproductive work behavior (Accepted Hypothesis)

4.6 Conclusion

Based on the results of the structural equation analyses, all hypotheses are valid.

Based on the multigroup analysis, the following conclusions showed:

1. Information technology has some effects on both general staff and executives, which will cause some work connectivity during non-office hours, but through multigroup analysis, it can be found that Information technology has some impact on both general staff

and executives, it will cause some work connectivity during non-office hours, but through multigroup analysis, it can be found that

2. High identity awareness have a different impact on general staff and executives. Through multigroup analysis, it can be found that will cause executives to increase work connectivity during non-office hours, while at the same time, it will cause general staff and executives to increase work connectivity during non-office hours. The multigroup analysis shows that this will increase work connectivity for executives and decrease work connectivity during non-office hours for general staff.

3. Work connectivity during non-office hours caused both general staff and executives to create role overload. Through multigroup analysis, it can be found that work connectivity during non-office hours generated more role overload for general staff, but executives will perceive less role overload.

4. Work connectivity during non-office hours reduces the quality of work life for general staff and executives through multigroup analysis. Work connectivity during non-office hours has a more significant impact on general staff and thus reduces the quality of work life more than executives.

5. Work connectivity during non-office hours lowers employee engagement for general staff and executives. Through multigroup analysis, it can be found that work connectivity during non-office hours significantly impacts general staff and thus reduces employee engagement more than executives.

6. Work connectivity during non-office hours will cause both general staff and executives to develop counterproductive work behavior; as can be found through multigroup analysis, work connectivity during non-office hours results in more counterproductive work behavior for general staff and less counterproductive work behavior for executives. Behaviors, but executives have relatively less counterproductive work.

CHAPTER 5
RESEARCH CONCLUSION, DISCUSSION & RECOMMENDATION

5.1 Research Conclusion

This study aimed to investigate the impacts of work connectivity during non-office hours on people's attitudes and behaviors. The research was conducted around three main objectives: (1) To study the impacts of work connectivity during non-office hours on the attitude and behavior of general staff and executives in educational institutions in Shandong Province, China. (2) To conduct a comparative analysis on the attitude and behavior of general staff and executives regarding work connectivity during non-office hours. (3) To provide guidelines for general staff and executives in educational institutions on managing the impacts of work connectivity during non-office hours.

Accordingly, the study addressed the following questions: (1) What are the impacts of work connectivity during non-office hours on the work perception, attitude, and behavior of general staff and executive staff of educational institutions in Shandong, China? (2) What are the similarities and differences between the general staff and executive staff's attitude and behavior toward work connectivity during non-office hours? (3) How can we practically and constructively manage these workplace circumstances and challenges in the context of educational organizations?

The research employed a quantitative method, distributing questionnaires to full-time employees in the educational sector of Shandong Province, from which 202 valid questionnaires were received from executives and 414 from general staff. A 5-point Likert scale was used in the questionnaire to measure and compare the different manifestations of the two groups, general staff and executives, in the context of work connectivity during non-office hours.

The results of the study supported all hypotheses. Specifically, Information technology positively affects executives' and general staff's work contact during non-

office hours (H1a&b). High identity awareness can positively influence executives' work connectivity during non-office hours (H2a) and can negatively influence general staff's work connectivity during non-office hours (H2b). Work contact during non-office hours positively affects executives' and general staff's role overload (H3a&b). Work connectivity during non-office hours inversely affects executives' and general staff's quality of work life (H4a&b). Work connectivity during non-office hours inversely affects executives' and general staff's employee engagement (H5a&b). Work connectivity during non-office hours positively influences executives' and general staff's counterproductive work behavior (H6a&b).

Based on multigroup analysis, differences in the manifestations of work connectivity during non-office hours between the two groups, general staff and executives, can be compared.

1. The analysis of the data clearly indicates that the influence of information technology on the work connectivity during non-office hours of general staff and executives is almost identical, with a slightly stronger impact on executives than on general staff.

In the digital information age, labor has broken through the boundaries of time and space, providing flexible work methods and improving work efficiency. However, it has also led to new issues: the boundaries between work and life are blurred, leading to frequent invisible overtime and an inability to rest properly. In the past, there was a clear boundary between rest and work venues. In traditional work methods and labor environments, although occasional work connectivity during non-office hours occurred, there were strict regulations. Nowadays, "invisible overtime" is both widespread and unregulated, placing people in a transparent and "worked upon" atmosphere, as if there are no means to restrict or standardize it.

Some employers require employees to join work groups, and work can still be arranged through WeChat and other means after working hours, preventing employees from getting effective rest, and their rights to rest and privacy are not guaranteed, blurring the boundary between work and life.

Some employers require employees to be online 24 hours a day, and some employees are criticized, fined, or even fired for not responding to messages in time or not clocking in, attending online meetings, or liking and forwarding posts after work. Being "always online" traps employees in the work system, affecting their physical and mental health.

Because the right to disconnect and rest is different from the rest rights corresponding to traditional standard working hours, it is hidden and uncertain, not so explicit, so its regulation and exploration will take a process. However, regardless of the length of this process, it should be paid attention to, rather than being ignored as if it does not exist, allowing it to affect our lives in a hidden place.

2. Work connectivity during non-office hours has a negative impact on the attitudes and behaviors of both general staff and executives, with a slightly stronger negative impact on general staff than on executives.

China's Labor Law stipulates a working hour system where the working hours of employees should not exceed 8 hours per day, and the average weekly working hours should not exceed 44 hours. Referring to the Labor Law, practitioners in educational institutions, as workers in China, should enjoy the right to rest stipulated by law. Work connectivity during non-office hours is a "boundary-crossing" behavior that crosses the boundary between work and life (Jo & Lee, 2022), objectively increasing employees' working time and workload (Shi Guanfeng, Zheng Xiong, 2021), continuously exposing employees to work demands and invading employees' resources in other areas, which undoubtedly increases employees' stress and interference with employees' private lives.

Work connectivity during non-office hours occupies employees' non-work time (Gadeyne et al., 2018), which not only consumes employees' physical and mental resources but also may cause employees to miss opportunities to obtain resources from others, such as opportunities to accompany family members (Wang Xiaotian et al., 2019). At this time, employees will produce dissatisfaction and resistance, and when facing work requirements, individuals need to mobilize their control resources to suppress negative emotions and cognition. Therefore, work connectivity during non-

office hours increases employees' workload and overdraws self-control resources (He Yujie, Yu Jing, 2020), leading to a phenomenon of individual resource insufficiency.

Employees in a state of resource depletion will have a strong desire to protect existing resources to avoid a spiral increase in resource loss and will take measures to reduce their efforts (Hobfoll, 1989, 2001). Existing scholars have shown that individuals with resource depletion are prone to cognitive biases, believing that they cannot control the external environment (Fischer et al., 2008; Yu Guangyu et al., 2022), and have a negative cognition of work. Therefore, in order to maintain the existing resources from loss, employees will invest less resources in work, resulting in negative attitudes and behaviors.

This study has proven that as the frequency of work connectivity during non-office hours increases, it will have a negative impact on employees' attitudes and behaviors.

3.However, it is interesting to note that although work connectivity during non-office hours has the same directional impact on the attitudes and behaviors of general staff and executives, the same intensity of identity awareness will have completely opposite effects on the work connectivity during non-office hours of general staff and executives.

According to the Conservation of Resources Theory and Job Demand-Resource model, for most people, time is a non-renewable resource, especially rest time, which can be used to improve one's abilities, take care of the family, rest, meet friends, etc., but work connectivity during non-office hours poses a great potential threat to the free disposal of rest time.

Human capital theory believes that the price of time is the accumulation of human capital. The social nature of time determines that any time system in the past has its applicable limits, and the boundary of the social and cultural community is often the scope of application of a certain time system (Yu Jinyao, Hong Qingming, 2016).

Both general staff and executives are workers in China, and time, as a precious and non-renewable resource, is very important to them. Experimental data also shows that work connectivity during non-office hours does indeed have a negative impact on these two groups.

Therefore, for general staff and executives, a high degree of identity awareness should have a negative correlation with work connectivity during non-office hours. However, during the experiment, it was found that executives, due to a high degree of identity awareness, actually had more work connectivity during non-office hours.

After sorting out the relevant literature, the reason for this phenomenon is largely due to the lack of confidence caused by the imposter phenomenon caused by the executives' excessive expectations of themselves.

5.2 Discussion

Based on multigroup analysis, differences in the manifestations of work connectivity during non-office hours between the two groups, general staff and executives, can be compared.

This study aimed to provide answers to 3 research objectives:

(1) To study the impacts of work connectivity during the non-office hours on the attitude and behavior of general staff and executives in educational institutions in Shandong Province, China.

Work connectivity during non-office hours will cause role overload for both general staff and executives. Through multigroup analysis, it can be found that work connectivity during non-office hours will cause more role overload for general staff, but executives will perceive less role overload.

Work connectivity during non-office hours will reduce the quality of work life for both general staff and executives. Through multigroup analysis, it can be found that work connectivity during non-office hours has a greater impact on general staff, making them more likely to reduce the quality of work life than executives.

Work connectivity during non-office hours will reduce employee engagement for both general staff and executives. Through multigroup analysis, it can be found that work connectivity during non-office hours has a greater impact on general staff, making

them more likely to reduce employee engagement than executives.

Work connectivity during non-office hours will cause counterproductive work behavior for both general staff and executives. Through multigroup analysis, it can be found that work connectivity during non-office hours will cause more counterproductive work behavior for general staff, but executives will have relatively less counterproductive work behavior.

(2) To conduct a comparative analysis on the attitude and behavior of general staff and executives on work connectivity during non-office hours.

Information technology has a positive impact on the work connectivity during non-office hours for both general staff and executives. By comparison, it can be found that the development of information technology will cause more work connectivity during non-office hours for executives.

High identity awareness has completely different effects on the work connectivity during non-office hours of general staff and executives. Through multigroup analysis, it can be found that high identity awareness will increase work connectivity during non-office hours for executives, while it will decrease work connectivity during non-office hours for general staff.

(3) To provide guidelines for general staff and executives in educational institutions on managing the impacts of work connectivity during non-office hours.

By establishing the correct identity awareness for general staff and executives to regulate work connectivity during non-office hours, reduce employees' negative attitudes and behaviors, and thereby increase organizational performance.

5.3 Recommendations

Based on the results of this study, this section provides comprehensive recommendations for policymakers, managers, and future researchers to deepen the understanding of the Impacts of Work Connectivity during Non-Office Hours on People’s Attitudes and Behaviors. The study provides theoretical significance for improving the management level of the educational industry in China.

Recommendations on policy and strategy are as follows:

1. Establish a psychological resource compensation mechanism.

   Organizational resources are an important foundation for employee

development. Generally, organizational resources include two types: one is material resources, that is, the concrete resources allocated by the organization and leaders to help employees complete work; the other is psychological resources, which are emotional resources that keep employees in a positive mood. For executives, their psychological resources are extremely scarce, making them prone to work burnout and emotional exhaustion. The dynamic balance of individual resources is an important basis for their positive development. Organizations should compensate psychological resources for executives in a timely manner.

2. Expand the tolerance interval.

Achievement can be regarded as the central symptom of "Imposter Phenomenon." They have a strong obsession with achievement, not to prove their own value, but to prevent others from discovering their "true face." They will not take on new tasks proactively and lack the spirit of exploration and innovation, which deprives the organization of the potential momentum and energy for its own development. Organizations should establish an open and inclusive organizational culture, expand the tolerance space for executives to protect their self-esteem, enhance their positive emotions and exploratory spirit, and promote their psychological transformation.

3. Build a smooth feedback and communication situation.

Organizations should have smooth and effective feedback and communication situations to enhance communication between employees, leaders, and colleagues, reduce their psychological unease, improve their job pleasure, and strengthen their correct self-perception. Organizations should enhance the technicality of feedback, pay attention to the appropriateness of feedback methods, timing, and content. Organizations should convey a positive value to executives through normalized feedback to weaken the negative emotions of executives.

4. Maintain an appropriate psychological distance.

Pay attention to the "psychological distance effect" in interpersonal relationships. Interpersonal relationships in organizations also need to maintain an appropriate distance. Good interpersonal relationships are conducive to eliminating mutual suspicion and estrangement, promoting mutual trust, but too short a psychological distance can easily cause psychological pressure and burden. Therefore, organizations should pay attention to building an appropriate psychological distance

between employees.

Recommendations on management practices are as follows:

1. Be vigilant about the hidden dangers of work connectivity during non-office hours

and develop relevant management strategies.

Organizations need to manage and control the behavior of "invisible overtime" and not advocate frequent implementation of work connectivity during non-office hours (He Yujie, Yu Jing, 2020). Organizations should require managers not to use electronic communication devices to communicate with employees about work-related matters during non-working hours unless there is an emergency, actively disconnecting with employees during non-working hours to allow employees to rest assured. In addition, organizations can provide more benefits and allowances for employees' work connectivity during non-office hours when necessary, to compensate for this "invisible overtime" behavior.

2. Reasonably standardize online office work to eliminate excessive occupation of non-working hours.

In the context of the rapid development of information technology, in order to pursue the maximization of work efficiency, some organizations will use work connectivity during non-office hours to let employees handle work matters free of charge during non-working hours, leading to a lack of clear boundaries between employees' work and life fields, thereby intensifying the problem of employees being "on call" 24 hours a day. Organizations should grant employees the "right to disconnect," allowing employees not to reply to any work-related messages during certain periods. This will prevent negative impacts on employees' attitudes and behaviors.

3. Care about employees' psychological conditions and reduce self-consumption.

Organizational managers should reduce the consumption of employees' resources as much as possible. Provide human care to employees who suffer from work pressure, allowing them to release pressure in time, reduce the accumulation of negative experiences, prevent the loss of resources, and then devote themselves to work in a better state (Guan et al., 2022). If conditions permit, cognitive and emotional

adjustment training courses (Xia et al., 2019) can be offered to train employees on how to deal with work pressure situations.

4. Enhance employees' positive work cognition to prevent the occurrence of negative

impacts.

Organizations can regularly survey employees' work conditions and evaluate employees' work status in combination with the observations of department heads. At the same time, organizations can show concern for employees through this method and urge employees to adjust their work status in time. In addition, organizations should pay attention to employees' psychological needs, reduce negative experiences, and improve employees' sense of control over work, so that they can realize the value of work and show higher enthusiasm for work.

5. Optimize work design to maintain appropriate work difficulty and intensity.

Organizations should optimize employees' work design in combination with the actual ability of employees. Complex work increases the challenge and uncertainty for employees, posing higher requirements for employees' own abilities, which will increase the workload of employees with work connectivity during non-office hours. When the complexity of work is higher, work connectivity during non-office hours will exacerbate the state of self-consumption of employees. When designing work, organizations should appropriately decompose work content according to the size of the workload to ensure a reasonable level of work complexity.

Recommendations for further research are as follows:

1. Future research can explore the reasons why executives with high identity awareness still have more work connectivity during non-office hours, knowing that it will lead to the loss of their own resources, and propose a new, more correct, and healthy identity awareness for executives.

2. To avoid general staff falling into the same dilemma of identity awareness as executives in the face of changes in work demands, and to prevent general staff from following the same path as executives.

3. Distinguish the types of work connectivity during non-office hours. The premise of this study is that work connectivity during non-office hours is a passive and

involuntary behavior of employees. However, in some situations, work connectivity during non-office hours may be a voluntary behavior of employees. Future research can distinguish the types of work connectivity during non-office hours from the aspects of voluntariness and involuntariness, and explore the differentiated impact of different types of non-working hour work connectivity on employees' attitudes and behaviors.

4. This study was conducted in the organizational context of China. Future research can start from a cross-cultural perspective and conduct comparative studies in different cultural backgrounds to further expand the depth and breadth of work connectivity during non-office hours.

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APPENDIX

Questionnaire

Impacts of Work Connectivity During Non-Office Hours
on People's Attitudes and Behaviors:
A Comparative Case between General Staffs and Executives in Educational Institutions in Shandong Province, China

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To Questionnaire Respondent

Hello! Thank you very much for taking part in this research.

This study is anonymous and will be used for academic research only, and the data will be kept strictly confidential. Meanwhile, the second part of this questionnaire uses a 5-point Likert size, which is divided into 1-5 points, from 1 to 5: never (1), rarely (2), sometimes (3), often (4), very often (5).The options themselves are not right or wrong,the third part is a subjective answer to the question.so please fill them out fairly and objectively, as your thoughts will provide important help to my research. Thanks again!

Mr. Chen Xiangzhi
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Part 1 Demographic Information

Remark: please choose by using √

1. Your gender:

   ☐ Male ☐ Female

2. Your age is:

   ☐ Under 25 years old ☐ 26-35 years old

   ☐ 36-45 years old ☐ 46-55 years old ☐ Over 56 years old

3. Your highest level of education is:

   ☐ College and below ☐ Bachelor's degree

   ☐ Master's degree ☐ Doctoral degree

4. Your length of service

   ☐ Within 1-year ☐ 1-5 years

   ☐ 6-10 years ☐ 11-15 years ☐ More than 16 years

5. Your title:

   ☐ Lecturer ☐ Assistant Professor

   ☐ Associate Professor ☐ Professor

6. Your status:

   ☐ Full-time faculty member ☐ Full-time administrator

7. Monthly income:

   ☐ Less than ¥4,000 ☐ ¥4,000 to ¥8,000

   ☐ ¥8,000 to ¥12,000 ☐ More than ¥12,000

8. Weekly working hours:

   ☐ 40 hours and less ☐ More than 40 hours

<u>Part 2</u> Relational Factors

The questionnaire used Likert scale, ranging from 1 to 5 in which never (1), rarely (2), sometimes (3), often (4), very often (5).

Item	Your Attitudes and Behaviors	Alternative Answer				
		1	2	3	4	5
Information Technology						
1	The use of IT ensure and enhance safe transmission of confidential information to the right destination.					
2	Information Technology increases accessibility of knowledge, leading to my self-learning.					
3	The use of IT enable me to network with other people to improve my work productivity.					
4	The use of IT enhances quick response and recognitions from my superior.					
5	The use of IT enhances quick response and recognitions from my colleagues and team(s).					
6	IT infrastructures and facilities in my organization are efficient.					
7	IT infrastructures and facilities in my organization not user friendly.					
8	The use of social media platforms enhance the productivity of my works.					
9	IT system in my organization are fully designed to serve the mission and operations of the organization.					
Identity Awareness						
2.1	**Identity Awareness (For Executives)**					
10	I can trust my inner voice, it usually lead me in the right direction.					
11	I feel I don't really belong anywhere					
12	I don't remember my childhood thoughts and feeling but I believe in my current achievements.					
13	I have confidence of knowing what kind of person I really am.					
14	I am sharing my visions with those of the organization that I work for.					
15	I am fully aware on how people can manage to tell what is right and what is wrong.					
16	I believe in exploring possible thoughts and mindsets.					
17	I believe that people are connected by the shared passion.					
2.2	**Identity Awareness (For General Staffs)**					
10	I can certainly identify a few things that I can do very well (skill and expertise)					
11	I feel I don't really belong any departmental.					
12	I often surprise of my progress in work and life					

Item	Your Attitudes and Behaviors	Alternative Answer				
		1	2	3	4	5
13	I often aware of my inner self					
14	I believe my personal vision and organization's vision are mostly congruence.					
15	I certainly believe that I can distinguish right from wrong					
16	I like to experiment with different ways of thinking					
17	I believe that people are connected by the shared interest					
Work Connectivity During Non-Office Hours						
18	When I fall behind in my work during the day, I work hard at home at night or weekends to get caught up by using my cell phone and/or PC.					
19	When there is an urgent issue or deadline at work, I tend to bring work related tasks to home and solve it by using cellphone and/or PC.					
20	I prefer work at home after hours or on weekends so that I am able to avoid unexpected encounters with my supervisor and/or the co-workers that will potentially disrupt my ability to complete the task.					
21	My job enables me to perform many of its tasks independently by using smart phone and/or PC.					
22	Using technological tools and devices in my jobs would increase productivity.					
23	My employer/supervisor expects the staffs' use of technological tools to work form their home at night/weekends.					
24	There is a "social pressure" emanating from important people in your organization requiring you to remain connected and reachable during the non-office time.					
25	I leave my cell phone turned off and do not use my PC for work related tasks when I return home from work.					
26	I ignore job-related task when I am on my vocation or holidays and refrain from using modern communication devices for those tasks.					
27	I frequently review work related online contents by using communication tools.					
Role Overload						
28	There is a great need to lighten some of my work.					
29	I feel stressed at work.					
30	I take on too many responsibilities.					
31	I am overburdened with work.					
32	The amount of work I've taken on is so great that I can't guarantee quality.					
Quality of Work Life						
33	I can learn new skills and get a sense of achievement from my job, even though it is challenging.					

Item	Your Attitudes and Behaviors	Alternative Answer				
		1	2	3	4	5
34	There is a good promotion system in the school and there will be opportunities for advancement.					
35	I will be recognized and rewarded by my leaders if my performance is outstanding					
36	I have a higher salary and benefits package than my peers and I earn enough to live on.					
37	My job will not bring me too much mental pressure and will not affect my physical and mental health.					
Employee Engagement						
38	I am very excited and proud to work					
39	I wake up in the morning wanting to go to work and I have a lot of energy when I work					
40	I'm happy with the high intensity of my work					
41	I am passionate about my work					
42	I am immersed in my work and I can forget myself.					
Counterproductive Work Behavior						
43	I sometimes take extended breaks without permission					
44	I have had a conflict with a colleague at work					
45	I have misappropriated organizational property					
46	I have deliberately slowed down my work at times, even though this may interfere with work that is important to others					
47	I sometimes do non-work related things during office hours					

Part 3 **Relational Factors**

Open-ended questions

This open-ended questionnaire is expected to provide an understanding of the work status of employees through a survey of your work situation. The interview does not involve personal privacy or state secrets, and we will keep the answers you give strictly confidential. In addition, the questionnaire is not mandatory and you do not need to take any responsibility and consequences:

1. How has the intensity and pressure of work changed in the last six months compared to before?
2. Can you give some examples of how the workload has changed?
3. What do you think are the reasons for these changes in workload?
4. Is there any overtime work in your department?
5. What do you consider to be "overtime"?
6. How is overtime recognized and compensated in your school?
7. How do you think overtime work affects you?
8. Your daily working hours are approximately hours (including time spent at work and at home).
9. Do you have anything to add?

We apologize for any inconvenience caused and thank you again for your help! We wish you good health and progress in your career!

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