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Stress Management at the Workplace:

A Comparative Study

between Chinese and German Companies

Dissertation

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Vorgelegt
von

Dong Li

aus
Xinyang, China

Dekan:	**Prof. Dr. Jörg Gundel**
Erstberichterstatter:	**Prof. Dr. Torsten M. Kühlmann**
Zweitberichterstatter:	**Prof. Dr. Reinhard Meckl**
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Abstract

Although extensive scholarly and practical attention has been paid to workplace stress in cross-cultural settings over the past decades, the comparative studies on workplace stress management between Chinese and German companies remain elusive. To fill this research gap, a comparative study on stress management at the workplace between Chinese and German companies has been conducted in two culturally different countries: China and Germany.

To obtain a relatively comprehensive and accurate comparison of stress management at the workplace between Chinese and German companies, four new scales, namely Sources of Work Stress Scale, Coping with Stress Scale, Health and Well-being Scale, and Job Satisfaction Scale, have been developed and validated by several empirical studies with German and Chinese samples. The softwares SPSS 22, Smart PLS 3 and Amos 22 were used to test the factor structure, reliability, validity and the cross-cultural equivalence for each scale. The aim of these important steps is to lay a solid foundation for the current comparative study and ensure the validity of the research results.

After the reliability, validity and cross-cultural equivalence were all established by several pre-surveys with Chinese and German samples, the formal questionnaire surveys with four scales were conducted in Chinese and German companies. Participants could finish either the paper-and-pencil version or the online version of questionnaires. In China, participants were randomly chosen from a variety of industries in different cities. Correspondingly, German participants were randomly selected from various industries in different cities in Germany.

The independent-samples t test and effect size statistics were conducted to identify whether there are some significant differences between Chinese and German employees' sources of work stress, coping with stress at work, and the consequences of work stress, such as health and well-being, and job satisfaction.

Results of hypotheses testing regarding Chinese and German employees' sources of work stress indicate that all the hypotheses were supported except one hypothesis. Specifically speaking, compared with their German counterparts, Chinese employees reported significantly more stress caused by workload, competition and comparison, role uncertainty, lack of control, pay and career prospects, lack of competency, relationships at work, and boredom at work. However, Chinese employees did not report significantly more stress caused by work-life balance compared with German employees.

Results of hypotheses testing regarding Chinese and German employees' coping with stress indicate that Chinese employees use positive thinking and self-blame as ways to deal with stress more often compared with their German counterparts. German employees use physical exercises, leisure and relaxation, and problem-solving coping as ways to deal with stress more often than their Chinese counterparts. Results of hypotheses testing show that German employees use religious coping as a way to deal with stress not significantly more often than Chinese employees. However, German employees use acceptance as a way to deal with stress more often rather than less often compared with their Chinese counterparts.

Results of hypotheses testing regarding Chinese and German employees' job satisfaction indicate that German employees reported significantly higher level of job satisfaction than their Chinese counterparts.

Results of hypotheses testing regarding Chinese and German employees' physical health and psychological well-being find that there is no significant difference between Chinese employees and German employees in physical health and there is also no significant difference between Chinese employees and German employees in psychological well-being.

The correlation analyses were also conducted in both samples to observe the relationship between health and well-being and job satisfaction as well as the relationship between job satisfaction and turnover intention. Results of hypotheses testing find that the problems of physical health and the problems of psychological well-being are both negatively related to the level of job satisfaction in German samples. In Chinese samples, the problems of physical health are not significantly related to job satisfaction, only the problems of psychological well-being are negatively related to the level of job satisfaction. Results of hypotheses testing indicate that the job satisfaction is negatively related to turnover intention in both samples. Employees who report higher levels of job satisfaction will report lower intention to quit.

Contents

List of Abbreviations

AGFI	Adjusted Goodness-of-Fit Index
AIS	American Institute of Stress
AMOS	Analysis of Moment Structures
ASSET	A Shortened Stress Evaluation Tool
AVE	Average Variance Extracted
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CFPS	China Family Panel Studies
CISS	Coping Inventory for Stressful Situations
CMV	Common Method Variance
CR	Composite Reliability
CRI	Coping Response Inventory
CSQ	Coping Strategies Questionnaire
CSS	Coping with Stress Scale
DCM	Demand-Control Model
df	degree of freedom
EAPs	Employee Assistance Programs
EFA	Exploratory Factor Analysis
e.g.	Latin: exempli gratia = example given
ES	Effect Size
EU	European Union
HTMT	Heterotrait-Monotrait Ratio
IFI	Incremental Fit Index
GAS	General Adaptation Syndrome
GFI	Goodness of Fit Index

GfK	Gesellschaft für Konsumforschung
HSE	Health and Safety Executive
HWS	Health and Well-being Scale
JSS	Job Satisfaction Scale
KMO	Kaiser-Meyer-Olkin
MI	Modification Indices
ML	Maximum Likelihood
NA	Negative Affectivity
NIOSH	National Institute of Occupational Safety and Health
PE fit	Person-Environment fit
RMSEA	Root Mean Square Error of Approximation
SAD	Season Affective Disorder
SD	Standard Deviation
SDB	Social-desirability Bias
SEM	Structural Equation Modeling
SMIs	Stress Management Interventions
SMT	Stress Management Training
SPSS	Statistical Package for the Social Sciences
SRMR	Standardized Root Mean Square Residual
SWSS	Sources of Work Stress Scale
TLI	Tucker-Lewis Index
TM	Transcendental Meditation
VET	Vocational Education and Training
WCC	Ways of Coping Checklist
WCQ	Ways of Coping Questionnaire
WHO	World Health Organization

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1 Introduction

This chapter will focus on the introduction to the research, including the research background, research questions, research objectives and research framework.

1.1 Research Background

Stress is inevitable in our lives and work and almost no one is exempt from stress. It has been frequently studied as a multidisciplinary concept over the last century (Aliah, 2011). A large number of works from psychologists, epidemiologists, therapists, consultants, journalists and so on have paid attention to stress (Newton & Fineman, 1995). People have called stress "the third wave plague" as it has become a common occurrence in both developed and developing countries (Aliah, 2011; Sutherland & Cooper, 1990; Zehan, 2012).

The international economic associations were dramatically close with the emergence of organizations of free trade in 1990s (Thomas & Peterson, 2014). There are some very important trade organizations in the world, including the European Union (EU), the North American Free Trade Agreement (NAFTA), the Asia-Pacific Economic Cooperation (APEC) and the World Trade Organization (WTO) (Thomas & Peterson, 2014) that has 164 members as of July 2016. Another very important trade organization is the ASEAN-China Free Trade Area (ACFTA) which is the biggest area of free trade in terms of population size. As a result of the advent of free trade organizations, the world's economic interconnections are increasingly strengthened, and the local economic conditions are no longer isolated from other countries, they are easily influenced by the world economic conditions (Thomas & Peterson, 2014).

With the development of world economy and the globalization of labor market, competition among employees has become increasingly fierce, and more and more employees

have been affected by mergers, downsizing, outsourcing, or redundancy (Landsbergis, 2003; Siegrist, 2012b). These changes not only take place in the developed countries, but also are now spreading quickly across developing countries like China, India, and Vietnam in Asia as well as Brazil in Latin America (Schnall, Rosskam, & Dobson, 2009; Siegrist, 2012b).

In recent years, we have been subject to the economic crises, higher competition, negative news from all over the world, and the emergence of incurable and rapid spreading diseases, which make people exposed to stress more often than before (Shchuka, 2010). Stress in this day and age, is not something new (Agrawal, 2001). There has been a persistent pressure on employees because of the rapid developments in technology and the need to meet customer demands of low price but high quality products (Bamber, 2011, 2013).

Every job is potentially stressful, although the stresses may be different from each other (Furnham, 2012). As a growing problem worldwide, work stress or occupational stress has caused substantial costs to both employees and organizations (Aliah, 2011; Cotton & Hart, 2003) through lost production due to sick leaves, early retirement due to ill health, lawsuits and poor performance at work (Bamber, 2011, 2013).

The World Health Organization (WHO) has acknowledged work stress to be a global epidemic (Avey, Luthans, & Jensen, 2009). It is impossible to avoid the losses caused by stress at work. However, it is of theoretical and practical importance to reduce the negative effects of work stress for the better performance and health.

Stress management has become an important aspect in business management, especially for human resource managers. Many researchers as well as practitioners have paid attention to workplace stress over the past decades. They have elucidated the current situations of research, the sources of stress (stressors), the mechanism of stress physiology and psychology, health and well-being, coping strategies, and the styles that individuals and organizations cope with stress (Avey et al., 2009). However, to find out the stressors and reduce the workplace stress, to select appropriate strategies for stress management, to maintain a healthy development for both individuals and organizations is a dynamic and systemic process not a certain isolated aspect, and the comparative studies on workplace stress between China and Germany are relatively few in number. Therefore, the time is also for new perspectives of research (Avey et al., 2009).

In an overly competitive workplace (Bamber, 2011, 2013), there has been increased anxiety, uncertainty, and higher stress levels (Abramowitz, 2012). Under such circumstances, more and more attention is being paid to work stress by researchers and practitioners in not only developed countries but also developing countries. As we know, China is the biggest developing country, and Germany is a representative developed country. Therefore, a comparative study on stress management at the workplace between Chinese and German companies would be of great theoretical and practical significance.

1.2 Research Questions

Though many studies have investigated work stress in cross-cultural settings (Glazer & Beehr, 2005; Liu, Spector, & Shi, 2007; Peterson et al., 1995; Spector et al., 2001), comparative studies on workplace stress between China and Germany remain elusive. To fill the research gap, this study will compare employees' work stress in two culturally different countries: China and Germany. The title of the research topic is: ***Stress Management at the Workplace: A Comparative Study between Chinese and German Companies.***

Many studies have explored the definition of stress (Schuler, 1980; Seaward, 2013, 2017), job satisfaction, sources of work stress, coping strategies (Cooper & Payne, 1989; Faragher, Cooper, & Cartwright, 2004; Folkman & Lazarus, 1988; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986) and correspondent psychological, physical, and behavioural reactions (Liu et al., 2007). The current study will focus on the following five aspects:

- Chinese and German employees' sources of work stress: What are the Chinese and German employees' main sources of work stress? Is there any significant difference between them?
- Chinese and German employees' coping with stress at work: How do Chinese and German employees cope with stress at work? Is there any significant difference between them?
- Chinese and German employees' health and well-being: What are the current

conditions of Chinese and German employees' health and well-being? Is there any significant difference between them?

- Chinese and German employees' job satisfaction: How is the job satisfaction of Chinese and German employees? Is there any significant difference between them?

- Relationships: What is the relationship between problems of health and well-being and job satisfaction? What is the relationship between job satisfaction and turnover intention?

1.3 Research Objectives

By questionnaire surveys on employees' work stress in Chinese and German companies, the aim of this study is to compare stress management at the workplace between Chinese and German companies. Specifically speaking, there are five objectives of this study:

- First, to identify the main sources of work stress of both Chinese employees and German employees.

- Second, to investigate how Chinese employees and German employees cope with stress at work.

- Third, to recognize the conditions of health and well-being of both Chinese employees and German employees.

- Fourth, to know the level of job satisfaction of both Chinese employees and German employees.

- Fifth, to find out whether there are some relationships among job satisfaction, health and well-being, and turnover intention.

1.4 Research Framework

The frame structure of the research is shown in Figure 1.1. The entire dissertation can be divided into six parts:

The first part (Chapter 1) is the introduction to the research. The second part (Chapter 2 and Chapter 3) is the literature review on stress and work stress. The third part (Chapter 4) focuses on the research methodology and hypotheses. The fourth part (Chapter 5) is the introduction of bias and equivalence, which are two important concepts in cross-cultural research. The fifth part (Chapter 6, Chapter 7, Chapter 8 and Chapter 9) is the development and validation of the four scales, namely Sources of Work Stress Scale, Coping with Stress Scale, Health and Well-being Scale, and Job Satisfaction Scale, which will be used as research tools in the future. The sixth part (Chapter 10 and Chapter 11) is the core research results, discussion and conclusion based on the empirical investigations in Chinese and German companies.

Specifically speaking, Chapter 1 is the Introduction. The research background, research questions, research objectives, and research framework will be given.

Chapter 2 focuses on the literature on Stress, including the definition of stress, history and pioneers of stress research, types of stress, sources of stress, and costs of stress.

Chapter 3 focuses on the literature on Work Stress, including the definition of work stress, theories and models of work stress, sources of work stress, work stress and job satisfaction, work stress and health and well-being, coping with stress at work, and stress management interventions.

In Chapter 4, Research Methodology and Hypotheses, the research design, research hypotheses, procedure, instruments and measures are introduced.

Chapter 5 is the Bias and Equivalence in Cross-Cultural Research. It focuses on the need to establish equivalence, taxonomy of bias, sources of bias, taxonomy of equivalence, and the strategies to deal with bias and establish equivalence in cross-cultural research. This chapter can be regarded as the theoretical foundation of the cross-cultural equivalence examinations for the four scales developed and used in this study.

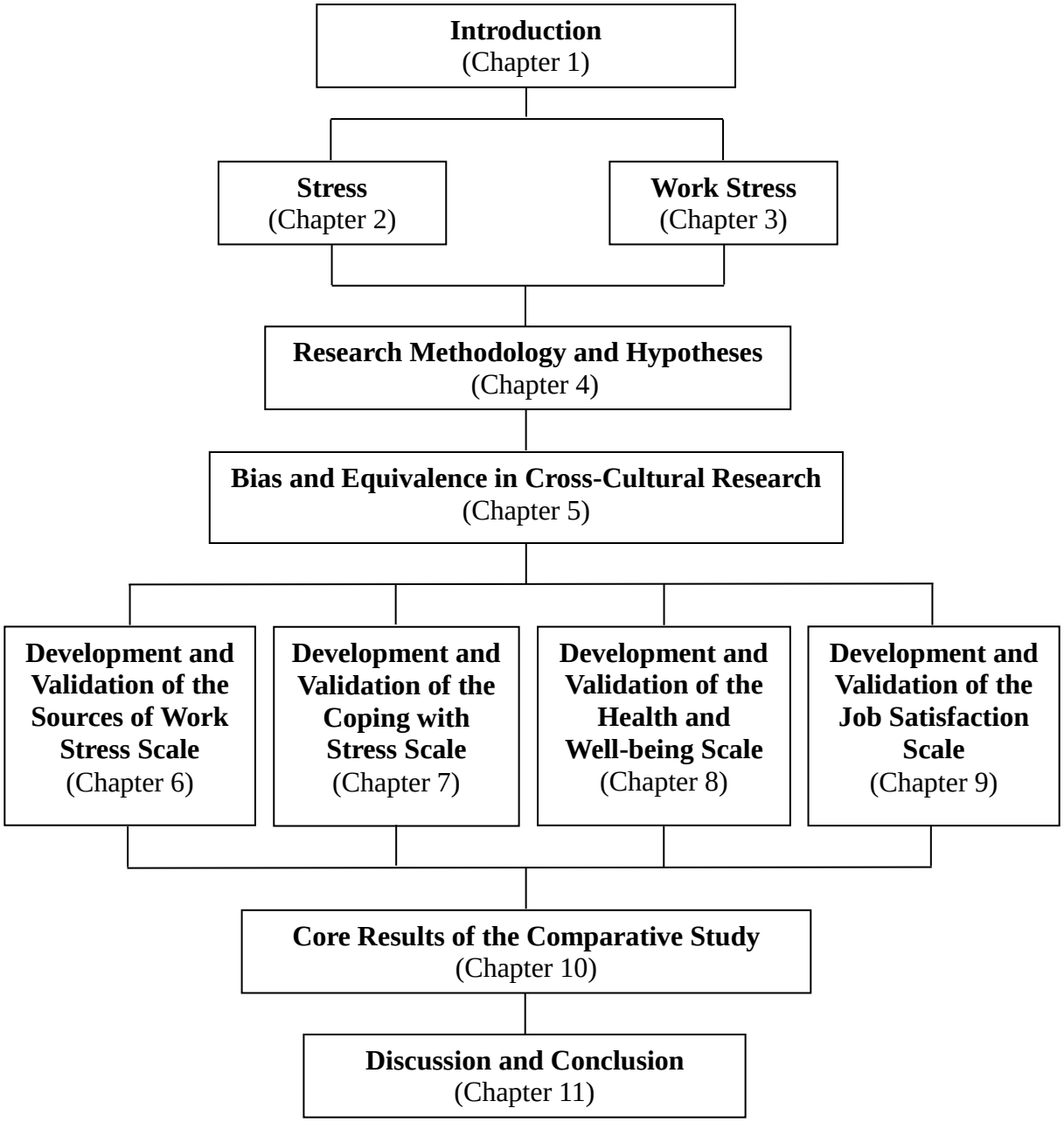

Figure 1.1: Frame structure of the research

Chapter 6 is the Development and Validation of the Sources of Work Stress Scale (SWSS). First, it begins with the practical needs to develop the SWSS. Then, it describes the theoretical framework and foundation of the SWSS. Next, it introduces six empirical studies to develop and validate the SWSS. Finally, it examines the cross-cultural equivalence of the SWSS with Chinese and German samples.

Chapter 7 is the Development and Validation of the Coping with Stress Scale (CSS), including the practical needs to develop a coping scale, the theoretical framework and foundation of the CSS, eight empirical studies to develop and validate the CSS, and the cross-cultural equivalence examinations of the CSS with Chinese and German samples.

Chapter 8 concentrates on the Development and Validation of the Health and Well-being Scale (HWS). First, it begins with the introduction of the HWS. Then, it describes the theoretical foundation of the HWS. Next, it introduces six empirical studies to develop and validate the HWS. Finally, it examines the cross-cultural equivalence of the HWS with Chinese and German samples.

Chapter 9 focuses on the Development and Validation of the Job Satisfaction Scale (JSS), including the introduction of the JSS, the theoretical foundation of the JSS, six empirical studies to develop and validate the JSS, and the cross-cultural equivalence examinations of the JSS with Chinese and German samples.

Chapter 10 is the Core Results of the Comparative Study. This chapter concentrates on the introduction to the surveys, method, and results of hypotheses testing.

Chapter 11 is the Discussion and Conclusion. The main findings and contributions of the comparative study are discussed. At the same time, the limitations, the implications for future research and practice, and the conclusions are also given.

2 Stress

This chapter is the literature on stress, including the definition of stress, history and pioneers of stress research, types of stress, sources of stress, and costs of stress.

2.1 Definition of Stress

The term stress is derived from the Latin words “strictus” which means “tight” or “narrow” and “stringere” which means “to tighten” (Cox, 1978; Furnham, 2012; Rani & Singh, 2012). It was originally used in physics (Seaward, 2013, 2017). When an external force is exerted to an object, the object creates internal resistance to this force. The internally resistance force per unit area is named “stress” (Bansal, 2015). For example, when a car is running or parked on the road, the road will subject to the stress.

Nowadays the word stress is used frequently in management, organizational behaviour, psychology, medicine, health sciences etc., as stress has become an increasingly critical problem in modern society. It has been debated frequently over the years, and it has many definitions and connotations based on different perspectives (Seaward, 2013, 2017).

Careful definition of stress is important for understanding stress well. Conventionally, stress has been explained as a stimulus, response or interaction between stimulus and response, and such definitions are now valued historically and empirically (Dewe, O'Driscoll, & Cooper, 2010, p. 3).

The earliest researchers on stress mainly focused on physiological aspects (Aliah, 2011). Selye (1956) developed a psychological model named General Adaptation Syndrome (GAS) establishing a connection between illness and stress (Aliah, 2011). According to Selye (1956), stress refers to the body’s nonspecific response to any demand exerted on it. The relationship between stress and illness was not the only attempt to understand psychological stress;

various human traits such as emotion, motivation and performance have been connected to anxiety (Aliah, 2011).

Levi (1987) described stress like this:

> the interaction between, or misfit of, environmental opportunities and demands, and individual needs and abilities, and expectations, elicit reactions. When the fit is bad, when needs are not being met, or when abilities are over-or undertaxed, the organism reacts with various pathogenic mechanisms. These are cognitive, emotional, behavioural and/or physiological and under some conditions of intensity, frequency, or duration, and in the presence or absence of certain interacting variables, they may lead to precursors of disease. (Levi, 1987, p. 9)

Levi's definition considered stress from both positive and negative aspects. Therefore, it's very necessary to differentiate between positive stress (termed eustress) and negative stress (termed distress): stress is inevitable, distress is not (Cooper, 2013; Quick & Quick, 1984; Weinberg, Bond, Cooper, & Sutherland, 2010).

Cox, Griffiths, and Rial-González (2000, p. 13) described stress as "a psychological state which is both part of and reflects a wider process of interaction between the person and their (work) environment". This definition emphasized the importance of an individual's appraisal of the situation which ultimately determines whether the situation is actually regarded as a source of stress; that is to say, if an individual perceives the demand as threat and perceives that this threat exceeds his or her coping abilities, then stress will occur (Coffey, Samuel, Collins, & Morris, 2012).

Psychologically speaking, stress is explained by Richard Lazarus as a state of anxiety occurred when encounters and demands exceed an individual's coping abilities. Physiologically speaking, stress can be regarded as the rate of wear and tear on one's body (Seaward, 2013, 2017). According to the Stimulus-Organism-Response (S-O-R) model, stress is regarded as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her wellbeing" (Lazarus & Folkman, 1984b, p. 19). Widely acknowledged by researchers, this definition states that an encounter is stressful only when it is detected and evaluated as a threat to an individual's well-being (Seel, 2011). What might be regarded as a threat to one

person may not be thought as a threat to another one (Seaward, 2017).

Lazarus's and Selye's definitions of stress have been expanded by specialists in holistic medicine as the inability to deal with a perceived threat (regardless of whether it's real or imaged) to an individual's well-being, bringing about a number of physiological reactions and adaptations (Seaward, 2017).

Stress is explained by the HSE (Health and Safety Executive) as people's unfavorable response to excessive pressure or certain kinds of demands upon them (Lewis, Yarker, Donaldson-Feilder, Flaxman, & Munir, 2010, p. 309). It is the reaction people have when they don't have enough abilities or resources to cope with the stresses or demands placed upon them (Donaldson-Feilder, Lewis, & Yarker, 2011). Now HSE's definition is generally agreed or used by many scholars (Agolla, 2009; Donaldson-Feilder et al., 2011).

Seaward (2017) pointed out that when researchers not only paid much attention to the physical aspects of the processes related to the stress symptoms but also focused on the correlation between stress and illness, the research field began to interconnect with other fields like sociology, psychology, physics and clinical medicine. Exploring stress from different perspectives has brought about the existence of many definitions of stress (Seaward, 2017).

To better understand the mechanisms behind stressful encounters or events, future researchers should pay more attention to the dynamics of stress and the series of stressful encounters, suggested by Kaplan (1996). This suggestion captures the essence of the transactional framework (Lazarus, 2000) that focuses on the nature of individual's interaction with the environment and explains how the transaction occurs (Aldwin, 2007; Dewe et al., 2010).

2.2 History and Pioneers of Stress Research

There are a lot of pioneers within existing history of stress and stress management research. In his book, Greenberg (2017, p. 4) has outlined some of the pioneers in stress and stress management (see Table 2.1).

Table 2.1: Pioneers in stress and stress management (Greenberg, 2017, p. 4)

Pioneer	**Date**	**Area of Study/Influence**
Oskar Vogt	1900	Hypnosis
Walter Cannon	1932	The fight-or-flight response
Edmund Jacobson	1938	Progressive relaxation
Johannes Schultz	1953	Autogenic training
Stewart Wolf/Harold Wolff	1953	Stress and headaches
George Engel	1955	Stress and ulcerative colitis
Hans Selye	1956	The physiological responses to stress
A. T. W. Simeons	1961	Psychosomatic disease
Stewart Wolf	1965	Stress and the digestive system
Wolfgang Luthe	1965	Autogenic training
Lawrence LeShan	1966	Stress and cancer
Richard Lazarus	1966	Stress and coping/hassles
Thomas Holmes/Richard Rahe	1967	Stress/life change/illness
Robert Keith Wallace	1970	Transcendental meditation
Thomos Budzynski	1970	Stress and headaches
Meyer Friedman/Ray Rosenman	1974	Type A behavior pattern
Carl Simonton	1975	Stress and cancer
Robert Ader	1975	Psychoneuroimmunology
Herbent Benson	1975	The relaxation response/meditation
Daniel Goleman	1976	Meditation
Gary Schwartz	1976	Meditation/biofeedback
Robert Karasek	1979	Job Demand-Control Model
Suzanne Kobasa	1979	Hardiness
Anita DeLongis	1982	Hassles and illness
Dean Ornish	1990	Stress/Nutrition/Coronary Heart Disease
Jon Kabat-Zinn	1992	Meditation and Stress Reduction
Christina Maslach	1993	Burnout
J.K. Kiecolt-Glaser	1999	Psychoneuroimmunology
Shelly Taylor	2000	Tend and Befriend/Women’s Coping Style
Patch Adams	2002	Humor and Stress and Health
Johan Denollet	2005	Type D Personality
E. L. Worthington	2005	Forgiveness and Health

Around 1900, the physiologist Oskar Vogt argued that people had the capacity to hypnotize themselves (Greenberg, 2017). Then Johannes Schultz, a German psychiatrist, developed an autohypnotic relaxation method by using hypnosis together with specific training to induce the sensations of heaviness and warmth in one's limbs (Schultz, 1953). This method was well known as autogenic training and was further developed by Wolfgang Luthe (Luthe & Schultz, 1965), a student of Johannes Schultz (Greenberg, 2017).

Dr. Edmund Jacobson developed the technique progressive relaxation (Jacobson, 1938) (also called neuromuscular relaxation) which involves a structured series of training to help people get rid of unnecessary muscular tension (Greenberg, 2017).

By introducing the word "stress" to refer to emotional stimuli that potentially affect physiological response of organisms Walter Cannon was the earliest person who established stress as a discipline for academic research (Beehr & Franz, 1987). Being a noted physiologist, Cannon is almost regarded as a founding father of stress research as in the early 20th century (Greenberg, 2017; Newton & Fineman, 1995).

Employed in Harvard Medical School, Cannon had great interest in the physiology of instincts, an interest based on thoughts within social Darwinism, eugenics and the newly rising social psychology (Newton & Fineman, 1995). Making reference to Darwin, Cannon asserted that instincts (e.g., fear and anger) arose as they have been developed for speedy response during the fight for human existence (Newton & Fineman, 1995, p. 20). He was the earliest scholar who expounded the reaction of the body to stress, and called this reaction the fight-or-flight response (Cannon, 1932). When encountering a threat, people's body will get ready for this threat itself, to either decide to fight or run away (Cannon, 1932; Greenberg, 2017). Cannon elsewhere had acknowledged that his arguments about the fight-or-flight response were derived from McDougall (Cannon, 1939; Newton & Fineman, 1995).

The concept of stress is acknowledged by most scholars as starting with Cannon's work, but more effectively with that of Hans Selye (Newton & Fineman, 1995) as there was not a clear definition of the wider concept of stress until Hans Selye, a Prague student who majored in medicine described it in 1926 (Hearnshaw, 1987, p. 209). As a young endocrinologist who was born in Vienna in 1907 and was interested in the fight-or-flight response, Hans Selye followed Cannon's lead and thoroughly studied the fight-or-flight response (Greenberg, 2017; Seaward, 2017; Selye, 1956). He described the changes of physiology in rats' body by using

and revealing them to stressors-the potential factors to cause stress (Seaward, 2017). He pointed out that the body responded in the same way no matter how is the stressor (Greenberg, 2017). Selye found that some physiological adaptations occurred due to repeated exposures to stress, examples of such changes were as follows (as cited in Seaward, 2017, p. 13):

- Enlargement of the adrenal cortex (a gland that produces stress hormones)
- Constant release of stress hormones; corticosteroids released from the adrenal cortex
- Atrophy or shrinkage of lymphatic glands (thymus gland, spleen, and lymph nodes)
- Significant decrease in the white blood cell count
- Bleeding ulcerations of the stomach and colon
- Death of the organism

It was quite difficult to see these subtle changes until permanent damage had caused (Seaward, 2017). Selye's findings were first published in his work *The Stress of Life* (Selye, 1956) and the aim of the studies is to figure out the physiological reactions to chronic stress and its connection with illness (Seaward, 2017). In his book, Selye summarized the stress reaction mechanism as the general adaptation syndrome (GAS), a three-stage process where the body attempts to cope with stress by adjusting to it (Greenberg, 2017; Seaward, 2017):

> **Stage One: Alarm Reaction.** The alarm reaction describes Cannon's original 'fight or flight' response. In this stage, several body systems are activated, primarily the nervous system and the endocrine system, followed by the cardiovascular, pulmonary, and musculoskeletal systems. Like a smoke alarm detector buzzing late at night, all senses are put on alert until the danger is over. (Seaward, 2017, p. 13)
>
> **Stage Two: Stage of Resistance.** In the resistance stage, the body tries to revert to a state of physiological calmness or homeostasis, by resisting the alarm. Because the perception of a threat still exists, however, complete homeostasis is never reached. Instead the body stays activated or aroused, usually at a lesser intensity than during the alarm stage, but enough to cause a higher metabolic rate in some organ tissue. One or more organs may in effect be working overtime, as a result, enter the third and final stage. (Seaward, 2017, p. 13)

> **Stage Three: Stage of Exhaustion:** Exhaustion occurs when one (or more) of the organs targeted by specific metabolic processes can no longer meet the demands placed upon it and fails to function properly. This can result in death to the organ and, depending on which organ becomes dysfunctional (e.g., the heart), possibly the death of organism as a whole. (Seaward, 2017, p. 13)

Selye's studies stated the confines of the physiological risks associated with stress, created better comprehension to the close correlation between stress and illness and also formed the basis for using relaxation techniques to stop the stress response and reduce the propensity to illness (Seaward, 2017).

Greenberg (2017) noted that Selye attracted a lot of followers, for example, A. T. W. Simeons, who paid attention to the area of psychosomatic disease in his work (Simeons, 1961). Other scholars have studied the effects of stress, e.g., Dr. Harold Wolff (Wolff, 1953) found that the prisoners of war held by the Japanese camps had much greater emotional stress than the ones held by the German camps in World War II, probably being the main reason why only 1% prisoners of war imprisoned in German concentration camps died before they were released, while 33% imprisoned in Japanese camps died before they were released. The effects of stress on digestive function were noted by Stewart Wolf (Wolf, 1965); the effects of stress on cancer were discussed by Lawrence Leshan (LeShan, 1966); the relationship between stress and ulcerative colitis was examined by George Engel (Engel, 1955); while Meyer Friedman and Ray Rosenman as well as some other researchers found the correlation between stress and coronary heart disease (Friedman & Rosenman, 1974); and Wolf and Wolff did some research on stress and headaches (Wolf & Wolff, 1953) (as cited in Greenberg, 2017, p. 6).

As mentioned by Greenberg (2017), Carl Simonton and his colleague studied the relationship between stress and cancer and believed that personality is associated with cancer (Simonton & Simonton, 1975); Thomas Budzynski helped some headache sufferers relieve headaches by using biofeedback successfully (Budzynski, Stoyva, & Adler, 1970); As a cardiologist, Herbert Benson created a relaxation technique which is similar to transcendental meditation (TM) and effectively employed it to treat people suffering from high blood pressure (Benson & Klipper, 2000) when studying TM with Robert Keith Wallace (Wallace, 1970); Daniel Goleman and Gary Schwartz studied the effects of meditation and

demonstrated that meditators can keep psychologically stable more easily compared with nonmeditators (Goleman & Schwartz, 1976); Robert Karasek and his colleagues did some research on the Job Demand-Control Model (Karasek et al., 1988); Suzanne Kobasa studied the hardiness (Kobasa, Maddi, Puccetti, & Zola, 1985). Greenberg (2017) noted that some other researchers paid attention to the relationship between change in life and its effect upon health, for example, Thomas Holmes and Richard Rahe found that the greater the changes throughout one's life, the more prominent the opportunity of the beginning of sickness (Holmes & Rahe, 1967); Lazarus and DeLongis stated that daily hassles are even more harmful to people's health than major changes in life (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Lazarus, 1984).

A research field named psychoneuroimmunology has developed due to the fact that researchers have focused on the effects of stress on the immunological system (Greenberg, 2017). Robert Ader and J. K. Kiecolt-Glaser are the pioneers in this area (Ader & Cohen, 1975; Kiecolt-Glaser & Glaser, 1999); Moreover, Shelly Taylor's studies discovered some differences in stress coping strategies utilized by men and women (Taylor et al., 2000); Johan Denollet studied the Type D personality (depressed, anxious and irritable) and found its connection with coronary heart disease (Denollet, 2005); E. L. Worthington argued that forgiveness can become a nonstressful, healthy behaviour (Worthington, 2005); Dean Ornish paid attention to stress, nutrition, and coronary heart disease (Ornish et al., 1990); Jon Kabat-Zinn did some research on meditation and stress relief (Kabat-Zinn, Massion, & Kristeller, 1992); Christina Maslach concentrated on the area of burnout (Maslach, Schaufeli, & Leiter, 2001); Patch Adams conducted research on humor, stress and health (Adams, 2002).

The overview above has shown the brief history of stress research and only enumerated some representative pioneers. Obviously, there have been many other researchers on stress and stress management since 1900. However, the subsequent researchers either mainly follow the steps of these pioneers or are influenced by their studies.

2.3 Types of Stress

Many people have some misunderstandings about stress. When it comes to stress, universally people would think of its negative consequences (e.g., tiredness, depression, disease, anxiety,

strain, and poor performance) and that it is something that should be completely eliminated from all aspects of our lives (Bamber, 2011, 2013). In fact, not all stress is bad for people. Of course, we can not and also should not eradicate stress. Hans Selye (1976) once said, "*To be totally without stress is to be dead*." Stress should be managed and controlled. Stress can be divided into either two types or three types. In 1976, Selye divided stress into eustress and distress as two types of stress (Kupriyanov & Zhdanov, 2014). Some other researchers in recent years, however, divided stress into three types: eustress, neustress, and distress (Seaward, 2013, 2017).

Eustress is good stress that brings about positive consequences like better performance or personal growth (Greenberg, 2017). "Eu" originates from the Greek term meaning good or positive (Selye, 1980). A person experiences eustress during any situation in which he or she feels motivated or inspired. Eustress is a sort of stress that prompts actions that benefit the individual. Also, stress that encourages maximum performance is also called eustress. For instance, falling in love with someone or meeting someone famous (Seaward, 2013, 2017).

Neustress is stress that is considered neither good nor bad, it includes any type of information or sensory stimuli that is regarded as insignificant or irrelevant (Seaward, 2013, 2017). News of a natural disaster such as hurricane in one country can be regarded as neustress for the people in another country far away.

Distress, the third kind of stress, means bad stress that leads to negative effects such as decreased performance and growth (Greenberg, 2017). It is what we consider bad stress and abbreviate simply as stress (Seaward, 2013, 2017). Most of the time when people think of stress, they think of moments when they are under unpleasant pressure, when something bad happens, or when they are coping with the daily stressful events that cause annoyance or depression (Colligan & Higgins, 2006). Distress can be divided into acute and chronic where acute stress is intense but lasts for a short time and disappears quickly, while chronic stress is not as severe as acute stress but long in duration (Seaward, 2013, 2017). The research by the American Institute of Stress (AIS) found that chronic stress is usually related to illness due to the body's perpetual arousal of risk (Seaward, 2013, 2017).

From the above discussion, we know that stress has been divided into three kinds by some researchers in recent years. Some stress is neither good nor bad; some stress can help us achieve set targets and encourage optimum performance; however, some stress can become

disabling and lead to emotional turmoil, burnout, and sickness (Colligan & Higgins, 2006).

Initially formulated in 1908 by Robert M. Yerkes and John Dillingham Dodson (Yerkes & Dodson, 1908), the Yerkes-Dodson curve shows an empirical association between arousal and performance, which is also applied to athletic performance (Brann, Owens, & Williamson, 2012). The relationship between eustress, distress, and health is perhaps best explained by the Yerkes-Dodson Curve (see Figure 2.1).

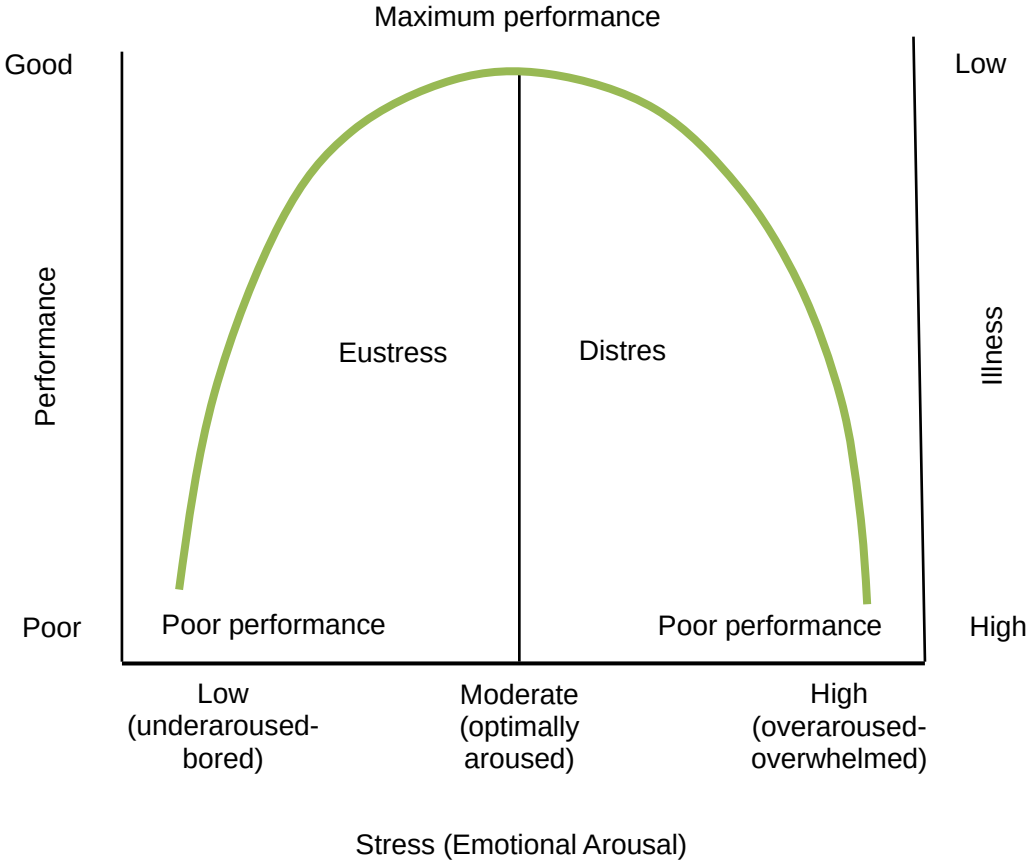

Figure 2.1: The Yerkes-Dodson curve (Seaward, 2017, p. 9)

As stress rises (shifting from eustress to distress), performance and health declines (risk of illness increases), and the best place is the optimal level of stress at the midpoint, before where eustress becomes distress (Seaward, 2017). The performance starts to decline in efficiency if the stress goes beyond the optimal level and the health is probably at serious risk of diseases or illness at the same time (Seaward, 2017). The Yerkes-Dodson law illustrates the difference between excessive stress and minimal stress (Greenberg, 2017). Performance goes

up to a point with emotional arousal, as shown to the left of the midpoint. When levels of stress (emotional arousal) become too high, performance declines, as shown to the right of the midpoint (Brann et al., 2012).

2.4 Sources of Stress

Stress is a typical psychophysical reaction to demanding events in the environment (Selye, 1974). People experience stress differently and the sources of stress are also different (Donaldson-Feilder et al., 2011). According to Greenberg (2017), there are many kinds of stressors. Some are environmental factors (e.g., toxins, crowded), some are psychological factors (e.g., depression), others are sociological factors (e.g., job loss), and also some philosophical factors (e.g., time use).

Grant, Compas, Stuhlmacher, et al. (2003, p. 449) defined stressors as "environmental events or chronic conditions that objectively threaten the physical and/or psychological health or well-being of individuals of a particular age in a particular society". This definition agrees with the usual "stimulus-based" definitions of stress (Grant et al., 2003; Holmes & Rahe, 1967). Lazarus and Folkman (Folkman & Lazarus, 1985; Lazarus, 1991, 1999) argued that stress is appraised as either threat or challenge. Seaward (2017) maintained that any real or imagined situation, circumstance, or stimulus that is perceived as a challenge, threat or harm is called a stressor, which means source of stress.

The work of Girdano, Dusek, and Everly (2012) divided stressors into three types: bioecological factors, psychointrapersonal factors, and social factors (as cited in Seaward, 2017, p. 10). Some biological and ecological factors (e.g., sunlight, gravitational pull, and solar flares) that affect people's biological rhythms may result in stress, a good example is the season affective disorder (SAD) (Seaward, 2017). Psychointrapersonal factors involve those values, beliefs, attitudes, thoughts, opinions, perceptions and so on (Seaward, 2017). Social factors include traffic jam, crowed urban areas, long lines at checkout stands, financial insecurity, low socioeconomic status, global warming, global population increases, major life changes and so on (Seaward, 2017). To predict the major life changes that cause personal stress, Holmes and Rahe (1967) developed an inventory called Social Readjustment Rating Scale (see Table 2.2).

Table 2.2: Social Readjustment Rating Scale (Holmes & Rahe, 1967, p. 216)

Rank	Life event	Mean value
1	Death of spouse	100
2	Divorce	73
3	Marital separation	65
4	Jail term	63
5	Death of close family member	63
6	Personal injury or illness	53
7	Marriage	50
8	Fired at work	47
9	Marital reconciliation	45
10	Retirement	45
11	Change in health of family member	44
12	Pregnancy	40
13	Sex difficulties	39
14	Gain of new family member	39
15	Business readjustment	39
16	Change in financial state	38
17	Death of close friend	37
18	Change to different line of work	36
19	Change in number of arguments with spouse	35
20	Mortgage over $10,000	31
21	Foreclosure of mortgage or loan	30
22	Chance in responsibilities at work	29
23	Son or daughter leaving home	29
24	Trouble with in-laws	29
25	Outstanding personal achievement	28
26	Wife begin or stop work	26
27	Begin or end school	26
28	Change in living conditions	25
29	Revision of personal habits	24
30	Trouble with boss	23
31	Change in work hours or conditions	20
32	Change in residence	20
33	Change in schools	20
34	Change in recreation	19
35	Change in church activities	19
36	Change in social activities	18
37	Mortgage or loan less than $10,000	17
38	Change in sleeping habits	16
39	Change in number of family get-togethers	15
40	Change in eating habits	15
41	Vacation	13
42	Christmas	12
43	Minor violations of the law	11

In this inventory, the higher mean value an event has, the more possibility it has to cause stress for an individual (Seaward, 2017). Although major life changes may be chronic stressors, Richard Lazarus argued that the hassles frequency and intensity were more likely to adversely affect one's psychological and somatic health than life events (Lazarus, 1984). Richard Lazarus defined daily hassles as everyday life experiences and circumstances evaluated as salient and adverse or detrimental to one's well-being (Lazarus, 1984, p. 376).

Maybe a stressor is not perceived as dangerous to an individual as to another. Stress may not become distress because of an individual's effective coping strategies (Wheaton & Montazer, 2010). Figure 2.2 indicates that whether a number of stressors can turn into stress depends on the context or condition of the occurrence and its meaning which in turn can possibly result in distress, depending on an individual's coping mechanisms (Wheaton & Montazer, 2010).

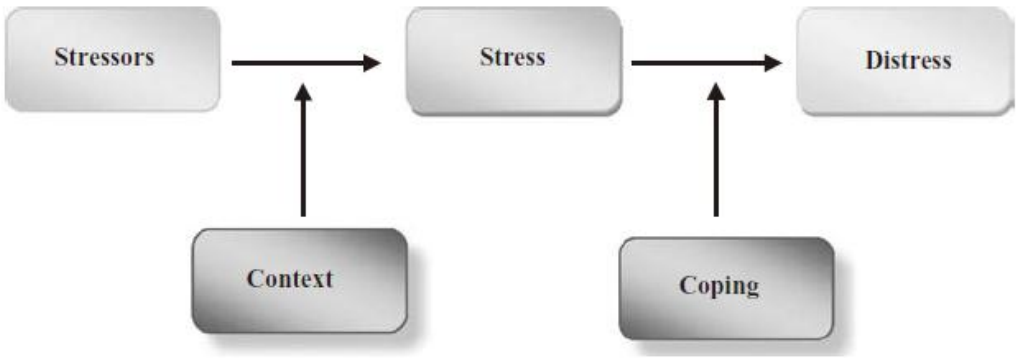

Figure 2.2: Stressors, stress, and distress (Wheaton & Montazer, 2010, p. 172)

2.5 Costs of Stress

Now the stress model is widely used to evaluate the health and well-being of employees (Tetrick, 2002), and try to recognize the costs of stress for employees, employers as well as society through this lens (Dewe et al., 2010).

When it comes to the question of "why study stress", Bartlett (1998) claims that stress is

a fundamental aspect of health psychology. Moreover, the concept of stress provides people the information of overall human functioning. Therefore, stress, health, work, and well-being have become particularly linked (Bartlett, 1998; Dewe et al., 2010).

Although the costs of stress at work are difficult to estimate, a lot of studies have reported that stress has tremendous impact on both economic costs and human suffering (Woods & West, 2010).

Data from a lot of surveys have reported the impacts and costs of stress at work. For example, the “Living to Work?” survey in 2003 by the Chartered Institute of Personnel and Development found that 25% of the workers reported some kind of negative health consequence because of long work hours (Dewe et al., 2010). 40% participants reported that they had a negative impact on their family relations, most of whom also reported having a negative effect on their work performance. The study of the Health and Safety Executive (2007) showed that 420,000 UK workers thought they encountered stress, depression or anxiety that brought about illness. There were 195,000 new cases of stress, depression and anxiety in 2006, and the prevalence rate of these problems at that time was almost twice that of the 1990s (Dewe et al., 2010).

Stress can not only be annoying but also cause health problems, which can result in other negative outcomes, such as bad relationships with beloved or poor academic performance. Managing stress is a serious topic that some very smart people have dedicated their time and effort to (Greenberg, 2017).

In conclusion, Chapter 2 is the literature on stress. First, it has introduced the definition of stress. Then, it has reviewed the history and pioneers of stress research. Next, it has discussed the types of stress. After that, it has introduced the sources of stress. Finally, it has discussed the costs of stress.

3 Work Stress

This chapter will focus on the literature on work stress, including the definition of work stress, theories and models of work stress, sources of work stress, work stress and job satisfaction, work stress and health and well-being, coping with stress at work, and stress management interventions.

3.1 Definition of Work Stress

Work stress means stress related to one's work or job. Work stress is also called workplace stress, job stress, or occupational stress. It is difficult to reach a consensus on the definition of the term stress (Cox & Griffiths, 1995; Mark & Smith, 2008). Similarly, there is no consensus on how to define work stress.

Ganster and Rosen (2013, p. 1088) regarded stress as "a feature of the external environment that acts on an individual, the individual's responses (psychological, physiological, and behavioral) to environmental demands, threats, and challenges, or the interaction of the two". Thus, Ganster and Rosen (2013, p. 1088) defined work stress as "the process by which workplace psychological experiences and demands (stressors) produce both short-term (strains) and long-term changes in mental and physical health".

Bamber (2011, p. 24) noted that "stress is experienced when the individual appraises their coping resources to be insufficient to manage the demands of the situation that they are faced with". Similarly, work stress is defined by the NIOSH (National Institute for Occupational Safety and Health) of the United States as:

> The harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the worker. (as cited in Bamber, 2011, p. 24)

Griffin, Hogan, Lambert, Tucker-Gail, and Baker (2010) pointed out that work-related stress is accompanied by anxiety, uneasiness, worry, hardness, tension, frustration and suffering. Cooper and Payne (1989) claimed that work stress may occur when people fail to adapt to changes at work.

In America, a survey by General Social Survey has shown that there had been a high level of stress in about one-third of employees in the last twenty years (Davis, Smith, & Marsden, 2007; Hurrell Jr & Sauter, 2012).

As a sphere of research to examine the health and productivity outcomes as relates to work environment, work stress is a considerably new field of studies which began to crystallize in the early l970s (Hurrell Jr & Sauter, 2012; Levy, Wegman, Baron, & Sokas, 2006; Quick, Quick, Nelson, & Hurrell Jr, 1997). Hurrell Jr and Sauter (2012) noted that its hypothetical and theoretical foundation can date back to the animal research conducted by Hans Selye in the 1930s (Selye, 1936) and the earlier research on the accompanying physiology of emotion done by Walter Cannon (Cannon, 1914).

3.2 Theories and Models of Work Stress

Various models of work stress have attracted the attention of researchers and have become the determinants for the selection of independent and dependent variables (Cooper & Payne, 1989). Although they differ in fame and empirical support, they essentially guide both practice and research (Mark & Smith, 2008). Some influential theories and models will be outlined below.

3.2.1 Person-Environment Fit Model

Furnham (2012) noted that although a couple of researchers advanced this prototype, it was summarily epitomized by Caplan (1983). Lewin (1951) proposed a concept that an individual's personalities interacted with the environment at work can determine strain (a state of worry and tension), and consequent behaviour and health. This concept ultimately became the Person-Environment (PE) Fit Model (French, 1973) which argues that the fit between a

person and the work environment is a critical factor to influence the person's health (Mark & Smith, 2008). Employees' skills, abilities, attitudes and resources should meet their job demands, and the work environments should meet the needs, knowledge, and skills of the employees (Mark & Smith, 2008). Misfit in either of these dimensions can lead to some problems like health related problems, reduced efficiency, and other problems (French, Caplan, & Harrison, 1982; Mark & Smith, 2008).

3.2.2 Social Environment Model (Michigan Model)

After carrying out a series of studies at the University of Michigan, French and Kahn in 1962 put forward what is designated as the Social Environment Model, which is sometimes called the Michigan Model or ISR Model (Mark & Smith, 2008). This model has served as the foundation for further work stress research emphasizing the role of the workplace on health of employees (French & Kahn, 1962). Mark and Smith (2008) noted that the Social Environment Model also pays much attention to one's own subjective perceptions of stressors.

The Social Environment Model was adequate for empirical studies in the 1960s and 1970s. However, with time it became virtually too simple to elucidate the complexities associated with stress (Furnham, 2012). This model was improved by Hurrell and McLaney (1988) and then was developed into the NIOSH model which explains that how stressors, acute reactions, individual differences, and illness outcomes happen (Mark & Smith, 2008).

3.2.3 The Role Stress Model

Kahn, Wolfe, Quinn, Snoek, and Rosenthal (1964) argued that role stressors include three facets: role conflict, role ambiguity, and role overload. This theoretical model has been widely used in the literature on sources of work stress. Role conflict happens when one encounters incompatible or conflicting work demands. Role ambiguity occurs when there is insufficient information regarding the job responsibilities or duties (Bhagat, Segovis, & Nelson, 2012; Dubinsky & Mattson, 2015). Beehr (2014) noted that role ambiguity is regarded as one of the sources of stress at work in the early literatures. Role overload happens when there are too many tasks to do with high time pressures and there are not enough resources to meet the job

demands (Bhagat et al., 2012).

Bhagat et al. (2012) argued that although the three facets of role stressors are helpful for us to understand the essence of an individual's stress, the role stress model provides us little information about the transaction process between an individual and the environment.

3.2.4 Transactional Model

It is one of the most famous models of the occupational stress process. Figure 3.1 is Lazarus's Transactional Model of occupational stress (Lazarus, 1966) which illustrates the two way relationship and the pivotal role of the individual's cognitive appraisal during the process of occupational stress experienced (as cited in Bamber, 2011, p. 25). It is named "transactional" because it emphasizes that stress exists neither in the individual nor the environment, but rather in the interaction between the individual and the environment (Ganster & Rosen, 2013).

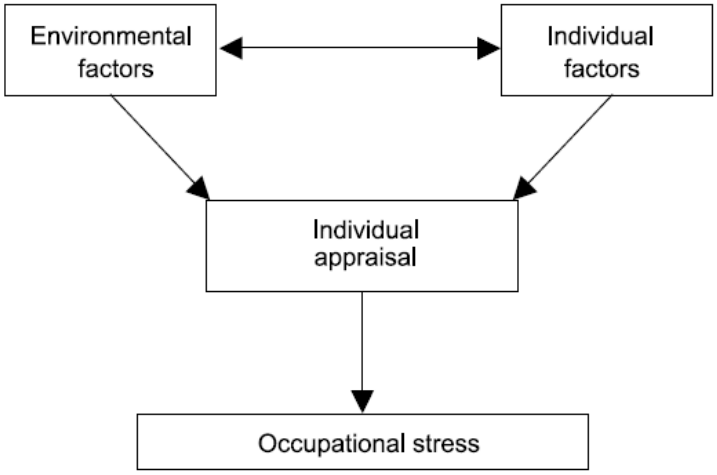

Figure 3.1: The Transactional Model of occupational stress

Occupational stress is inevitable when an individual realizes that he or she does not have the necessary abilities, coping resources and personal traits that a job requires, or that the job itself can not satisfy the needs of an individual (Bamber, 2011, 2013). Individual's cognitive process plays an critical role in initiating physiological processes (Ganster & Rosen, 2013). The Transactional Model proposes that the better the fit between an individual and the work

environment, the lower level of the experienced work stress, and vice versa (Bamber, 2011, 2013). However, Ganster and Rosen (2013) noted that it has been disputed that the hypothesis that all environmental stressors operate by cognitive appraisals, for instance, Hobfoll (1998) argued that in Lazarus's Transactional Model too much focus has been put on individual's cognitive process without enough emphasis on the objective environment.

3.2.5 Demand-Control Model

Kompier (2003) argued that the most important model of stress at work may be the Demand-Control Model (Karasek, 1979). Based on the research of Karasek and colleagues (Karasek & Theorell, 1990), the Demand-Control Model (DCM) theorizes the active behaviour/learning and health of a person is determined by the amount of control the person has over the environmental situation around the person (De Jonge, Dollard, Dormann, Le Blanc, & Houtman, 2000; Karasek, 1998).

> This model stated originally that the combination (additive or multiplicative) of excessive psychological demands on a person and the lack of decision latitude (control) directly leads to the development of cardiovascular disease. Again theses (demand and control) can be defined objectively and subjectively. (Furnham, 2012, p. 362)

Ganster and Rosen (2013) noted that the Demand-Control Model has been frequently used as guideline in the area of work stress, stimulating many studies in epidemiology, psychology and management.

3.2.6 Demand Control Support Model

Karasek (1979) proposed a model of interaction in which high demands and low control would cause high strain, but that higher control would cushion the adverse effects of demands on outcomes. This model was named Demand-Control Model, which originally emphasizes the psychosocial job traits of job demands and job control (Mark & Smith, 2008). Cox and Griffiths (1995) stated that this model is interactional because emphasis is placed on the basic features of a person's interactions with their environment instead of the occurrence process

during this interaction.

This model was further extended and developed into Demand Control Support Model, which comprises social support due to the fact that support may buffer the negative effect in high demand situations (Cooper, Dewe, & O'Driscoll, 2001; Karasek & Theorell, 1990; Lim, 1996; Mark & Smith, 2008).

3.2.7 The Uncertainty Model of Work Stress

Beehr and Bhagat (1985) found that uncertainty at work may be the most common work stressor after examining the nature of some typical sources of work stress. They proposed that the stress experienced is a multiplicative result of uncertainty, importance, and duration (Bhagat et al., 2012). Figure 3.2 presents the uncertainty theory of work stress. The formula is: $S = Uc \times I \times D$.

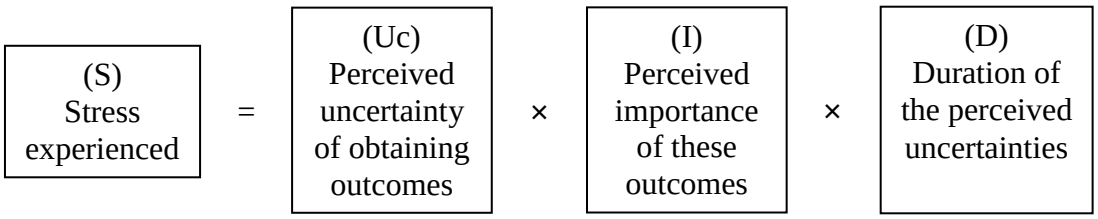

Figure 3.2: The uncertainty theory of work stress (Bhagat et al., 2012, p. 58)

This theory has made a contribution that it regards the role of duration of the perceived uncertainties as a major factor in the experience of work stress (Beehr, 1995; Beehr & Bhagat, 1985; Beehr & Newman, 1998; Bhagat et al., 2012). This theory can also be used to explain the four common work stressors, namely role ambiguity, role conflict, role overload, and underuse of job skills (Beehr, 1995; Beehr & Bhagat, 1985; Beehr & Newman, 1998; Bhagat et al., 2012). Specifically speaking, the four common work stressors will result in uncertainties at work and then bring about stress for employees.

3.2.8 Control Theory

This theoretical model stated that an individual's perceived control is determined by generalized locus of control as well as actual control of the environment (Furnham, 2012). As stated by Spector (1998):

> Perceived control is posited to moderate the relation between environmental and perceived job stressor. Specifically, when control is high, the strength of relation between environmental and perceived job stressor should be low. The individual is not likely to interpret the condition/situation as a job stressor and will not exhibit an emotional reaction. Conversely, when perceived control is low, the relation between environmental and perceived job stressor will be strong. An individual is likely to interpret the condition/situation as being a job stressor and will exhibit an emotional reaction. Note that the control must be over the specific job stressor itself. More general control is not going to have an effect unless it is perceived to be effective against the job stressor. (Spector, 1998, p. 157)

Perceived control plays a moderator role between environmental stressor and job stress: high perceived control, low perceived job stress. Conversely, low perceived control, high perceived job stress (Furnham, 2012). A person's feeling of control are increased through environmental and psychological mediations as implied by the model (Spector, 1998).

3.2.9 Effort-reward Imbalance Theory

The Effort-reward Imbalance Theory (Siegrist, 1996, 2012a) emphasizes the extent to which an individual is rewarded for his or her effort. In this model, unfair reward (imbalanced or failed exchange) occurs when an individual's high effort is insufficiently matched by reward (Ganster & Rosen, 2013). A graphic representation of the Effort-reward Imbalance Model is given in Figure 3.3. In this model, effort is the person's reaction to the demands or obligations placed upon him or her and can be classified as external effort, which is the effort of the person to cope with demands coming from outside, and internal effort, which is the zeal to meet his or her expectations (Furnham, 2012).

When a higher levels of effort is not fairly rewarded, the risk of sickness and emotional

tensions increases (Furnham, 2012). Ganster and Rosen (2013) noted that the effort-reward imbalance (too much effort paired with too few rewards) tends to cause negative emotional problems and physiological stress responses. Conversely, a fair reward for effort (balanced social exchange) will bring about positive emotions and will increase general growth and well-being. Furnham (2012) argued that the importance of reward can not be overemphasized as reward is a composite measure of financial rewards (such as wages, salary, and benefits), esteem, social control, promotion, and security.

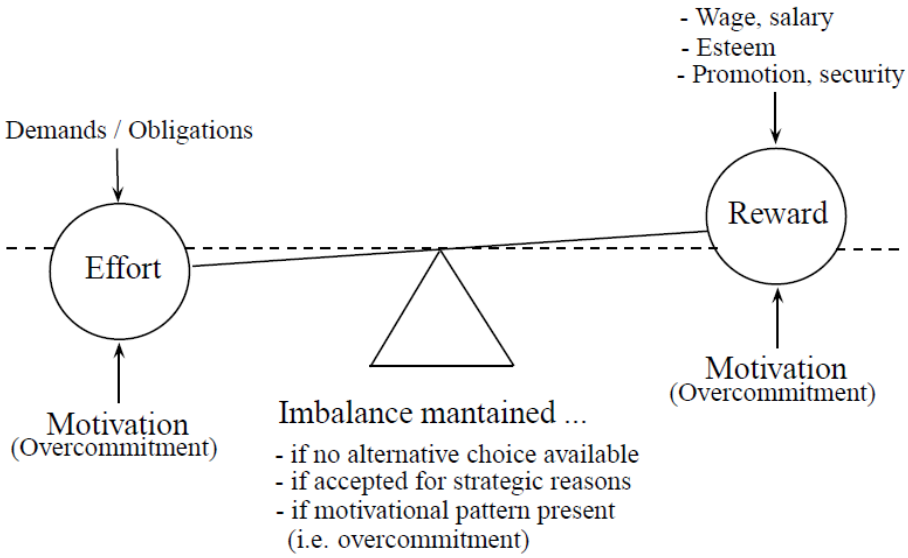

Figure 3.3: Graphic representation of the Effort-reward Imbalance Model (Siegrist, 2012a)

3.3 Sources of Work Stress

Numerous researchers have paid attention to sources of work stress (work stressor) during in the past five decades.

Kahn et al. (1964) proposed role conflict, role ambiguity, and role overload to be the work stressors.

Cooper and Marshall (1976) first raised a classification of work stressor. Cartwright and Cooper (1997, pp. 13-22) refined it and divided the work-related stressors into six categories

and then Dewe et al. (2010, p. 67) summarized this classification:

- Factors intrinsic to the job itself, encompassing work environment, workloads, work hours, use of technologies, risks or hazards.
- Roles in the organization, including role ambiguity, role conflict, role responsibilities, and role overload.
- Social relationships at work, such as relationships with colleagues, supervisors, and customers.
- Career development, such as job insecurity, perceived under- or over- promotion, and lack of a sense of career achievements.
- Organizational factors, including organizational structure, political climate within the organization, organizational policies, lack of effective participation in decision-making processes, overly bureaucratic structure, inappropriate and ineffective communication strategies.
- The work-home interface, such as conflict or interference between work and family life.

Bamber (2011, pp. 25-32) argued that work stress can arise from individual factors, factors in the work environment, and the home-work interface:

- Individual factors. These encompass genetic/inherited characteristics that people are born with, acquired/learned characteristics that people obtained over time, and personality/trait of an individual which define who they are.
- Factors in the work environment. These include variables such as job demands, physical working conditions, control, supports, relationships, role, change, and pay and career prospects.
- The home-work interface. It is usually called life-work balance or work- life conflict. Stress outside of the workplace (such as financial crisis, taking care of babies or old people) can influence work performance, and vice versa.

Donaldson-Feilder et al. (2011, pp. 3-4) argued that the most common causes of stress include eight categories:

- Demands: aspects of work to which people have to respond, such as workload, work pattern and the work environment;

- Control: the extent to which people have a say in the way they do their work;
- Support: the encouragement, sponsorship, and resources provided by the organization, line management and colleagues;
- Relationships: promoting positive working to avoid conflict and dealing with unacceptable behaviour such as bullying;
- Role: the extent to which individuals understand their role within the organization, and the degree to which roles are conflicting;
- Change: the extent to which organization change (large or small) is effectively managed and communicated within the organization;
- Career development: the extent to which the organization provides opportunities for promotion, skills development and job security; and
- Work-home interface: the extent to which individuals are able to balance the demands of work and home, particularly in the context of dependent care and dual-earning families.

Hurrell Jr and Sauter (2012, pp. 234-237) summarized that work stressors generally can be categorized into job/task demands, organizational factors, and physical factors.

Furnham (2012, pp. 365-371) proposed four general categories of work stressor including work-related causes of stress, career development, home-work interface, and individual/personality causes of stress.

Further literature on work stressors will be introduced in Chapter 6.

3.4 Work Stress and Job Satisfaction

There are many definitions on job satisfaction (Aziri, 2011). Locke (1976, p. 1300) described job satisfaction as "a pleasurable or positive emotional state resulting from an appraisal of one's job or job experiences". Job satisfaction was defined by Spector (1997) as the degree to which individuals like or dislike their job (Spector, 1997). Spector's definition is one of the most frequently cited definitions. Jönsson (2012) noted that job satisfaction can be seen as an overall attitude that people have towards their job. It is the extent to which an individual feels positively or negatively about various aspects of the job (e.g., work conditions, co-workers,

roles, rewards, and working hours).

Job satisfaction has been broadly studied in industrial and organizational psychology because of its effects on organizational behaviour (Ahmad, Ahmad, & Shah, 2010; Kwok, Cheng, & Wong, 2015). It is the prominent parameter for assessing the joy levels of the productive employee in organizational studies (Wright & Cropanzano, 2000). Job satisfaction is often linked to standards deployed by organizations, such as job performance, habitual absence from work, and employee turnover (Bowling, Wagner, & Beehr, 2018).

A high job satisfaction is helpful for boosting team-spirit and efficiency among employees (Kwok et al., 2015; Spector, 1997). However, reduced commitment to work is displayed by individuals who have lower job satisfaction as they are more likely to be absent, make mistakes, experience stress and quit the job (Agarwal & Sajid, 2017; Hausknecht, Hiller, & Vance, 2008; Lee, Gerhart, Weller, & Trevor, 2008). A lot of studies have proved a strong relation between job satisfaction and turnover intention of the employees (Agarwal & Sajid, 2017; Cooper-Hakim & Viswesvaran, 2005).

Despite the economic effect on organizations, job satisfaction also plays an important part in employees' well-being (Kwok et al., 2015; Van Saane, Sluiter, Verbeek, & Frings-Dresen, 2003). Job satisfaction is usually associated with the sense of achievement, while job dissatisfaction, on the other hand, is often related to the psychological issues like depression and worry (Aziri, 2011; Spector, 1997). As work has significant importance to the life of people, job satisfaction is also linked with life satisfaction and happiness as they are all grouped as subjective well-being (Kwok et al., 2015; Zelenski, Murphy, & Jenkins, 2008).

Job satisfaction can reduce the possibility of job stress and burnout. Those employees with high satisfaction may be less troubled by worry and stress from the job. Conversely, those with low satisfaction may have more worry and stress (Lambert, Qureshi, Frank, Klahm, & Smith, 2018). Therefore, it's very essential to find ways to improve the level of job satisfaction for employees (Kwok et al., 2015).

Job satisfaction will be further discussed in Chapter 9.

3.5 Work Stress and Health and Well-being

Health and well-being related to work has turned into prevailing global subjects in the mainstream media, such as TV, magazines, newspapers, and research journals (Danna & Griffin, 1999). The consequences of work stress caused by long working hours on employees' well-being have been mentioned by many researchers (Park et al., 2001; Shields, 1999; Smyth, Qian, Nielsen, & Kaempfer, 2013; Sparks, Cooper, Fried, & Shirom, 1997). One tragic example is a series of suicides by migrant workers at the Taiwan-owned manufacturer, Foxconn, in mainland China. Eleven suicides and three suicide attempts occurred at Foxconn in Shenzhen city between the months of January and May 2010. Foxconn is the largest global manufacturer of electrical products, who makes products for brands like Dell, Nokia and Apple. It has been suggested by Solidarity International that these suicides are mainly caused by long working hours. Foxconn is only a representative example, as long working hours is common for many factories in China (Smyth et al., 2013).

The study of Belloc and Breslow (1972) conducted on 6,928 American adults revealed that some specific practices were closely related to adults' good physical health:

- Usually sleeping seven to eight hours per day;
- Eating breakfast almost every day;
- Rarely or never eating between meals;
- Often participating in physical activity in free time;
- Never or moderately drinking of alcoholic beverage;
- Never smoking cigarettes;

People who followed majority of these practices were healthier than those who did not (Cooper & Payne, 1989).

Based on the latest evidence, recommendations are made for living a healthy lifestyle, which constitutes doing regular physical activities, eating balanced diet rich in nutrients, sparingly using drugs, alcohol and caffeine, giving up smoking, and having adequate rest and sleep (Bamber, 2011, 2013).

Health and well-being related to work stress will be further introduced in Chapter 8.

3.6 Coping with Stress at Work

It is very necessary for scholars to figure out interactions between different styles of coping to advance comprehension of the intensity and scope of coping mechanisms (Dewe et al., 2010).

In a widely used definition from Lazarus, coping was defined as "constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus, 2006, p. 110). This definition somewhat simply emphasizes that "coping is the effort to manage psychological stress" (Lazarus, 2006, p. 111) and it brings concern to the fact that coping involves strategies whose effectiveness is unsure since they focus on managing stressful situations as towards avoiding or mitigating them.

Coping strategies were frequently classified as two types: problem-focused coping and emotion-focused coping (Baqutayan, 2015; Folkman & Lazarus, 1980; Lazarus & Folkman, 1984a). Problem-focused coping involves dealing with the source of stress (Baqutayan, 2015) and using constructive and direct methods to solve problems, including active approaches to alter stressful circumstances. Emotion-focused coping reflects attempts to deal with thoughts and feelings associated with the stressor (Litman, 2006), to take measures to reduce the emotional reaction to problems, including some efforts to control one's emotions or reconstruct the cognition of stress, such as avoidance, seeking emotional support (Siu, Spector, & Cooper, 2006). Emotion-focused coping involves actions to prevent emotional stress as well as the cognitive changes to regulate emotional stress.

Scholars have noted that the transactional model is a model used very often to provide a more dynamic view on job stress (Harris, 1991) and that proper assessment is absolutely necessary to comprehend the depth of the stress process (Dewe et al., 2010; Perrewé & Zellars, 1999).

Coping is described as individuals' cognitive and behavioural efforts in managing work demands perceived as beyond their resources or capabilities (Lazarus, 1984). Lazarus's research created a new focal point of coping with stress beyond the limits of defense "to include a wider range of cognitive and behavioural responses that ordinary people use to manage distress" (Folkman & Moskowitz, 2004). The focal point of Lazarus's hypothesis is

the concept of cognitive appraisal; as soon as an encounter is perceived to be stressful, coping mechanisms are deployed to react to the disturbed person-environment transaction (Lazarus, 1990). Transaction here refers to the system where stress is in-between environment and the individual. It is the continual interaction between the two neither in the environment nor in the individual alone (Lazarus, 1990).

Research has shown that the removal of distress is done mainly by successful coping strategies (Lazarus and Folkman, 1984).

Coping with stress will be further discussed in Chapter 7.

3.7 Stress Management Interventions

There is still a keen interest in work stress interventions, as evidenced by a proliferation of literature on this issue (Hurrell Jr & Sauter, 2013). Although recognized that stress can potentially affect both the employees' work performance and lives, the attention paid to deal with stress-related subjects by organizations is still relatively low compared with the investments in other areas like technological development, financing and marketing (Beehr & O'Driscoll, 2002; Cooper et al., 2001).

People have different views concerning the essence of workers' traits compared to the working environments as the primary source of stress. Opinions like these led to the advancement and application of primary, secondary, and tertiary intervention strategies for work stress (Hurrell Jr & Sauter, 2012, p. 240). Stress researchers have proposed various definitions of stress management interventions (SMIs). Generally speaking, an SMI is "any activity which is designed to reduce or eliminate stressors and/or their efforts on strain" (Burke & Richardsen, 2000; Dewe et al., 2010; Murphy & Sauter, 2003). A number of these activities, like job design, have direct impact on removing or reducing stressful encounters at work (e.g. role ambiguity, role conflict or role overload), meanwhile trainings on stress management can significantly reduce the effects of stress for employees. Also, special programs like employee assistance programs (EAPs) should be used to help employees who have undergone huge amounts of stress (Dewe et al., 2010).

It is critical to know the conceptualization of the stress management interventions (SMIs). One way of considering intervention is from perspective of the level of interventions. A widely quoted framework for SMIs can be found in Table 3.1. SMIs were classified as primary, secondary, and tertiary (Bhagat et al., 2012; Cartwright & Cooper, 2005; Quick et al., 1997; Quick, Quick, & Nelson, 1998) ranging from completely proactive or preventive (primary interventions) to completely reactive (tertiary interventions) (Dewe et al., 2010). Table 3.1 depicts the three levels of interventions and provides some examples for each level of interventions (Bhagat et al., 2012).

3.7.1 Primary Interventions

The first level of interventions is primary interventions. They pay attention to those people who are not sick at present and aim to reduce the number of stressors or their intensity (Bhagat et al., 2012). It claims that the most effective way of reducing stress at work is by eliminating or lessening the sources of stress (Dewe et al., 2010). Primary interventions may be either psychosocial or socio-technical (Hurrell Jr & Sauter, 2012). Psychosocial interventions mainly focus on the individual process and psychosocial facets of the workplace and reduce stress by changing employee's perceptions of the working environment or changing the working conditions. However, socio-technical interventions mainly aim to change specific working conditions which are thought to be consequential for work stress (Hurrell Jr & Sauter, 2012).

Sometimes primary interventions are regarded as preventive in nature (Bhagat et al., 2012; Tetrick, Quick, & Quick, 2005), which insinuates that proactive approaches to deal with stressors will be more effective than reactive ones (Dewe et al., 2010).

As indicated in Table 3.1, primary interventions aim to modify and reduce stressors by changing an organization's work conditions, structures, systems, or task characteristics (Bhagat et al., 2012). Summarized by Elkin and Rosch (1990), primary interventions can be conducted to reduce sources of stress at work by decreasing workload, increasing employees' opportunities to participate in decision-making process, redesigning work for more autonomy and control (Dewe et al., 2010), reducing time pressure, redesigning reward distributions, and clarifying job roles.

Table 3.1: Stress management interventions (Bhagat et al., 2012, pp. 92-94)

Type	Primary Interventions	Secondary Interventions	Tertiary Interventions
Goal	Preventive	Preventive-Reactive	Reactive
Purpose	Modify and reduce stressors by changing an organization's work conditions, task characteristics, system, or structures	Changing the way individuals respond to work stress to prevent negative health consequences by raising awareness of the causes of these effects and helping people to develop more healthy and adaptive response strategies	Focus on helping individuals cope with the consequences of work stressors and treat the effect of their distress
Examples of Intervention	● Redesign of reward distributions to be more equitable ● Use of employee participative management programs ● Reorganization of lines of authority ● Changing in decision-making progresses in making relevant decisions ● Restructuring organizational units ● Sociotechnical interventions: Redesign of job tasks, job functions, job processes, and work schedules ● Implementation of job enrichment-job enlargement programs ● Improved ergonomic designs, work loads ● changes in job roles and their clarity ● Reduced time pressures ● Changes in climate social support and constructive feedback ● Creating goal-setting programs	● Wellness programs ● Team building ● Cognitive-behavioral skills training ● Stress management training ● Communication and information sharing programs ● Meditation training ● Physical fitness programs ● Relaxation training ● Muscle- relaxation training ● Spiritual and faith practice	● Employee assistance programs ● Counseling ● Medical care ● Self-hypnosis and autogenic training ● Meditation practices ● Mental imaging ● Physical exercise ● Massage therapy ● Relaxation techniques ● Progressive relaxation techniques ● Breath focus ● Spiritual and faith practices

Source: Adapted from Cooper, C. L., Dewe P. J., & O'Driscoll, M. P., *Organizational stress: A review and critique of theory, research, and applications*. Thousand Oaks, CA, Sage Publications, Inc., 2001; Quillian-Wolever, R. E., & Wolever, M. E., in Quick, J. C., and Tetrick, L. E. (Eds.), *Handbook of occupational health psychology*. Washington, D.C.: American Psychological Association, 2003, pp. 355-375; Quick, J. D., Quick, J. C. & Nelson, D. L., in Cooper, C. L. (Ed), *Theories of organizational stress, New York, NY, Oxford Press,*1998, pp. 245-268.

3.7.2 Secondary Interventions

In contrast, secondary interventions don't aim to directly cope with the potential stressor (s) but instead to change individuals' responses to the stressors (Bhagat et al., 2012; Dewe et al., 2010).

As indicated in Table 3.1, secondary interventions usually put emphasis on changing the relationship between stressors and resultant strains (states of worry and tension) by either improving peoples' resilience to stress or by training special techniques to deal with the symptoms of strain (Hurrell Jr & Sauter, 2012). Examples are "wellness" programs (health promotion activities), cognitive-behavioural therapy, stress inoculation training, meditation and relaxation training (Bhagat et al., 2012; Dewe et al., 2010). A well-known example is stress management training (SMT), which usually helps individuals strengthen their coping skills or change their appraisals of perceived stressors (Dewe et al., 2010).

Secondary interventions are regarded as preventive or reactive measures in nature (Bhagat et al., 2012; Cooper et al., 2001). They are usually too general and are only used to manage stress occurred (Hurrell Jr & Sauter, 2012). Although been thought to be less effective and more short-term in their effect (Bhagat et al., 2012), secondary interventions are utilized more frequently by organizations than are primary interventions, as the costs and logistics are regarded as less excessive (Cooper et al., 2001; Hurrell Jr & Sauter, 2012; Noblet & LaMontagne, 2006).

3.7.3 Tertiary Interventions

The third level of interventions presented in Table 3.1 is tertiary interventions which for the most part entail recovery strategies to manage stress (Dewe et al., 2010). Tertiary interventions are widely recognized and used in Western society (Bhagat et al., 2012). Unlike the secondary interventions, tertiary interventions mainly focus on treating the physical, psychological, or behavioural consequences of stressors at work, minimizing the effect of existing illness and restoring health and well-being (Hurrell Jr & Sauter, 2013).

One of the prominent examples of tertiary interventions is the employee assistance program (EAP), which usually involves a variety of counseling services for employees

suffering from personal or work-related problems, difficulties or stress (Bhagat et al., 2012; Dewe et al., 2010). Since the 1980s, EAPs have been used more and more widely in the world. Nevertheless, some evidence has proved that EAPs can improve employees' well-being, work performance, and organization's productivity (Bhagat et al., 2012; Dewe et al., 2010).

More examples of tertiary interventions are medical care, self-hypnosis, meditation, mental imaging, physical exercise, massage therapy, relaxation techniques, and breath mindfulness. These practice can improve people's immune system functioning and appears to be helpful to deal with the negative physiological and psychological effects of chronic stress (Bhagat et al., 2012; Cartwright & Cooper, 2005; Quick & Tetrick, 2003). Some of these interventions, such as meditation, physical exercise, and relaxation techniques, can also be regarded as secondary interventions because of their preventive effects on people's physical health (Bhagat et al., 2012).

In conclusion, Chapter 3 is the literature on work stress. First, it has introduced the definition of work stress. Second, it has reviewed the theories and models of work stress. Third, the sources of work stress have been introduced. Then, the work stress and job satisfaction have been discussed. Next, it has discussed the work stress and health and well-being. After that, it has introduced the coping with stress at work. Finally, it has discussed the stress management interventions.

4 Research Methodology and Hypotheses

In this chapter, the research design, research hypotheses, procedure, instruments and measures will be introduced.

4.1 Research Design

To obtain a more complete comparison of stress management at the workplace between Chinese and German employees, both quantitative and qualitative data were collected by questionnaire surveys in Chinese and German companies. Chinese data were collected from various industries in different cities of China. Correspondingly, German data were collected from a variety of industries in different cities of Germany. The numbers of participants from each industry in both Chinese and German companies are equal or roughly equivalent.

Questionnaire survey is a widely used method of data collection. However, in the area of work stress it is quite difficult to find a comprehensive questionnaire or scale that can evaluate not only the sources of work stress, but also the coping strategies of work stress, the health and well-being, and the job satisfaction.

Faragher et al. (2004, p. 191) suggested that to effectively evaluate stress, the questionnaire used must:

- be validated and reliable, with proven psychometric properties;
- be easy to complete, with a proven record of achieving an acceptably high response rate;
- be constructed using items directly pertinent both to the hazards/stressors and the moderating/mediating factors likely to be found;
- provide accurate estimates of the size of the factors identified and their impact on either individuals or groups of employees;

- be applicable both to the industry and to the work levels of the employees being assessed;
- have published normative values to allow organizations to benchmark themselves against comparable work populations.

However, few stress assessment tool could meet all the criteria above. The usual conflict is that measures tend to be lengthy in an attempt to carry out a comprehensive and full evaluation (Faragher et al., 2004). The interests of response are often low when participants are asked to finish a very long thus time-consuming questionnaire.

So it's very necessary to develop a short but well validated stress evaluation questionnaire or scale which can be finished quickly and easily (Faragher et al., 2004). However, a very short questionnaire or scale can not hope to comprehensively and accurately evaluate the sources of work stress, the coping strategies, the health and well-being, and the job satisfaction.

To try to overcome these problems, four new scales, namely Sources of Work Stress Scale, Coping with Stress Scale, Health and Well-being Scale, and Job Satisfaction Scale, have been well developed and validated, aim to measure the work stressors, coping strategies of work stress, health and well-being related to work stress, and job satisfaction.

4.2 Research Hypotheses

To go into the further research, the corresponding research hypotheses are developed according to the research questions mentioned in Chapter 1 and the literature below.

4.2.1 HS1-HS9: Chinese and German Employees' Sources of Work Stress

During the research on work stress, there is a long history of identifying the potential factors that cause stress at work. Many studies have identified the common causes of stress at work (Donaldson-Feilder et al., 2011). The current research has identified nine common causes of

stress at work and proposed a nine-factor model that the common sources of work stress include workload, competition and comparison, role uncertainty, control, pay and career prospects, competency, work-life balance, relationships at work, and boredom at work (please refer to Chapter 6 for further details). Different research hypotheses regarding Chinese and German employees' sources of work stress are proposed below.

4.2.1.1 HS1: Workload

As a potential source of work stress, long working hours have been attracting enormous concern for researchers and practitioners (Fiksenbaum, Jeng, Koyuncu, & Burke, 2010). Chen, Siu, Lu, Cooper, and Phillips (2009) argued that it is particularly necessary to study work stress in China because very great changes have taken place in many aspects in China since the reform and opening-up policy began in 1978.

According to Chinese labor laws and other relevant regulations, workers are entitled to an 8-hour working day (no more than 3 hours overtime per day), a 40-hour working week, at least one day off per week, and no more than 36 hours overtime per month (Egels-Zandén, 2014). However, some Chinese companies can't fully conform to the legal standards for maximum work hours in Chinese labor law and other relevant regulations (Bartley & Lu, 2012). One study reported that Chinese migrant workers' weekly working time was 56 hours on average, and 75% of the surveyed people worked over 48 hours weekly (Smyth et al., 2013).

Chinese employees work prolonged hours to finish the tasks or orders quickly and efficiently which leads to great stress for them (O'Rourke & Brown, 2003; So, 2009). So (2009) mentioned that a lot of migrant workers suffer from long-term stress and exhaustion caused by working long hours. The State Council Information Office of the People's Republic of China reported on February 28th, 2015 that there were 274 million migrant workers in China in 2014, including 168 million rural-urban migrant workers. They are the driving force for China's high rate of growth.

The government website of Heilongjiang province reported on July 21, 2014 that the average weekly working time in Heilongjiang was 45.5 hours, nationwide was 45.2 hours. The Statistics Bureau of Gansu province also released a report on December 10, 2014 saying

that the average working time per week from January to November, 2014 in Gansu was 48.09 hours. On December 14, 2018, the National Bureau of Statistics of China reported that the average weekly working time nationwide in November, 2018 was 46.2 hours.

Kaiser, Reutter, Sousa-Poza, and Strohmaier (2018) reported that those Germans who are employed work 37.9 hours per week on average. Andrews, Gerner, Schank, and Upward (2014) said that there have been policy controversies over the increases of the standard working hours in Germany. Rosta and Aasland (2011) reported that the standard full time workweek was between 40-42 hours in Germany. According to SOEP figures, Holst and Wieber (2014) showed that the actual weekly working time for men in Germany was high, at 42.2 hours in 2013, as in 1991, it was 42.5 hours. For women, the average actual working time was 32.3 hours in 2013 and 33.7 hours in 1991 (see Figure 4.1).

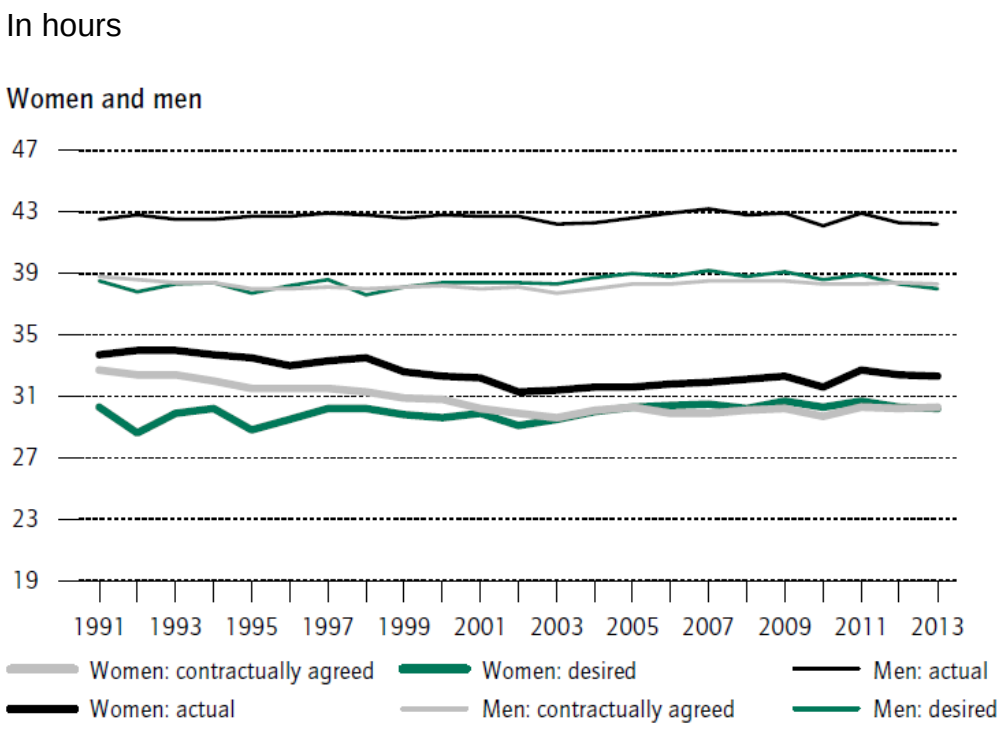

Figure 4.1: Contractually agreed, actual, and desired weekly working time[1] for employees (Holst et al., 2014)[2]

[1] 1992 data for western Germany only. No data available for 1996. Values for 1992 and 1996 calculated as arithmetic mean of previous and subsequent year.
[2] Sources: SOEPv30, provisional weighting from SOEPv29 for 2013; calculations by DIW Berlin.

Based on the literature above, we know that many Chinese employees are subjected to long working hours. It seems that the average working hours per week is much longer for Chinese employees compared to German employees. Long working hours usually lead to heavy workload. Thus, the Hypothesis S1 (HS1) is developed:

HS1: Chinese employees will report more stress caused by workload than their German counterparts. Specifically, Chinese employees will report that they feel stressed by workload more often than their German counterparts.

4.2.1.2 HS2: Competition and Comparison

Friedman (2005) has noted that a person can compete for job opportunities with another person regardless of his or her place in the world. Competition is felt not only from the local labor market but also from the global labor market (Beerepoot & Lambregts, 2015).

Workplace stress is significantly greater in developing nations as compared to developed nations, reported by WHO. People in developing countries such as China are getting some advantages from the rapid economic growth, nevertheless, in a highly competitive atmosphere, they also have much pressure to be one step ahead of others which brings about protracted stress (Birdie, 2017). People are pressured to compete for the resources, money, job opportunities, career advancement opportunities, self-respect, status, and power needed for functioning in social life or at workplace (Salmon, Crawford, & Walters, 2008).

A great number of Chinese are driven by social comparison and also temporal comparison (Ge, Tian, & Li, 2015). Due to the mutually dependent qualities of Chinese organizations, superiors usually push subordinates into comparisons between each other by comparing with colleague's better performance to increase productivity or comparing with colleague's worse performance to strengthen self-reflection, or ask subordinates to compare with their own past similar experience over time (Ge et al., 2015).

Therefore, the Hypothesis S2 (HS2) is given according to the previous literature:

HS2: Chinese employees will report more stress caused by competition and comparison than their German counterparts. Specifically, Chinese employees will report that they feel stressed by competition and comparison more often than their German counterparts.

4.2.1.3 HS3: Role Uncertainty

Many literatures on occupational stress have paid attention to role stressors, including role conflict and role ambiguity. Role conflict takes place when an individual encounters incompatible or conflicting job demands from the role-set members. Role ambiguity happens when an individual is not sure about how to carry out assigned job tasks (Dubinsky & Mattson, 2015) or when an individual is not clear about the job responsibilities, objectives and expectations from others at work.

Both role ambiguity and role conflict can lead to the uncertain state of meeting the job demands or expectations from others. Therefore, the two dimensions can be put together into one concept named role uncertainty. Role uncertainty at work will cause some stress. However, different cultural societies, organizations or groups have different uncertainty avoidance orientations.

Hofstede's notion of uncertainty avoidance is the level of tolerance or comfort of a society or culture's for uncertainty, ambiguity, and unstructured circumstances which are novel, unpredictable, shocking and unusual (Hofstede, 1994, p. 4). House, Hanges, Javidan, Dorfman, and Gupta (2004) defined uncertainty avoidance as "the extent to which a society, organization, or group relies on social norms, rules, and procedures to alleviate the unpredictability of future events" (House et al., 2004, p. 30).

Based on House et al. (2004, p. 618), some characteristics of high and low uncertainty avoidance societies are listed below:

Characteristics of high uncertainty avoidance societies:

- Tend to use formality in interactions with others
- Document agreements in legal contracts
- Be orderly and keep meticulous records
- Rely on formalized policies and procedures
- Take more moderate calculated risks
- Inhibit new product development but facilitate the implement stage through risk aversion and tight controls
- Have stronger resistance to change

- Show stronger willingness to establish rules allowing predictability of behavior
- Have less tolerance for breaking rules

Characteristics of low uncertainty avoidance societies:

- Tend to use informality in interactions with others
- Rely on the word of others they trust rather than contractual arrangements
- Are less orderly and keep fewer records
- Rely on informal interactions and norms for most matters
- Be less calculating when taking risks
- Encourage the new product development especially in the initial stage, through higher risk taking and minimal planning or controls
- Have less resistance to change
- Show less intention to establish rules to control or influence behavior
- Have more tolerance for breaking rules

The GLOBE study of 62 societies by House et al. (2004) has indicated that majority of nations with high reported uncertainty avoidance practices are developed nations while those with low reported practices are developing nations. This study also has indicated that China is a lower uncertainty avoidance country with practices score of 4.94 compared to West Germany with practices score of 5.22 and East Germany with a practice score of 5.16.

Thus, hypothesis HS3 is proposed:

HS3: Chinese employees will report more stress caused by role uncertainty than their German counterparts. Specifically, Chinese employees will report that they feel stressed by role uncertainty more often than their German counterparts.

4.2.1.4 HS4: Control

Individualism is defined as a self-orientation that puts more emphasis on autonomy and control (Ralston, Egri, Stewart, Terpstra, & Kaicheng, 1999), whereas collectivism is defined as group-orientation that attaches more importance to group interests and compliance (Ho & Chiu, 1994). Triandis (1995) stated that individualists are mainly driven by their own needs, preferences and rights, giving priority to themselves rather than to group. However,

collectivists tend to regard themselves as parts of a whole, such as a family, an organization, a tribe, or a nation. They are mainly motivated by group norms and duties.

German people have a characteristic of individualism through autonomy and independence (Kühlmann & Rabl, 2009). While Chinese people are often portrayed as collectivist (Hsu, 1981; Hui & Triandis, 1986; Liu et al., 2007) and are depicted by the Confucian rules of face-saving (Boisot & Child, 1996; Liu et al., 2007; Ralston et al., 1999; Ralston, Kai-Cheng, Wang, Terpstra, & Wei, 1996; Redding, 1990) and forbearance (Hwang, 1997). Collectivist Chinese tend to accept one's fate, maintain harmony in a group, and give priority to group needs, interests and compliance rather than to themselves (Liu et al., 2007). Cultural differences between China and Germany have an impact on work stressors and collectivists tend to perceive lower control or autonomy than individualists (Liu et al., 2007).

The Hypothesis S4 (HS4) is developed according to the statement above:

HS4: Chinese employees will report more stress caused by lack of control over work than their German counterparts. Specifically, Chinese employees will report that they feel stressed by lack of control over work more often than their German counterparts.

4.2.1.5 HS5: Pay and Career Prospects

Germany (The Federal Republic of Germany) is the largest economy in EU (European Union) with a population of 82 million. Industrially, its foremost areas include automobiles, engineering, electronics, and chemicals (Brodbeck & Frese, 2007). Germany is famous for its industrialized products, such as cars, machines, electronics (Wang, 2014), and also its social welfare system. When it comes to the German social welfare, we have to mention the health care system of Germany which is of good repute around the world. It was established in the late 19th century as the first universal health care system in the history of the world (Obermann, Müller, Müller, Schmidt, & Glazinski, 2013). German health care system provides excellent quality care. Just as Mossialos, Wenzl, Osborn, and Sarnak (2016) mentioned:

> Health insurance is mandatory for all citizens and permanent residents of Germany. It is provided by […] statutory health insurance (SHI) system, or by substitutive private health insurance (PHI). […] SHI covers preventive services, inpatient and outpatient

> hospital care, physician services, mental health care, dental care, optometry, physical therapy, prescription drugs, medical aids, rehabilitation, hospice and palliative care, and sick leave compensation. […] PHI also plays a mixed complementary and supplementary role, covering minor benefits not covered by SHI, access to better amenities, and some copayments. (Mossialos et al., 2016, pp. 69-70)

Much of this is based on the steady growth in health care expenditures, the significant amount of money spent on health care in Germany. For example, the total health expenditure was equivalent to 10.8% of GDP (gross domestic product) in 2001, 11.6% of GDP in 2010 (Obermann et al., 2013) and 11.5% of GDP in 2013 (Mossialos et al., 2016).

The Chinese annual GDP growth rate has ranged from 8.4% in 2000 to 10.3% in 2010. After reaching its peak of 14.2% in 2007, it fell to 7.7% in 2012 and 6.9% in 2017. The rapid development helps the Chinese government to develop its systems of political, economic, and public administration. Due to the rise of GDP levels in recent decades, China's economy has become the world's second most powerful economy (Lee, 2013).

However, the development of the health care sector is now far behind economic growth in China. Total health expenditures rose from 3.02% of (mainland) China’s GDP in 1978 to 5.15% in 2011, totaled RMB 24.34 trillion ($376.94 billion USD) and per capita expenses were RMB 1,807 ($279.7 USD). The MoH (*ministry of health*) of the People's Republic of China reported that total health spending had increased to 4.96% of GDP by 2009, and to 5.57% of GDP by 2013, and that the government intended to increase health spending to 7% of GDP by 2020. Expenditure on health care as a percentage of GDP has been rising in China, but remains low if compared to developed nations and even some other developing nations (Hew, 2006).

The Chinese health care system has being criticized for poor quality of health care services, insufficient coverage of health insurance, soaring health care costs, and inequality among urban and rural residents, as it has divided Chinese people into three distinct groups: rural residents, urban working residents, and urban non-working residents (Zhai et al., 2017).

Though government’s health expenditures expanded, personal expenditure on health, particularly the high and catastrophic health care expense showed significant increment rather than decrement (Zhai et al., 2017). A large number of Chinese people have to face the medical

care out of their financial reach because of the high cost of seeing a doctor (Hew, 2006). High out-of-pocket health payments have pushed around 7% of the Chinese into poverty every year (Zhai et al., 2017).

Besides the health care system, social pension system in China is also being criticized for its inequality across regions, limited and incomplete coverage and low benefit level. Liu and Sun (2016) have mentioned that the benefit amount in 2014 was only RMB 81 yuan (approximately 13 US dollars) per month on average which is far from sufficient to guarantee basic standards of living for the elderly in China. Figure 4.3 shows China's monthly social pensions benefit level in different regions in 2014.

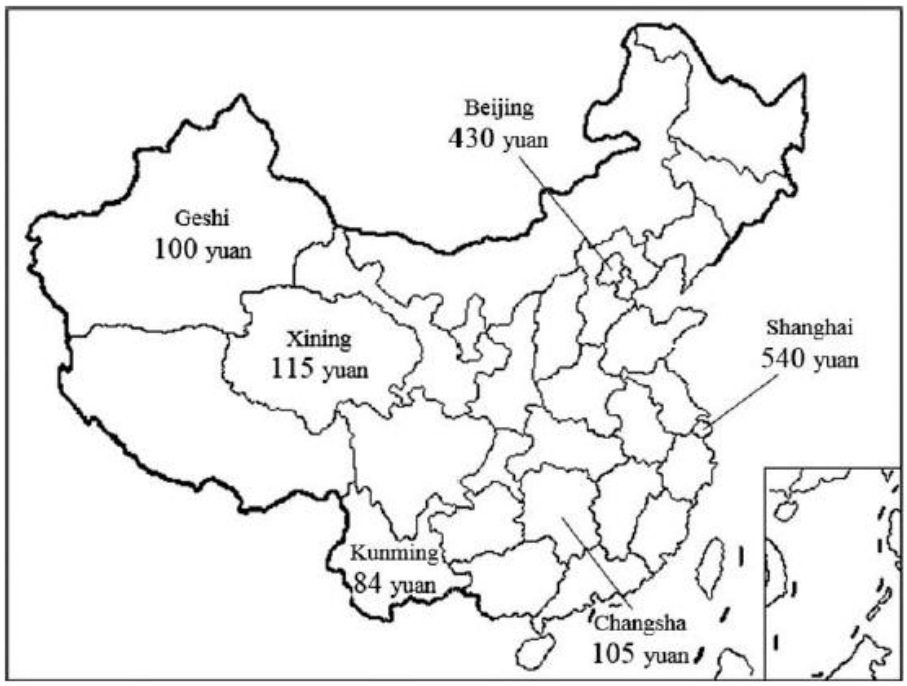

Figure 4.2: Monthly benefit level of social pensions in different regions of China in 2014
Source: Compiled by the authors based on various data from http://www.mohrss.gov.cn/.

China's monthly social pensions benefit level went up 5%-10 % every year from 2014 to 2018. In 2017, monthly benefit amount of social pensions nationwide was around 125 RMB per month on average. The monthly benefit amount was different in different provinces or cities. It was around 850 RMB per month in Shanghai, 560 RMB per month in Beijing. However, it was only 140 RMB per month in Qin Hai, and 120 RMB per month in Guangdong as well as Ning Xia. Though China has introduced the pension reform aimed to

establish a universal, non-contributory pension since 2015, Liu and Sun (2016) still argued that the pension scheme is not fully universal.

In addition, Chinese people think highly of filial piety, a concept refers to the behaviours and duties to support and care for one's parents especially when they are not able to take care of themselves (Van de Vijver, 1998). Chinese adults married have the obligations to provide necessary financial support for their parents, especially for the old ones who don't have enough money for basic living standards. It was estimated that one out of every three families in China have only one child as a result of the infamous one-child policy, and increasing amounts of married people will have obligations for not only one child but also four old people, especially parents and parents-in-law (Cai & Cheng, 2014; Chen & Standing, 2007).

At this stage, most of the Chinese people feel anxious and pressured by the growing costs of living. This is the main reason why most of the Chinese people are working very hard. They hope to earn enough money for the future expenses, such as costs of housing, health care, children's education and other basic living necessities. That is to say, they expect to have more income or better career prospects to cope with the increasing expenses for better life.

Based on the previous literature, HS5 is raised:

HS5: Chinese employees will report more stress caused by pay and career prospects than their German counterparts. Specifically, Chinese employees will report that they feel stressed by pay and career prospects more often than their German counterparts.

4.2.1.6 HS6: Competency

The competency based approaches were introduced into the business environment around 1970 (Draganidis & Mentzas, 2006). The term "competency" was introduced into the human resource researches by McClelland (1973), a distinguished Harvard's psychologist, who argued that competency tests should be developed and used as an alternative to intelligence or aptitude evaluations, which were failed to predict job performance (Draganidis & Mentzas, 2006; McClelland, 1998).

Competency is the individual's level of being competent for his or her work or the quality of being physically and intellectually qualified. Competency includes characteristics to

perform a job effectively such as relevant job skills, knowledge, abilities, job training and work experience (Draganidis & Mentzas, 2006).

The German vocational education and training (VET) system has a very good reputation in the world. It is widely accepted as effective and future-oriented VET model (Hummelsheim & Baur, 2014) whose aim is to provide "broadly based basic vocational training and the qualifications and competences required to practice an occupation as a skilled worker" (Hippach-Schneider, Krause, & Woll, 2007, p. 33). However, the VET in Asian countries such as China has a poor image and reputation due to the relative low performance (Hummelsheim & Baur, 2014).

There is a large gap between the market demands for training and the supplies of VET system in China. Rapid economic growth in Asian countries such as China requires employees to have more skills and competencies to shift from mass production to high quality production (Hummelsheim & Baur, 2014). Under this situation, Chinese employees probably have less enough job skills and vocational training and thus have more pressure caused by competency than their German counterparts.

The hypothesis HS6 is put forward based on the statements above:

HS6: Chinese employees will report more stress caused by competency than their German counterparts. Specifically, Chinese employees will report that they feel stressed by competency more often than their German counterparts.

4.2.1.7 HS7: Work-life Balance

As a developing country, China is still a labor-intensive economy to a large extent. Long-working hours result in little time for Chinese workers to take part in leisure activities or engage in interests and hobbies. Only when China successfully reforms the social welfare system and income distribution system, and successfully implements the economic restructuring and industrial upgrading, will the situation change a lot.

On May 1st, 1886, over one million workers joined a nationwide strike organized by the Federation of Organized Trades and Labor Unions to claim the 8-hour workday (Foner, 1947; Hunnicutt, 1984; Johnson & Lipscomb, 2006) in line with the slogan, "eight hours for work,

eight hours for rest, eight hours for what we will." (Foner, 1975; Johnson & Lipscomb, 2006). But evidence also shows that some individuals working long hours are still thriving (Fiksenbaum et al., 2010).

Smyth et al. (2013) reported that about 36% respondents in China had worked over 60 hours per week and around 12% had "often" or "always" worked over six days during the last three months, though Chinese labor law states that working hours should not be over 40 hours per week and working days should not be over six days per week. Generally, the Chinese workers put in lengthy amount of hours into their job without enough time for rest, often more than 11 hours daily for several weeks at a stretch (So, 2009). They leave home early for work in the morning and arrive home late in the night. Under this situation, most Chinese workers do not have sufficient time or energy for leisure activities because of work. They often feel a time conflict between work and private life.

Compared with Chinese employees, German employees have normal weekends off and thus have more time for leisure and relaxation. They may feel a time conflict between the private life and work less often than Chinese employees.

Thus, HS7 is proposed as follows:

HS7: Chinese employees will report more stress caused by lack of work-life balance than their German counterparts. Specifically, Chinese employees will report that they feel stressed by work-life conflict more often than their German counterparts.

4.2.1.8 HS8: Relationships at Work

Liu et al. (2007) claimed that culture may have some influence on employees' perceptions of work stress. Employees in eastern countries have different perceptions about stress at work compared with those employees in western countries.

When it comes to Chinese culture, "Guan Xi" is often been mentioned by many scholars. The Chinese term "Guan Xi" means more than the common word "relationship", it usually means specific personal connection (Dong & Liu, 2010; Fu, Wu, Yang, & Ye, 2013; Wang, 2014; Yeung & Tung, 1996). Some Chinese people like to choose "Guan Xi" as channels for the sake of convenience rather than normal bureaucratic channels to pursue personal interests

and solve some problems (Wang, 2014; Yeung & Tung, 1996).

Chinese culture attaches great importance to "Guan Xi" among people, because Chinese people think that the good interpersonal relationships among people will bring something like harmony, support, encouragement, convenience or help. The main functions of interpersonal relationships are to give and receive reciprocal favors (Kulich & Zhang, 2010; Wang, 2014). In order to achieve pleasant relationships and career advancement, Chinese people have been spending much time in dealing with complicated interpersonal relationships (Liu et al., 2007). It is really annoying to handle the complicated interpersonal relationships. For the Chinese employees in companies, it may cause some stress at work.

Germany and China differ in many aspects, such as culture, religions, histories, values and politics. Just as Brodbeck and Frese (2007, p. 165) argued "Social interaction in German companies tends to be more task oriented, straightforward, and less "kind" than in many other countries."

According to some scholars' research contributions (Glunk, Wilderom, & Ogilvie, 1996; Hall & Hall, 1990; Nees, 2000; Schroll-Machl, 2002), Kühlmann and Rabl (2009) summed up the main German cultural characteristics as the following six aspects (as cited in Wang, 2014, p. 59):

- Individualism through autonomy and independence;
- Expertise as one measure of important achievement;
- Compartmentalization between private and professional life and interpersonal distance;
- High clarity and directness of communication patterns;
- Importance of order and rules due to rational and analytical thought;
- Emphasis on scheduling, punctuality and reliability.

From the statement above, we know that German people put more emphasis on individual independence and achievement, compartmentalization between work and life, direct communication as well as order and rules. It means that they may spend more time on job tasks, performance and private life rather than intricate social connections. Individualist Germans most times resolve issues via explicit and direct verbal conversation. Sometimes, it causes conflict or dispute but is beneficial to solving issues and having the stress released or

let the bad feelings out.

However, collectivist Chinese people tend to spend much time, energy and also money to maintain group harmony and save "face" (in Chinese "mian zi 面子"). "Saving face" means avoiding a sense of shame (Hofstede, 2001) which is one important feature of Confucianism (Fang, 2003; Liu et al., 2007; Redding & Ng, 1982). Chinese tend to gain "face" for not only themselves but also their family and groups (Schütte & Ciarlante, 1998). Chinese people usually try to avoid direct humiliation to save "face" for both self and others, because they think losing face is shameful (Fang, 2003).

As another important feature of Confucianism (Hwang, 1997), "forbearance" generally refers to the personal control over one's emotions or feelings in order to keep harmonious relationships (Liu et al., 2007). "Saving face" and "forbearance" will be helpful to avoid direct conflict and unpleasant relationship to some degree, but they will cause much stress for themselves. Without letting anger out, one may suffer from negative emotions internally, which eventually bring about anxiety, worry or despair (Fernandez-Ballesteros, Ruiz, & Garde, 1998; Liu et al., 2007).

So, the hypothesis HS8 is raised as follows:

HS8: Chinese employees will report more stress caused by relationships at work than their German counterparts. Specifically, Chinese employees will report that they feel stressed by relationships at work more often than their German counterparts.

4.2.1.9 HS9: Boredom at Work

For a long time boredom at work has been considered as potential cause of stress (Guest, Williams, & Dewe, 1978). Researchers have focused on it since the beginning of the 20th century (Van Hooff & Van Hooft, 2014; Wyatt, Langdon, & Stock, 1937). Boredom has been regarded as an uncomfortable feeling characterized by a lack of interest or enthusiasm in work (Harris, 2000). Being boring at work is quite common (Van Hooff & Van Hooft, 2014).

Many researchers argued that working overtime would result in fatigue such as boredom (Savery & Luks, 2000; Schuster & Rhodes, 1985). Employees in human computation workflows probably feel boring by working long hours. Consistent with previous studies,

Rzeszotarski, Chi, Paritosh, and Dai (2013) had the similar opinion that heavy workloads and long hours can cause negative effects such as fatigue and boredom.

As mentioned before, a large number of Chinese employees work long hours, particularly migrant workers. It seems that the average working hours per week is much longer for Chinese employees compared to German employees. Thus, Chinese employees may experience work-related boredom more often than German employees.

Accordingly, the Hypothesis S9 (HS9) is developed:

HS9: Chinese employees will report more stress caused by boredom at work than their German counterparts. Specifically, Chinese employees will report that they feel stressed by boredom at work more often than their German counterparts.

4.2.2 HC1-HC7: Chinese and German Employees' Coping with Stress at Work

Coping is defined as the management of internal and external demands of situations, regarded as stressful, through people's thoughts and behaviours (Lazarus & Folkman, 1984a). A comprehensive literature review related to coping strategies or coping styles has been conducted to identify the types of coping defined in theories and widely used coping scales or questionnaires. This research has identified ten common strategies for coping with stress at work, namely future-oriented coping, positive thinking, physical exercises, social support, leisure and relaxation, religious coping, avoidance, acceptance, self-blame, and problem-solving coping (please refer to Chapter 7 for further details). Some research hypotheses regarding Chinese and German employees' coping with stress at work are proposed below.

4.2.2.1 HC1: Positive Thinking

Focusing on the brighter side of situations, positive thinkers perceive the stress as less threatening than negative thinkers (Naseem & Khalid, 2010). Positive thinking is an approach for individual to cope with the ill feelings associated with stress (Rotondo, Carlson, & Kincaid, 2003).

The reform and opening policy started in 1978 has brought about unprecedented economic development and great social changes in China (Frijters, Liu, & Meng, 2012). Most people in China benefit from the rapid economic growth and income growth. Frijters et al. (2012) found that continued optimistic expectations of the economic development are the main reason for the relative stability of the Chinese political system to avoid the collapse of communism happened in the former Soviet Union regions. On the one hand, optimistic economic expectations can keep Chinese positive, satisfied, happy and hopeful and therefore can maintain social stability of China. On the other hand, the Chinese media try to control the news and often prevent the public from knowing some very negative news. The positive expectations sometimes put a lid on emerging social problems (Frijters et al., 2012) that can lead to negative effects. Moreover, Chinese folk wisdom attaches importance to positive and optimistic attitude because it is of benefit to both physical and mental health (Lai & Wong, 1998).

The surge of refugees into Europe and its crisis have drew international attention (Holmes & Castañeda, 2016). The refugee crisis and the terrorism threat have become hot topics in the mainstream media in Germany and abroad. There have been heated debates over the UK's vote to exit the EU (Wike, Stokes, & Simmons, 2016). After the attacks in Paris and Brussels, many Europeans including German people think that the crisis of refugee and the threat of terrorism are never really separate (Wike et al., 2016), although refugee and terrorism are not the same thing (Nail, 2016). An investigation conducted in eight of the ten European countries reported that 50% or more Europeans think that the wave of refugees will increase the possibility of terrorism threat, become an economic burden and take their jobs and social benefits (Wike et al., 2016). Many Germans also feel worried, pessimistic and negative about the future of Germany and the debates over refugee policy may deeply split German society. Moreover, many media tend to report negative news because they can easily draw people's attention than positive news. German people have been exposed to much negative news due to the freedom and pluralism of the media.

Based on the statements above, probably Chinese people are more positive than German people about the future of their life, work and country. Thus, HC1 is proposed:

HC1: Chinese employees use positive thinking as a way to deal with stress more often than their German counterparts.

4.2.2.2 HC2: Physical Exercises

So (2009) and Zhou (1997) noted that majority of Chinese migrant workers have to work 11 to 12 hours per day on average despite the Chinese labor laws which intend to ensure that employees work eight hours per day, 40 hours per week, and at least one day off per week (Chan, 1998; Ding & Warner, 1999; Egels-Zandén, 2014; Warner, 1996).

Smyth et al. (2013) investigated and showed that about 36% respondents in China worked over 60 hours per week and around 12% "often" or "always" worked over six days during the last three months. Many Chinese employees have to leave home early for work in the morning and reach home late and exhausted at night.

Under these circumstances, a lot of Chinese employees don't have sufficient time or energy to get involved in physical exercises, sports activities, or fitness activities. Once they have one day or two days off, probably they will sleep more, go shopping, meet or talk with friends, or have some decious food to refresh themselves.

However, German employees have more time to for physical activities, sports and fitness. The relation between employers and employees is regulated by the German Labour Law. There exist many legislations regarding contract terms, including holidays, working hours, paid leave, part time job etc. (Lorenz & Falder, 2016). For example, the maximum permitted working hours is regulated by the Hours of Employment Act for the protection of employee's health (Lorenz & Falder, 2016).

Thus, Hypothesis C2 (HC2) is developed:

HC2: German employees do physical exercises as a way to deal with stress more often than their Chinese counterparts.

4.2.2.3 HC3: Leisure and Relaxation

Lin, Zhu, and Xie (2012) discussed that many factors include income, time, and individual interests can affect the enjoyment of leisure. The arrangement for work, rest and leisure time is a fundamental feature of a group of people's lifestyle standard (Eglite & Zarins, 1993; Hui-fen, Zhen-shan, Dong-qian, & Yang, 2012).

Qualitative studies undertaken by Li (2006) and Jacka (2005) reported that rural-urban migrants in China have little time for leisure activities. Twenty participants in Li's research said that they never went out for leisure activities because of tiredness after work and just wanted to rest rather than to participate in social activities (as cited in Smyth et al., 2013).

Although situation is getting better in recent years, many Chinese employees still have to work overtime because of the fierce competition at work or in the labor market or their strong willingness for better economic status. Some employees would like to work on weekends to earn more money for a house, a car, or better life. Under this circumstance, a lot of Chinese employees do not have sufficient time or energy for leisure and relaxation. In contrast, German employees have more time for leisure activities, relaxation, interests and hobbies as they have normal weekends off and seldom work overtime.

Based on the statements above, HC3 is raised:

HC3: German employees use leisure and relaxation as a way to deal with stress more often than their Chinese counterparts.

4.2.2.4 HC4: Religious Coping

In 2007, Chinese Spiritual Life Survey (CSLS) of 7,021 participants aged 16 to 75 years showed that 23.2% of them affirmatively confirmed their religious affiliation (Yang, 2012). The China Family Panel Studies (CFPS) in 2012 conducted a survey on religion in (Mainland) China for the first time. Only 10% of the participants gave a religious affiliation in this survey (Wenzel-Teuber, 2017). The reasons may lie in the questionnaire structure and the lack of samples from the strongly Buddhist and Muslim regions like Tibet, Qinghai, Xinjiang and Ningxia in CFPS 2012 survey (Wenzel-Teuber, 2017). The new CFPS survey in 2014 modified the question on religion. Then about 26% of the participants gave a religious affiliation. Table 4.1 shows the results of CFPS from 2012 and 2014. The CFPS 2014 survey indicated that 15.87% of the Chinese participated in the survey were identified as Buddhists, 5.94% as unspecified other religions, 0.85% as Taoists, 0.81% as members of the popular sects, 2.53% as Christians (including 2.19% Protestants and 0.34% Catholics) and 0.45% as Muslims, 73.56% of the participants reported that they had no religious belief (Wenzel-Teuber, 2017, p. 27). CFPS 2014 survey investigated the participants on religious

belief in a particular concept of divinity instead of belonging to a particular religious group, therefore it is regarded as one of the most reliable studies to date (Wenzel-Teuber, 2017)[3].

Table 4.1: Religious beliefs of adults in China according to CFPS, surveys of 2012 and 2014 (adapted) (Wenzel-Teuber, 2017, p. 27)

	Buddhism	Daoism	Popular belief	Islam	Catholicism	Protestantism	No religious belief	Other	Total
2012	6.50%	0.31%	\	0.71%	0.27%	2.00%	90.06%	0.15%	100.00% (20,035)
2014	15.87%	0.85%	0.81%	0.45%	0.34%	2.19%	73.56%	5.94%	100.00% (19,260)

Sinnewe, Kortt, and Dollery (2015) noted that the population of Germany was 81.1 million based on 2011 official statistics (U.S. Department of State, 2012). It is estimated that approximately 31% of them are Catholics while about 30% are Protestants. Around 5% of the population claim to be Islam. Finally, about 35% of the total population confirmed that they have no religious affiliation (U.S. Department of State, 2012).

Based on the statements above, we know that about 23.20% of the Chinese people have religious affiliation in 2007 and about 26.44% in 2014 (Wenzel-Teuber, 2017). 73.56% of the Chinese participated in the CFPS 2014 survey reported no religious affiliation. Perhaps Germans are more religious than Chinese. Therefore, the hypothesis HC4 is proposed:

HC4: German employees use religious coping as a way to deal with stress more often than their Chinese counterparts.

4.2.2.5 HC5: Acceptance

Acceptance coping means to accept the reality of a stressful situation (Carver, Scheier, & Weintraub, 1989, p. 270) . Zoellner and Maercker (2006) noted that it is of great importance for a person to learn to accept unchangeable situations and adapt to uncontrollable events.

[3] Information is also available at Wikipedia: https://en.wikipedia.org/wiki/Religion_in_China

Consistent with previous studies (Spector, Sanchez, Siu, Salgado, & Ma, 2004; Weisz, Rothbaum, & Blackburn, 1984), Siu et al. (2006) found that Chinese people are more likely to use secondary control, namely emotion-focused coping to deal with stress, for example, the passive adaptive coping which means to accept and adapt to unchangeable situations. Due to the fact that collectivist Chinese tend to maintain group harmony, one must learn to change himself or herself to fit the external environment or fit in with others (Siu et al., 2006). This usually involves accepting or adapting to the uncontrollable situations or events.

Hypothesis C5 (HC5) is accordingly proposed:

HC5: Chinese employees use acceptance as a way to deal with stress more often than their German counterparts.

4.2.2.6 HC6: Self-blame

Confucius's concept of persons argued that the superior persons who have high moral achievement should worry only about their own inability rather than others' failure to understand them. They should seek in themselves rather than blame Heaven or others for their own failure (Tsai, 2001).

A research of Shi and Zhao (2014) on the impact of coping strategies used by the college students on perceived self-efficacy found that when Chinese students face adversities they are more likely to use self-blame coping strategies than their Western counterparts. Introspection or self-examination is an important method of cultivation advocated by Confucian wisdom. Constant introspection or self-blame is a good habit to improve and cultivate oneself. In contrast, always putting blame on others without self-examination is a bad conduct (Cheng, 2000; Dong, 2018; Luo, 1995; Wang, 1963; Yan, 2009).

HC6 is developed according to the statements above:

HC6: Chinese employees use self-blame as a way to deal with stress more often than their German counterparts.

4.2.2.7 HC7: Problem-solving Coping

Problem solving is defined by D'zurilla and Goldfried (1971) as a cognitive mechanism that provides a number of effective solutions to cope with a problem and increases the possibility of choosing the most efficient reaction. Reva (2011) argued that problem solving is the process of finding solutions to particular problems. Tjosvold, Yu, and Hui (2004) noted that problem solving makes contributions to resolve a broad spectrum of organizational issues and conflicts.

As stated in the above section, collectivist Chinese people tend to avoid direct conflict to save "face" and to maintain harmonious relationships in stressful situations (Liu et al., 2007). This will be helpful to avoid unpleasant interpersonal situations but it is not helpful to solve problems. Former studies have indicated that sometimes candid problem-solving approaches are easily regarded as threats to collectivist Chinese (Tjosvold et al., 2004). However, individualist German people put more emphasis on tasks and performance rather than complicated interpersonal relationships. Brodbeck and Frese (2007, p. 165) have noted that "Social interaction in German companies tends to be more task oriented, straightforward […] than in many other countries". German people are more likely to use explicit and direct verbal conversation to solve problem rather than to save "face". This is beneficial for problem-solving.

Thus, Hypothesis C7 (HC7) is raised:

HC7: German employees use problem-solving coping as a way to deal with stress more often than their Chinese counterparts.

4.2.3 HH1-HH2: Chinese and German Employees' Health and Well-being

The research hypotheses regarding Chinese and German employees' physical health and psychological/mental well-being related to work stress are proposed below (please refer to Chapter 8 for more literature on physical health and psychological well-being).

Prevailing economic situations may have impact on employees' health and well-being.

Employees from developing nations exhibit lower levels of well-being than those who are from developed nations (Sadri, Marcoulides, Cooper, & Kirkcaldy, 1996). The cross-cultural study of McCormick and Cooper (1988) supported this finding in that physical and psychological stress were higher in developing nations like Brazil, Egypt, and Asian countries than in developed nations like the USA, Germany, and Sweden. Spector et al. (2001) observed that workers in Japan, mainland China, Hong Kong, and Taiwan had more stress mentally and physically than their counterparts in America.

Due to the development of positive psychology (Chen et al., 2009; Peterson, 2006; Seligman & Csikszentmihalyi, 2000), there has been more emphasis on psychological health at the workplace (Seligman, 2008). Stress coping program has become a good choice for enhancing employees' psychological health at work, which, in turn, may improve performance as well as profits in organizations (Chen et al., 2009; Seligman, 2008). Empirical studies have shown that people who believe in individualism have higher levels of well-being than their counterparts who support collectivism (Diener & Suh, 1999; Veenhoven, Ehrhardt, Ho, & de Vries, 1993).

Based on the literature above, two hypotheses are proposed:

HH1: Chinese employees will report more problems of physical health than their German counterparts.

HH2: Chinese employees will report more problems of psychological well-being than their German counterparts.

4.2.4 HJ: Chinese and German Employees' Job Satisfaction

The research hypothesis regarding Chinese and German employees' job satisfaction is proposed below (please refer to Chapter 9 for more literature on job satisfaction).

Several aspects such as pay, benefits, work environment, relationships at work, job autonomy, supervision, promotion opportunities, and the job itself are the main factors that can affect an employee's job satisfaction (Agarwal & Sajid, 2017; Bowling et al., 2018; Kanwar, Singh, & Kodwani, 2012). Some scholars found that there exists a positive correlation between pay level and job satisfaction (Yahaya, Yahaya, Maalip, Ramli, &

MdKamal, 2012). As mentioned before, Germany has a very good social welfare system. However, China's social welfare system is still far from people's expectations. Individuals have to bear a heavy economic burden at this stage, because they are pressured by the growing costs of living, education, housing, and health care and so on. Most of Chinese workers do not have enough income for their basic needs or expectations. Moreover, collectivist Chinese tend to perceive lower control or autonomy at work than individualist Germans. Chinese people have to deal with complicated interpersonal relationships. The phenomenon that inequalities exist between different areas and people is still a serious problem. As a result, Chinese employees' job satisfaction with the income, work environment, job autonomy, and relationships at work may be lower than their German counterparts.

According to the statement above, the Hypothesis J (HJ) is raised as follows:

HJ: German employees will report higher level of job satisfaction than their Chinese counterparts.

4.2.5 HR1: Problems of Health and Well-being and Job Satisfaction

From various viewpoints, many scholars studied the relationship between job stress and health, as well as the link between job stress and job satisfaction. What is the relationship between job satisfaction and health and well-being?

If an employee's knowledge and skills are not sufficient for coping with demands at work, the perception of the employee's job is likely to be negative, and a sense of stress may be felt by this employee. The stress may cause physiological and psychological problems, such as headaches, sleeping loss, poor appetite, anxiety and nervousness. Such physiological and psychological conditions can negatively affect the employee's job satisfaction, commitment, and performance.

Faragher, Cass, and Cooper (2005) argued that the level of job satisfaction is an important factor influencing the health of employees. Low satisfaction is likely to bring about a reduction in health (particularly mentally) of an individual. Employees with low job satisfaction tend to have more emotional burn-out, less self-esteem and more anxiety and depression (Faragher et al., 2005). So job satisfaction is a significant indicator for health and

well-being (Voltmer, Rosta, Siegrist, & Aasland, 2012).

Thus, the Hypothesis R1 (HR1) is proposed:

HR1: The problems of physical health and psychological well-being are negatively related to job satisfaction. The more problems of physical health and psychological well-being an employee reported, the lower level of job satisfaction the employee has.

4.2.6 HR2: Job Satisfaction and Turnover Intention

Job satisfaction is referred to as "the extent to which people like (satisfaction) or dislike (dissatisfaction) their jobs" (Spector, 1997, p. 2). The frequently used Job Descriptive Index appraises five dimensions of job satisfaction, including the job itself, pay, promotion, supervision, and coworkers (Kinicki, Mckee-Ryan, Schriesheim, & Carson, 2002). In addition, job security, working hours, support from superior, and level of control over work are also related to the level of job satisfaction (Burke, 1998; Faragher et al., 2005; Noblet, Rodwell, & McWilliams, 2001).

When the employees are satisfied with their job, they will perform better, enjoy with their tasks, and have less intention to quit the job. This is also good for the organization to reduce the rate of turnover and absenteeism (Yahaya et al., 2012).

According to the statements above, the Hypothesis R2 (HR2) is developed:

HR2: The job satisfaction is negatively related to turnover intention. Employees who report higher levels of job satisfaction will report lower intention to quit.

4.3 Procedure

First, four scales including Sources of Work Stress Scale, Coping with Stress Scale, Health and Well-being Scale, and Job Satisfaction Scale were developed and validated by empirical studies with German and Chinese samples. The softwares SPSS 22, Smart PLS 3 and Amos 22 were used to test the factor structure, reliability, convergent validity, discriminant validity,

and cross-cultural equivalence. Content validity was based on a comprehensive literature review and expert consultation to develop the most suitable items for the scale (Glasberg et al., 2006). Although content validity is defined differently, it usually refers to the extent to which the items of an assessment instrument are appropriate and represent the theoretical content domain of the targeted construct for a specific purpose of evaluation (Haynes, Richard, & Kubany, 1995; Nunnally & Bernstein, 1995). Face validity was based on consensus on the wording among experts and participants that the items of the scale can be easily understood and theoretically relevant to the participants with different educational levels (Glasberg et al., 2006). It was defined by Nunnally and Bernstein (1995) as the extent to which an assessment instrument reflects what it is intended to assess.

Then, the questionnaire surveys with four scales were distributed either online or face-to-face. Participants can finish either the paper-and-pencil version or the online version. Both Chinese and German can be set as the survey language. The website settings ensured that every participant completed all the survey with no question missed. Otherwise, the questionnaire could not be submitted.

Next, quantitative and qualitative data from Chinese and German samples were collected by questionnaire surveys in China and Germany. To obtain a more complete comparison of stress management at workplace between Chinese and German employees, Chinese data were collected from various industries in different cities of China. Correspondingly, German data were also collected from many different industries in different cities of Germany.

Finally, the research results and conclusions of the surveys on stress management at the workplace in Chinese and German companies are reported, including the introduction to the surveys, the statistical and analysis methods, and some conclusions related to research hypotheses. At the same time, the research findings, the contributions, the limitations of this study, the recommendations for future research and practice, and the conclusions are also provided.

4.4 Instruments and Measures

The instruments applied in this study include four newly developed and validated scales,

namely Sources of Work Stress Scale, Coping with Stress Scale, Health and Well-being Scale, and Job Satisfaction Scale.

Demographic information such as participants' gender, age education level, overall level of work stress, turnover intention, and weekly working hours was obtained through the supplementary information at the end of the questionnaire survey. Based on the research questions and research hypotheses, the detail measures used in this study and the number of items are elaborated in the following section.

4.4.1 Sources of Work Stress Scale

It is developed and validated with Chinese and German samples to measure Chinese and German Employees' sources of work stress, consisting of 30 items.

Some main sources of work stress are listed. Respondents are required to indicate how often they feel stressed by any of the sources of stress at work. Respondents answer on a five-point Likert-type scale, ranging from 1 to 5 where "Never" is scored as 1, "Seldom" is scored as 2, "Sometimes" is scored as 3, "Often" is scored as 4, and "Always" is scored as 5. Table 4.2 shows the measures of Sources of Work Stress Scale and the number of items.

Table 4.2: The measures of Sources of Work Stress Scale and the number of items

Instrument	Measures	Number of Items
Sources of Work Stress Scale	Workload	3
	Competition and Comparison	4
	Role Uncertainty	3
	Control	3
	Pay and Career Prospects	4
	Competency	3
	Work-life Balance	3
	Relationships at Work	4
	Boredom at Work	3

4.4.2 Coping with Stress Scale

It is developed and validated with Chinese and German samples to measure Chinese and German Employees' strategies to cope with stress at work, consisting of 30 items.

Some possible coping strategies are listed. Respondents are required to answer how often they actually use each of them as a way of coping. Respondents answer on a five-point Likert-type scale, with options ranging from 1 to 5 where "Never" is scored as 1, "Seldom" is scored as 2, "Sometimes" is scored as 3, "Often" is scored as 4, and "Always" is scored as 5. The measures of Coping with Stress Scale and the number of items are demonstrated in Table 4.3.

Table 4.3: The measures of Coping with Stress Scale and the number of items

Instrument	Measures	Number of Items
Coping with Stress Scale	Future-oriented Coping	3
	Positive Thinking	3
	Physical Exercises	3
	Social Support	3
	Leisure and Relaxation	3
	Religious Coping	3
	Avoidance	3
	Acceptance	3
	Self-blame	3
	Problem-solving Coping	3

4.4.3 Health and Well-being Scale

It is developed and validated with Chinese and German samples to measure Chinese and German employees' physical health and psychological well-being, consisting of eight items.

Respondents are required to indicate their conditions of physical health and psychological well-being. Respondents answer on a five-point Likert-type scale, with response options ranging from 1 to 5 where “Never” is scored as 1, “Seldom” is scored as 2, “Sometimes” is scored as 3, “Often” is scored as 4, and “Always” is scored as 5. Table 4.4 is the measures of Health and Well-being Scale and the number of items.

Table 4.4: The measures of Health and Well-being Scale and the number of items

Instrument	Measures	Number of Items
Health and Well-being Scale	Physical Health	4
	Psychological Well-Being	4

4.4.4 Job Satisfaction Scale

It is developed and validated with Chinese and German samples to measure Chinese and German employees’ job satisfaction, consisting of eight items.

Respondents should indicate the extent to which they feel satisfied or dissatisfied with their job. Respondents answer on a five-point Likert-type scale, with options ranging from 1 to 5 where “Very dissatisfied” is scored as 1, “Somewhat dissatisfied” is scored as 2, “Neutral” is scored as 3, “Somewhat satisfied” is scored as 4, and “Very satisfied” is scored as 5. Table 4.5 shows the measure of Job Satisfaction Scale and the number of items.

Table 4.5: The measure of Job Satisfaction Scale and the number of items

Instrument	Measure	Number of Items
Job Satisfaction Scale	Job Satisfaction	8

In conclusion, Chapter 4 has focused on the research methodology and hypotheses. First, it has introduced the research design. Then, the research hypotheses have been raised based on some literatures. Next, the procedure of the research has been introduced. Finally, it has introduced the instruments and measures.

5 Bias and Equivalence in Cross-Cultural Research

This chapter will introduce the need to establish equivalence, taxonomy of bias, sources of bias, taxonomy of equivalence, and the strategies to deal with bias and establish equivalence in cross-cultural research.

5.1 The Need to Establish Equivalence

The amount of cross-cultural studies in sociology, management, marketing, psychology, education, and political sciences has risen steadily over the past thirty years (Van de Vijver & Leung, 1997; Wang, 2014). Most of them are conducted to compare countries, cultures or groups on certain characteristics (Van de Vijver, 2003).

A prerequisite of cross-cultural research is the equivalence (or lack of bias) of measures (He & Van de Vijver, 2012; Van de Vijver & Tanzer, 2004). It is essential to establish equivalence or comparability at each stage of the research when conducting a cross-cultural research. A failure to establish cross-cultural equivalence probably lead to bias conclusions (Buil, de Chernatony, & Mart ńez, 2012) and threaten the validity of research (Deković et al., 2006). There will be no foundation for data comparison across countries if there is a lack of measurement equivalence in data (Beuckelaer, Lievens, & Swinnen, 2007). Therefore, in a cross-cultural research an important question to be considered is that whether or not the scores obtained among different cultural groups can be compared (Van de Vijver & Tanzer, 2004).

Bias and equivalence have become the key concepts when analyzing the test scores in cross-cultural assessment (Poortinga, 1989; Van de Vijver & Leung, 1997; Wang, 2014). From a conceptual viewpoint, they are two opposite concepts of each other; scores are equivalent when there is no bias (Van de Vijver & Leung, 1997). That is to say, equivalence means the opposite of bias (Van de Vijver & Tanzer, 2004) while bias is the same with

nonequivalence (Van de Vijver, 2003). Bias denotes the existence of nuisance factors that lead to the incomparability of scores obtained in different cultural groups, whereas equivalence denotes the comparability of scores measured across different cultures (Van de Vijver, 2003).

5.2 Taxonomy of Bias

Bias happens if score discrepancies on the measures of a specific construct are inconsistent with variations in the intrinsic characteristic (He & Van de Vijver, 2012; Van de Vijver & Tanzer, 2004). Bias has been classified as three kinds as it can be caused by theoretical construct, method, and item content (Van de Vijver & Leung, 1997; Van de Vijver & Tanzer, 2004).

5.2.1 Construct Bias

It can occur when the construct tested is not equivalent or equal across different cultural groups (Van de Vijver & Leung, 1997; Van de Vijver & Tanzer, 2004; Wang, 2014). A good case of construct bias is the concept of filial piety, which refers to the behaviours and duties related to being a good son or daughter for his or her parents (Van de Vijver, 1998). Chinese adults have more obligations to their parents unlike their Western counterparts (Van de Vijver & Tanzer, 2004). The concept of filial piety in Chinese societies is broader than that in Western societies where immaterial aspects such as love and respect are considered more important (Van de Vijver, 1998). In Chinese culture, filial piety is not only as a good trait to judge somebody, but also an obligation to their parents. Sons and daughters are commonly expected to play active roles in supporting and caring for their parents especially when their parents are very old or unable to take care of themselves (Van de Vijver, 1998). Thus, filial piety comparison across different cultural groups may lead to bias conclusions.

The instrument developed in a Western society will not adequately address all facets in a non-Western society. Similarly, an instrument developed in a Chinese cultural society will comprise of behaviours or characteristics that are only related to the concept slightly in a Western cultural society (Van de Vijver & Tanzer, 2004).

5.2.2 Method Bias

This is a common connotation for nuisance factors arising from the sampling, structural characteristics of the instrument, or processes of administration (He & Van de Vijver, 2012). Method bias has been classified as three types as follows:

Sample bias may arise from incomparability of samples on other facets and not the target variable (Van de Vijver & Tanzer, 2004). Boehnke, Lietz, Schreier, and Wilhelm (2011) proposed that the sampling across different cultures should be driven by the objectives of the study to reduce sample bias, for example, heterogeneous cultures should be chosen if the objective is to examine cross-cultural similarity and homogenous cultures should be chosen for the objective of exploring cultural differences (as cited in He & Van de Vijver, 2012).

Instrument bias involves issues arising from the characteristics of the instrument (He & Van de Vijver, 2012). People from different cultures are inclined to be familiar with stimulation sources, reaction mechanisms or reaction procedures at different levels. These kinds of differences across cultural backgrounds often influence the results on target measures, therefore the tests have to be adapted locally to address the biases deriving from stimulus familiarity (He & Van de Vijver, 2012).

Administration bias may be caused by administration process, vague guidelines, contact between administrator and participants, and communication issues (e.g., language barrier) between interviewers and respondents (He & Van de Vijver, 2012).

5.2.3 Item Bias

An item that has a different psychological meaning cross-culturally means it is biased (Van de Vijver & Tanzer, 2004). Item bias can be caused by bad translation, item inapplicability across cultures, or items with extra characteristics or with vague meanings (He & Van de Vijver, 2012). The translations of an instrument will be challenged due to the fact that some words and phrases in a language may have no equivalents (direct but accurate translation) in a second language (He & Van de Vijver, 2012). For instance, when the Brief COPE (Carver, 1997) is used as a coping measure in China, the translation of the item “I've been learning to live with it” must be appropriately taken into account because there is not a direct but accurate

translation for this sentence in Chinese language. Item bias will occur if the phrase “live with it” were translated as “get along with it”. According to dictionary, “live with” means “tolerate or acclimatize oneself to”, and the expression “learn to live with something” means “accept a new but unpleasant situation that you can not change”.

Various techniques can be used to identify item bias. The bias at the item level can be assessed by using Structural Equation Modeling (SEM) (Wang, 2014).

5.3 Sources of Bias

It is essential to know the causes of bias in cross-cultural assessment in order to reduce bias. Van de Vijver and Tanzer (2004, p. 124) summarized the typical sources for the three types of bias in cross-cultural assessment (see Table 5.1).

Construct bias occurs when partial overlap exists between the definitions of construct across different cultures. The difference in appropriate behaviour that a construct has in different cultural settings, inadequate sample distribution and deficient description of all facets linked to the construct can also lead to construct bias (Van de Vijver & Tanzer, 2004).

Method bias has been classified as three types from the aspects of sample, administration, and instrument.

Sample bias or incomparability of samples happens when there is a difference in relevant characteristics between the samples used and the target construct (Van de Vijver & Tanzer, 2004). Of all method bias, sample bias seems to have more possibilities to jeopardize comparability in cross-cultural studies when different cultures are examined (Van de Vijver, 2003).

Administration bias is a type of method bias that arises from the particular form of administration. It can be caused by differences in the physical, technical, or social administration conditions or any other environmental administration conditions (Van de Vijver & Tanzer, 2004). Individual administration, physical space between respondents, or group size are some examples of social environmental conditions (Van de Vijver, 2003). Administration bias may also come from ambiguity of instructions for both respondents and

administrators as well as differential expertise of administrators (Van de Vijver & Tanzer, 2004). Tester or interviewer effects and communication issues between the interviewers and interviewees can also lead to administration bias (Van de Vijver & Tanzer, 2004). For example, communication problems may occur when a survey is conducted in a language that is not native to interviewers or respondents (Van de Vijver, 2003).

Table 5.1: Typical sources for the three types of bias in cross-cultural assessment[4] (Van de Vijver & Tanzer, 2004, p. 124)

Type of Bias	Source of Bias
Construct bias	Only partial in the definition of the construct across cultures Differential appropriates of the behaviors associated with the construct (e.g., skills do not belong to the repertoire of the cultural groups) Poor sampling of all relevant behavior (e.g., short instruments) Incomplete coverage of all relevant aspects/facets of the construct (e.g., not all relevant domains are sample
Method bias	Incompatibility of sample (e.g., caused by differences in education, motivation) [a] Differences in environmental administration conditions, physical (e.g., recording devices) or social (e.g., class size) [b] Ambiguous instructions for respondents and/or guidelines for administrators [b] Differential expertise of administrators [b] Tester/interview/observer effects (e.g., halo effects) [b] Communication problems between respondent and tester/interviewer (including interpreter problems and taboo topics) [b] Differential familiarity with stimulus material [c] Differential familiarity with response procedures [c] Differential response styles (e.g., social desirability, extremity scoring, acquiescence) [c]
Item bias	Poor item translation and/or ambiguous items Nuisance factors (e.g., item may invoke additional traits or abilities) Cultural specifics (e.g., incidental differences in connotative meaning and/or appropriateness of the item content)

[a] Sample bias.
[b] Administration bias.
[c] Instrument bias.

[4] Modified after Van de Vijver, F., & Poortinga, Y. H. (1997). Towards an integrated analysis of bias in cross-cultural assessment. *European Journal of Psychological Assessment, 13*(1), 29-37.

Instrument bias is a type of method bias related to the particular assessment instrument. Differential familiarity with the stimulus information, the required response procedures and the response styles can usually lead to instrument bias (Van de Vijver & Tanzer, 2004). The writing of Latin and Arabic in different directions was seen as a bias (Van de Vijver, 2003).

Item bias is also called differential item functioning. Of all types of bias, item bias has been studied the most extensively (Van de Vijver, 2003). Item bias is usually a resultant effect of poor translation of item and ambiguities in the original item (Van de Vijver & Tanzer, 2004). Poor translation is an effect of lingual errors or by "genuine" linguistic idiosyncrasies. The German term "Zeitgeist" is an example of linguistic idiosyncrasies as it has no one-to-one translation in English (Van de Vijver & Tanzer, 2004). Culture-specific nuisance factors and cultural specifies such as the familiarity with the content of item, or connotations related to the item wording can also lead to item bias. For instance, if a questionnaire survey on how German and Chinese people cope with stress contains the item "I go to a Karaoke bar with friends for relaxation", Chinese people will report higher scores on this item than German people. It is because going to a Karaoke bar with friends is a common way to relax for Chinese people, however, German people seldom use this way for relaxation. Moreover, it is also much easier to find a Karaoke bar in China than in Germany due to the fact that Karaoke bar is more popular in China. This is a case of item bias caused by low familiarity with item content. Thus, this biased item has to be deleted from the coping questionnaire when applied to both German and Chinese samples for a comparative study.

5.4 Taxonomy of Equivalence

Equivalence is usually connected to the measurement levels that comparison can be made at which scores obtained from various cultural groups (Van de Vijver & Leung, 1997). It can be classified into three types.

5.4.1 Construct Equivalence

Being the first lowest level, construct equivalence (structural equivalence) is also named "configural invariance" (Van de Vijver & Tanzer, 2004; Wang, 2014). It exists in a

cross-cultural assessment when the same theoretical framework is tested across various cultural groups, despite whether the measurement of the construct is from equivalent instruments across different cultures (He & Van de Vijver, 2012; Van de Vijver & Tanzer, 2004). Without construct equivalence in a cross-cultural research, there will be no basis for comparison and it is equivalent to comparing apples with oranges (He & Van de Vijver, 2012). In contrast, construct inequivalence occurred if different constructs are measured with an instrument in two cultural groups or when there is a partial overlap of the concepts of the construct across cultures (Van de Vijver & Tanzer, 2004).

5.4.2 Measurement Unit Equivalence (Metric Equivalence)

As the second level of equivalence, it is also called “metric invariance” (Wang 2014; Hair et al., 2006; Van Herk et al., 2005). Equivalence of this level is achieved if two metric measures share the common measurement units with diverse origins; That is, there is a shift with a constant offset when compared one measure to the other measure (Van de Vijver & Tanzer, 2004). An example can be found in the measurement of distance measured by kilometers and miles. Distances measured by either kilometers or miles can be compared directly. However, distances measured by kilometers can not be compared directly with distances measured by miles. A valid comparison of these two measurements is not possible only when they are changed to the same origin (He & Van de Vijver, 2012).

5.4.3 Full Score Equivalence (Scalar Equivalence)

As the highest level of equivalence, it (scalar equivalence) is achieved if two metric scales share the same unit of measurement and also the same origin (Van de Vijver & Tanzer, 2004). In this situation, the obtained scores can be compared directly as they are bias free. For example, temperature differences can be directly compared when measured by degrees Celsius in two groups (Van de Vijver & Tanzer, 2004).

5.5 Strategies to Deal with Bias and Establish Equivalence

Besides reliability and validity, it is becoming more customary to demonstrate equivalence (or lack of bias) of measures in cross-cultural assessment (He & Van de Vijver, 2012). To deal with bias and establish equivalence in cross-cultural research, He and Van de Vijver (2012) suggest some important strategies to consider during research at the design, implementation, and analysis stages.

At the design stage, two comparability driven approaches, namely decentering and convergence are recommended in cross-cultural comparisons to ensure construct equivalence (He & Van de Vijver, 2012; Van de Vijver & Leung, 1997). According to Werner & Campbell (1970), cultural decentering approach is used to create instruments simultaneously in a number of cultures and only keep the common items for the comparison (as cited in He & Van de Vijver, 2012). To make items suitable for a cross-cultural research, it is often necessary to remove some specific items. According to Campbell (1986), convergence approach is used to develop instruments independently in various cultures, and all instruments are then used in all cultures (as cited in He & Van de Vijver, 2012).

Subsequently, it is foreseen that merging some items both measures might help with better personality comprehension. Both quantitative studies and subjective interview can be deployed as a preliminary test of the application and suitability of instruments before beginning cross-cultural studies (He & Van de Vijver, 2012).

At the implementation stage, all researchers should create a standard protocol and abide by it. This would help reduce many of the response bias that can occur due to uncertainties in different social settings. In order to handle cultural diversity in a professional way, administrators should be competent of intercultural communication. To collect data efficiently, instructions should be clear with enough illustrations. Detailed record of the field work and respondents' feedback are very important for further analysis (He & Van de Vijver, 2012).

At the analysis stage, scholars have proposed many analytic techniques to examine bias and achieve equivalence. The exploratory factor analysis (EFA) as well as confirmatory factor analysis (CFA) can be used for the tests of different levels of equivalence (He & Van de Vijver, 2012). EFA is efficient in checking and comparing factor structures, especially when

the latent factors of a construct are unclear. Scholars can use various dimension reducing methods and take the similarity of latent factors as a basis for defining similarity (He & Van de Vijver, 2012). A better technique to test equivalence is by SEM. CFA is often used to test equivalence as one of the applications of SEM (Van de Vijver & Leung, 1997; Wang, 2014). When a CFA model demonstrates an acceptable fit, the hypothesized factor structure can be accepted, and therefore different levels of equivalence can be achieved (He & Van de Vijver, 2012). CFA can be performed with softwares such as LISREL, AMOS, Mplus and SmartPLS.

As suggested by Wang (2014), to obtain more detailed information about cross-cultural equivalence and the techniques to reduce bias and establish equivalence in cross-cultural research, please refer to the book written by Van de Vijver and Leung (1997): *Methods and Data Analysis for Cross-Cultural Research.*

In conclusion, Chapter 5 has introduced the need to establish equivalence, taxonomy of bias, sources of bias, taxonomy of equivalence, and strategies to deal with bias and establish equivalence in cross-cultural research. This chapter can be seen as the theoretical foundation of the cross-cultural equivalence examinations for the four scales developed and used in this study.

6 Development and Validation of the Sources of Work Stress Scale

This chapter will focus on the development and validation of the Sources of Work Stress Scale (SWSS), including the practical needs to develop the SWSS, the theoretical framework and foundation of the SWSS, six empirical studies to develop and validate the SWSS, and the examinations of cross-cultural equivalence with Chinese and German samples.

6.1 Practical Needs to Develop the Sources of Work Stress Scale (SWSS)

China is the largest developing country representing an ever increasing economy with 20% of the world's population, and Germany is a representative developed country. It must be of great significance to collect evidence from Chinese employees and German employees to make a contribution to the development of theories and practices of work stress research (Lu, Kao, Siu, & Lu, 2010).

Some scholars thought that previous studies on work stress as well as coping was disappointing (Bar-Tal & Spitzer, 1994; Lu et al., 2010). Most of the work stress theories and models are developed and empirically validated in Western industrialized nations (Cooper et al., 2001; Lu et al., 2010) and most of the data were collected from English-speaking nations (Gilboa, Shirom, Fried, & Cooper, 2008). The work stressors scales based on these theories and models tend to become problematic when used in Chinese cultural context. The theoretical models often show a poor goodness of fit to the data, and the reliability coefficients of some subscales are often unacceptably low (less than .70).

Love and Beehr (1981) argued that the unavailability of a reliable, valid, and usable

standardized measurement tool makes researches of work stress highly problematic. The practical needs to develop a new scale to measure work stressors (sources of work stress) was prompted by empirical studies using both German and Chinese samples.

As stated before, a lot of scholars have identified the common causes of work stress (please refer to section 3.3 for further details).

A model of work stressors initially proposed by Cooper and Marshall (1976) and later improved by Cartwright and Cooper (1997, pp. 13-22) who confirmed six major sources of stress at work: factors intrinsic to the job itself, roles in the organization, social relationships at work, career development, organizational factors, and the work-home interface.

After a series of empirical studies, Faragher et al. (2004, pp. 194-197) developed a shortened stress evaluation tool (ASSET) to examine workplace stressors. In the ASSET model, work stressors include: work relationships, work-life balance, overload, job security, control, resources and communication, pay and benefits, and aspects of the job.

Donaldson-Feilder et al. (2011, pp. 3-4) proposed that the most common causes of stress include: demands, control, support, relationships, role, change, career development, and work-home interface.

Bamber (2011, pp. 25-32) concluded that work stress can be caused by individual factors (genetic/inherited factors, acquired/learned factors, and personality/trait factors), factors in the work environment (job demands, physical working conditions, control, support, relationships, role, change, pay and career prospects) and the home-work interface.

Hurrell Jr and Sauter (2012, pp. 234-237) highlighted that job stressors includes job and task demands (e.g., workload, content, and control), organizational factors (e.g., role demands, management styles, security issues, and interpersonal relations), and physical conditions (e.g., noise, heat or cold).

Furnham (2012, pp. 365-371) proposed that work stressors include four general categories: work-related causes of stress, career development, home-work interface, and individual/personality causes of stress.

Many other studies have also identified the common causes of work stress

(Donaldson-Feilder et al., 2011). Kahn and his colleagues proposed role conflict and role ambiguity to be the work stressors, followed by role overload (Kahn et al., 1964). Pushed by significant economic, social and political change (Dewe et al., 2010) the categories of work stressors have developed since then, comprising role demands, demands intrinsic to the job (e.g., the physical environment, workloads, working hours), relationships at work, career prospects issues, organizational structure and culture issues (Beehr & Newman, 1978; Cartwright & Cooper, 1997; Marshall & Cooper, 1976) followed by work-life balance, mergers and acquisitions, organizational change, retrenchment, redundancies and outsourcing (Sulsky & Smith, 2005).

This research proposes a nine-factor model that the sources of work stress mainly consist of workload, competition and comparison, role uncertainty, control, pay and career prospects, competency, work-life balance, relationships at work, and boredom at work. The following sections will focus on the development and validation of the SWSS.

6.2 Theoretical Framework and Foundation of the SWSS

Detail dimensions and theoretical foundation of the Sources of Work Stress Scale (SWSS) will be introduced below.

6.2.1 Workload

According to the TUC (2000) survey, high workload was reported as the major cause of stress (Faragher et al., 2004). Workload was described as “the amount of stress experienced by individuals due to the perception that they are unable to cope or be productive with the amount of work allocated to them” (De Bruin & Taylor, 2005, p. 753).

Workload can be assessed by many factors such as working hours, work intensity, work pace, productivity level, or the physical or cognitive demands of the job (Jacobs, Hellman, Markowitz, & Wuest, 2013). For example, Ng and Feldman (2008) found that there is an association between longer working hours and increased job stress.

Three items were written to assess workload in the SWSS, such as “Do you feel stressed by having heavy workload?”

6.2.2 Competition and Comparison

Nowadays fierce competition has turned into a significant source of work stress. The reduction in the life span of products, the need to reduce production costs, and effective logistics and marketing are all motives for creating and developing innovations to meet these challenges (Morel, Camargo, & Boly, 2013). Friedman (2005) stated in his famous book, *The World Is Flat*, that competition can be not only from the domestic labor market but also from the global labor market (Beerepoot & Lambregts, 2015).

Effort to make people more productive is an important motivational issue in management (Vroom, 1964). Convincingly using activities at the workplace in contemporary organizations requires workers to compare themselves to their colleagues or opponents over time (Ge et al., 2015). The comparison includes self-improvement from both lateral and vertical dimension comparisons (Ge et al., 2015). In the social comparison theory, social comparison was initially defined by Festinger (1954) as “individuals evaluate their own opinions and abilities by comparing themselves with others for the purpose of uncertainty reducing and self-enhancing” (Ge et al., 2015, p. 1305). Comparison with others often involves competition (Ge et al., 2015). Thus, competition and comparison can be put together into one dimension.

In the SWSS, competition and comparison is measured with four items such as “Do you feel stressed by the competition in the workplace?”

6.2.3 Role Uncertainty

Beehr and Bhagat (1985) found that uncertainty at work may be the most common work stressor. Role ambiguity, role conflict, and role overload will lead to uncertainty at work for employees. Numerous researchers have paid attention to role stressors.

Role ambiguity is regarded as one of the sources of stress at work in the early literatures (Beehr, 2014). Beehr defined role ambiguity as “deficient or uncertain information in the

environment regarding the role behaviours expected of the focal person" (Beehr, 2014, p. 58). It is usually associated with role conflict, though conceptually distinct (De Bruin & Taylor, 2005). Role conflict is referred to as "the existence of two or more sets of expectations on the focal person … such that compliance with one makes compliance with the other more difficult" (Beehr, 2014, p. 58). Both role conflict and role ambiguity will cause the state of being uncertain of fulfilling the job demands or expectations from others such as colleagues or role-set members at work. Thus, role conflict and role ambiguity can be put together as one concept named role uncertainty.

Role uncertainty at work is assessed with three items such as "Do you feel stressed by being not clear about the range of your job responsibilities?"

6.2.4 Control

An employee's sense of control over the work is related to the stress experienced by him or her. Those employees who have some level of control over their work environment are less inclined to be exposed to stress than those ones who do not (Faragher et al., 2004; Makin, Cooper, & Cox, 2000). Job autonomy is the degree of power, influence, or control over the work or the ability to make decisions by oneself rather than by others at the workplace. Thus, job autonomy can be regarded as job control latitude (De Bruin & Taylor, 2005). Having no say in deciding how to do the work or lack of influence over the way to perform the work can be a stressor (Faragher et al., 2004).

Three items were written to assess control in the SWSS, such as "Do you feel stressed by lack of control over your work?"

6.2.5 Pay and Career Prospects

All workers are entitled to have the financial rewards for the work they do. They have rights to get the equal opportunities for career, promotion prospects and job security (Bamber, 2011, 2013). The financial rewards for an individual's performance such as pay and benefits often influence the feelings of self-worth and determine an individual's lifestyle to a large degree (Faragher et al., 2004). A lack of opportunity for an employee to further his or her career

prospects such as promotion within the organization is related to the stress perceived by him or her at work (De Bruin & Taylor, 2005). Pay and benefits as well as the career prospects are considered to be a stressor (Faragher et al., 2004), being combined to form a single category Pay and Career Prospects.

The dimension pay and career prospects in the SWSS is assessed with four items such as "Do you feel stressed by the fact that your pay and benefits do not meet your expectations?" and "Do you feel stressed by having insufficient opportunities for promotion?"

6.2.6 Competency

Job insecurity has been regarded as one of the most significant stressors for employees (Faragher et al., 2004; O'Driscoll & Cooper, 1996) and was cited by many researchers such as Faragher et al. (2004). Being incompetent or not qualified for one's job probably leads to job insecurity such as job loss. Therefore, competency can be seen as job security latitude to a large extent.

David McClelland, a distinguished Harvard's psychologist, is famous for the introduction of the term "competency" into the human resource studies (Draganidis & Mentzas, 2006). McClelland (1973) proposed that competency tests should be developed and used as an alternative to intelligence tests, which were failed to predict job performance (Draganidis & Mentzas, 2006; McClelland, 1998). Competency refers to the skill, knowledge, ability, experience and certain qualifications required for an individual to perform his or her job effectively (Jackson & Schuler, 2003). It is an individual's level of being competent for the work or the quality of being qualified physically and intellectually.

Competency in the SWSS is measured with three items such as "Do you feel stressed by not mastering necessary skills for your job?"

6.2.7 Work-life Balance

There is a conceptual similarity among work-life balance, work-life conflict, work-life interference, and work-life spillover. Work-life balance/conflict refers to "the stress

experienced by an individual as a result of a lack of social support at home or from friends and work-nonwork additivity, spillover and conflict with regard to stress within and outside the workplace" (De Bruin & Taylor, 2005, p. 754).

The job demands have serious impact on an employee's personal and home life. Balancing the various demands of life and work has been considered as the primary cause of stress at work (Faragher et al., 2004).

Work-life balance is measured with three items such as "Do you feel stressed by the time conflict between your private life and your work?"

6.2.8 Relationships at Work

Poor relationships, inadequate support, isolation and unfair treatment at work can potentially cause stress (Faragher et al., 2004; Kahn et al., 1964). Having poor relationships at the workplace usually leads to the experience of work stress for the employees (Sutherland & Cooper, 1988), while having good relationships with others (e.g., colleagues, superiors or customers) at work is helpful for employees to deal with stress (Faragher et al., 2004).

Four items were written to assess relationships at work such as "Do you feel stressed by unfriendly relationships with others at work?"

6.2.9 Boredom at Work

Boredom at work has been studied since the beginning of the 20th century (Van Hooff & Van Hooft, 2014), and for a long time it has been seen as a potential source of stress. Boredom at work is commonly characterized by a lack of stimulation, a lack of value, a lack of interest and difficulty concentrating (Fisherl, 1993; Tze, Klassen, Daniels, Li, & Zhang, 2013), and can be defined as "a negative (i.e., unpleasant, dissatisfying) and often deactivating (i.e., low arousal) activity-related emotion, implying that the activity (e.g., the work task) acquires negative intrinsic value" (Van Hooff & Van Hooft, 2014). Boredom at work is usually caused by repetition, monotony, work underload, and inadequate utilization of skills (Fisherl, 1993; Loukidou, Loan-Clarke, & Daniels, 2009; Van Hooff & Van Hooft, 2014).

Boredom at work was measured with three items in the SWSS such as “Do you feel stressed by boring work?”

6.3 Six Studies to Develop and Validate the SWSS

10 empirical studies were carried out to develop and validate the Sources of Work Stress Scale (SWSS) in both China and Germany from March 2015 to January 2018. However, six of them are more significant than the others. Thus, these six empirical studies will be introduced in detail in this section.

Study 1 through Study 4 focused on developing and refining the SWSS. As the factor structure of the SWSS was problematic and several coefficients of reliability were unacceptably low (less than .70), the construct of the SWSS was redefined with some items rewritten, removed or added, in an attempt to improve construct validity and factor reliability. Study 5 and Study 6 focused on validating the construct of the theoretical 9-factor model of the SWSS. Using data from 258 German samples and 226 Chinese samples respectively, Study 5 and Study 6 tested the fit and the construct validity of the theoretical 9-factor model of the SWSS with the software AMOS 22, compared to the competing 7-factor model and the independent model. Further tests for convergent validity, discriminant validity and reliability of the theoretical 9-factor model of the SWSS were conducted with SmartPLS 3.

The internal consistency reliability, composite reliability, convergent validity, discriminant validity, and the model fit indices of the SWSS among both Chinese and German samples will be provided.

6.3.1 Study 1: Initial Items Development of Chinese Version

6.3.1.1 Method

6.3.1.1.1 Participants

This survey was carried out from April 6, 2015 to April 24, 2015 in China. Participants were

81 employees working at Chinese companies. The sample consisted of 32 males (39.51%) and 49 females (60.49%). 11.11% (N = 9) of them were less than 25 years old; 59.26% (N = 48) were 25 to 29 years old, 19.75% (N = 16) were 30 to 34 years old, 6.17 % (N = 5) were 35 to 39 years old, none (N = 0) of them were 40 to 44 years old, 3.70% (N = 3) were more than 44 years old.

6.3.1.1.2 Measures

Based on the theoretical foundation and extensive literature review in section 6.2, a preliminary 28-item Sources of Work Stress Scale (SWSS) was written and pretested as the first version in Chinese samples. Originally developed in English, the SWSS was translated into Chinese version. Each version had forward and back translations to ensure the meaning equivalence. The scale was first translated into Chinese by two bilingual speakers. Another two bilingual speaker was asked to back-translate the scale from Chinese into English.

6.3.1.1.3 Procedure

This questionnaire survey was conducted in Chinese. The guideline of the SWSS is as follows (displayed here in English):

> "The following 28 questions below are about some main sources of work stress. Please indicate how often you feel stressed by any of them. For each item please tick ONE box only."

Respondents answer on a five-point Likert-type scale. The responses range from 1 to 5 in the following order: Never, Seldom, Sometimes, Often and Always, where "Never" is scored as 1 and "Always" is scored as 5. For example, the question "Do you feel stressed by having heavy workload?" is listed as an item. Respondents should indicate how often they feel stressed by heavy workload.

Participants were asked to open a website and answer survey questions on mobile phones or computers. The website settings ensured no questions were left unanswered.

6.3.1.1.4 Data Analysis

The exploratory factor analysis (EFA) was used at this stage to obtain the initial evidence for

factor structure of the 28-item SWSS (Ferris et al., 2005). A preliminary principal components analysis with varimax rotation was conducted and the number of factors was established by analyzing the scree plot using eigenvalues larger than 1.0 (Faragher et al., 2004).

6.3.1.2 Results and Discussion

Using the Kaiser-Guttman criterion of keeping only those factors with eigenvalues greater than 1.0 (Ferris et al., 2005), an eight-factor solution emerged. The rotated component matrix of factor loadings indicated that the factor structure of the 28-item scale was problematic, and some items loaded on two or more factors with the greatest loading not being on the expected factor (Cronin & Allen, 2017). Thus, the construct of the SWSS was refined with some items removed, modified or rewritten in an attempt to improve the factor structure and factor reliability (Faragher et al., 2004) such as the item "Do you feel stressed by lack of effective consultation and communication in your organization?" was removed, the item "Do you feel stressed by doing something outside your job description?" was replaced with a new one "Do you feel stressed by role ambiguity?"

6.3.2 Study 2: Modification of the Items of Chinese Version

6.3.2.1 Method

6.3.2.1.1 Participants and Procedure

The survey was carried out from January 10 to July 26, 2016. Respondents were 85 employees at Chinese companies consisted of 45 males (52.94%) and 40 females (47.06%). 17.65% (N = 15) of them were less than 25 years old, 51.76% (N = 44) were 25 to 29 years old, 14.12% (N = 12) were 30 to 34 years old, 9.41 % (N = 8) were 35 to 39 years old, 3.53% (N = 3) were 40 to 44 years old, 3.53% (N = 3) were more than 44 years old.

6.3.2.1.2 Measures and Data Analysis

A 28-item scale with some items modified was used as the second version to assess the factor

structure of the SWSS. Respondents were asked to open a website to complete the survey questions on smartphones or computers. Reliability analysis was deployed by the most commonly quoted Cronbach's alpha (α) coefficient which indicates the degree to which the items within a scale measure the same underlying construct (Glasberg et al., 2006). A cut-off value of .70 is a widely accepted social science standard. However, the values between .60 and .70 are sometimes regarded as acceptable (George & Mallery, 2003).

6.3.2.2 Results and Discussion

As suggested by the results of reliability analysis, several items were modified or deleted, and some additional items were added trying to improve the factor structure and factor reliability, for example, the item "Do you feel stressed by working overtime?" was replaced with "Do you feel stressed by excessively long working hours?"

6.3.3 Study 3: Construct Refinement of German Version

6.3.3.1 Method

6.3.3.1.1 Participants and Procedure

This survey was conducted from January 13 to July 25, 2016. Participants were 37 employees working at German companies. The sample consisted of 27 males (72.97%) and 10 females (27.03%). None (N = 0) of them was less than 25 years old, 21.62% (N = 8) were 25 to 29 years old, 21.62% (N = 8) were 30 to 34 years old, 27.03 % (N = 10) were 35 to 39 years old, 8.11 % (N = 3) were 40 to 44 years old, 21.62% (N = 8) were more than 44 years old.

6.3.3.1.2 Measures and Data Analysis

The 28-item scale with several items modified was used as the third version to assess the factor structure of the SWSS. Although the SWSS was initially created in English, it has been translated into Chinese and German. During this process, there were repeated forward and back translations of the scale to guarantee the meaning equivalence. To evaluate internal consistency, Cronbach's alpha reliability analysis was conducted in SPSS 22.

6.3.3.2 Results and Discussion

Reliability analysis indicated that Cronbach alpha value of Control (α = .385) was unacceptably low (less than .70). Thus three items of this dimension were reworded and rewritten. For example, the German item "*Fühlen Sie sich vom Ausschluss von für Ihre Arbeit relevanten Entscheidungsfindungsprozessen gestresst?*" (in English "Do you feel stressed by being excluded from decision making related to your work?") was replaced with *"Fühlen Sie sich dadurch gestresst, dass Sie nicht mitbestimmen können wie Sie ihre Arbeit gestalten?"* (in English "Do you feel stressed by having no say in deciding how you do your work?").

As the Cronbach alpha value of Competency (α = .609) was not very satisfactory, three items of this dimension were rewritten and refined. For example, the German item "*Fühlen Sie sich von einem Mangel an Arbeitsqualifikationen und Arbeitserfahrung gestresst?*" (in English "Do you feel stressed by a lack of job skills and experience?") was rewritten as "*Fühlen Sie sich dadurch gestresst, dass Ihnen keine notwendigen Fort- oder Weiterbildungsmöglichkeit durch Ihre Arbeit geboten werden?*" (in English "Do you feel stressed by not getting necessary job skills training?").

Reliability analysis also indicated that Cronbach alpha value of Relationships at Work (α = .631) would increase if an item was deleted. Thus, the old German item "*Fühlen Sie sich vom Mangel an notwendiger Hilfe und Unterstützung am Arbeitsplatz gestresst?*" (in English "Do you feel stressed by not receiving necessary help and support at work?") was deleted. Another item was rewritten as "*Fühlen Sie sich gestresst, weil Sie von anderen am Arbeitsplatz isoliert werden?*" (in English "Do you feel stressed by being isolated by others at work?").

Moreover, the construct of the SWSS was redefined with one dimension Boredom at Work added. Three items were rewritten to assess Boredom at Work, such as "*Fühlen Sie sich von eintöniger Arbeit gestresst?*" (in English "Do you feel stressed by monotonous work?"). At last, the 30-item scale was created for the next study.

6.3.4 Study 4: Further Refinement of Wording of German Version

6.3.4.1 Method

6.3.4.1.1 Participants and Procedure

The survey was launched from June 2 to July 4, 2017. Participants were 48 employees working at German companies. The sample consisted of 31 males (64.58%) and 17 females (35.42%). 6.25% (N = 3) of them were less than 25 years old; 16.67% (N = 8) were 25 to 29 years old, 14.58% (N = 7) were 30 to 34 years old, 14.58% (N = 7) were 35 to 39 years old, 16.67% (N = 8) were 40 to 44 years old, 31.25% (N = 15) were more than 44 years old.

6.3.4.1.2 Measures and Data Analysis

The 30-item German version Sources of Work Stress Scale with one dimension added and several items refined was used as the fourth version to test the factor structure of the SWSS with German samples. Reliability analysis was carried out by calculating Cronbach's alpha.

6.3.4.2 Results and Discussion

Reliability analysis indicated that Cronbach alpha value of Competency (α = .607) would increase if an item was deleted. Thus, the German item "*Fühlen Sie sich dadurch gestresst, dass Ihnen keine notwendigen Fort- oder Weiterbildungsmöglichkeit durch Ihre Arbeit geboten werden?*" (in English "Do you feel stressed by not getting necessary job skills training?") was replaced with "*Fühlen Sie sich dadurch gestresst, dass Sie nicht kompetent genug für Ihre Arbeit sind?*" (in English "Do you feel stressed by being not competent enough for your work? "). Reliability analysis also indicated that Cronbach alpha value of Boredom at Work (α = .633) would increase if an item was deleted. Thus, the German item "*Fühlen Sie sich gestresst, weil Sie zu wenig Freude an Ihrer Arbeit empfinden?*" (in English "Do you feel stressed by the lack of joy in your work?") was rewritten as "*Fühlen Sie sich durch ein mangelndes Interesse an Ihrer Arbeit gestresst?*" (in English "Do you feel stressed by a lack of interest in your work?"). Finally, the German version SWSS (30 items, nine dimensions) was created with wording refined. Then, it was translated into English and Chinese. Table 6.1 is the items and item wordings of the 30-item SWSS displayed in English.

Table 6.1: Items and item wordings of the 30-item Sources of Work Stress Scale (SWSS)

Workload (WL)	
WL_i1	Do you feel stressed by excessively long working hours?
WL_i10	Do you feel stressed by having heavy workload?
WL_i17	Do you feel stressed by working intensively?
Competition and Comparison (CC)	
CC_i2	Do you feel stressed by having to compare yourself to others?
CC_i13	Do you feel stressed by competition with others at work?
CC_i21	Do you feel stressed by the atmosphere of competition at work?
CC_i26	Do you feel stressed by the competition in the workplace?
Role Uncertainty (RU)	
RU_i3	Do you feel stressed by not having a clear job description?
RU_i11	Do you feel stressed by role ambiguity?
RU_i23	Do you feel stressed by being not clear about the range of your job responsibilities?
Control (CON)	
CON_i4	Do you feel stressed by having no say in deciding how you do your work?
CON_i22	Do you feel stressed by a lack of influence on what you do at work?
CON_i27	Do you feel stressed by lack of control over your work?
Pay and Career Prospects (PCP)	
PCP_i5	Do you feel stressed by the fact that your pay and benefits do not meet your expectations?
PCP_i14	Do you feel stressed by having insufficient opportunities for promotion?
PCP_i19	Do you feel stressed by not receiving satisfactory rewards for your effort at work?
PCP_i30	Do you feel stressed by not receiving recognition you deserve for your performance?
Competency (COM)	
COM_i6	Do you feel stressed by not mastering necessary skills for your job?
COM_i18	Do you feel stressed by being not competent enough for your work?
COM_i24	Do you feel stressed by not having sufficient capabilities for your work?
Work-life Balance (WLB)	
WLB_i7	Do you feel stressed by not having enough energy to deal with both work and your hobbies?
WLB_i15	Do you feel stressed by the time conflict between your private life and your work?
WLB_i20	Do you feel stressed by not having enough time for both work and leisure activities?
Relationships at Work (RW)	
RW_i8	Do you feel stressed by bad relationships with others at work?
RW_i12	Do you feel stressed by being isolated by others at work?
RW_i25	Do you feel stressed by being subject to bullying by others at work?
RW_i29	Do you feel stressed by strained relationships with others at work?
Boredom at Work (BW)	
BW_i9	Do you feel stressed by boring work?
BW_i16	Do you feel stressed by a lack of interest in your work?
BW_i28	Do you feel stressed by monotonous work?

Until now, the German, English and Chinese versions of the SWSS are ready for the validation with large sample size (N > 200). Studies 1 through 4 provided some preliminary evidences for the factor structure and reliability of the SWSS. As validity is a continuous process (Cronin & Allen, 2017; DeVellis, 2016), it is essential to test model fit and the factor structure with larger sample size. Evidence for model fit indices, convergent validity, discriminant validity and factor reliability will be assessed in the subsequent studies (Cronin & Allen, 2017).

6.3.5 Study 5: Validation of the SWSS with German Samples

6.3.5.1 Method

6.3.5.1.1 Participants and Procedure

This survey was carried out from November 2016 to December 2017 in Germany. Respondents were 258 employees working at German companies. They were 135 males (52.33%) and 123 females (47.67%). 6.20% (N = 16) of them were less than 25 years old, 18.22% (N = 47) were 25 to 29 years old, 12.02% (N = 31) were 30 to 34 years old, 13.95 % (N = 36) were 35 to 39 years old, 17.05% (N = 44) were 40 to 44 years old, 32.56% (N = 84) were more than 44 years old. The demographic information is presented in Table 6.2.

Table 6.2: Demographic information of 258 German employees

	Germany
Age	
≤ 24	16
25-29	47
30-34	31
35-39	36
40-44	44
≥ 45	84
Overall	258
Female	123
Male	135

Questionnaires were distributed either online or face-to-face. Participants can finish either the paper-and-pencil version or the online version at the website https://www.wjx.cn/.

6.3.5.1.2 Measures

30-item German version Sources of Work Stress Scale *(Stressquellen bei der Arbeit)* was used for this survey to assess the construct validity and factor reliability.

6.3.5.1.3 Data Analysis

To examine the fit and the construct validity of the theoretical 9-factor model (hypothesized model) of the SWSS, confirmatory factor analysis (CFA) was performed with Analysis of Moment Structures (AMOS) version 22, using data from 258 employees working at German companies. Maximum likelihood estimation method was employed to assess different models.

Further tests for the convergent validity and discriminant validity of the SWSS were performed with software SmartPLS 3. Cronbach's alpha reliability and composite reliability (CR) were also calculated with SmartPLS 3 to assess the reliability of the SWSS.

It is necessary to test the fit of other plausible or competing models which can be compared to the fit of the theoretical model in the process of developing a scale (Cronin & Allen, 2017; Jackson, Gillaspy Jr, & Purc-Stephenson, 2009). Thus, the theoretical 9-factor model (see Figure 6.1) was tested and compared to the competing 7-factor model, and the independent model. The independence model is one which assumes that all variables are independent of one another (Knoll, Rieckmann, & Schwarzer, 2005). The competing 7-factor solution (see Figure 6.2) sometimes emerged in the EFA.

As different indices demonstrate a different aspect of model fit and there is no golden rule to assess model fit, it is necessary to report a number of indices (Crowley & Fan, 1997; Hooper, Coughlan, & Mullen, 2008). To test model fit, the following fit indices will be reported: chi-square (x^2), chi-square statistic divided by degrees of freedom (x^2/df), the Incremental Fit Index (IFI), the Tucker-Lewis Index (TLI) or Non-Normed Fit Index (NNFI), the Comparative Fit Index (CFI), the Adjusted Goodness-of-Fit Index (AGFI), the Standardized Root Mean Square Residual (SRMR) and the Root Mean Square Error of Approximation (RMSEA) (Steiger, 1980).

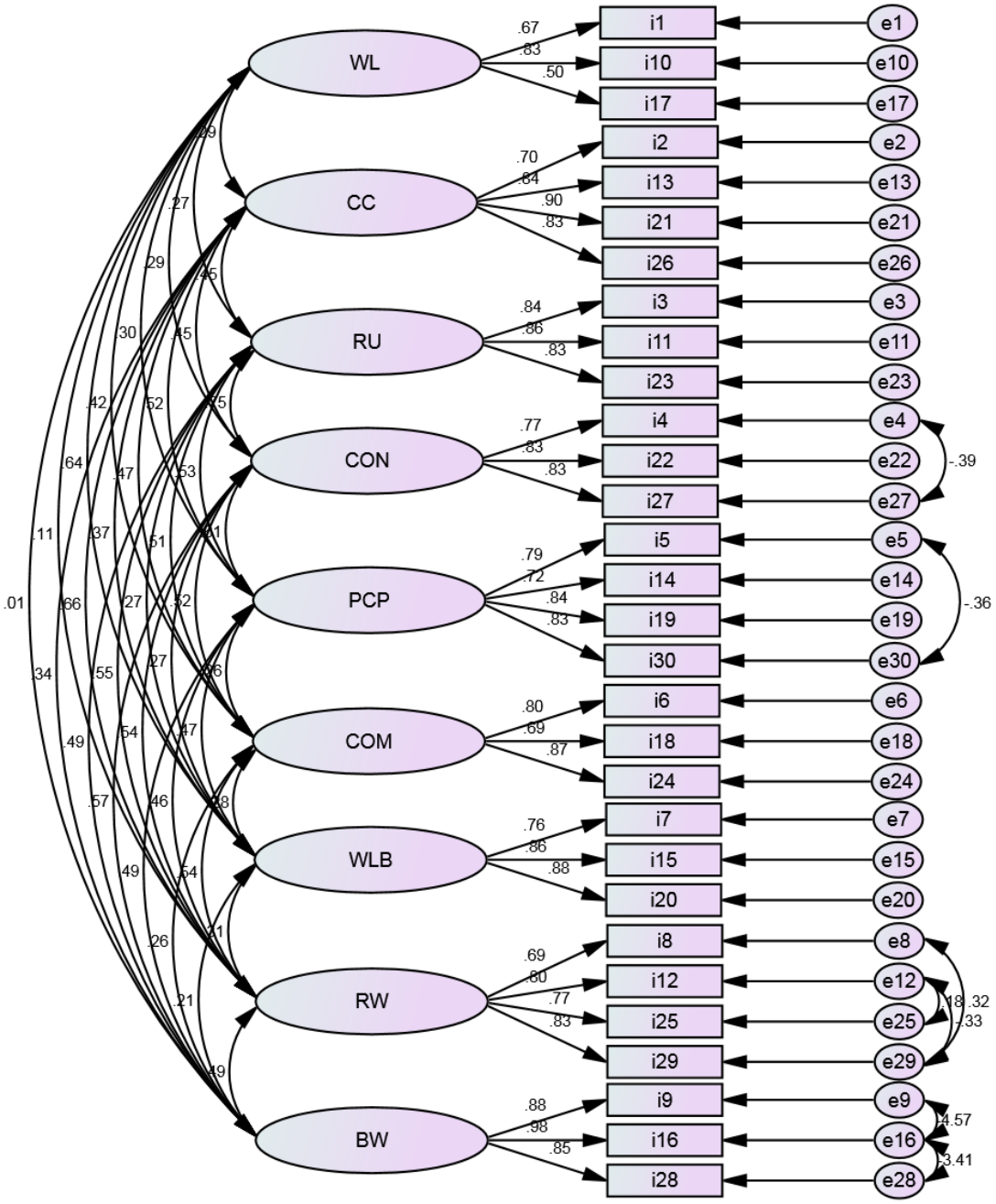

Figure 6.1: Confirmatory factor analysis for the theoretical 9-factor model in Study 5 (German sample, N = 258)

Note: WL = Workload; CC = Competition and Comparison; RU = Role Uncertainty; CON = Control; PCP = Pay and Career Prospects; COM = Competency; WLB = Work-life Balance; RW = Relationships at Work; BW = Boredom at Work.

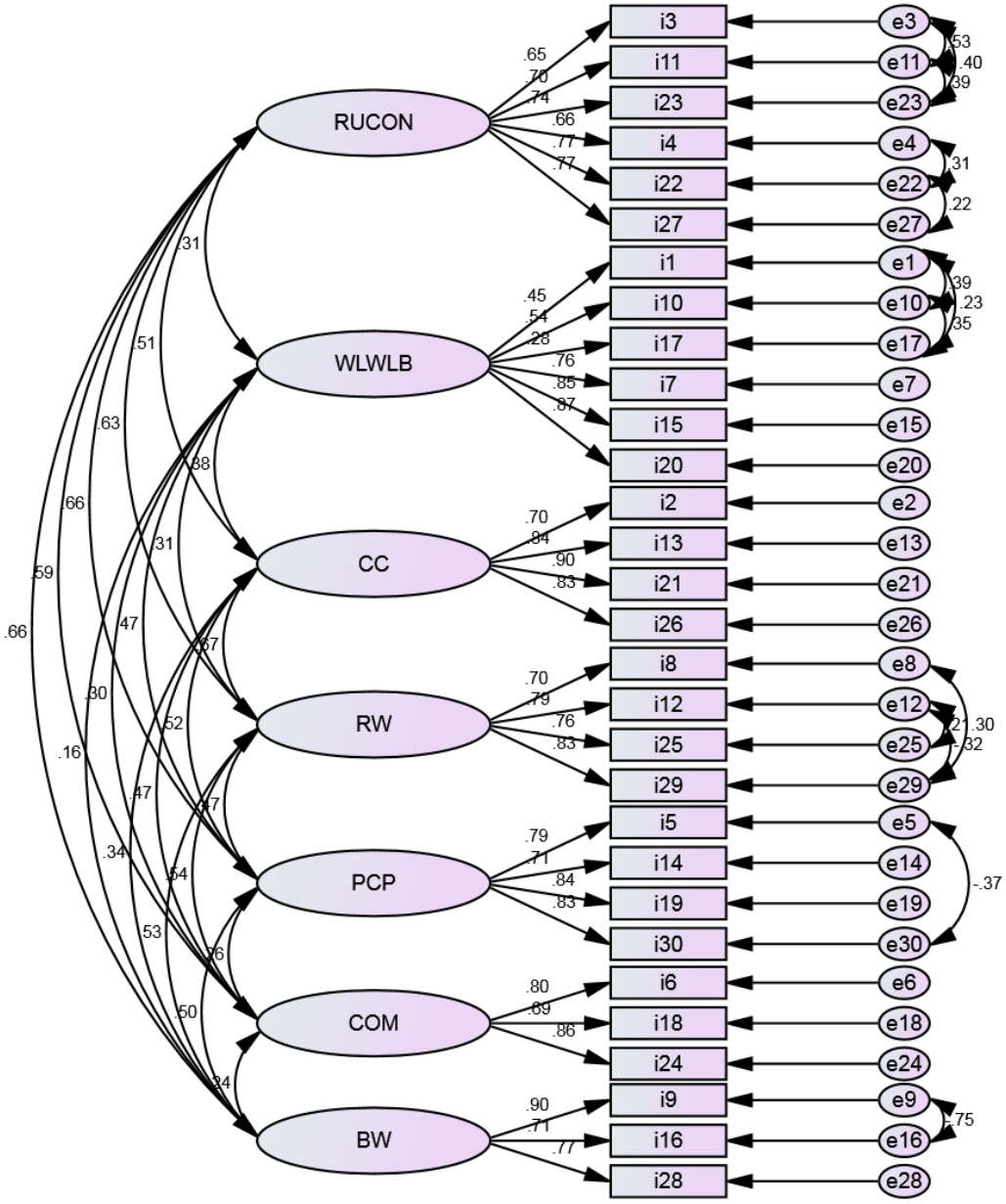

Figure 6.2: Confirmatory factor analysis for the 7-factor model in Study 5 (German sample, N = 258)

Note: RUCON = Role Uncertainty + Control; WLWLB = Workload + Work-life Balance; CC = Competition and Comparison; RW = Relationships at Work; PCP = Pay and Career Prospects; COM = Competency; BW = Boredom at Work.

The IFI, TLI (NNFI), CFI, and AGFI statistics range from 0 to 1 (Topcu & Erdur-Baker, 2010). Values of .90 or higher are generally considered an acceptable model fit to the data for

the NFI, TLI (NNFI), CFI (Hu & Bentler, 1999; Mulaik et al., 1989; Schermelleh-Engel, Moosbrugger, & Müller, 2003), and a value over .80 is acceptable for the AGFI (Anderson & Gerbing, 1984; Cole, 1987; Conners, Sitarenios, Parker, & Epstein, 1998; Conners et al., 1997; Ferris et al., 2005; Gefen, Straub, & Boudreau, 2000; Marsh, Balla, & McDonald, 1988).

The chi-square "assesses the magnitude of discrepancy between the sample and fitted covariances matrices" (Hu & Bentler, 1999, p. 2). However, models rarely fit via the chi-square test statistic (Cronin & Allen, 2017; McIntosh, 2007), because chi-square is often inflated by large sample size (N > 200) (Ortega, Brenner, & Leather, 2007). As chi-square is quite sensitive to sample size (Muenjohn & Armstrong, 2008; Ortega et al., 2007), the ratio of chi-square relative to the degrees of freedom (x^2/df) was also used to assess the overall fit of the model. Jöreskog and Sörbom (2003) noted that large x^2/df ratio indicates a poor fit, and small x^2/df ratio indicates a good fit (Cronin & Allen, 2017). Although there is no consensus on an acceptable ratio for x^2/df (Hooper et al., 2008), a lot of scholars have suggested the values below 5 for the x2/df ratio as acceptable (Wheaton, Muthen, Alwin, & Summers, 1977), and the values of 3 or less indicate adequate model fit (Byrne & Marsh, 1999).

For RMSEA, a value of .06 or less implies a close fit, below .08 indicates an acceptable fit, and over .10 is regarded as a poor fit. For SRMR, a cutoff value close to .08 means an acceptable fit (Ferris et al., 2005; Hu & Bentler, 1999). The SRMR can be calculated in AMOS 22 via the plugin function *Standardized RMR* (Wang, 2014).

6.3.5.2 Results and Discussion

The chi-square (x^2) value is labeled CMIN which means minimum chi-square (Garson, 2013) in AMOS. Modification Indices (MI) provided by AMOS can improve the fit of the tested models by correlating selected parameters within the models (Muenjohn & Armstrong, 2008). To improve the model fit, correlations between error terms of items 4-27, 5-30, 8-29, 12-25, 12-29, 9-16, 16-28 were added by following the examination of the modification indices (Topcu & Erdur-Baker, 2010) (see Figure 6.1). In fact, the contents of these pairs are similar providing theoretical evidence for the statistical findings (Topcu & Erdur-Baker, 2010).

An "i" before the Arabic numerals is short for "item", so i1 means item 1. Similarly, e10 means error 10 as "e" is short for "error terms". Error terms are indicative of random error in

measurement (Kline, 2011). Their regression weights in AMOS are constrained to the conventional value "1" (Wang, 2014). The single-headed arrows mean paths of regression, and the double-headed arrows mean paths of covariance (Wang, 2014).

After adding correlation between these terms (Topcu & Erdur-Baker, 2010), results of the CFA (see Table 6.3) indicated an acceptable model fit for the theoretical 9-factor model (x^2 = 680.387, x^2/df = 1.880, IFI = .932, TLI = .917, CFI = .931, AGFI = .809, SRMR = .0563, and RMSEA = .059). The competing 7-factor model results (x^2 = 745.550, x2/df = 2.010, IFI = .920, TLI = .904, CFI = .919, AGFI = .795, SRMR = .0677, and RMSEA = .063) also indicated acceptable fit. However, results of the CFA indicated an unacceptable fit for the independent model (x2 = 5032.196, x2/df = 11.568, IFI = .000, TLI = .000, CFI = .000, AGFI = .000, RMR = .386, and RMSEA = .203) which meant that the independent model was rejected.

Table 6.3: Fit indices statistics for the independent model, 7-, and 9-factor models in Study 5

	x^2	x^2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Independent model	5032.196	11.568	.000	.000	.000	.174	*	.203
7-factor model	745.550	2.010	.920	.904	.919	.795	.0677	.063
Theoretical 9-factor model	680.387	1.880	.932	.917	.931	.809	.0563	.059

Note: N = 258.

* RMR of Independent Model = .386. The SRMR was calculated in AMOS 22 via the plugin function Standardized RMR. However, there was no result for SRMR of Independent Model.

All the 9-factor model and 7-factor model met the standards to show acceptable fit of the model. However, the theoretical 9-factor model was identified to be superior to the other models. It has provided better indices of fit to the data and is more theoretically reasonable.

The current study confirmed that the construct validity of the 30-item SWSS is established and the theoretical 9-factor model is the best representation of the underlying dimensionality (Ferris et al., 2005) among German samples. The examinations of

cross-cultural equivalence of the SWSS in German and Chinese samples will be performed in subsequent sections.

Further steps to examine the validity of the theoretical 9-factor model (hypothesized model) of SWSS were conducted with software SmartPLS 3. Evidence for convergent validity, discriminant validity together with reliability will be provided.

Reliability analysis was performed by calculating Cronbach's alpha and composite reliability (CR). Values of .700 or greater for Cronbach's alpha and composite reliability (CR) (Samar, Ghani, & Alnaser, 2017) are generally regarded as acceptable. A rho_A value of .700 or greater is regarded as acceptable to demonstrate composite reliability (Wong, 2019). Table 6.4 demonstrates that the reliability of the German version SWSS is acceptable.

Table 6.4: Construct reliability and validity of Sources of Work Stress Scale (N = 258)

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Boredom at Work	.780	.793	.869	.689
Competency	.824	.825	.895	.739
Competition and Comparison	.889	.893	.924	.752
Control	.825	.830	.896	.742
Pay and Career Prospects	.861	.863	.906	.706
Relationships at Work	.862	.864	.906	.708
Role Uncertainty	.881	.882	.927	.808
Work-life Balance	.870	.875	.920	.794
Workload	.695	.737	.829	.621

Convergent validity assesses the extent to which there is correlation of two measures within the same concept (Hair, Black, Babin, Anderson, & Tatham, 2010). To guarantee the convergent validity, high correlations are necessary and a value above .700 is seen to be satisfactory. Convergent validity is established by loadings above .700 and average variance extracted (AVE) above .500. Table 6.4 indicates that the convergent validity of the German version SWSS is established as AVE of each subscale of the German version SWSS is greater

than .500.

The discriminant validity of the measures was studied by Fornell and Larcker (1981). Discriminant validity is the extent to which items are separated among constructs and measures different notions (Fornell & Larcker, 1981). Discriminant validity is shown by the AVE's square root being above any of the inter-construct correlations (Hair, Sarstedt, Pieper, & Ringle, 2012) and can be determined by studying the correlation between the measures of the possible interweaving constructs (Fornell & Larcker, 1981). As illustrated by bold values on the diagonals in Table 6.5 based on the output of SmartPLS 3, the square root of the AVE is larger than the comparable row and column values indicating the measures are discriminated according to Fornell-Larcker Criterion.

Discriminant validity can also be calculated by studying the cross loading of the indicators (Hair Jr et al., 2016). This can be done through the outer loadings of an indicator's on the associated constructs, which is supposed to be larger than all of its loading on the other constructs (Ngah et al., 2015). Table 6.6 demonstrates that all the items estimating a particular construct showed higher loading on the associated construct and lower loading on the other constructs which establishes discriminant validity.

The newest addition to the discriminant validity tests is the Heterotrait-Monotrait Ratio (HTMT), a more comprehensive and less restricted method, suggested by Henseler, Ringle, and Sarstedt (2015). The key criterion to assess the HTMT relates to whether the HTMT ratio reaches 1.0. A value around 1.0 (or above 1.0) will be viewed as a discriminant validity violation, however a value of .85 or .90 is suggested as useful threshold value (Henseler et al., 2015).

Similarly, a threshold value of HTMT .85 is suggested by Kline (2011) and of .90 is suggested by Gold, Malhotra, and Segars (2001). Table 6.7 demonstrates all HTMT values are lower than the suggested threshold value, indicating that discriminant validity of the German version SWSS is established.

In summarization, all indices from the outputs of AMOS 22 indicate that the theoretical 9-factor model (hypothesized model) of SWSS demonstrates acceptable fit to the data among Germany samples. All evidences from output of SmartPLS 3 indicate that both the convergent validity and discriminant validity of the German version SWSS are established. Meanwhile, the Cronbach's alpha reliability and composite reliability (CR) of the German version SWSS

are acceptable. Thus far, the construct reliability and construct validity of the SWSS has been demonstrated**.** The correlation between these 10 dimensions is moderate suggesting that they are related but distinct. These results support the model of SWSS which includes nine distinct components in the German culture or context. Thus, both the reliability and the validity of SWSS are established. SWSS is a validated and reliable tool to measure work stressors among Germany samples.

Table 6.5: Discriminant validity (Fornell-Larcker criterion) of Sources of Work Stress Scale (N = 258)

	Boredom at Work	Competency	Competition and Comparison	Control	Pay and Career Prospects	Relationships at Work	Role Uncertainty	Work-life Balance	Workload
Boredom at Work	**.830**							.	
Competency	. .268	**.860**					.	.	
Competition and Comparison	.349	.426	**.867**						
Control	.590	.466	.425	**.861**					
Pay and Career Prospects	.522	.270	.503	.569	**.840**				
Relationships at Work	.480	.478	.567	.470	.417	**.841**			
Role Uncertainty	.498	.449	.416	.662	.473	.480	**.899**		
Work-life Balance	.199	.275	.340	.241	.413	.291	.245	**.891**	
Workload	-.012	.344	.255	.248	.241	.095	.201	.513	**.788**

Table 6.6: Discriminant validity (cross loadings) of Sources of Work Stress Scale (N = 258)

	Boredom at Work	Competition and Comparison	Competency	Control	Pay and Career Prospects	Role Uncertainty	Relationships at Work	Work-life Balance	Workload
BW_i16	**.808**	.379	.321	.549	.510	.478	.443	.295	.157
BW_i28	**.852**	.230	.169	.446	.392	.360	.340	.076	-.093
BW_i9	**.830**	.222	.137	.446	.363	.374	.392	.075	-.156
CC_i13	.320	**.879**	.375	.299	.395	.347	.525	.253	.193
CC_i2	.305	**.801**	.328	.435	.506	.367	.373	.322	.265
CC_i21	.308	**.906**	.414	.376	.454	.395	.539	.313	.227
CC_i26	.278	**.879**	.356	.371	.393	.334	.522	.291	.203
COM_i18	.275	.374	**.835**	.445	.329	.388	.442	.265	.279
COM_i24	.210	.351	**.882**	.386	.134	.395	.405	.163	.294
COM_i6	.200	.371	**.861**	.364	.221	.374	.380	.277	.316
CON_i22	.559	.382	.374	**.908**	.541	.591	.414	.222	.132
CON_i27	.487	.366	.491	**.853**	.448	.608	.419	.239	.297
CON_i4	.476	.350	.332	**.821**	.482	.506	.382	.156	.211
PCP_i14	.502	.462	.207	.497	**.815**	.371	.357	.288	.143
PCP_i19	.418	.374	.244	.490	**.880**	.376	.341	.380	.223
PCP_i30	.449	.424	.247	.509	**.846**	.493	.420	.340	.171
PCP_i5	.376	.428	.206	.408	**.819**	.339	.273	.386	.285
RU_i11	.434	.317	.439	.594	.442	**.905**	.401	.237	.178
RU_i23	.504	.364	.378	.637	.411	**.890**	.484	.178	.117
RU_i3	.403	.441	.397	.552	.424	**.901**	.405	.246	.248
RW_i12	.459	.509	.422	.410	.370	.451	**.822**	.185	.024
RW_i25	.372	.451	.403	.385	.311	.383	**.854**	.182	.055
RW_i29	.419	.513	.417	.416	.366	.415	**.865**	.276	.126
RW_i8	.357	.429	.362	.366	.353	.358	**.823**	.338	.115
WLB_i15	.174	.355	.247	.228	.395	.215	.298	**.902**	.490
WLB_i20	.152	.291	.236	.206	.372	.206	.259	**.910**	.461
WLB_i7	.209	.257	.252	.209	.334	.234	.216	**.860**	.417
WL_i10	-.049	.208	.306	.171	.211	.233	.090	.499	**.871**
WL_i17	.059	.149	.231	.201	.095	.088	.034	.259	**.662**
WL_i1	-.013	.237	.271	.226	.240	.129	.088	.416	**.816**

Table 6.7: Discriminant validity (HTMT) of Sources of Work Stress Scale (N = 258)

	Boredom at Work	Competency	Competition and Comparison	Control	Pay and Career Prospects	Relationships at Work	Role Uncertainty	Work-life Balance	Workload
Boredom at Work								.	
Competency	.310						.	.	
Competition and Comparison	.401	.496							
Control	.718	.559	.499						
Pay and Career Prospects	.615	.314	.576	.673					
Relationships at Work	570	.563	.643	.556	.479				
Role Uncertainty	.583	527	.469	.774	.539	.546			
Work-life Balance	.218	323	.384	.282	.478	.335	.281		
Workload	.214	.452	.321	.334	.302	.116	.244	.637	

6.3.6 Study 6: Validation of the SWSS with Chinese Samples

6.3.6.1 Method

6.3.6.1.1 Participants and Procedure

This survey was carried out from October 2016 to January 2018 in China. Respondents were 226 employees working at Chinese companies. The sample consisted of 106 males (46.90%) and 120 females (53.10%). 11.95% (N = 27) of them were less than 25 years old; 29.20% (N = 66) were 25 to 29 years old, 31.86% (N = 72) were 30 to 34 years old, 9.29 % (N = 21) were 35 to 39 years old, 10.18% (N = 23) were 40 to 44 years old, 7.52% (N = 17) were more than 44 years old (see Table 6.8).

Table 6.8: Demographic information of 226 Chinese employees

	China
Age	
≤ 24	27
25-29	66
30-34	72
35-39	21
40-44	23
≥ 45	17
Overall	226
Female	120
Male	106

Questionnaires were distributed either online or face-to-face. Respondents could finish either the paper-and-pencil version or the online version at a website. The website settings ensured that the online questionnaire could be submitted upon the completion of all questions.

6.3.6.1.2 Measures

The 30-item Chinese version Sources of Work Stress Scale (SWSS) (工作压力源量表) was used for this survey to assess the construct validity and factor reliability. Initially developed in

English, the SWSS was translated from English into Chinese. In this process, repeated forward and back translations of the scale were carried out to guarantee the meaning equivalence.

6.3.6.1.3 Data Analysis

CFA was repeated in Study 6 with the software AMOS 22 to further test the fit and construct validity of the theoretical 9-factor model (hypothesized model) of the SWSS in Study 5, using data from 226 employees working at Chinese companies. Maximum likelihood estimation method was used to assess different models. The theoretical 9-factor model was tested and compared to the competing 7-factor model, and the independent model. The competing 7-factor solution sometimes emerged in the EFA.

Construct validity including convergent validity and discriminant validity of the SWSS was further examined with software SmartPLS 3.

To assess reliability, Cronbach's alpha reliability and composite reliability (CR) were calculated by SmartPLS 3.

6.3.6.2 Results and Discussion

As suggested by modification indices test, correlations between error terms of items 1-10, 3-11, 5-14, 5-19 were added to increase the model fit (Topcu & Erdur-Baker, 2010) (see Figure 6.3).

Staying consistent with Study 5, results of the CFA after the addition of these correlation terms (see Table 6.9) indicated an unacceptable fit for the independent model (x^2 = 3976.628, x^2/df = 9.142, IFI = .000, TLI = .000, CFI = .000, AGFI = .134, RMR = .371, and RMSEA = .190) which meant that the independent model was rejected. The results indicated an acceptable model fit for the theoretical 9-factor model (x^2 = 667.789, x^2/df = 1.830, IFI = .916, TLI = .898, CFI = .915, AGFI = .796, SRMR = .0541, and RMSEA = .061). The competing 7-factor model results (x^2 = 701.914, x^2/df = 1.862, IFI = .910, TLI = .894, CFI = .908, AGFI = .791, SRMR = .0541, and RMSEA = .062) indicated acceptable fit.

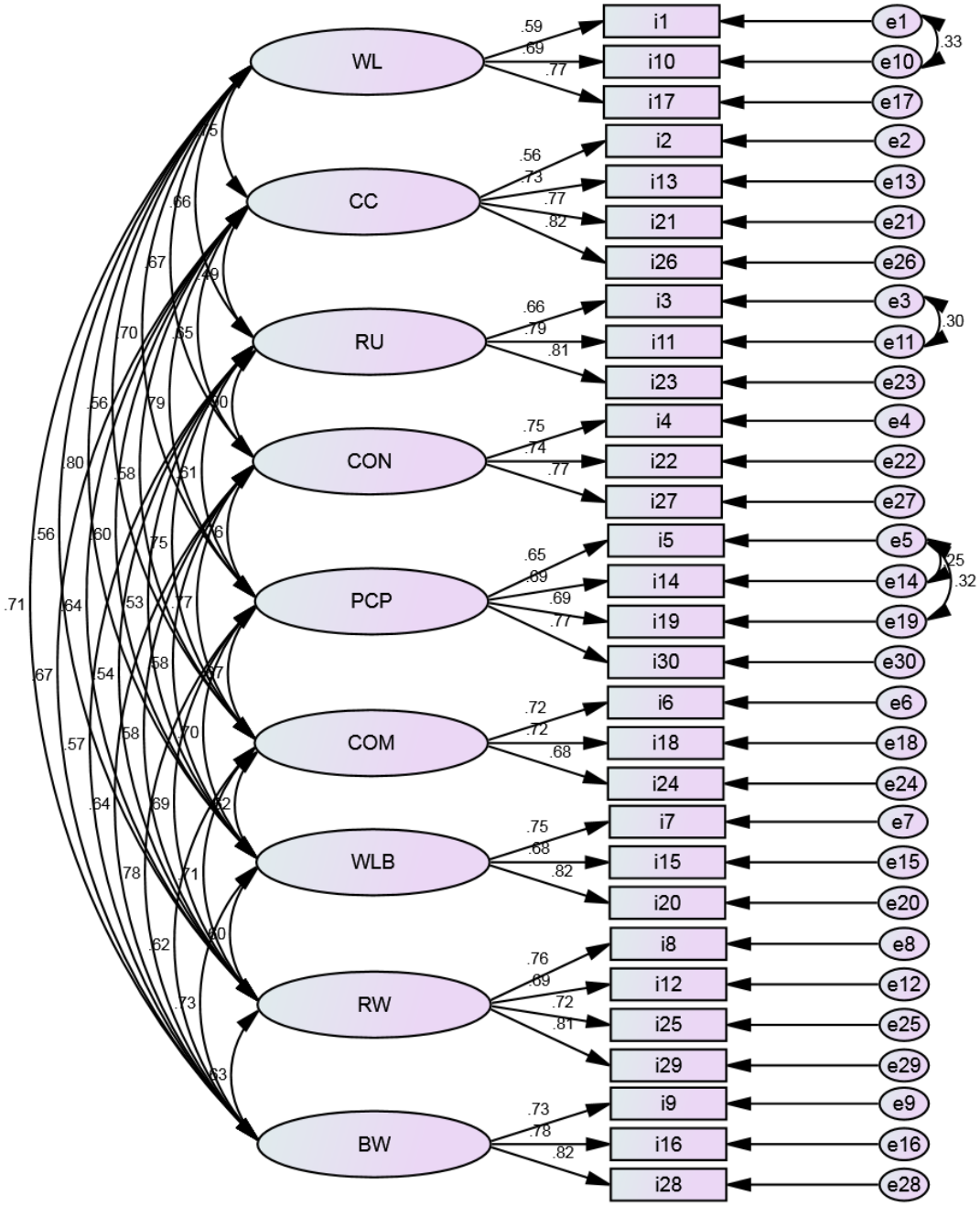

Figure 6.3: Confirmatory factor analysis for the theoretical 9-factor model in Study 6 (Chinese samples, N = 226)

Note: WL = Workload; CC = Competition and Comparison; RU = Role Uncertainty; CON = Control; PCP = Pay and Career Prospects; COM = Competency; WLB = Work-life Balance; RW = Relationships at Work; BW = Boredom at Work.

Table 6.9: Fit indices statistics for the independent model, 7-, and 9-factor models in Study 6

	x^2	x^2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Independent Model	3976.628	9.142	.000	.000	.000	.134	*	.190
7-factor Model	701.914	1.862	.910	.894	.908	.791	.0541	.062
Theoretical 9-factor Model	667.789	1.830	.916	.898	.915	.796	.0541	.061

Note: N = 226.

* RMR of Independent Model = .371. The SRMR was calculated in AMOS 22 via the plugin function *Standardized RMR*, however, there was no result for SRMR of Independent Model.

The theoretical 9-factor model (see Figure 6.3) and the 7-factor model (see Figure 6.4) met the standards to indicate acceptable fit of the model; however, the theoretical 9-factor model was confirmed to be superior to the competing 7-factor models since it has provided better fit indices and moreover it is more theoretically sound.

The current study confirmed that the construct validity of the 30-item SWSS is established and the theoretical 9-factor model is the best representation of the underlying dimensionality (Ferris et al., 2005) among Chinese samples. The examinations of cross-cultural equivalence of the SWSS in German and Chinese cultural samples will be conducted in the subsequent section.

Further evidence for reliability and validity including convergent validity and discriminant validity of the theoretical 9-factor model (hypothesized model) of the SWSS will be provided by software SmartPLS 3.

Reliability is confirmed by Cronbach's alpha and composite reliability (CR) values of .700 or greater. A rho_A value of .700 or larger is acceptable to demonstrate composite reliability (Wong, 2019). Table 6.10 indicates that the reliability of the Chinese version SWSS is acceptable.

Convergent validity is achieved by loadings greater than .700 and AVE larger than .500 (Fornell & Larcker, 1981). Table 6.10 also indicates that the convergent validity of the

Chinese version SWSS is established.

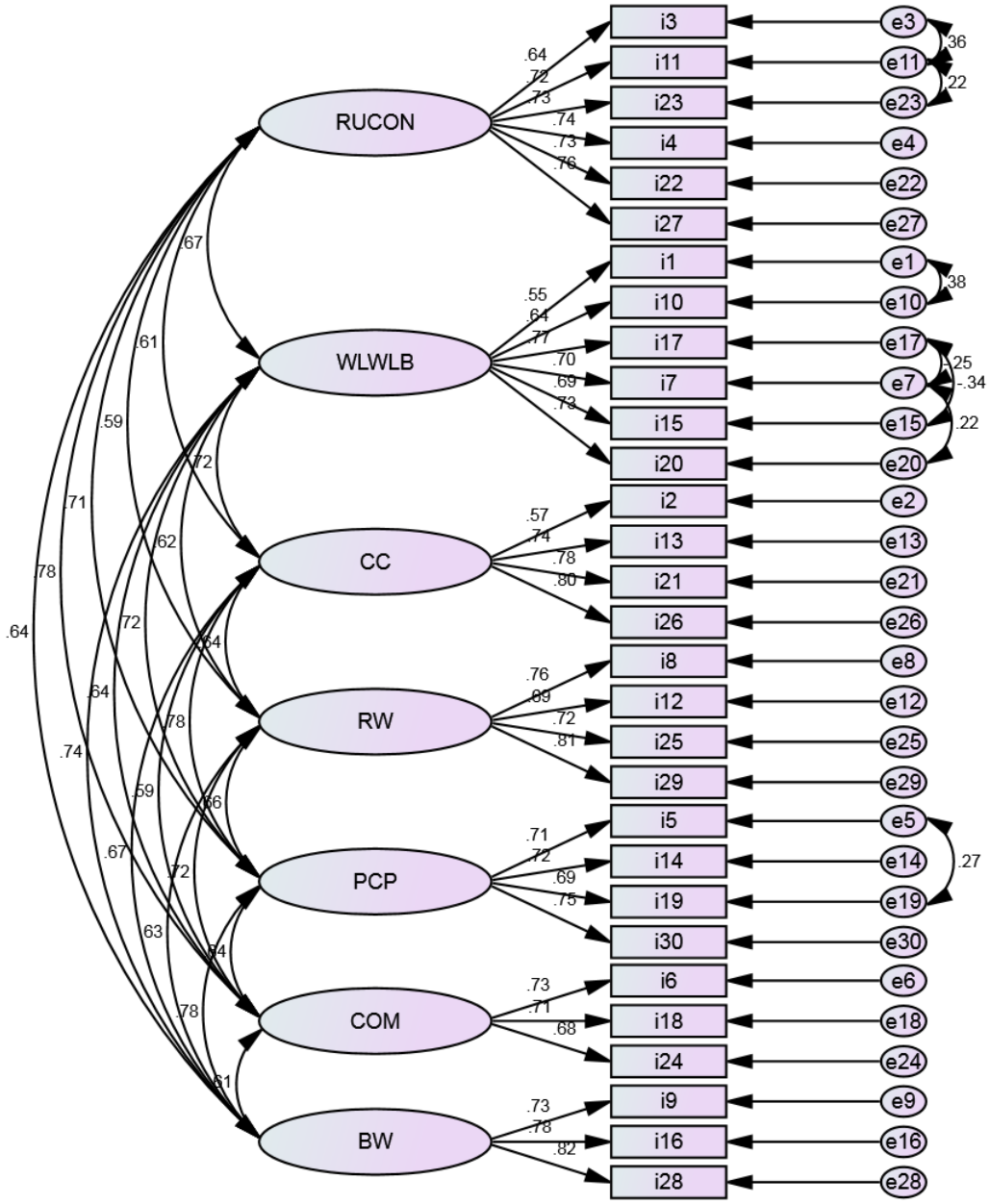

Figure 6.4: Confirmatory factor analysis for the competing 7-factor model in Study 5 (Chinese Sample, N = 226)

Note: RUCON = Role Uncertainty + Control; WLWLB = Workload + Work-life Balance; CC = Competition and Comparison; RW = Relationships at Work; PCP = Pay and Career Prospects; COM = Competency; BW = Boredom at Work.

Table 6.10: Construct reliability and validity of Sources of Work Stress Scale (N = 226)

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Boredom at Work	.822	.828	.893	.736
Competency	.749	.753	.856	.666
Competition and Comparison	.808	.816	.875	.639
Control	.795	.797	.880	.709
Pay and Career Prospects	.826	.828	.884	.656
Relationships at Work	.834	.841	.889	.668
Role Uncertainty	.822	.823	.894	.738
Work-life Balance	.793	.795	.879	.708
Workload	.769	.782	.865	.682

Discriminant validity is achieved by the AVE's square root being above any of the inter-construct correlations (Hair et al., 2012). Table 6.11 shows that the AVE's square root, illustrated by bold values on the diagonals, is larger than the corresponding row and column values indicating the establishment of discriminant validity of the measures according to Fornell-Larcker Criterion.

Discriminant validity can also be tested by comparing the outer loadings of an indicator on the associated constructs. It is supposed to be larger than all of its loading on the other constructs (Ngah et al., 2015). Table 6.12 indicates that the discriminant validity of the constructs is achieved.

Another approach to test discriminant validity is the Heterotrait-Monotrait Ratio (HTMT) (Samar et al., 2017). For HTMT value, Henseler et al. (2015) stated .85 or .90 as useful threshold values. Similarly, Kline (2011) suggested a threshold of .85 for HTMT. and Gold et al. (2001) suggested a threshold of .90. Table 6.13 demonstrates that all HTMT values are lower than the suggested threshold value, indicating that discriminant validity of the German version SWSS is established.

In summarization, all indices from the outputs of AMOS 22 indicate that the theoretical 9-factor model (hypothesized model) of SWSS demonstrates acceptable fit to the data among Chinese samples. All evidences from output of SmartPLS 3 demonstrate that both the convergent validity and discriminant validity of the Chinese version SWSS are established. Meanwhile, the Cronbach's alpha reliability and composite reliability (CR) of the Chinese version SWSS are acceptable. So far, the construct reliability and construct validity of the SWSS has been demonstrated**.** The correlations between these nine dimensions are moderate suggesting that they are related but distinct. These results support the model of the SWSS, including nine distinct components in the Chinese culture. Thus, both the reliability and the validity of SWSS are established. SWSS is a validated and reliable tool to measure work stressors among Chinese samples.

Table 6.11: Discriminant validity (Fornell-Larcker criterion) of Sources of Work Stress Scale (N = 226)

	Boredom at Work	Competency	Competition and Comparison	Control	Pay and Career Prospects	Relationships at Work	Role Uncertainty	Work-life Balance	Workload
Boredom at Work	**.858**							.	
Competency	.484	**.816**					.	.	
Competition and Comparison	.555	.478	**.799**						
Control	.515	.592	.537	**.842**					
Pay and Career Prospects	.625	.486	.636	.578	**.810**				
Relationships at Work	.518	.572	.532	.478	.530	**.817**			
Role Uncertainty	.470	.559	.428	.707	.483	.443	**.859**		
Work-life Balance	.585	.495	.540	.462	.549	.495	.445	**.841**	
Workload	.534	.396	.593	.488	.511	.410	.504	.597	**.826**

Table 6.12: Discriminant validity (cross loadings) of Sources of Work Stress Scale (N = 226)

	Boredom at Work	Competition and Comparison	Competency	Control	Pay and Career Prospects	Role Uncertainty	Relationships at Work	Work-life Balance	Workload
BW_i16	**.861**	.459	.428	.403	.549	.413	.426	.559	.421
BW_i28	**.874**	.550	.416	.518	.614	.388	.471	.515	.505
BW_i9	**.840**	.410	.401	.394	.431	.411	.436	.426	.444
CC_i13	.400	**.817**	.324	.390	.514	.292	.349	.401	.443
CC_i2	.394	**.683**	.392	.418	.427	.337	.334	.525	.456
CC_i21	.484	**.828**	.452	.430	.545	.424	.485	.443	.487
CC_i26	.488	**.857**	.358	.474	.539	.313	.513	.370	.505
COM_i18	.438	.408	**.825**	.502	.423	.476	.427	.513	.356
COM_i24	.314	.353	**.795**	.464	.334	.397	.476	.321	.257
COM_i6	.422	.405	**.827**	.481	.424	.490	.501	.368	.349
CON_i22	.444	.457	.481	**.837**	.458	.583	.376	.369	.411
CON_i27	.482	.520	.559	**.857**	.502	.571	.500	.436	.408
CON_i4	.371	.376	.451	**.832**	.501	.634	.324	.359	.414
PCP_i14	.506	.551	.343	.434	**.794**	.442	.426	.459	.366
PCP_i19	.510	.451	.366	.456	**.812**	.350	.411	.458	.430
PCP_i30	.479	.558	.518	.561	**.809**	.417	.525	.444	.432
PCP_i5	.533	.490	.328	.407	**.825**	.346	.336	.416	.428
RU_i11	.395	.364	.518	.621	.426	**.896**	.395	.415	.436
RU_i23	.414	.339	.537	.650	.386	**.842**	.392	.334	.392
RU_i3	.401	.403	.381	.548	.433	**.837**	.353	.397	.473
RW_i12	.418	.390	.457	.388	.453	.342	**.782**	.325	.260
RW_i25	.317	.419	.500	.400	.353	.367	**.800**	.320	.266
RW_i29	.492	.495	.493	.453	.483	.412	**.855**	.473	.418
RW_i8	.453	.428	.422	.315	.435	.323	**.829**	.485	.378
WLB_i15	.437	.498	.455	.352	.465	.382	.419	**.817**	.441
WLB_i20	.558	.457	.389	.417	.517	.355	.412	**.858**	.571
WLB_i7	.478	.404	.407	.395	.398	.387	.419	**.849**	.491
WL_i10	.424	.484	.304	.375	.423	.358	.364	.521	**.855**
WL_i17	.499	.538	.390	.497	.479	.496	.392	.518	**.832**
WL_i1	.385	.433	.272	.311	.349	.378	.239	.430	**.789**

Table 6.13: Discriminant validity (HTMT) of Sources of Work Stress Scale (N = 226)

	Boredom at Work	Competency	Competition and Comparison	Control	Pay and Career Prospects	Relationships at Work	Role Uncertainty	Work-life Balance	Workload
Boredom at Work								.	
Competency	.611						.	.	
Competition and Comparison	.674	.613							
Control	.630	.763	.668						
Pay and Career Prospects	.752	.606	.773	.707					
Relationships at Work	.620	.725	.639	.581	.628				
Role Uncertainty	.573	.707	.527	.874	.583	.533			
Work-life Balance	.720	.637	.680	.580	.674	.603	.552		
Workload	.661	.508	.745	.610	.632	.494	.627	.757	

6.4 Cross-cultural Equivalence Examinations of the SWSS

It has become customary to not only report reliability and validity, but also to establish equivalence (or lack of bias) of measures in cross-cultural studies (He & Van de Vijver, 2012). It is pivotal to establish equivalence or comparability of the measures, because an absence to establish cross-cultural equivalence probably lead to bias conclusions (Buil et al., 2012).

Structural Equation Modeling (SEM) is used to examine the cross-cultural equivalence of the Sources of Work Stress Scale (SWSS) in German and Chinese samples. As an application of SEM (Van de Vijver & Leung, 1997; Wang, 2014), Confirmatory Factor Analysis (CFA) is often used to examine equivalence (He & Van de Vijver, 2012). If a CFA model demonstrates an acceptable fit, the hypothesized factor structure can not be rejected, and therefore different levels of equivalence can be achieved (He & Van de Vijver, 2012). CFA can be carried out with SEM softwares such as LISREL, Mplus, AMOS and SmartPLS.

According to the theories on bias and equivalence in cross-cultural research (please refer to Chapter 5), the Construct Equivalence is achieved and the construct has the same meaning across groups if the multigroup CFA yields an acceptable fit (He & Van de Vijver, 2012). The Measurement Unit Equivalence (Metric Equivalence) can be achieved if two metric measures share the same unit of measurement but with different origins. That is to say, the scale of one measure is changed with a constant offset in comparison to the other measure (Van de Vijver & Tanzer, 2004). An example can be found in the measurement of length measured by inches and centimeters. The Full Score Equivalence (Scalar Equivalence) can be achieved if two metric measures share the same unit of measurement and also the same origin (Van de Vijver & Tanzer, 2004).

Based on the reports in Study 5 and Study 6, all indices from the outputs of AMOS 22 indicate that the SWSS (theoretical 9-factor model) demonstrates acceptable fit to the data among either German samples or Chinese samples (see Table 6.14). And the German and Chinese versions of SWSS share the same unit of measurement and the same origin. Thus, the SWSS has reached three equivalence levels (Construct Equivalence, Measurement Unit Equivalence, and Full Score Equivalence) across Chinese and German cultures. This also means that the connotation or significance of the SWSS is conveyed in a very similar way across the two cultural groups.

Table 6.14: Cross-cultural equivalence examinations of Sources of Work Stress Scale (theoretical 9-factor model) among German and Chinese samples

CFA in Study 5 (German samples, N = 258)

	x^2	x^2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Theoretical 9-factor Model	680.387	1.880	.932	.917	.931	.809	.0563	.059

CFA in Study 6 (Chinese samples, N = 226)

	x^2	x^2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Theoretical 9-factor Model	667.789	1.830	.916	.898	.915	.796	.0541	.061

In conclusion，Chapter 6 has focused on the development and validation of the SWSS with German and Chinese samples, including the practical needs to develop a scale to measure work stressors, the theoretical foundation of the SWSS, six empirical studies to develop and validate the SWSS, and the cross-cultural equivalence examinations with German and Chinese samples. The softwares SPSS 22, Smart PLS 3 and Amos 22 were used to test the factor structure, reliability, convergent validity, discriminant validity, and cross-cultural equivalence. All evidences demonstrate that both the convergent validity and discriminant validity of the CSS are established. Meanwhile, the Cronbach's alpha reliability and composite reliability (CR) of the CSS are acceptable. Thus, both the reliability (see Table 6.15) and the validity of SWSS are established. SWSS is a validated and reliable tool to measure work stressors in both Chinese society and German society. At the same time, the SWSS has reached three equivalence levels across Chinese and German cultures.

Table 6.15: Reliability statistics: Sources of Work Stress Scale (SWSS)

Factors	Number of Items	Cronbach's α		
		Study 4 (German Samples, N = 48)	Study 5 (German Samples, N = 258)	Study 6 (Chinese Samples, N = 226)
Workload	3	.713	.695	.769
Competition and Comparison	4	.887	.889	.808
Role Uncertainty	3	.902	.881	.822
Control	3	.775	.825	.795
Pay and Career Prospects	4	.763	.861	.826
Competency	3	.642	.824	.749
Work-life Balance	3	.915	.870	.793
Relationships at Work	4	.783	.862	.834
Boredom at Work	3	.649	.780	.822

Note: Due to the fact that the SWSS in Study 1 to Study 3 was the preliminary version and was very different from the final version, reliability statistics will not show the Cronbach's α of each subscale in Study 1 to Study 3.

7 Development and Validation of the Coping with Stress Scale

Chapter 7 is the development and validation of the Coping with Stress Scale (CSS). First, it will begin with the practical needs to develop a coping scale. Then, it will describe the theoretical framework and foundation of the CSS. Next, it will introduce eight studies to develop and validate the CSS. Finally, it will examine the cross-cultural equivalence with Chinese and German samples.

7.1 Practical Needs to Develop the Coping with Stress Scale (CSS)

Studies on coping as a special field of psychological inquiry (Folkman & Moskowitz, 2004) started from the early 1970s, motivated by the work of Lazarus (1966).

As stated before, coping strategies were usually divided into two types: problem-focused coping and emotion-focused coping (Baqutayan, 2015; Folkman & Lazarus, 1980; Lazarus & Folkman, 1984a). Rice (1999) claimed that such a simple dichotomy can not overcome its inherent weaknesses and that these two types of coping are not independent. It is necessary to describe people's thoughts or actions in detail. A full understanding of coping should consider both of them (Dewe et al., 2010). Previous research on workplace stress and coping has been regarded as disappointing (Bar-Tal & Spitzer, 1994; Lu et al., 2010). Some traditional approaches have considered coping to be a relatively stable process (Stone, Greenberg, Kennedy-Moore, & Newman, 1991). However, Lazarus (1991) argued that coping also has a dynamic nature.

Kato (2015) has reviewed 2000 articles and reported the rate of use of coping scales in

scientific journals published between 1998 and 2010. The most widely used coping scale was the COPE whose rate of use was 20.20%, including its short version Brief COPE and some revised versions.

Although the Brief COPE developed by Carver is frequently used, some subscales of the Brief COPE do not have acceptable internal consistency reliabilities in the studies of some researchers (e.g., α of Acceptance = .57, α of Denial = .54, α of Venting= .50,) (Carver, 1997). Exploratory Factor Analysis (EFA) of the Brief COPE identified different number of factors across various samples. For example, Carver's analysis of the Brief COPE reported the 9-factor model derived from the 14 two-item subscales (Carver, 1997). Cooper, Katona, and Livingston (2008) categorized Brief COPE items into three factors: problem-focused, emotion-focused, and dysfunctional coping subscales. Derived from EFA, Deborah L. Snell established three factors: approach, avoidant, and help seeking coping styles by using the Brief COPE in their study (Snell, Siegert, Hay-Smith, & Surgenor, 2011). Su et al. (2015) determined six factors in Chinese samples and found that the theoretical model of the Brief COPE has poor goodness of fit to the data. Hence, the confirmatory factor analysis (CFA) results neither supported the model (with a x^2 = 2382.16, a x^2/df ratio of 6.81, with a CFI = .74, GFI = .60, and an RMSEA = .15) that grouped the subscales into the emotion-focus, problem-focus, and dysfunctional coping strategies, nor the model (with a x^2 = 2315.62, a x^2/df ratio of 6.60, with a CFI = .74, GFI = .61, and an RMSEA = .15) that grouped the subscales into adaptive and maladaptive coping strategies (Su et al., 2015). Snell et al. (2011) examined a 9-factor model based on the results of the EFA reported by Carver. The use of software AMOS version 16 revealed a x^2 = 476.9, a x^2/df ratio of 1.519, with a GFI = .816, and an RMSEA = .06. The RMSEA and the GFI all indicated a less than ideal fit (Snell et al., 2011). These results should be considered when using the Brief COPE as a research tool.

The second most widely used coping scale was the Ways of Coping Questionnaire (WCQ) (Folkman & Lazarus, 1988) with a frequency of 13.60%. This included its first version, the Ways of Coping Checklist (WCC) (Folkman & Lazarus, 1980) and the short version of the WCC. The revised WCQ is a scale of 66 items including a broad variety of thoughts and actions used by people to cope with the stressful events, and the internal consistency reliabilities of the eight factors of WCQ ranked from .56 to .85 (Folkman & Lazarus, 1985). Two different factorial structures were extracted from factor analysis with separate data sets by giving two sets of scales. The first scale is based on a study of a broad

variety of stressful events reported by a community sample (Folkman et al., 1986), and the second scale is based on a study of college students' coping strategies for examinations (Folkman & Lazarus, 1985). Many studies have demonstrated that the WCQ has poor model fit to the data (Edwards & O'Neill, 1998; Parker, Endler, & Bagby, 1993).

The Coping Strategies Questionnaire (CSQ) (Rosenstiel & Keefe, 1983) was another coping scale which was frequently used to measure strategies to cope with pain (Swartzman, Gwadry, Shapiro, & Teasell, 1994). The frequency of use for the CSQ was 4.95%.

There are many other frequently used coping scales, such as the Coping Inventory for Stressful Situations (CISS) whose rate of use was 4.15%, Religious-COPE (R-COPE) whose rate of use was 3.40% and Coping Response Inventory (CRI) whose rate of use was 3.05% (Kato, 2015).

Despite the fact that there are many scales or questionnaires on coping, most of them were developed before the year 2000, some prior to 1990. These outdated scales or questionnaires do not include the recently developed strategies such as future-oriented coping (e.g., proactive coping, preventive coping and anticipatory coping) and leisure and relaxation as a coping strategy. As coping develops, the coping scales and questionnaires should be updated with new coping strategies.

Most of the coping scales or questionnaires were developed and validated in Western industrialized countries (Siu et al., 2006). However, they would most likely become problematic when used in Chinese cultural society. The theoretical models often indicate a poor goodness of fit to the data, and the reliability coefficients of some subscales are often unacceptably low (Siu et al., 2006).

Given the problems above, there are practical needs to develop a coping scale which should be empirically tested and validated in both Western and Chinese societies and include some novel coping strategies in recent years. It should have acceptable psychometric properties and be completed quickly and easily. Therefore, this research proposes a ten-factor model that the strategies for coping with stress at work mainly consist of future-oriented coping, positive thinking, physical exercises, social support, leisure and relaxation, religious coping, avoidance, acceptance, self-blame, and problem-solving coping. The following sections will focus on the development and validation of the Coping with Stress Scale (CSS).

7.2 Theoretical Framework and Foundation of the CSS

The first phase in the development of a scale is to establish its construct (Clark & Watson, 1995; Cronin & Allen, 2017). In order to have clear definitions and components, items created should fit with the definition and represent every component of the construct (Cronin & Allen, 2017). As mentioned before, an extensive literature review related to coping was conducted to explore the coping strategies or coping styles defined in theories and widely used coping scales or questionnaires.

The Coping with Stress Scale (CSS) was developed based on the relevant literature and frequently used questionnaires on coping listed below:

- COPE, by Carver et al. (1989)
- Brief COPE, by Carver (1997)
- Ways of Coping Questionnaire (WCQ), by Folkman and Lazarus (1980, 1988)
- Coping Strategies Questionnaire (CSQ), by Rosenstiel and Keefe (1983)
- Occupational Stress Indicator (OSI) (short version of the Dutch), by Evers, Frese, and Cooper (2000)
- Stressverarbeitungsfragebogen (SVF, SVF 120), by Janke, Erdmann, and Kallus (1997)
- Chinese Coping Strategies Scale, by Siu et al. (2006)

Detail dimensions and theoretical foundation of the CSS will be introduced as follows.

7.2.1 Future-oriented Coping

Traditional coping models tended to focus on how people deal with past or ongoing stressors (Hu & Gan, 2011). There are actually several terms which can be seen as future-oriented coping like proactive coping, preventive coping (Hu & Gan, 2011) and anticipatory coping. Researchers typically compare proactive coping (anticipating potential stressors and acting in advance) (Aspinwall & Taylor, 1997) not only with reactive coping (to deal with a stressful event that has occurred), but also with anticipatory coping (to deal with an impending demand) and preventive coping (to prepare for possible demands) (Dewe et al., 2010). Similar to

proactive coping, anticipatory and preventive coping are future-oriented (Folkman & Moskowitz, 2004). That is to say, in contrast with reactive coping, anticipatory coping, preventive coping and proactive coping can be merged into one concept referenced as future-oriented coping (Gan, Yang, Zhou, & Zhang, 2007), a strategy that focuses on stressors that may occur in the future (Hu & Gan, 2011).

Few coping scale used in published articles have a measurement of future-oriented coping. In the newly developed CSS, four items were written as update and refinement to measure future-oriented coping, such as "I prepare for stressful situations that may occur in the future." and "I take preventive actions to avoid future problems or troubles."

7.2.2 Positive Thinking

According to Cox et al. (2000), the individual's appraisal of the situation ultimately determines whether the situation is an actual source of stress or not. Positive thinkers view stress as less threatening and can cope with it more effectively compared to negative thinkers (Naseem & Khalid, 2010). Being positive is defined as "a way of talking and acting that reflects an optimistic or positive attitude or feeling state, and the multifaceted notion of hope" (McGrath, 2004, p. 26). Focusing on the brighter side of situations, positive thinking generates positive emotions and other feelings such as optimism, hope, joy and well-being (Naseem & Khalid, 2010).

In the revised Ways of Coping Questionnaire (Folkman et al., 1986), the dimension Focusing on the Positive could be regarded as Positive Thinking, measured with items such as "Look for the silver lining, so to speak; try to look on the bright side of things." In the Brief COPE by Carver (1997), the dimension Positive Reframing was also equivalent to Positive Thinking, measured with items like "I've been looking for something good in what is happening." In the short version of the Dutch OSI (Evers et al., 2000), the Active Positive Attitude could be regarded as Positive Thinking , measured with items like "I think I can learn from certain unpleasant experiences as well." Positive Thinking was also assessed in Chinese Coping Strategies (Siu et al., 2006), for example, "Try to maintain an active positive attitude." In the SVF (*Stressverarbeitungsfragebogen*) 120 (Janke et al., 1997), a German Stress Processing Questionnaire, some items could be regarded as Positive Thinking, such as "...

sage ich mir, alles ist halb so schlimm" (in English "I tell myself that things are not that bad") and *"…sage ich mir, das wird sich mit der Zeit schon wieder einrenken"* (in English "I tell myself that it will be alright again as time goes on").

The items mentioned above were adapted for the CSS. Four items were written as the first version to assess positive thinking, for example, "I try to see problems from different perspectives and maintain an active positive attitude."

7.2.3 Physical Exercise

Physical exercise has been defined in many ways. One of the most widely cited definitions from Caspersen, Powell, and Christenson (1985, p. 128) described it as "a subcategory of physical activity that is planned, structured, repetitive, and purposive in the sense that improvement or maintenance of one or more components of physical fitness is an objective". Focused exclusively on using exercise as an approach to cope with stress, Berger (1994) argued that exercise is connected with psychological and physiological benefits. It is an effective technique to reduce stress for people who have normal level of stress as well as people who have high level of stress. Seaward (2013) noted that physical exercise can both utilize the stress hormones for their intended purpose and lead to the cathartic release of stress.

Neither the COPE nor the Brief COPE by Carver has paid any attention to dimension of Physical Exercise as a strategy to cope with stress. However, in the revised Ways of Coping Questionnaire by Folkman et al. (1986) , one item belongs to dimension of Physical Exercise, that is "I jog or exercise." In Chinese Coping Strategies (Siu et al., 2006), one item focuses on Physical Exercise, that is "Do physical exercises."

As physical exercise is an ideal way to deal with stress, three items were written to assess physical exercise in the CSS, such as "I do physical exercises." and "I partake in fitness activities."

7.2.4 Social Support

There are many definitions on social support. Rodriguez and Cohen (1998, p. 535) defined it as "a multidimensional construct that refers to the psychological and material resources available to individuals through their interpersonal relationships". The taxonomies of social support types have been proposed by many researchers (Sarason, 1985). Cohen and Hoberman (1983) have distinguished four separate functions of social support: tangible aid, belonging, self-esteem and appraisal. According to House (1981), social support can be categorized into four broad types: emotional support, instrumental support, informational support and appraisal support (Glanz, Rimer, & Viswanath, 2008).

Social Support was assessed in the revised Ways of Coping Questionnaire (Folkman et al., 1986), such as "I asked a relative or friend I respected for advice." and "I got professional help." In the COPE (Carver et al., 1989), Social Support was measured with items like "I've been getting help and advice from other people." and "I've been getting comfort and understanding from someone." In the short version of the Dutch OSI (Evers et al., 2000), Social Support was assessed with items such as "When I have problems I discuss them with my partner or my friends." Social Support was also assessed in Chinese Coping Strategies (Siu et al., 2006), for example, "Discuss with my colleagues." In the SVF (*Stressverarbeitungsfragebogen*) 120 (Janke et al., 1997), Social Support was measured with items like "*... bitte ich jemanden, mir behilflich zu sein*" (in English "I ask someone to help me").

The CSS adapted the above items and four items were written to assess social support, such as "I seek advice and help from others (e.g., colleagues, superiors, relatives or friends)." and "I seek help from a professional."

7.2.5 Leisure and Relaxation

The view that leisure plays an important role in people's lives and coping with stress is mentioned in some literature on leisure (Coleman & Iso-Ahola, 1993; Dewe et al., 2010). Some scholars distinguished between the role leisure plays as a coping resource, where leisure participation can strengthen the companionship, friendship, and beliefs about the availability

of social support (Haworth & Lewis, 2005), and the role leisure acts as a coping strategy, where context-specific coping cognitions or behaviours will derive from leisure activities (Dewe et al., 2010). Iwasaki, Mactavish, and MacKay (2005) argued that leisure plays lots of parts in dealing with stress, including serving as a positive distraction or time-out, energizing and renewing, promoting of life balance, a resilience facilitator and the ability to deal with stress proactively.

Few coping scales used in published articles had a Leisure and Relaxation dimension as a coping strategy. In the Chinese Coping Strategies (Siu et al., 2006), only one single item is about relaxation, that is, "Take time to relax."

As supplement and refinement three items were created to measure leisure and relaxation in the CSS, such as "I try to make myself feel better by leisure activities (e.g., Music, TV, computer, games, travelling)." and "I relax through my interests and hobbies."

7.2.6 Religious Coping

Folkman and Moskowitz (2004) noted that researchers now pay more attention to religious coping and its role for individuals to find "meaning and purpose". Religious coping is a concept involves using individual's religious belief or life to deal with stressful situations (Aldwin & Levenson, 2013). It includes cognitive, emotional, or behavioural responses to stress in religious terms (Wortmann, 2013). Pargament (1997) argued that religious coping may achieve some purposes like closeness to God, hope, peace, comfort, finding meaning in life, strengthening association with others, personal restraint, and self-development.

Religious Coping was assessed in Coping Strategies Questionnaire (CSQ) (Rosenstiel & Keefe, 1983; Swartzman et al., 1994), for example, "I rely on my faith in God." It was also assessed in COPE inventory (Carver et al., 1989) and Brief COPE (Carver, 1997), such as "I seek God's help." "I've been trying to find comfort in my religion or spiritual beliefs." and "I've been praying or meditating."

These items above were adapted for the CSS and three items were generated to evaluate religious coping, such as "I try to find comfort in my religious beliefs." and "I pray to God."

7.2.7 Avoidance

Avoidance coping refers to cognitive and behavioural efforts involving denying, minimizing, or avoiding dealing directly with stressful encounters or events (Holahan, Moos, Holahan, Brennan, & Schutte, 2005). Coping strategies such as staying away from a stressful situation, distraction, disengagement, denial, and social withdrawal are common forms of avoidance coping (Nater, 2013).

Avoidance coping was evaluated in the revised Ways of Coping Questionnaire (Folkman et al., 1986), such as "Tried to make myself feel better by eating, drinking, smoking, using drugs or medication, etc." It was also assessed in the coping measure developed by HavLovic and Keenan (1991) with items such as "I accept the situation because there is little I can do to change it." (Rotondo et al., 2003). In Brief COPE (Carver, 1997) Avoidance coping was measured with two items, for example, "I've been turning to work or other activities to take my mind off things." In the SVF (*Stressverarbeitungsfragebogen*) 120 (Janke et al., 1997), Avoidance coping was measured with items like *"...versuche ich, meine Aufmerksamkeit davon abzuwenden"* (in English "I try to distract my attention") and *"...überlege ich, wie ich von nun an solchen Situationen ausweichen kann"* (in English "I think about how I can avoid such situations from now on").

Four items were written to measure avoidance coping in the CSS, such as "I do something (e.g., watching TV, reading, sleeping, shopping, traveling, smoking, drinking alcohol or using drugs) to think about the problems less." and "I occupy myself with something else to avoid thinking about the stressful situations."

7.2.8 Acceptance

According to Carver and his colleagues, acceptance is "a functional coping response, in that a person who accepts the reality of a stressful situation" (Carver et al., 1989, p. 270). By using acceptance coping, someone actually recognizes that a stressor exists, but has not taken any further action (Lazarus & Folkman, 1984b). As a relatively passive coping, acceptance coping can not exert an effect on the adjustive outcome (Ward & Kennedy, 2001). However, it is crucial to have the ability to accept situations and adapt to uncontrollable or unchangeable

events (Zoellner & Maercker, 2006).

In the revised Ways of Coping Questionnaire (Folkman et al., 1986), certain items could be regarded as Acceptance Coping, such as "Accept it, since nothing can be done." In the Brief COPE (Carver, 1997), Acceptance was measured with two items namely "I've been accepting the reality of the fact that it has happened." and "I've been learning to live with it." Acceptance was also assessed in Chinese Coping Strategies (Siu et al., 2006), for example, "Accept the reality without straining myself."

The CSS adapted the above items. Four items were written to assess acceptance coping, such as "I try to accept the reality." and "I learn to live with it."

7.2.9 Self-blame

Various studies have explored the relationship between self-blame and coping (Sholomskas, Steil, & Plummer, 1990). Primarily based on the study of Bulman and Wortman (1977) on the injured spinal cord (Sholomskas et al., 1990), self-blame has been regarded as useful for victims' adjustment to negative encounters in life and it has been found to be an indicator of poor adaptation to stress (Bolger, 1990; McCrae & Costa Jr, 1986).

In the revised Ways of Coping Questionnaire (Folkman et al., 1986), Self-blame was evaluated with items such as "Criticize or lecture myself." and "Realize I brought the problem on myself." The original COPE did not have a measure of Self-blame. In the Brief COPE by Carver (1997), Self-blame was measured with two items namely "I've been criticizing myself." and "I've been blaming myself for things that happened."

These items above were adapted for the CSS. Three items were written to assess self-blame, such as "I blame myself." and "I think it was my fault."

7.2.10 Problem-solving Coping

Problem solving is the process of discovering solutions to specific problems to achieve a certain goal (Reva, 2011). D'zurilla and Goldfried (1971) proposed to use problem-solving theory and studies in behaviour modification. In the past few decades, many studies have

explored the associations between problem-solving coping and psychological stress (D'zurilla & Sheedy, 1991).

In the revised Ways of Coping Questionnaire (Folkman et al., 1986), Problem-solving was evaluated with items such as “I made a plan of action and followed it.” and “Came up with a couple of different solutions to the problem.” In the Brief COPE (Carver, 1997), items like “I've been taking action to try to make the situation better.” and “I've been trying to come up with a strategy about what to do.” could be regarded as Problem-solving coping.

Four items were written to evaluate problem-solving coping in the newly developed CSS. For example, “I analyze the causes of the problem and find ways to solve the problem.”

7.3 Eight Studies to Develop and Validate the CSS

12 empirical studies have been performed to develop and validate a new coping measure named Coping with Stress Scale (CSS) as well as to examine its psychometric properties. These empirical studies were carried out in both China and Germany from May 2014 to January 2018. However, eight of them are more significant than the others. Thus, these eight empirical studies carried out from August 2014 to January 2018 are introduced in detail in this section. The internal consistency reliability, composite reliability, convergent validity, discriminant validity, and the model fit indices of the CSS among both Chinese and German samples will be provided.

Study 1 through Study 6 focus on creating and refining the CSS. As several coefficients of reliability were unacceptably low, the construct of the CSS was redefined with two dimensions (Acceptance Coping and Religious Coping) added. Some items were modified, removed or added, in an attempt to improve construct validity and factor reliability. Using data from 258 German samples and 253 Chinese samples respectively, studies 7 and 8 test the fit and the construct validity of the theoretical 10-factor model of the CSS with the software AMOS 22, compared to the competing 8-factor model, 7-factor model, and the independent model. Further tests for convergent validity, discriminant validity and reliability of the theoretical 10-factor model of the CSS were conducted with SmartPLS 3.

Initially created in English, the CSS has been translated from English into Chinese and German versions. In this process, the forward and back translations of the scale were carried out many times to ensure the meaning equivalence. The refinement and accuracy of each item in the English, German and Chinese version was discussed with at least two bilingual speakers, both native speakers and second-language students.

7.3.1 Study 1: Initial Development of the Items

7.3.1.1 Method

7.3.1.1.1 Participants

This survey was carried out from August 18, 2014 to March 29, 2015 in China. Participants were 34 employees consisted of 11 males (32.35%) and 23 females (67.65%) working at Chinese companies. 23.53% (N = 8) of them were less than 25 years old, 55.88% (N = 19) were 25 to 29 years old, 17.65% (N = 6) were 30 to 34 years old. 2.94% (N = 1) was 40 to 44 years old.

7.3.1.1.2 Measures

Based on the theoretical foundation stated above and extensive literature review, a preliminary 36-item CSS was written and pretested in China as the first version to represent the eight dimensions of coping (in the later studies, another two dimensions will be added).

7.3.1.1.3 Procedure

Originally created in English, the CSS was translated from English into Chinese version. This survey was conducted in Chinese. The guideline of the CSS is as follows (displayed in English):

> "The following 36 items are about the ways people cope with stress. How do you cope with stress? Some possible coping strategies are listed below. How often do you actually use them as ways of coping with stress at work? For each item please tick ONE box only."

Respondents answer on a five-point Likert-type scale, ranging from 1 to 5 in the following order: Never, Seldom, Sometimes, Often and Always, where "Never" is scored as 1, "Seldom" is scored as 2, "Sometimes" is scored as 3, "Often" is scored as 4, and "Always" is scored as 5. For example, the coping strategy "I relax with recreational activities" is listed as an item, whereby respondents should indicate how often they actually use it as a strategy to cope with stress at work.

7.3.1.1.4 Data Analysis

Reliability analysis was carried out by Cronbach's alpha (α) which indicates that to what extent the items within a scale measure the same underlying construct (Glasberg et al., 2006). A value of .70 or higher for alpha is widely accepted. Sometimes lower thresholds as .60 are also regarded acceptable (George & Mallery, 2003).

7.3.1.2 Results and Discussion

As several coefficients of reliability were unacceptably low, more than ten items were removed or modified.

Reliability analysis indicated that α value of Social Support will increase if an item was deleted. Therefore, the item "I seek help from a professional." was removed. Reliability analysis also indicated that α value of Leisure and Relaxation will increase if two items are deleted. The problem of these two items could be underpinned by misleading factors within the questionnaire survey, such as sentence lengthiness and bracketed examples. Thus, these two items "I reduce stress by using appropriate relaxing techniques (e.g., Breathing Techniques, Meditation, Visualization, Massage, Progressive Muscular Relaxation, Tai Chi boxing, Yoga or Hypnosis)." and "I try to make myself feel better by leisure activities (e.g., Music, TV, computer, games, travelling)." were respectively rewritten as new and concise ones "I relax with recreational activities." and "I reduce tension through leisure activities."

Lastly, 18 out of 36 items were chosen and refined as a new version scale. A shortened 18-item scale was created for the next study.

7.3.2 Study 2: Construct Redefining with Two Dimensions Added

7.3.2.1 Method

7.3.2.1.1 Participants

The survey was conducted from June 11 to July 4, 2015. Respondents were 100 employees working at Chinese companies. They worked 48.7 hours per week on average. 57.00% (N = 57) of them were male and 43.00% (N = 43) were female. 11.00% of them were less than 25 years old, 45.00% were 25 to 29 years old, 35.00% were 30 to 34 years old, 8.00% were 35 to 39 years old, 1.00% was 40 to 44 years old (see Table7.1).

Table 7.1: Demographic information of 100 Chinese employees

	China
Age	
≤ 24	11
25-29	45
30-34	35
35-39	8
40-44	1
≥ 45	0
Overall	100
Female	43
Male	57

7.3.2.1.2 Measures and Procedure

A shortened 18-item scale was used as the second version to assess the factor structure.

The website https://www.wjx.cn/ was used as the online website due to its simplicity and user-friendly interface. Both Chinese and German can be set as the survey language. Participants were asked to open the website and complete the survey questions on either smart phones or computers. The website was set to ensure that every participant finished the entire survey, without missing a question. Otherwise, the survey could not be submitted.

7.3.2.1.3 Data Analysis

To test the factor structure of the 18-item scale, a preliminary EFA was performed. The alpha factoring extraction and the direct oblimin factor rotation were applied to simplify the factor structure. The number of factors was established by scree plot analysis using eigenvalues larger than 1.0 (Faragher et al., 2004). Internal consistency reliability is assessed by calculating Cronbach's alpha.

7.3.2.2 Results and Discussion

The pattern matrix of factor loadings indicated that the factor structure of the 18-item scale was problematic, and some items loaded on two or more factors with lower loading on the intended factor but highest loading on the other factors (Cronin & Allen, 2017). Moreover, several coefficients were still unacceptably low. Thus, the construct of the CSS was redefined with two dimensions (Acceptance Coping and Religious Coping) added, and some lengthy items modified or reworded, appropriate additional items added in an attempt to improve factor reliability (Faragher et al., 2004). For example, “I try to change what I can change and adapt to what I can not change.” was replaced by a new and concise item “I try to adapt to what I can not change.”

An open-ended methodology was used at the end of the questionnaire survey by asking participants whether they have any other strategy except the 18 coping strategies mentioned above. After incorporating respondents’ feedback, another six coping strategies were generated and several items were modified. Altogether, 30 items were created to represent the 10 dimensions or subscales of coping (three items in each subscale).

7.3.3 Study 3: Modification of Several Items of Chinese Version

7.3.3.1 Method

7.3.3.1.1 Participants and Procedure

This survey took place in September 24 to 27, 2016. Participants were 21 students from

Shanghai University of Finance and Economics, China. 38.10% (N = 8) of them were males and 61.90% (N = 13) were females. 57.14% of them were less than 20 years old; 42.86% were 20 to 24 years old. Participants were told to open a website and complete the online questionnaire survey.

7.3.3.1.2 Measures and Data Analysis

The 30-item scale was used as the third version to test the factor structure and reliability. Although the use of student samples in empirical studies is usually discouraged, there are exceptions to this rule (Bello, Leung, Radebaugh, Tung, & Van Witteloostuijn, 2009). For example, when student data is "used in concert with comparable managerial samples to simultaneously explore differences in views and values within, as well as between, countries and cultures", the use of student samples could be regarded as acceptable (Bello et al., 2009, p. 363). Since the strategies for university students to cope with stress in their life and studies can be similar to the employees, the 30-item CSS was pretested with university students, the 30-item CSS was pretested with university students.

Internal consistency reliability was estimated by alpha-if-deleted values. The Cronbach reliability coefficients of two dimensions (α of Positive Thinking = .580, α of Avoidance = .481, N = 21) demonstrated to be unacceptably low.

7.3.3.2 Results and Discussion

Several items were modified or rewritten in an attempt to improve construct validity and factor reliability. For example, reliability analysis indicated that Cronbach alpha value of Avoidance coping will increase if an item was deleted. The problem of this item could be that the sentence was too lengthy and the bracketed examples were misleading factors for the participants in this questionnaire survey. Thus, the old item "I do something (e.g., watching TV, reading, sleeping, shopping, traveling, smoking, drinking alcohol or using drugs) to think about the problems less." was rewritten as a new and concise item "I do something else to distract my attention from the stressful events."

7.3.4 Study 4: Modification of Several Items of German Version

7.3.4.1 Method

7.3.4.1.1 Participants and Procedure

The survey was conducted from September 28 to October 10, 2016. Participants were 66 students at University of Bayreuth, Germany. They were interviewed face-to-face and then finished the paper-and-pencil version of survey questions. The sample consisted of 35 males (53.03%) and 31 females (46.97%).

7.3.4.1.2 Measures and Data Analysis

Originally created in English, the Coping with Stress Scale (CSS) was first translated from English into German version named *"Umgehen mit Stress"*. Then it was discussed with experienced researchers at a seminar. Items that were regarded to be confusing or ambiguous were removed or reworded. The 30-item German version CSS with refined wording was used as the fourth version to assess the factor structure and reliabilities.

A preliminary EFA was performed. The alpha factoring extraction and the direct oblimin factor rotation were conducted. The pattern matrix of factor loadings demonstrated that most of the items loaded on the intended factor. However, several items loaded on two or more factors with lower loading on its intended factor but highest loading on the others (Cronin & Allen, 2017).

Reliability analysis was also conducted by Cronbach's alpha.

7.3.4.2 Results and Discussion

Reliability analysis indicated that Cronbach coefficients of two dimensions (α of Positive Thinking = .384, α of Problem-solving =.420, N = 66) were unacceptably low. Thus, items of these two dimensions were reworded and rewritten respectively. The German item *"Ich sage mir selbst, dass ich etwas aus der stressigen Erfahrung lernen kann."* (in English "I tell myself that I can gain something from stressful experience.") was rewritten as *"Ich glaube,*

dass mit der Zeit alles gut werden wird." (in English "I believe that everything will turn out fine as time goes on."). Then, The German item "*Ich bemühe mich darum, das Problem zu lösen.*" (in English "I concentrate my efforts to solve the problem.") was rewritten as " *Ich entwickle einen Plan, um aus der stressigen Situation herauszukommen.*" (in English "I make a plan of action to get out of the stressful situation.").

Reliability analysis also indicated that Cronbach alpha value of Social Support would increase if an item was deleted. Thus, the old German item "*Ich hole mir Hilfe und Ratschläge von anderen ein (z.B. Kollegen, Vorgesetzten, Verwandten oder Freunden).*" which means "I seek advice and help from others (e.g., colleagues, superiors, relatives or friends)." was shortened as new one "*Ich hole mir Hilfe und Ratschläge von anderen ein.*" which means "I seek advice and help from others."

7.3.5 Study 5: Further Refinement of Wording of Chinese Version

7.3.5.1 Method

7.3.5.1.1 Participants and Procedure

This survey took place from October 12 to October 22, 2016. Respondents were 27 employees working at Chinese companies. They were invited to open a website and complete the online scale on either smartphones or computers.

7.3.5.1.2 Measures and Data Analysis

The fifth version of the 30-item scale with wording refined and items modified was used to evaluate the construct validity and factor reliability. Internal consistency reliability is evaluated by calculating Cronbach's alpha.

7.3.5.2 Results and Discussion

Reliability analysis indicated that Cronbach alpha value of Acceptance would increase if an item was deleted. The problem of the Chinese translation for the item "I learn to live with it" may be caused by item bias from poor translation. There is not a directly equivalent

translation for this sentence in Chinese language. The direct translation is not a common expression in Chinese. Thus, this item was replaced by "I try to accept the things I can not change" which is much easier to understand in Chinese context. According to dictionary, the expression, "Learn to live with something" means "Accept a new but unpleasant situation that someone can not change".

7.3.6 Study 6: Further Refinement of Wording of German Version

7.3.6.1 Method

7.3.6.1.1 Participants and Procedure

This survey was carried out from November 23, 2016 to July 3, 2017. Participants were required to finish the paper-and-pencil version of questionnaires. They were 40 employees working at German companies. 65.00% (N = 26) of them were male and 35.0% (N = 14) of them were female. 7.5% (N = 3) of them were less than 25 years old; 12.50% (N = 5) were 25 to 29 years old, 10.00% (N = 4) were 30 to 34 years old, 17.50 % (N = 7) were 35 to 39 years old, 17.50% (N = 7) were 40 to 44 years old, 35.00% (N = 14) were more than 44 years old.

7.3.6.1.2 Measures and Data Analysis

The 30-item German version scale with wording refined was used as the sixth version to assess the construct validity and factor reliability.

Reliability analysis was conducted to estimate the internal consistency of the dimensions.

7.3.6.2 Results and Discussion

According to some participants' suggestions, two German items of Religious Coping were refined. For example, "*Ich hole mir Hilfe von Gott*" which means "I seek help from God" in English was reworded as "*Ich hole mir Hilfe von Gott (Allah/Buddha/...)*" which means "I seek help from God (Allah/Buddha/etc.)". Due to people's religious differences, the item was reworded to incorporate God, Allah, Buddha, or the other supernatural powers. In this manner,

the survey would be indiscriminate against different religious preferences in our cross-cultural comparative study.

The 30-item German version CSS was created with wording refined to represent the 10 dimensions of coping for the next study. Then, it was translated into English and Chinese versions. Table 7.2 indicates the items and item wordings of the 30-item CSS in English. Until now, the German, English and Chinese versions of the 30-item CSS are ready for the validation with large sample size (N > 200).

7.3.7 Study 7: Validation of the CSS with German Samples

7.3.7.1 Method

7.3.7.1.1 Participants and Procedure

The survey was conducted from November 2016 to December 2017 in Germany. Respondents were 258 employees consisted of 135 males (52.33%) and 123 females (47.67%) working at German companies. 6.20% (N = 16) of them were less than 25 years old; 18.22% (N = 47) were 25 to 29 years old, 12.02% (N = 31) were 30 to 34 years old, 13.95 % (N = 36) were 35 to 39 years old, 17.05% (N = 44) were 40 to 44 years old, 32.56% (N = 84) were more than 44 years old. The same demographic information of 258 German employees has been presented in Table 6.2 (refer to section 6.3.5).

Survey questions were distributed either online or face-to-face. Participants could finish either the paper-and-pencil version or the online version at a website. The website was set to ensure that every participant completed the entire survey on smartphones or computers. Otherwise, the online survey could not be submitted.

7.3.7.1.2 Measures

The 30-item German version Coping with Stress Scale (*Umgehen mit Stress*) was used for this survey to assess the construct validity and factor reliability.

Table 7.2: Items and item wordings of the 30-item Coping with Stress Scale (CSS)

Future-oriented Coping (FOC)	
FOC_i1	I prepare for stressful situations that may occur in the future.
FOC_i12	I take preventive actions to avoid future problems or troubles.
FOC_i25	I think ahead and try to avoid stressful situations.
Positive Thinking (PT)	
PT_i2	I believe that everything will turn out fine as time goes on.
PT_i14	I try to see problems with a positive attitude.
PT_i30	I try to see problems optimistically and tell myself that situations are not worse than imagined.
Physical Exercises (PE)	
PE_i3	I do physical exercises.
PE_i16	I participate in sports activities.
PE_i28	I partake in fitness activities.
Social Support (SS)	
SS_i4	I seek comfort and understanding from someone.
SS_i11	I seek advice and help from others.
SS_i27	I talk to others about my problems or troubles.
Leisure and Relaxation (LR)	
LR_i5	I relax with recreational activities.
LR_i15	I relax through my interests and hobbies.
LR_i19	I reduce tension through leisure activities.
Religious Coping (RC)	
RC_i6	I try to find comfort in my religious beliefs.
RC_i13	I pray to God (Allah/Buddha/etc.).
RC_i22	I seek help from God (Allah/Buddha/etc.).
Avoidance (AVO)	
AVO_i7	I occupy myself with something else to avoid thinking about the stressful situations.
AVO_i17	I try to avoid thinking about the problems or troubles.
AVO_i24	I do something else to distract my attention from the stressful events.
Acceptance (ACC)	
ACC_i8	I try to accept the reality.
ACC_i18	I try to adapt to what I can not change.
ACC_i23	I try to accept the things I can not change.
Self-blame (SB)	
SB_i9	I blame myself.
SB_i21	I think it was my fault.
SB_i29	I criticize or accuse myself.
Problem-solving Coping (PSC)	
PSC_i10	I analyze the causes of the problem and find ways to solve the problem.
PSC_i20	I make a plan of action to get out of the stressful situation.
PSC_i26	I take active action to make the situation better.

7.3.7.1.3 Data Analysis

CFA was conducted with AMOS 22 to examine the fit and the construct validity of the theoretical 10-factor model (hypothesized model) of the CSS, using data from 258 employees working at German companies. Maximum likelihood estimation method was used to assess different models.

SmartPLS 3 was used to test the convergent validity, discriminant validity, Cronbach's alpha reliability, and composite reliability (CR) of the CSS.

In the process to develop a scale, it is necessary to test the fit of other plausible or competing models and compare it to the fit of the theoretical model (Cronin & Allen, 2017; Jackson et al., 2009). Thus, the theoretical 10-factor model (see Figure 7.1) was tested and compared to the competing 8-factor model, 7-factor model, and the independent model. The independence model is one which assumes that all variables are independent of one another (Knoll et al., 2005). The competing 8-factor solution (see Figure 7.2) and 7-factor solution (see Figure 7.3) sometimes emerged in the exploratory factor analysis (EFA).

Various indices need to be reported because there is no golden rule to assess model fit and different indices demonstrate a different aspect of model fit (Crowley & Fan, 1997; Hooper et al., 2008). Due to the sensitivity or often detrimental effect of sample size on GFI, it has become less popular to report GFI in recent years (Sharma, Mukherjee, Kumar, & Dillon, 2005). The following indices will be used to evaluate model fit: chi-square (x^2), chi-square statistic divided by degrees of freedom (x^2/df), IFI, TLI (also called NNFI), CFI, AGFI, SRMR, and RMSEA.

For a good model fit to the data, values of .90 or higher are generally considered as acceptable for the NFI, TLI (NNFI), CFI (Hu & Bentler, 1999; Mulaik et al., 1989; Schermelleh-Engel et al., 2003), and a value larger than .80 is regarded as acceptable for the AGFI (Anderson & Gerbing, 1984; Cole, 1987; Conners et al., 1998; Conners et al., 1997; Ferris et al., 2005; Gefen et al., 2000; Marsh et al., 1988). The IFI, TLI (NNFI), CFI, and AGFI range from 0 to 1 (Topcu & Erdur-Baker, 2010).

As chi-square is sensitive to sample size (Muenjohn & Armstrong, 2008; Ortega et al., 2007) and often inflated by large sample size (N > 200) (Ortega et al., 2007), the ratio of chi-square relative to the degrees of freedom (x^2/df) was often used to assess the overall fit of

the model. Jöreskog and Sörbom (2003) suggested that large x^2/df ratio indicates a poor fit, and small x^2/df ratio indicates a good fit (Cronin & Allen, 2017). Although there is no consensus on an acceptable ratio for x^2/df (Hooper et al., 2008), a lot of scholars have argued that a value less than 5 indicates acceptable model fit (Wheaton et al., 1977), and the values of 3 or less indicate adequate model fit (Byrne & Marsh, 1999).

A value of .06 or less for RMSEA implies a close fit, below .08 implies an acceptable fit, and over .10 is seen as a poor fit. A cutoff value close to .08 for SRMR indicates an acceptable fit (Ferris et al., 2005; Hu & Bentler, 1999).

7.3.7.2 Results and Discussion

In AMOS, the chi-square (x^2) value is labeled CMIN which means minimum chi-square (Garson, 2013). Modification Indices (MI) in AMOS provide a strategy to improve the fit of the tested models by correlating selected parameters within the models (Muenjohn & Armstrong, 2008).

To improve the model fit, correlations between error terms of items 2-14, 7-17 were added (Topcu & Erdur-Baker, 2010) (see Figure 7.1). In fact, the contents of these pairs are similar providing theoretical justification for the statistical findings (Topcu & Erdur-Baker, 2010).

An “i” before the Arabic numerals is short for “item”, for example, i2 means item 2. Similarly, e7 means error 7 as “e” is short for “error terms”. Error terms represent random error in measurement (Kline, 2011). Their regression weights in AMOS are constrained to “1”, a conventional value (Wang, 2014). The single-headed arrows mean paths of regression, and the double-headed arrows mean paths of covariance (Wang, 2014).

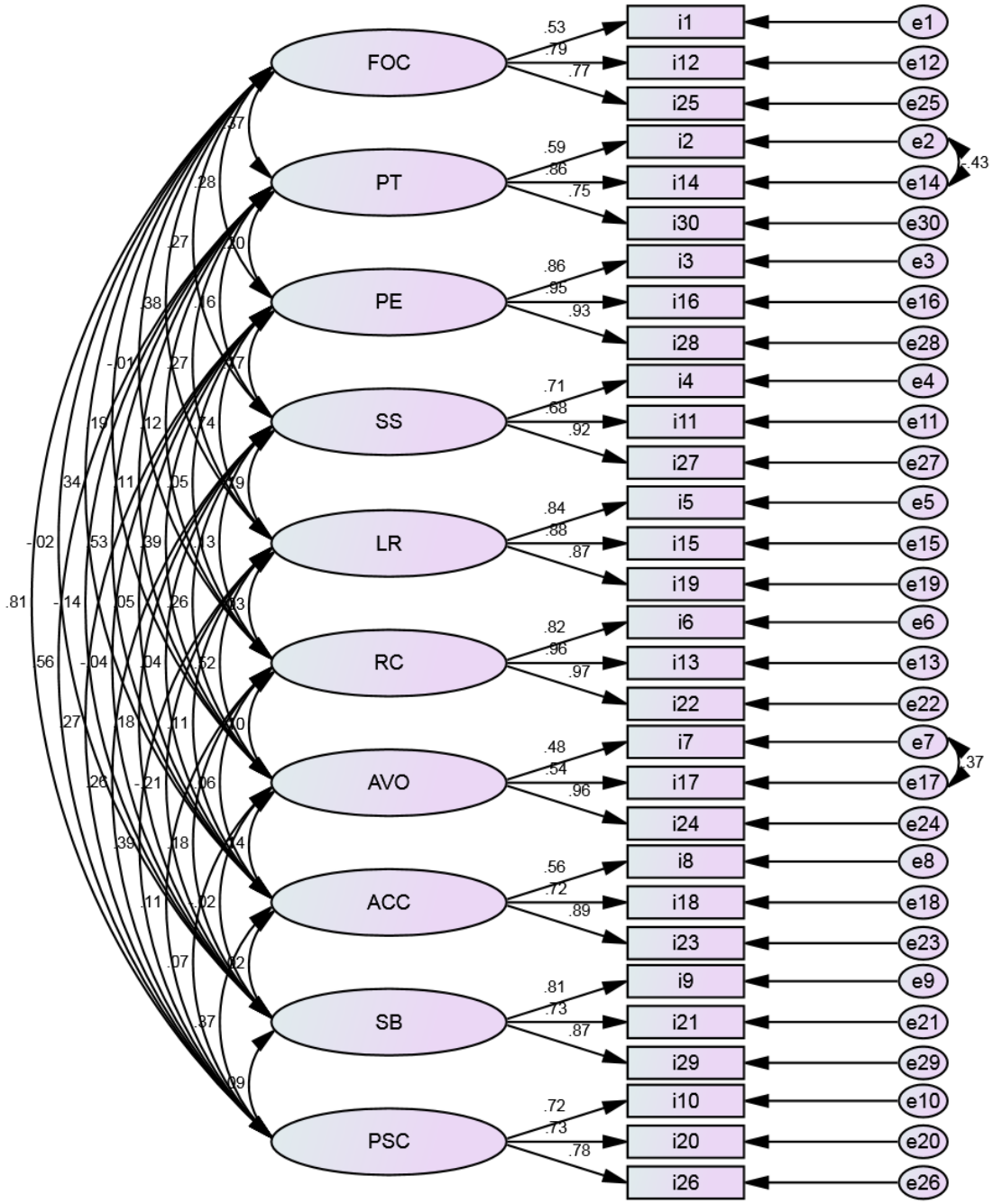

Figure 7.1: Confirmatory factor analysis for the theoretical 10-factor model in Study 7 (German sample, N = 258)

Note: FOC = Future-oriented Coping; PT = Positive Thinking; PE = Physical Exercises; SS = Social Support; LR = Leisure and Relaxation; RC = Religious Coping; AVO = Avoidance; ACC = Acceptance; SB = Self-blame; PSC = Problem-solving Coping.

Upon adding correlation between these terms (Topcu & Erdur-Baker, 2010), results of the CFA (see Table 7.3) indicated an acceptable model fit for the theoretical 10-factor model (x^2 = 670.556, x^2/df = 1.873, IFI = .930, TLI = .913, CFI = .929, AGFI = .815, SRMR = .0587, and RMSEA = .058). The competing 8-factor model results (x^2 = 730.006, x^2/df = 1.984, IFI = .919, TLI = .902, CFI = .917, AGFI = .803, SRMR = .0707, and RMSEA = .062) and 7-factor model results (x^2 = 738.889, x^2/df = 1.976, IFI = .918, TLI = .903, CFI = .917, AGFI = .805, SRMR = .0710, and RMSEA = .062) also indicated acceptable fit. However, results of the CFA indicated an unacceptable fit for the independent model (x^2 = 4821.521, x^2/df = 11.084, IFI = .000, TLI = .000, CFI = .000, AGFI = .000, RMR = .226, and RMSEA = .198) which meant that the independent model was rejected.

Table 7.3: Fit indices statistics for the independent model, 7-, 8-, and 10-factor models in Study 7

	x^2	x^2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Independent Model	4821.521	11.084	.000	.000	.000	.000	*	.198
7-factor Model	738.889	1.976	.918	.903	.917	.805	.0710	.062
8-factor Model	730.006	1.984	.919	.902	.917	.803	.0707	.062
Theoretical 10-factor Model	670.556	1.873	.930	.913	.929	.815	.0587	.058

Note: N = 258.

* RMR of Independent Model = .226. The SRMR was calculated in AMOS 22 via the plugin function Standardized RMR. However, there was no result for SRMR of Independent Model.

All the theoretical 10-factor model (see Figure 7.1), the 8-factor model (see Figure 7.2) and the 7-factor model (see Figure 7.3) met the standards to prove acceptable fit of the model. However, the theoretical 10-factor model was identified to be superior to the other models. It has provided better data fit indices and is more theoretically reasonable.

The current study confirmed that the construct validity of the 30-item CSS is established and the theoretical 10-factor model is the best representation of the underlying dimensionality (Ferris et al., 2005) among German samples. Subsequent sections of this dissertation will

cover the tests of cross-cultural equivalence of the CSS in German and Chinese cultural samples.

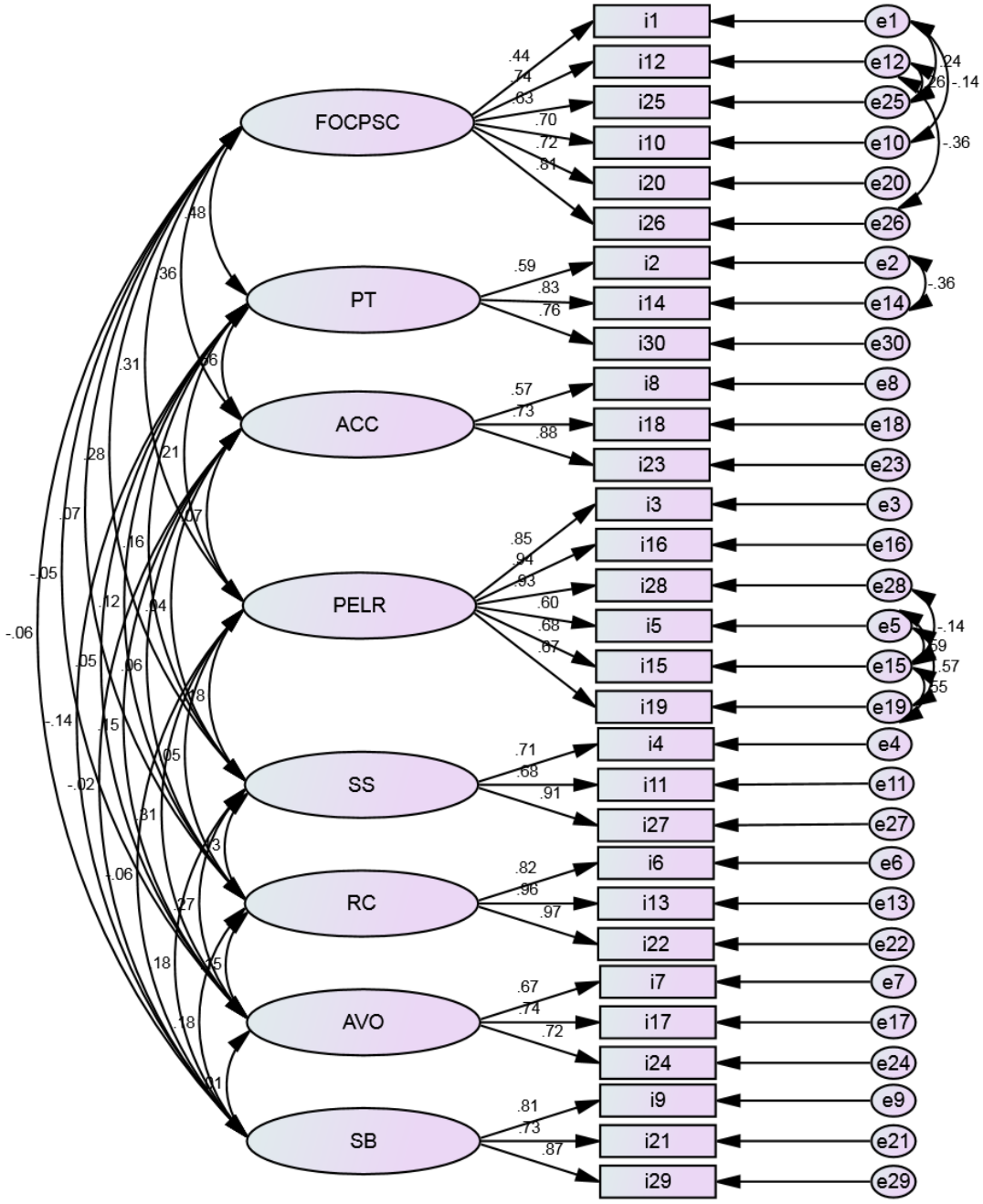

Figure 7.2: Confirmatory factor analysis for the 8-factor model in Study 7 (German sample, N = 258)

Note: FOCPSC = Future-oriented Coping + Problem-solving Coping; PT = Positive Thinking; ACC = Acceptance; PELR = Physical Exercises + Leisure and Relaxation; SS = Social Support; RC = Religious Coping; AVO = Avoidance; SB = Self-blame.

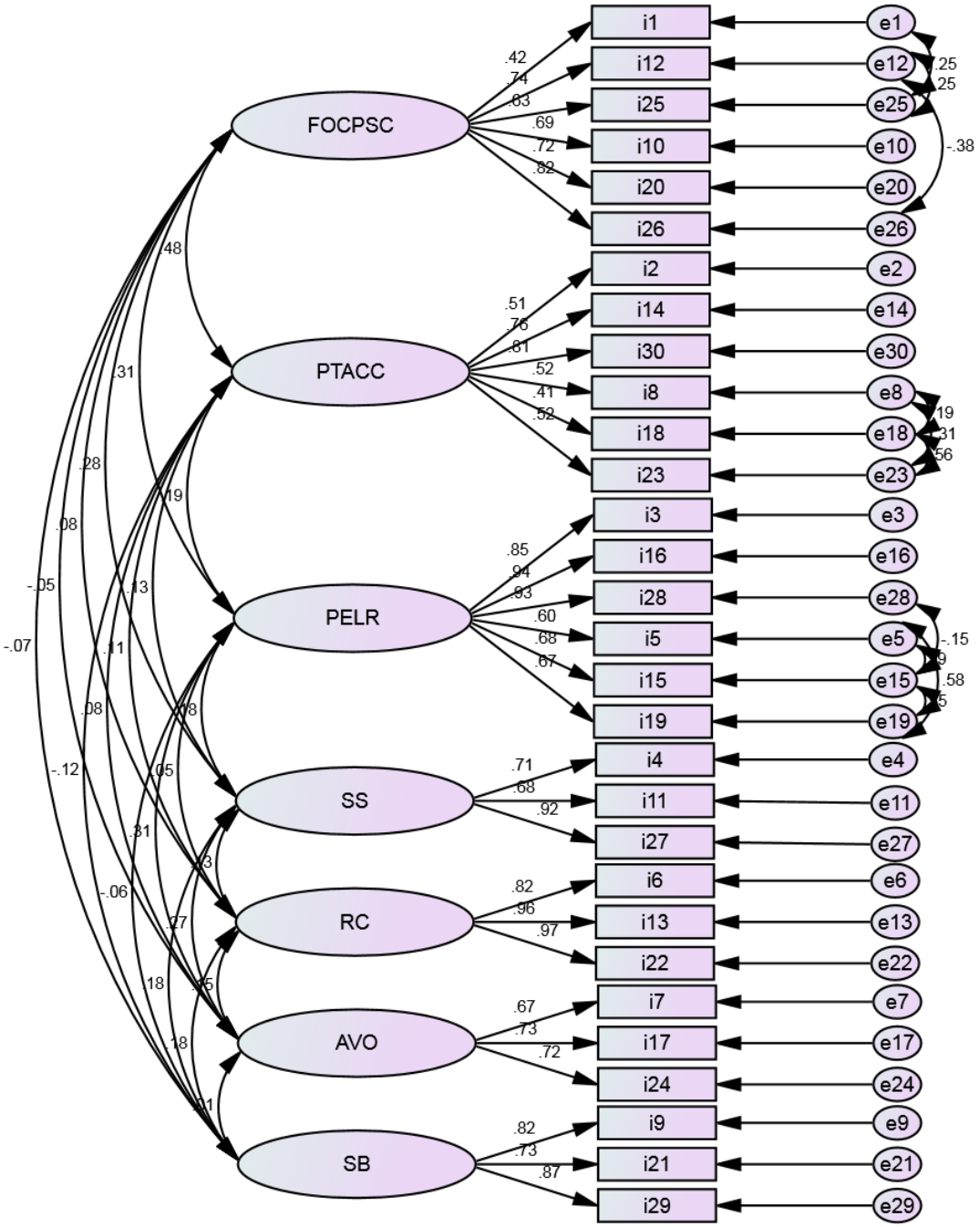

Figure 7.3: Confirmatory factor analysis for the 7-factor model in Study 7 (German sample, N = 258)

Note: FOCPSC = Future-oriented Coping + Problem-solving Coping; PTACC = Positive Thinking + Acceptance; PELR = Physical Exercises + Leisure and Relaxation; SS = Social Support; RC = Religious Coping; AVO = Avoidance; SB = Self-blame.

Further examinations for the validity of the theoretical 10-factor model (hypothesized model) of CSS were carried out with software SmartPLS 3. Evidence for convergent validity, discriminant validity, and reliability will be given.

Reliability is demonstrated by Cronbach's alpha and composite reliability (CR). Values of .700 or greater for Cronbach's alpha and composite reliability (CR) (Samar et al., 2017) are generally considered as acceptable. A rho_A value of .700 or greater is thought to be acceptable to demonstrate composite reliability (Wong, 2019). Table 7.4 demonstrates that the reliability of the German version CSS is acceptable.

Table 7.4: Construct reliability and validity of Coping with Stress Scale (N = 258)

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Acceptance	.752	.757	.858	.668
Avoidance	.749	.975	.842	.643
Future-oriented Coping	.740	.780	.850	.657
Leisure and Relaxation	.901	.903	.938	.835
Physical Exercises	.935	.937	.959	.885
Positive Thinking	.728	.763	.846	.649
Problem-solving Coping	.785	.786	.875	.700
Religious Coping	.940	.941	.962	.893
Self-blame	.846	.922	.902	.755
Social Support	.806	.853	.882	.714

Convergent validity assesses the extent to which there is correlation of two measures with the same concept (Hair et al., 2010). For the convergent validity, greater than .700 is considered to be satisfactory. Convergent validity is established by loadings greater than .700 and average variance extracted (AVE) greater than .500. Table 7.5 indicates that the convergent validity of the German version CSS is established as AVE of each subscale of the German version CSS is greater than .500.

Fornell-Larcker criterion was used to assess the discriminant validity. Discriminant

validity is the extent to which items are separated among constructs and measures different notions (Fornell & Larcker, 1981). It is established by the AVE's square root being over all of the inter-construct correlations (Hair et al., 2012). As illustrated by bold values on the diagonals in Table 7.5 based on the output of SmartPLS 3, the square root of the AVE is above the corresponding row and column values. It indicates that the measures are discriminated.

Discriminant validity can also be evaluated by testing the cross loading of the indicators (Hair Jr et al., 2016). This can be done through comparing the outer loadings of an indicator on the associated constructs, which is supposed to be larger than all of its loading on the other constructs (Ngah et al., 2015). Table 7.6 demonstrates that all the items evaluating a particular construct showed higher loading on the associated construct and lower loading on the other constructs which establishes discriminant validity.

Heterotrait-Monotrait Ratio (HTMT) is the newest method to test the discriminant validity. The main criterion to assess the HTMT relates to whether the HTMT ratio reaches 1.0. A value around 1.0 (or above 1.0) will be viewed as a discriminant validity violation, however a value of .85 or .90 is suggested by Henseler et al. (2015) as useful threshold value.

Similarly, a threshold HTMT value of .85 is suggested by Kline (2011) and of .90 is suggested by Gold et al. (2001). Table 7.7 demonstrates all HTMT values are lower than the suggested threshold value, indicating that discriminant validity of the German version CSS is established.

In summarization, all indices from the outputs of AMOS 22 indicate that the theoretical 10-factor model (hypothesized model) of CSS demonstrates acceptable fit to the data among Germany samples. All evidences from output of SmartPLS 3 indicate that both the convergent validity and discriminant validity of the German version CSS are established. Meanwhile, the Cronbach's alpha reliability and composite reliability (CR) of the German version CSS are acceptable. Thus far, the construct reliability and construct validity of the CSS has been demonstrated**.** The correlation between these 10 dimensions is moderate suggesting that they are related but distinct. These results support the model of CSS which includes ten distinct components in the German culture or context. Thus, both the reliability and the validity of CSS are established. CSS is a validated and reliable tool to measure coping strategies among Germany samples.

Table 7.5: Discriminant validity (Fornell-Larcker criterion) of Coping with Stress Scale (N = 258)

	Acceptance	Avoidance	Future-oriented Coping	Leisure and Relaxation	Physical Exercises	Positive Thinking	Problem-solving Coping	Religious Coping	Self-blame	Social Support
Acceptance	**.817**									
Avoidance	.122	**.802**								
Future-oriented Coping	.297	.103	**.810**							
Leisure and Relaxation	.149	.398	.321	**.914**						
Physical Exercises	.082	.300	.239	.684	**.941**					
Positive Thinking	.508	.081	.283	.225	.173	**.806**				
Problem-solving Coping	.340	-.017	.625	.333	.226	.427	**.836**			
Religious Coping	.037	.123	.012	.052	.076	.118	.098	**.945**		
Self-blame	-.020	.006	-.007	-.188	-.040	-.104	-.070	.151	**.869**	
Social Support	.052	.231	.255	.178	.163	.155	.242	.098	.137	**.845**

Table 7.6: Discriminant validity (cross loadings) of Coping with Stress Scale (N = 258)

	Acceptance	Avoidance	Future-oriented Coping	Leisure and Relaxation	Physical Exercises	Positive Thinking	Problem-solving Coping	Religious Coping	Self-blame	Social Support
ACC_i18	**.791**	.200	.253	.105	.064	.350	.177	-.027	.040	.078
ACC_i23	**.872**	.090	.239	.051	.033	.446	.281	.089	-.027	.013
ACC_i8	**.786**	.028	.238	.199	.100	.438	.355	.023	-.050	.041
AVO_i17	.142	**.770**	-.020	.201	.121	.046	-.100	.102	-.042	.113
AVO_i24	.120	**.912**	.174	.469	.375	.119	.074	.087	-.012	.232
AVO_i7	.007	**.710**	-.004	.148	.095	-.032	-.130	.140	.103	.185
FOC_i12	.240	.048	**.863**	.340	.239	.248	.591	-.008	-.044	.261
FOC_i25	.290	.103	**.866**	.233	.165	.293	.547	.013	-.053	.158
FOC_i1	.185	.119	**.690**	.186	.175	.119	.341	.033	.124	.201
LR_i15	.179	.394	.261	**.919**	.640	.233	.277	.069	-.208	.117
LR_i19	.127	.396	.298	**.915**	.649	.165	.322	.004	-.163	.180
LR_i5	.098	.296	.323	**.907**	.583	.221	.315	.071	-.142	.193
PE_i16	.041	.282	.232	.663	**.956**	.171	.209	.068	-.034	.145
PE_i28	.103	.297	.253	.647	**.949**	.161	.242	.040	-.053	.143
PE_i3	.086	.267	.189	.621	**.918**	.155	.184	.109	-.024	.173
PT_i14	.397	-.016	.286	.221	.170	**.857**	.511	.142	-.130	.117
PT_i2	.320	.152	.173	.214	.143	**.677**	.183	.047	-.036	.202
PT_i30	.507	.097	.208	.112	.102	**.869**	.278	.080	-.069	.075
PSC_i10	.325	-.093	.490	.244	.122	.391	**.812**	.056	-.044	.193
PSC_i20	.251	.092	.541	.324	.212	.349	**.836**	.082	-.091	.218
PSC_i26	.281	-.048	.537	.265	.229	.332	**.860**	.107	-.047	.196
RC_i13	.047	.113	.027	.038	.078	.095	.092	**.961**	.156	.104
RC_i22	.009	.117	-.028	.005	.028	.086	.088	**.962**	.178	.085
RC_i6	.051	.118	.034	.105	.110	.155	.097	**.911**	.093	.089
SB_i21	.056	-.025	-.020	-.115	.009	-.004	-.010	.042	**.777**	.100
SB_i29	-.052	-.014	.021	-.178	-.039	-.165	-.110	.128	**.918**	.118
SB_i9	-.016	.040	-.029	-.178	-.052	-.058	-.050	.182	**.905**	.136
SS_i11	.098	.188	.298	.179	.102	.195	.280	.025	.035	**.859**
SS_i27	.057	.237	.208	.172	.155	.144	.212	.133	.154	**.903**
SS_i4	-.074	.145	.093	.069	.180	-.001	.071	.103	.202	**.768**

Table 7.7: Discriminant validity (HTMT) of Coping with Stress Scale (N = 258)

	Acceptance	Avoidance	Future-oriented Coping	Leisure and Relaxation	Physical Exercises	Positive Thinking	Problem-solving Coping	Religious Coping	Self-blame	Social Support
Acceptance										
Avoidance	.181									
Future-oriented Coping	.395	.165								
Leisure and Relaxation	.174	.404	.383							
Physical Exercises	.096	.288	.285	.744						
Positive Thinking	.679	.162	.362	.280	.209					
Problem-solving Coping	.432	.165	.797	.395	.261	.534				
Religious Coping	.073	.160	.043	.064	.084	.135	.114			
Self-blame	.074	.080	.104	.205	.048	.107	.095	.150		
Social Support	.116	.273	.312	.199	.198	.236	.277	.118	.180	

7.3.8 Study 8: Validation of the CSS with Chinese Samples

7.3.8.1 Method

7.3.8.1.1 Participants and Procedure

This survey took place from October 2016 to January 2018 in China. Participants were 253 employees consisted of 120 males (47.43%) and 133 females (52.57%) working at Chinese companies. 11.86% of them were less than 25 years old; 29.25% were 25 to 29 years old, 32.02% were 30 to 34 years old, 9.09 % were 35 to 39 years old, 10.28% were 40 to 44 years old, 7.51% were more than 44 years old (see Table 7.8).

Table 7.8: Demographic information of 253 Chinese employees

	China
Age	
≤ 24	30
25-29	74
30-34	81
35-39	23
40-44	26
≥ 45	19
Overall	253
Female	133
Male	120

Participants could finish either the paper-and-pencil version or the online version at a website. The website settings ensured that the online survey could be submitted upon the completion of all questions.

7.3.8.1.2 Measures

30-item Chinese version Coping with Stress Scale (压力应对方式量表) was used for this survey to assess the construct validity and factor reliability. Originally created in English, the CSS was translated from English into Chinese. In this process, the forward and back

translations of the scale were carried out again and again to ensure the meaning equivalence.

7.3.8.1.3 Data Analysis

To further test the fit and construct validity of the theoretical 10-factor model (hypothesized model) of the CSS in Study 7, CFA was repeated in Study 8 with the software AMOS 22, using data from 253 employees working at Chinese companies. Maximum likelihood estimation method was conducted to evaluate different models. The theoretical 10-factor model was tested and compared to the competing 8-factor model, 7-factor model, and the independent model. The competing 8-factor solution and 7-factor solution sometimes emerged in the exploratory factor analysis (EFA).

Further tests for construct validity including convergent validity and discriminant validity of the CSS were performed with software SmartPLS 3. To assess reliability, Cronbach's alpha reliability and composite reliability (CR) were performed by SmartPLS 3.

7.3.8.2 Results and Discussion

Modification Indices (MI) in AMOS provide a strategy to improve the fit of the tested models (Muenjohn & Armstrong, 2008). Following the examination of the modification indices, correlation between error terms of items 2-30 were added to increase the model fit (Topcu & Erdur-Baker, 2010) (see Figure 7.4).

Staying consistent with Study 7, results of the CFA after the addition of these correlation terms (see Table 7.9) indicated an unacceptable fit for the independent model (x^2 = 4441.581, x^2/df = 10.211, IFI = .000, TLI = .000, CFI = .000, AGFI = .000, RMR = .249, and RMSEA = .191) which meant that the independent model was rejected. The results also indicated an acceptable model fit for the theoretical 10-factor model (x^2 = 670.080, x^2/df = 1.867, IFI = .924, TLI = .906, CFI = .922, AGFI = .808, SRMR = .0619, and RMSEA = .059). The competing 8-factor model results (x^2 = 776.309, x^2/df = 2.098, IFI = .900, TLI = .881, CFI = .899, AGFI = .791, SRMR = .0860, and RMSEA = .066) and 7-factor model results (x^2 = 789.975, x^2/df = 2.112, IFI = .898, TLI = .879, CFI = .896, AGFI = .789, SRMR = .0878, and RMSEA = .066) also indicated acceptable fit.

Table 7.9: Fit indices statistics for the independent model, 7-, 8-, and 10-factor models in Study 8

	x^2	x^2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Independent Model	4441.582	10.211	.000	.000	.000	.000	*	.191
7-factor Model	789.975	2.112	.898	.879	.896	.789	.0878	.066
8-factor Model	776.309	2.098	.900	.881	.899	.791	.0860	.066
Theoretical 10-factor Model	670.080	1.867	.924	.906	.922	.808	.0619	.059

Note: N = 253.

***** SRMR of Independent Model was not calculated (RMR of Independent Model = .249).

All the 10-factor model (see Figure 7.4), the 8-factor model (refer to Figure 7.2) and the 7-factor model (refer to Figure 7.3) met the standards to demonstrate acceptable fit of the model (Figures of the 8-factor model and 7-factor model in Study 8 will not be displayed here in order to save space, please see Figure 7.2 and Figure 7. 3 in Study 7 for reference). However, the 10-factor model was confirmed to be superior to the other models as it has provided better fit indices for data. Furthermore, it is more theoretically sound. The current study confirmed that the construct validity of the 30-item CSS is established and the theoretical 10-factor model is the best representation of the underlying dimensionality (Ferris et al., 2005) among Chinese samples. The tests of cross-cultural equivalence of the CSS in German and Chinese cultural samples will be conducted in the subsequent section.

Further evidence for reliability and validity including convergent validity and discriminant validity of the theoretical 10-factor model (hypothesized model) of the CSS will be provided by software SmartPLS 3. Reliability is confirmed by Cronbach's alpha and composite reliability (CR) values of .700 or greater. A rho_A value of .700 or larger is acceptable to demonstrate composite reliability (Wong, 2019). Table 7.10 indicates that the reliability of the Chinese version CSS is acceptable.

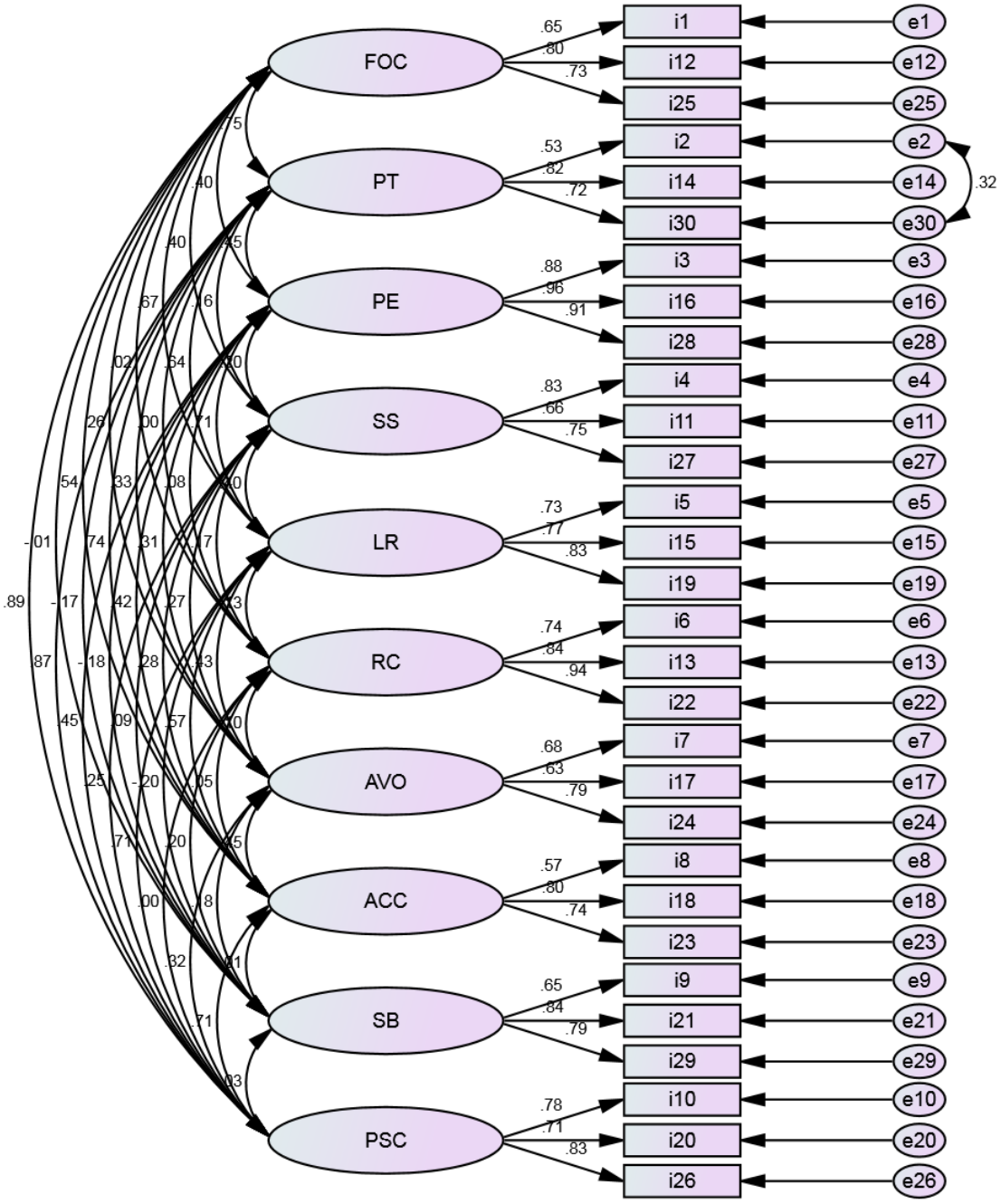

Figure 7.4: Confirmatory factor analysis for theoretical 10-factor model in Study 8 (Chinese Samples, N = 253)

Note: FOC = Future-oriented Coping; PT = Positive Thinking; PE = Physical Exercises; SS = Social Support; LR = Leisure and Relaxation; RC = Religious Coping; AVO = Avoidance; ACC = Acceptance; SB = Self-blame; PSC = Problem-solving Coping.

Table 7.10: Construct reliability and validity of Coping with Stress Scale (N = 253)

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Acceptance	.742	.773	.852	.659
Avoidance	.748	.831	.850	.656
Future-oriented Coping	.771	.797	.867	.684
Leisure and Relaxation	.817	.822	.891	.732
Physical Exercises	.940	.946	.962	.893
Positive Thinking	.768	.786	.865	.683
Problem-solving Coping	.817	.823	.891	.732
Religious Coping	.876	.921	.923	.800
Self-blame	.799	.869	.876	.703
Social Support	.786	.884	.867	.685

Convergent validity is achieved by loadings above .700 and AVE above .500 (Fornell & Larcker, 1981). Table 7.10 also indicates that the convergent validity of the Chinese version CSS is established.

Discriminant validity is achieved by the AVE's square root being over all of the inter-construct correlations (Hair et al., 2012). As illustrated in bold values on the diagonals in Table 7.11, the square root of the AVE is larger than the corresponding row and column values indicating the establishment of discriminant validity of the measures according to Fornell-Larcker Criterion.

Discriminant validity can also be evaluated by checking the outer loadings of an indicator on the related constructs. It is supposed to be larger than all of its loading on the other constructs (Ngah et al., 2015). Table 7.12 indicates that the discriminant validity of the constructs is achieved as all the items estimating a particular construct showed higher loading on that construct and lower loading on the other constructs.

The Heterotrait-Monotrait Ratio (HTMT) is another method to test discriminant validity (Samar et al., 2017). For HTMT value, Henseler et al. (2015) claimed .85 or .90 as useful

starting points. Similarly, a threshold of .85 is proposed by Kline (2011) and of .90 is suggested by Gold et al. (2001). Table 7.13 indicates that all HTMT values are lower than the suggested threshold value, indicating that discriminant validity of the German version CSS is established.

In summarization, all indices from the outputs of AMOS 22 indicate that the theoretical 10-factor model (hypothesized model) of CSS demonstrates acceptable fit to the data among Chinese samples. All evidences from output of SmartPLS 3 demonstrate that both the convergent validity and discriminant validity of the Chinese version CSS are established. Meanwhile, the Cronbach's alpha reliability and composite reliability (CR) of the Chinese version CSS are acceptable. So far, the construct reliability and construct validity of the CSS has been demonstrated. The correlations between these 10 dimensions are moderate suggesting that they are related but distinct. These results support the model of the CSS, including ten distinct components in the Chinese culture. Thus, both the reliability and the validity of CSS are established. CSS is a validated and reliable tool to measure coping strategies among Chinese samples.

Table 7.11: Discriminant validity (Fornell-Larcker criterion) of Coping with Stress Scale (N = 253)

	Acceptance	Avoidance	Future-oriented Coping	Leisure and Relaxation	Physical Exercises	Positive Thinking	Problem-solving Coping	Religious Coping	Self-blame	Social Support
Acceptance	**.812**									
Avoidance	.353	**.810**								
Future-oriented Coping	.406	.198	**.827**							
Leisure and Relaxation	.450	.335	.538	**.855**						
Physical Exercises	.357	.271	.332	.621	**.945**					
Positive Thinking	.560	.313	.564	.500	.396	**.826**				
Problem-solving Coping	.568	.264	.711	.588	.392	.666	**.856**			
Religious Coping	.046	.068	.038	.114	.101	.005	.005	**.895**		
Self-blame	-.003	.128	-.044	-.229	-.188	-.124	-.068	.164	**.838**	
Social Support	.279	.227	.368	.362	.174	.158	.283	.134	.101	**.828**

Table 7.12: Discriminant validity (cross loadings) of Coping with Stress Scale (N = 253)

	Acceptance	Avoidance	Future-oriented Coping	Leisure and Relaxation	Physical Exercises	Positive Thinking	Problem-solving Coping	Religious Coping	Self-blame	Social Support
ACC_i18	**.871**	.278	.373	.412	.281	.533	.518	.005	-.043	.239
ACC_i23	**.844**	.355	.397	.392	.340	.449	.507	.007	.030	.238
ACC_i8	**.710**	.209	.180	.272	.242	.364	.327	.133	.011	.201
AVO_i17	.244	**.772**	.092	.226	.187	.245	.196	.098	.061	.153
AVO_i24	.372	**.886**	.263	.367	.307	.325	.294	-.024	.080	.216
AVO_i7	.192	**.765**	.060	.161	.106	.144	.094	.157	.212	.174
FOC_i12	.442	.234	**.878**	.527	.353	.536	.646	.032	-.058	.344
FOC_i25	.313	.086	**.816**	.447	.221	.463	.612	.026	-.050	.261
FOC_i1	.219	.159	**.785**	.332	.230	.380	.489	.038	.012	.305
LR_i15	.429	.192	.469	**.865**	.487	.543	.555	.067	-.276	.257
LR_i19	.423	.380	.449	**.879**	.585	.382	.511	.166	-.126	.351
LR_i5	.292	.290	.464	**.822**	.523	.347	.436	.056	-.183	.326
PE_i16	.363	.268	.339	.616	**.962**	.394	.395	.074	-.194	.161
PE_i28	.352	.276	.317	.592	**.945**	.390	.375	.146	-.155	.208
PE_i3	.293	.220	.282	.548	**.928**	.337	.337	.066	-.186	.119
PT_i14	.532	.162	.533	.500	.316	**.843**	.656	.004	-.160	.188
PT_i2	.385	.316	.360	.331	.292	**.756**	.415	.026	-.041	.110
PT_i30	.453	.323	.483	.387	.374	**.876**	.547	-.014	-.089	.085
PSC_i10	.517	.153	.603	.533	.309	.555	**.855**	.009	-.077	.265
PSC_i20	.443	.280	.572	.431	.321	.515	**.823**	-.017	.056	.233
PSC_i26	.496	.248	.647	.540	.373	.632	**.888**	.018	-.138	.229
RC_i13	.015	.037	.029	.039	.064	-.035	-.035	**.908**	.172	.113
RC_i22	.059	.094	.003	.099	.066	.001	-.010	**.943**	.194	.113
RC_i6	.050	.043	.091	.194	.168	.062	.079	**.830**	.041	.143
SB_i21	.034	.123	-.024	-.139	-.128	-.107	.018	.125	**.838**	.053
SB_i29	.011	.140	.076	-.114	-.114	-.060	.042	.135	**.804**	.138
SB_i9	-.032	.081	-.111	-.274	-.205	-.129	-.163	.148	**.872**	.074
SS_i11	.327	.213	.388	.366	.136	.203	.367	.079	.124	**.881**
SS_i27	.131	.153	.212	.250	.156	.022	.121	.128	-.033	**.765**
SS_i4	.169	.185	.258	.250	.154	.107	.123	.153	.112	**.834**

Table 7.13: Discriminant validity (HTMT) of Coping with Stress Scale (N = 253)

	Acceptance	Avoidance	Future-oriented Coping	Leisure and Relaxation	Physical Exercises	Positive Thinking	Problem-solving Coping	Religious Coping	Self-blame	Social Support
Acceptance										
Avoidance	.437									
Future-oriented Coping	.496	.217								
Leisure and Relaxation	.562	.397	.663							
Physical Exercises	.422	.291	.379	.708						
Positive Thinking	.723	.399	.709	.616	.464					
Problem-solving Coping	.713	.308	.884	.714	.445	.821				
Religious Coping	.094	.146	.068	.152	.121	.054	.055			
Self-blame	.094	.193	.110	.257	.204	.148	.148	.182		
Social Support	.325	.279	.439	.433	.205	.168	.305	.176	.142	

7.4 Cross-cultural Equivalence Examinations of the CSS

It is vital to establish equivalence of the measures when psychological and work-related measures are used in cross-cultural studies. There will be no common basis to compare data across countries if there is an absence to establish cross-cultural equivalence will likely lead to bias conclusions (Buil et al., 2012).

To examine the cross-cultural equivalence of the Coping with Stress Scale (CSS) in German and Chinese cultural samples, Structural Equation Modeling (SEM) is employed. Confirmatory Factor Analysis (CFA) is a more advanced and scientifically oriented approach to examine equivalence (He & Van de Vijver, 2012). CFA can be performed with SEM softwares such as LISREL, Mplus and AMOS. When a CFA model demonstrates an acceptable fit, the hypothesized factor structure can be validated and therefore different levels of equivalence can be achieved (He & Van de Vijver, 2012).

Based on the theories on bias and equivalence in cross-cultural research (please refer to Chapter 5), the Construct Equivalence in a cross-cultural comparison is achieved if the multigroup CFA yields an acceptable fit. It means that the same theoretical construct is measured and the construct has the same connotation across groups (He & Van de Vijver, 2012; Van de Vijver & Tanzer, 2004). Measurement Unit Equivalence (Metric Equivalence) can be achieved if two metric measures have the same unit of measurement but different origins. That is to say, the scale of one measure is changed with a constant offset in comparison to the other measure (Van de Vijver & Tanzer, 2004). For example, the measurement of distance measured by kilometers and miles. Full Score Equivalence (Scalar Equivalence) can be achieved if two metric measures share the same measurement unit and also the same origin (Van de Vijver & Tanzer, 2004). Under these situations, the obtained scores can be compared directly.

According to the results in Study 7 and Study 8, all indices from the outputs of AMOS 22 indicate that the CSS (theoretical 10-factor model) demonstrates acceptable fit to the data among either Chinese samples or German samples (see Table 7.14). And the two versions of CSS share the same measurement unit and the same origin. Conclusively, the CSS has reached three equivalence levels (Construct Equivalence, Measurement Unit Equivalence, and Full Score Equivalence) across Chinese and German cultures. This also means that the

meanings of the CSS are conveyed in a very similar way among Chinese samples and German samples.

Table 7.14: Cross-cultural equivalence examinations of Coping with Stress Scale (theoretical 10-factor model) among German and Chinese samples

CFA in Study 7 (Chinese samples, N = 220)

	x^2	x^2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Theoretical 10-factor Model	670.556	1.873	.930	.913	.929	.815	.0587	.058

CFA in Study 8 (German samples, N = 253)

	x2	x2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Theoretical 10-factor Model	670.080	1.867	.924	.906	.922	.808	.0619	.059

In conclusion，Chapter 7 is the development and validation of the CSS with German and Chinese samples. First, it has discussed the practical needs to develop a coping scale. Then, it has described the theoretical framework and foundation of the CSS. Next, it has introduced eight studies to develop and validate the CSS. Finally, it has examined the cross-cultural equivalence with Chinese and German samples. The softwares including SPSS 22, Smart PLS 3 and Amos 22 were used to examine the factor structure, model fit, reliability, convergent validity, discriminant validity, and cross-cultural equivalence. All evidences indicate that both the convergent validity and discriminant validity of the CSS are established. Meanwhile, the Cronbach's alpha reliability (see Table 7.15) and composite reliability (CR) of the CSS are acceptable. The theoretical model demonstrates acceptable fit to the data. By contrast, most of the coping scales or questionnaires developed in Western countries are likely to become problematic when used in Chinese cultural society. The theoretical models often indicate a poor goodness of fit to the data, and the reliability coefficients of some subscales are often unacceptably low (Siu et al., 2006). However, the 30-item CSS developed in this research paper is a validated and reliable tool to measure coping strategies in both Chinese and

Western cultures (especially German culture). The CSS has been developed and validated in both China and Germany at the same time and with the same method. It has reached three equivalence levels across Chinese and German cultures.

Table 7. 15: Reliability statistics: Coping with Stress Scale (CSS)

Factors	Number of Items	Cronbach's α					
		Study 3 (Chinese Samples, N = 21)	Study 4 (German Samples, N = 66)	Study 5 (Chinese Samples, N = 27)	Study 6 (German Samples, N = 40)	Study 7 (German Samples, N = 258)	Study 8 (Chinese Samples, N = 253)
Future-oriented Coping	3	.701	.755	.772	.703	.740	.771
Positive Thinking	3	.580	.384	.637	.800	.728	.768
Physical Exercises	3	.944	.926	.969	.919	.935	.940
Social Support	3	.655	.817	.808	.706	.806	.786
Leisure and Relaxation	3	.850	.835	.813	.890	.901	.817
Religious Coping	3	.606	.891	.731	.957	.940	.876
Avoidance	3	.481	.553	.708	.710	.749	.748
Acceptance	3	.761	.685	.727	.707	.752	.742
Self-blame	3	.755	.830	.860	.865	.846	.799
Problem-solving Coping	3	.645	.420	.688	.803	.785	.817

Note: Due to the fact that the CSS in Study 1 and Study 2 was the preliminary version and was very different from the final version, reliability statistics will not show the Cronbach's α of each subscale in Study 1 and Study 2.

8 Development and Validation of the Health and Well-being Scale

This chapter will concentrate on the development and validation of the Health and Well-being Scale (HWS), including the introduction of this scale, the theoretical foundation of this scale, six empirical studies to develop and validate this scale, and the examinations of cross-cultural equivalence with German and Chinese samples.

8.1 Introduction

A lot of literature has focused on the health and well-being at workplace. Researchers have stated that work stressors can bring about negative results for employees' well-being (Lu et al., 2010). Many scales or questionnaires were developed to measure health and well-being. However, most of them were developed and validated in Western industrialized countries and most of the data came from English-speaking countries. They probably become problematic when used in Chinese cultural society. To overcome this problem, there are practical needs to develop a health and well-being scale that was empirically tested and validated in both Western and Chinese societies. It has to be a validated scale which has acceptable psychometric properties.

Based on the relevant literature, the Health and Well-being Scale (HWS) has been developed and then validated by several empirical studies in China and Germany. The HWS is designed to measure physical health and psychological well-being related to work stress.

The softwares including SPSS 22, Smart PLS 3 and Amos 22 were used to test the factor structure, reliability, convergent validity, discriminant validity, and cross-cultural equivalence.

8.2 Theoretical Foundation of the Health and Well-being Scale (HWS)

Stress is inevitable in our work and lives. When poorly managed, accumulated stress will affect our health and well-being (Jackson, 1999). It is generally accepted that the labor market is becoming more global and competitive, and there is often unrelenting pressure to boost productivity and increase profitability (Faragher et al., 2004). Consequently, the workplace is becoming more stressful and possibly less healthy for many companies and their employees (Faragher et al., 2004).

Prolonged periods of stress has harmful effects on employees' physical health and psychological/mental well-being, including effects on cardiovascular and gastrointestinal systems (Faragher et al., 2004; Zeller & Levin, 2013). To figure out job stress and its effect on people working in health care in northern Jordan, a socio-demographic questionnaire survey by Boran, Shawaheen, Khader, Amarin, and Hill Rice (2011) found that the most frequent health problems related to great stress were headaches (63%), irritability (58%), consuming more arousal drinks (e.g., coffee, cola) (56%), difficulty in concentrating (51%), chronic back pain (48%), and common colds (47%) (Boran et al., 2011, p. 145).

From the societal-level perspective, health and well-being includes two dimensions. It refers to "the actual physical health of workers, as defined by physical symptomatology and epidemiological rates of physical illnesses and diseases" (Danna & Griffin, 1999, p. 361) and also "the mental, psychological, or emotional aspects of workers as indicated by emotional states and epidemiological rates of mental illnesses and diseases" (Danna & Griffin, 1999, p. 361).

Various causes may influence physical health and psychological/mental well-being, and some of them are dispositional or personality-related factors, while others may be external factors such as home or work environment (O'Driscoll & Roche, 2015).

8.2.1 Physical Health

Physical health may be affected by working long hours because longer hours usually mean

more exposure to job demands, decreased time for recovery, and less activities for a healthy lifestyle (Cangiano & Parker, 2016). A lot of companies are constantly making reductions on their permanent employee numbers and preferring to sign short-term employment contracts, thus increasing employees' feelings of job insecurity. Retained employees are often being pushed to work unwillingly beyond their normal working hours, as managers try to efficiently increase productivity (Faragher et al., 2004).

Stress is related to many physical health problems like fatigue and heart disease (Haworth & Lewis, 2005; Houdmont & Leka, 2010). A lot of studies have reported that an increased susceptibility to cardiovascular disease has been linked to a high-strain job with high job demands and low job control (Houdmont & Leka, 2010; Karasek, 1979).

Fatigue is a major consequence of working long hours, and the physical and psychological issues resulting from long hours of work are mostly attributed to feelings of tiredness rather than the duration of the working day itself (O'Driscoll & Roche, 2015). Inadequate sleep can cause an increment in sympathetic nervous system activities thus lead to elevated blood pressure and heart rate (O'Driscoll & Roche, 2015).

8.2.2 Psychological Well-being

Well-being is a positive state associated with the emotional experience and the cognitive appraisal of our lives. As an important concept in positive psychology, well-being has been researched by many scholars including not only psychologists but also management, education, sociologists, and health specialists (Czerw, 2017; Deci & Ryan, 2008).

Stress is associated with not only physical health problems, but also some mental health problems (e.g., depression, eating disorders) (Haworth & Lewis, 2005; Houdmont & Leka, 2010). Prolonged periods of stress can lead to health problems like muscle tension, back pains, headaches, dizziness, tinnitus, weakness, burnout/exhaustion, irritability, worry, anxiety, depression, lack of confidence, sleep disturbances, gastrointestinal disturbances, and a general increased risk of illness (Boran et al., 2011; Faragher et al., 2004; Sparks, Faragher, & Cooper, 2001; Zeller & Levin, 2013).

Various empirical studies have shown that workers are often exposed to stress, anxiety, and depression if they work excessively long hours (e.g., over 60 hours per week) (O'Driscoll

& Roche, 2015). Stress is often the most widely used framework for comprehending employees' health and well-being as a subset of the interplays in their work environments (Spector & Goh, 2001; Tetrick, 2002). The Hordaland Health Study, a study of Norwegians by Kleppa, Sanne, and Tell (2008), investigated the correlation between working overtime and anxiety as well as depression and found that one reasonable answer for the positive correlation is that spending long hours in work induces maladaptive coping strategies like smoking, reduced participation in physical exercises, less adaptive lifestyles, and less opportunities to refresh themselves from work demands physically and psychologically (O'Driscoll & Roche, 2015).

Based on the literature above, the next section will focus on the development and validation of the Health and Well-being Scale (HWS) by several empirical studies with Chinese and German samples.

8.3 Six Studies to Develop and Validate the HWS

10 empirical studies have been carried out to develop and validate the Health and Well-being Scale (HWS) as well as to examine its psychometric properties. These empirical studies were carried out in both China and Germany from May 2014 to January 2018. However, six of them are more important than the others. Thus, these six empirical studies carried out from April 2015 to January 2018 will be thoroughly explained in this section.

The HWS has been translated from English into Chinese and German. The forward and back translations (English, German and Chinese versions) of the scale were carried out repeatedly to guarantee the meaning equivalence. The refinement and clarity of each item in the English, German or Chinese version was discussed with at least two bilingual speakers, such as German native speakers majoring in English, English native speakers majoring in German, and Chinese native speakers majoring in English and German.

The internal consistency reliability, composite reliability, convergent validity, discriminant validity, and the model fit indices of the HWS among both Chinese and German samples will be provided.

8.3.1 Study 1: Initial Items Development of Chinese Version

8.3.1.1 Method

8.3.1.1.1 Participants

This survey was conducted from April 6, 2015 to April 24, 2015 in China. Participants were 81 employees consisted of 32 males (39.51%) and 49 females (60.49%) working at Chinese companies. 11.11% (N = 9) of them were less than 25 years old; 59.26% (N = 48) were 25 to 29 years old, 19.75% (N = 16) were 30 to 34 years old, 6.17 % (N = 5) were 35 to 39 years old, 0.00% (N = 0) was 40 to 44 years old, 3.70% (N = 3) were more than 44 years old.

8.3.1.1.2 Measures

Based on the theoretical foundation stated above and extensive literature review, a preliminary 8-item Health and Well-being Scale (HWS) was written and pretested as the first version in China. Initially created in English, the HWS has been translated into Chinese version. There were repeated forward and back translations of the scale to ensure the meaning equivalence.

8.3.1.1.3 Procedure

This survey was conducted in Chinese. The guideline of the HWS is as follows (displayed here in English):

> "The following eight questions are about your health and well-being. For each question please tick ONE box with reference to your feelings in the past 6 months."

Respondents answer on a five-point Likert-type scale, ranging from 1 to 5 in the following order: Never, Seldom, Sometimes, Often and Always, where "Never" is scored as 1 and "Always" is scored as 5. For example, "How often have you had a headache?" is listed as an item. Respondents should indicate how often they have been exposed to headaches.

The website https://www.wjx.cn/ was used to publish the online questionnaire. Participants were asked to finish the questionnaire survey on either smart phones or computers. The website was set to ensure that every participant finished all the survey with no

question missed. Otherwise, the online questionnaire could not be submitted.

8.3.1.1.4 Data Analysis

To determine the factor structure of the 8-item scale, the explorative factor analysis (EFA) was done. A preliminary principal components analysis with varimax rotation was conducted. The number of factors was determined by scree plot analysis using the widely accepted value 1.0 as cut-off eigenvalue (Faragher et al., 2004).

8.3.1.2 Results and Discussion

A two-factor solution appeared that met the Kaiser-Guttman criterion of keeping only those factors with eigenvalues above 1.0 (Ferris et al., 2005). The rotated component matrix of factor loadings showed that three items loaded on two factors with lower loading on its intended factor but highest loading on the other factors (Cronin & Allen, 2017). Thus, the construct of the HWS was refined with one items reworded and two additional items added to the HWS in an attempt to improve the factor structure and factor reliability (Faragher et al., 2004). Specifically, two items “How often have you been dizzy?” and “How often have you had tinnitus?” were added and the item “How often have you felt tired?” was replaced with “How often have you felt weak?” Being tired is not specific because it can refer to either physically tired or mentally tired. At last, a 10-item scale was created for the next study.

8.3.2 Study 2: Items Refinement and Reliability Analysis of Chinese Version

8.3.2.1 Method

8.3.2.1.1 Participants and Procedure

The survey was launched from June 11, 2015 to July 26, 2016. Respondents were 185 employees working at Chinese companies. They worked 45.9 hours per week on average. 55.14% of them were male and 44.86% are female; 14.05% of them were less than 25 years old; 48.11% were 25 to 29 years old, 25.41% were 30 to 34 years old, 8.65% were 35 to 39

years old, 2.16% were 40 to 44 years old, 1.62% were more than 44 years old (see Table 8.1).

Table 8.1: Demographic information of 185 Chinese employees

	China
Age	
≤ 24	26
25-29	89
30-34	47
35-39	16
40-44	4
≥ 45	3
Overall	185
Female	83
Male	102

Participants were required to open a website and complete the survey questions on smart phones or computers. The website settings ensured that no questions were left unanswered by each participant.

8.3.2.1.2 Measures and Data Analysis

A 10-item scale was used as the second version to assess the factor structure. Reliability analysis was conducted by the most commonly quoted, Cronbach's alpha (α) coefficient (Glasberg et al., 2006). The widely accepted standard for alpha coefficient is .70 or higher. However, the values between .60 and .70 are sometimes considered as acceptable (George & Mallery, 2003).

8.3.2.2 Results and Discussion

Reliability analysis indicated that Cronbach reliability coefficients of two subscales (α of Physical Health = .781, α of Psychological Well-being =.787, N = 185) were all acceptable.

8.3.3 Study 3: Items Refinement and Reliability Analysis of German Version

8.3.3.1 Method

8.3.3.1.1 Participants and Procedure

This survey was carried out from January 13 to July 25, 2016. Survey questions were distributed by face-to-face talk after e-mail contact. Participants were 37 employees consisted of 27 males (72.97%) and 10 females (27.03%) working at German companies. None (N = 0) of them was less than 25 years old, 21.62% (N = 8) were 25 to 29 years old, 21.62% (N = 8) were 30 to 34 years old, 27.03 % (N = 10) were 35 to 39 years old, 8.11% (N = 3) were 40 to 44 years old, 21.62% (N = 8) were more than 44 years old.

Participants were asked to answer the German version Health and Well-being Scale (HWS) named *"Gesundheit und Wohlbefinden"*. Upon completion of a paper-and-pencil version survey, participants were also requested to check the items and find whether there was any grammar mistake or improper wording.

8.3.3.1.2 Measures and Data Analysis

First, the 10-item Health and Well-being Scale was translated into German version. In this process, the forward and back translations (English, German and Chinese versions) of the scale were carried out time and time again to ensure the meaning equivalence. Then, the German version scale was used to assess the reliabilities of the HWS with German samples. Reliability was calculated by Cronbach's alpha in SPSS 22.

8.3.3.2 Results and Discussion

Reliability analysis indicated that Cronbach reliability coefficients of two dimensions (α of Physical health = .619, α of Psychological Well-being = .686, N = 37) were all acceptable, however, they were not very satisfactory.

To improve the reliabilities of the two dimensions, the German item "*Wie oft haben Sie*

sich kraft- und antriebslos gefühlt?" (in English " How often have you felt weak and susceptible to disease?") was refined as *"Wie oft haben Sie sich kraftlos gefühlt?"* (in English "How often have you felt weak?"). Moreover, the item "*Wie oft haben Sie schlecht geschlafen?*" was replaced with "*Wie oft haben Sie Schlafmangel verspürt?*" according to German participants' suggestions. Most people see "bad sleep" and "lack of sleep" as something different. "I slept well, but too short!" is a very common reply, when German employees were asked about the quality of sleep.

8.3.4 Study 4: Further Reliability Analysis of German Version

8.3.4.1 Method

8.3.4.1.1 Participants and Procedure

The survey was launched from June 2 to July 4, 2017. Respondents were 48 employees consisted of 31 males (64.58%) and 17 females (35.42%) working at German companies. 6.25% (N = 3) of them were less than 25 years old; 16.67% (N = 8) were 25 to 29 years old, 14.58% (N = 7) were 30 to 34 years old, 14.58% (N = 7) were 35 to 39 years old, 16.67% (N = 8) were 40 to 44 years old, 31.25% (N = 15) were more than 44 years old. Participants were requested to open a website and answer survey questions on smart phones or computers. The website was set to ensure no questions were left unanswered by each participant.

8.3.4.1.2 Measures and Data Analysis

The 10-item German version scale (*Gesundheit und Wohlbefinden*) with wording refined was used to assess the reliabilities of the HWS with German samples. The internal consistency reliability was calculated by Cronbach's alpha.

8.3.4.2 Results and Discussion

The theoretical 2-factor model of the HWS is comprised of two dimensions, namely Physical Health (6 items) and Psychological Well-being (4 items). Reliability analysis showed that Cronbach reliability coefficients of the two dimensions (α of Physical Health = .610, α of

Psychological Well-being = .737, N = 48) were all acceptable. Thus, the 10-item German version HWS was ready for the next study to assess the construct validity and factor reliability. Table 8.2 is the items and item wordings of HWS displayed in English.

Table 8.2: Items and item wordings of Health and Well-being Scale (HWS)

Physical Health (PH)	
PH_i1	How often have you felt weak?
PH_i3	How often have you had a headache?
PH_i5	How often have you had dizziness?
PH_i7	How often have you had tinnitus?
PH_i9	How often have you felt a lack of sleep?
PH_i10	How often have you had poor appetite?
Psychological Well-being (PW)	
PW_i2	How often have you been irritable?
PW_i4	How often have you been worried?
PW_i6	How often have you felt a lack of confidence in yourself?
PW_i8	How often have you been stressed?

Studies 1 to 4 provided preliminary evidences for the factor structure and reliability analysis of the scale. It was necessary to confirm model fit and the factor structure with more samples because validity is an ongoing process (Cronin & Allen, 2017; DeVellis, 2016). Evidence for model fit indices, convergent validity and discriminant validity will be assessed during the subsequent studies (Cronin & Allen, 2017).

8.3.5 Study 5: Validation of the HWS with German Samples

8.3.5.1 Method

8.3.5.1.1 Participants and Procedure

This questionnaire survey was conducted from November 2016 to December 2017 in

Germany. Respondents were 258 employees working at German companies. 52.33% (N = 135) of them are male and 47.67% (N = 123) are female. 6.20% (N = 16) of them were less than 25 years old; 18.22% (N = 47) were 25 to 29 years old, 12.02% (N = 31) were 30 to 34 years old, 13.95 % (N = 36) were 35 to 39 years old, 17.05% (N = 44) were 40 to 44 years old, 32.56% (N = 84) were more than 44 years old. The same demographic information of 258 German employees has been presented in Table 6.2 (refer to section 6.3.5).

Questionnaires were distributed either online or face-to-face. Participants can finish either the paper-and-pencil version or the online version at a website. The website settings ensured that every participant finished all the survey on smart phones or computers with no questions left unanswered.

8.3.5.1.2 Measures

The 10-item German version Health and Well-being Scale *(Gesundheit und Wohlbefinden)* was used for this survey to assess the construct validity and factor reliability.

8.3.5.1.3 Data Analysis

To check the fit and the construct validity of the theoretical 2-factor model (10 items) of the German version HWS, CFA was performed with the software AMOS 22, using data from 258 employees working at German companies. Maximum likelihood estimation method was employed in order to evaluate different models.

For a newly created scale the factor loading should be not less than. 50 (Zainudin, 2012). Figure 8.1 shows that item 7 had a factor loading value of .35 and item 10 had a factor loading value of .37. To achieve unidimensionality state and better model fit (Nazim & Ahmad, 2013), these two items were removed from the theoretical 2-factor model. However, items 3 and 6 with factor loading value very close to .50 were kept (see Figure 8.2). Then, the 8-item German version HWS comprised of two subscales namely Physical Health (4 items) and Psychological Well-being (4 items) was ready for the CFA to assess the construct validity.

SmartPLS 3 was used for the further tests of convergent validity and discriminant validity of the theoretical 2-factor model (8 items) of the German version HWS. To assess reliability, Cronbach's alpha reliability and composite reliability (CR) were also calculated by

SmartPLS 3.

The theoretical 2-factor model (8 items) was tested and compared to the independent model, which assumes that all variables are independent of one another (Knoll et al., 2005).

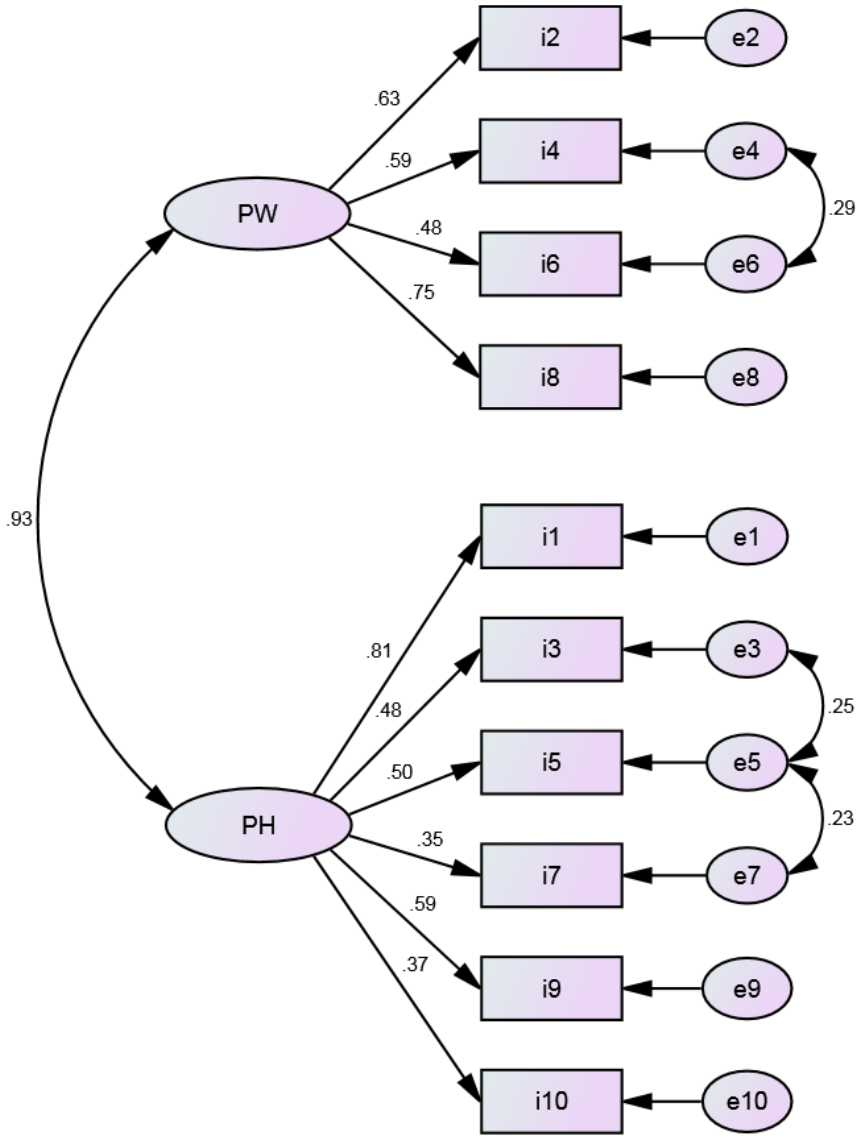

Figure 8.1: Confirmatory factor analysis for theoretical 2-factor model (10 items) in Study 5 (German sample, N = 258)

Note: PH = Physical Health; PW = Psychological Well-being.

As different indices demonstrate a different aspect of model fit (Crowley & Fan, 1997; Hooper et al., 2008). The following indices will be reported to test model fit: chi-square (x^2), chi-square statistic divided by degrees of freedom (x^2/df), IFI, TLI (NNFI), CFI, AGFI, SRMR, and RMSEA.

For a good model fit to the data, values of .90 or higher are generally considered to be acceptable for the NFI, TLI (NNFI), CFI, and a value over .80 is seen to be acceptable for the AGFI (Anderson & Gerbing, 1984; Cole, 1987; Conners et al., 1998; Conners et al., 1997; Ferris et al., 2005; Gefen et al., 2000; Marsh et al., 1988).

Many researchers suggest that the x^2/df ratio below 5 implies acceptable model fit (Wheaton et al., 1977), and the values of 3 or less indicate adequate model fit (Byrne & Marsh, 1999).

A value of .06 or less for RMSEA implies a close fit, below .08 is seen as an acceptable fit, and over .10 a poor fit. For SRMR, a cutoff value close to .08 is regarded as acceptable (Ferris et al., 2005; Hu & Bentler, 1999).

8.3.5.2 Results and Discussion

Modification Indices (MI) indicated that the fit of the tested model could be improved by correlating selected parameters within the models (Muenjohn & Armstrong, 2008). Thus, correlations between error terms of items 3-5, 4-6 were added to increase the model fit (Topcu & Erdur-Baker, 2010) (see Figure 8.2). In fact, the contents of these pairs are similar providing theoretical evidence for the statistical findings (Topcu & Erdur-Baker, 2010).

Here i2 means item 2 as “i” is short for “item” and e5 means error 5 as “e” is short for “error terms”. Error terms mean random error in measurement (Kline, 2011). Their regression weights in AMOS are constrained to “1”, a conventional value (Wang, 2014). The single-headed arrows mean paths of regression, and the double-headed arrows mean paths of covariance (Wang, 2014).

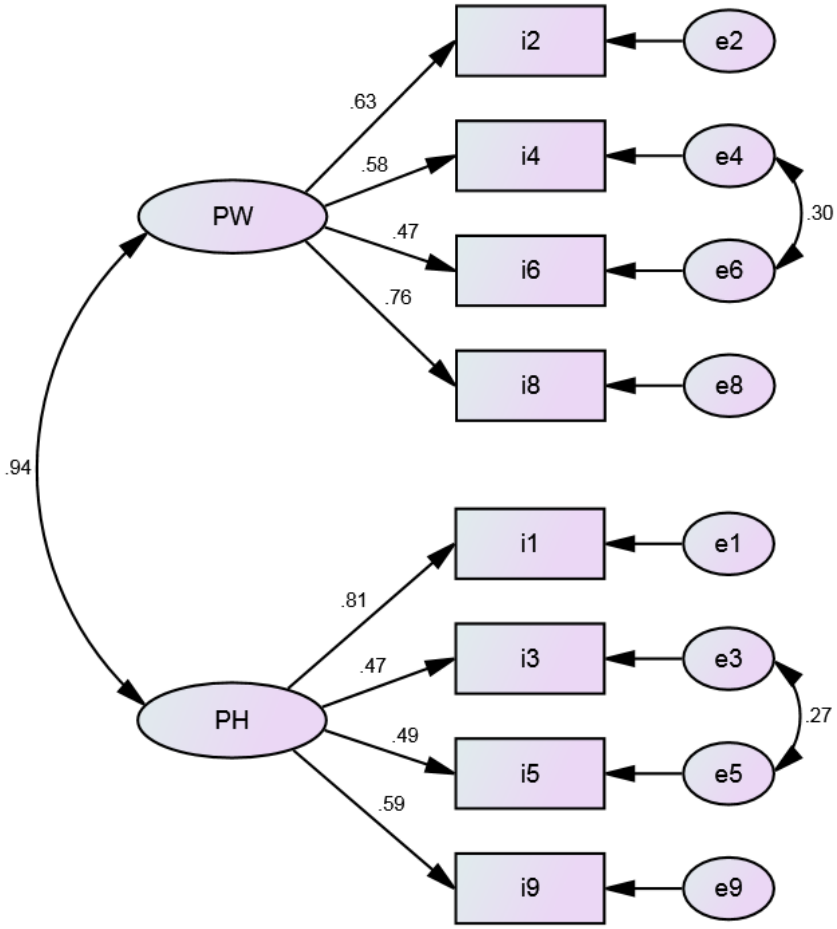

Figure 8.2: Confirmatory factor analysis for theoretical 2-factor model (8 items) in Study 5 (German sample, N = 258)

Note: PH = Physical Health; PW = Psychological Well-being.

Results of the CFA (see Table 8.3) indicated an acceptable model fit for the theoretical 2-factor model (8 items) (x^2 = 24.939, x^2/df = 1.467, IFI = .986, TLI = .977, CFI = .986, AGFI = .950, SRMR = .0369, and RMSEA = .043). Results of the CFA showed an unacceptable fit for the independent model (x^2 = 586.321, x^2/df = 20.940, IFI = .000, TLI = .000, CFI = .000, AGFI = .362, RMR = .273, and RMSEA = .279) which meant that the independent model was rejected and all variables are not independent of one another.

Table 8.3: Fit indices statistics for independent model and theoretical 2-factor model (8 items) in Study 5

	x^2	x^2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Independent Model	586.321	20.940	.000	.000	.000	.362	*	.279
Theoretical 2-factor Model (8 items)	24.939	1.467	.986	.977	.986	.950	. 0369	.043

Note: N = 258.

* RMR of Independent Model = .273. The SRMR was calculated in AMOS 22 via the plugin function Standardized RMR, however, there was no result for SRMR of Independent Model.

The theoretical 2-factor model (8 items) (see Figure 8.2) met the standards to demonstrate acceptable fit of the model. Thus, the current study confirmed that the construct validity of the 8-item HWS is established and the theoretical 2-factor model (8 items) is the best representation of the underlying dimensionality (Ferris et al., 2005). The examinations of cross-cultural equivalence of the 8-item HWS in German and Chinese cultural samples will be conducted in section 8.4 of this chapter.

Further examinations for the validity of the theoretical 2-factor model (8 items) of the HWS were conducted with software SmartPLS 3. Evidence for convergent validity, discriminant validity as well as reliability will be offered.

Values of .700 or bigger for Cronbach's alpha and CR are generally considered as acceptable. A rho_A value of .700 or greater is thought to be acceptable to demonstrate composite reliability (Wong, 2019). Table 8.4 shows that the reliability of the German version HWS is acceptable.

Convergent validity assesses that to what extent two measures are associated within the same concept (Hair et al., 2010). Convergent validity is confirmed by loadings over .700, and average variance extracted (AVE) over .500. Table 8.4 indicates that the convergent validity of the German version HWS is established, as AVE of each subscale of the German version HWS is greater than .500.

Table 8.4: Construct reliability and validity of the 8-item Health and Well-being Scale (N = 258)

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Physical Health	.706	.735	.818	.530
Psychological Well-being	.738	.750	.834	.558

Discriminant validity assesses that to what extent two similar concepts are distinct (Hair et al., 2010). It is established by the AVE's square root being above any of the inter-construct correlations (Hair et al., 2012). As illustrated by bold values on the diagonals in Table 8.5 based on the output of SmartPLS 3, the square root of the AVE is above the corresponding row and column values. It indicates that the measures are discriminated according to Fornell-Larcker Criterion.

Table 8.5: Discriminant validity (Fornell-Larcker criterion) of the 8-item Health and Well-being Scale (N = 258)

	Physical Health	Psychological Well-being
Physical Health	**.728**	
Psychological Well-being	.656	**.747**

Discriminant validity can also be assessed by testing the outer loadings of an indicator on the related constructs, which is expected to be larger than any of its loading on the other constructs (Ngah et al., 2015). Table 8.6 demonstrates that all the items evaluating a particular constructs showed higher loading on the associated construct and lower loading on the other constructs which establishes discriminant validity. In this table, "PH" is short for "Physical Health", "PW" is short for "Psychological Well-being".

Table 8.6: Discriminant validity (cross loadings) of the 8-item Health and Well-being Scale (N = 258)

	Physical Health	Psychological Well-being
PH_i1	**.824**	.611
PH_i3	**.672**	.387
PH_i5	**.693**	.424
PH_i9	**.714**	.447
PW_i2	.488	**.747**
PW_i4	.481	**.760**
PW_i6	.382	**.688**
PW_i8	.579	**.788**

The newest addition to the discriminant validity tests is the Heterotrait-Monotrait Ratio (HTMT), suggested by Henseler et al. (2015). The standard to assess the HTMT relates to whether the HTMT ratio reaches 1.0. A value around 1.0 (or above 1.0) will be viewed as a discriminant validity violation, whereas a value of .85 or .90 is suggested as useful threshold value (Henseler et al., 2015).

Similarly, Kline (2011) proposed a threshold of .85 for HTMT and Gold et al. (2001) suggested a threshold of .90. Table 8.7 shows that all HTMT values are smaller than the suggested threshold value, indicating that discriminant validity of the 8-item German version HWS is established.

Table 8.7: Discriminant validity (HTMT) of the 8-item Health and Well-being Scale (N = 258)

	Physical Health	Psychological Well-being
Physical Health		
Psychological Well-being	.876	

To sum up, all indices from the outputs of AMOS 22 show that the theoretical 2-factor model (8 items) of the Health and Well-being Scale (HWS) demonstrates acceptable fit to the data among Germany samples. All evidences from output of SmartPLS 3 show that both the convergent validity and discriminant validity of the German version HWS are established. Meanwhile, the internal consistency reliability (Cronbach's alpha) and composite reliability (CR) of the German version HWS are acceptable. So far, the construct reliability and construct validity of the HWS has been demonstrated. These results support the model of the HWS as including two distinct dimensions in the German culture or context. Thus, both the reliability and the validity of the HWS are established. The 8-item German version HWS is a validated and reliable tool to measure physical health and psychological well-being related to workplace stress among Germany samples.

8.3.6 Study 6: Validation of the HWS with Chinese Samples

8.3.6.1 Method

8.3.6.1.1 Participants and Procedure

This survey was carried out from October 2016 to January 2018 in China. Participants were 226 employees working at Chinese companies, consisted of 106 (46.90%) males and 120 females (53.10%). 11.95% (N = 27) of them were less than 25 years old; 29.20% (N = 66) were 25 to 29 years old, 31.86% (N = 72) were 30 to 34 years old, 9.29 % (N = 21) were 35 to 39 years old, 10.18% (N = 23) were 40 to 44 years old, 7.52% (N = 17) were more than 44 years old. The same demographic information of 226 Chinese employees has been presented in Table 6.8 (refer to section 6.3.6).

Questionnaires were distributed either online or face-to-face. Participants can finish either the paper-and-pencil version or the online version.

8.3.6.1.2 Measures

Initially developed in English, the HWS was translated into Chinese. Each version had forward and back translations to ensure the meaning equivalence. The 8-item Chinese version

Health and Well-being Scale (HWS) (健康和幸福感量表) was used for this survey to assess the construct validity and factor reliability.

8.3.6.1.3 Data Analysis

To further test the fit and the construct validity of the theoretical 2-factor model (8 items) of the HWS from Study 7, the confirmatory factor analysis (CFA) was repeated in Study 6 with the software AMOS 22, using data from 226 employees working at Chinese companies. Maximum likelihood estimation method was conducted to estimate different models. The theoretical 2-factor model (8 items) was tested and compared to the independent model. The independence model is one which assumes that all variables are independent of one another (Knoll et al., 2005).

To evaluate model fit, the following fit indices will be used: chi-square (x^2), chi-square statistic divided by degrees of freedom (x^2/df), IFI, TLI (NNFI), CFI, AGFI, SRMR, and RMSEA.

Further examinations for the convergent validity and discriminant validity of the theoretical 2-factor model (8 items) of the HWS were carried out with SmartPLS 3. In addition, internal consistency reliability (Cronbach's alpha) and composite reliability (CR) were also calculated with SmartPLS 3.

8.3.6.2 Results and Discussion

Modification indices suggested that adding correlation between error terms of items 1-3 would increase the model fit (see Figure 8.3).

Staying consistent with Study 5, results of the CFA (see Table 8.8) indicated an acceptable model fit for the theoretical 2-factor model (8 items) (x^2 = 31.274, x^2/df = 1.737, IFI=.983, TLI=.972, CFI=.982 AGFI =.932, SRMR = .0396, and RMSEA = .057). Results of the CFA also indicated an unacceptable fit for the independent model (x^2 = 778.777, x^2/df = 27.813, IFI = .000, TLI = .000, CFI = .000, AGFI = .247, RMR = .393, and RMSEA = .345) which meant that the independent model was rejected.

Table 8.8: Fit indices statistics for the independent model and 2-factor model (8 items) in Study 5

	x^2	x^2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Independent Model	778.777	27.813	.000	.000	.000	.247	*	.345
Theoretical 2-factor Model (8 items)	31.274	1.737	.983	.972	.982	.932	.0396	.057

Note: N = 226.

***** RMR of Independent Model = .393. The SRMR was calculated in AMOS 22 via the plugin function *Standardized RMR*, however, there was no result for SRMR of Independent Model.

The 2-factor model (8 items) (see Figure 8.3) met the standards to demonstrate acceptable fit of the model. Thus, it was confirmed by the current study that the construct validity of the 8-item HWS is established and the theoretical 2-factor model (8 items) is the best representation of the underlying dimensionality (Ferris et al., 2005) among Chinese samples. The tests of cross-cultural equivalence of the 8-item HWS in German and Chinese cultural samples will be performed in the subsequent section.

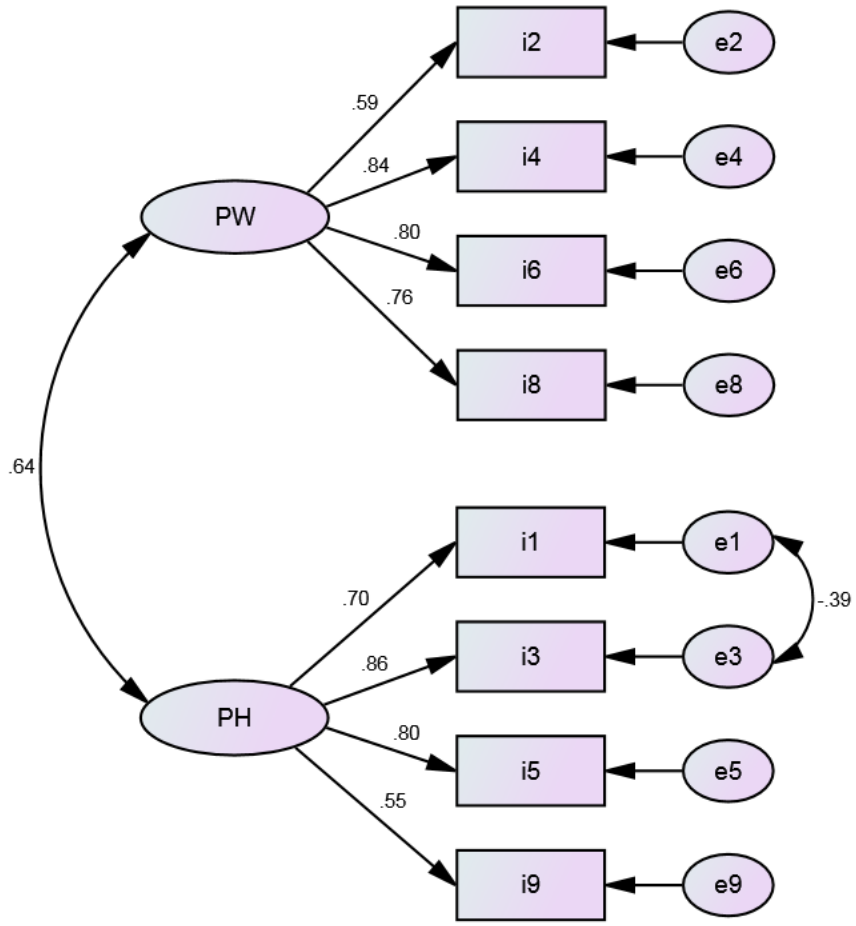

Figure 8.3: Confirmatory factor analysis for theoretical 2-factor model (8 items) in Study 5 (Chinese samples, N = 226)

Note: PH = Physical Health; PW = Psychological Well-being.

Further examinations for the validity of the theoretical 2-factor model (8 items) of the HWS were carried out with software SmartPLS 3. Evidence for convergent validity, discriminant validity together with reliability will be given.

Reliability is demonstrated by Cronbach's alpha and composite reliability (CR) values of .700 or larger. A rho_A value of .700 or larger is regarded as acceptable to demonstrate composite reliability (Wong, 2019). Table 8.9 indicates that the reliability of the Chinese version HWS is acceptable.

Table 8.9 also indicates that the convergent validity of the Chinese version HWS is established, as AVE of each subscale of the Chinese version HWS is greater than .500.

Table 8.9: Construct reliability and validity of the 8-item Health and Well-being Scale (N = 226)

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Physical Health	.799	.808	.870	.627
Psychological Well-being	.835	.863	.890	.670

Discriminant validity can be achieved by the AVE's square root being larger than any of the inter-construct correlations (Hair et al., 2012). Table 8.10 indicates that the AVE's square root, as illustrated by bold values on the diagonals, is larger than the corresponding row and column values indicating the establishment of discriminant validity of the measures according to Fornell-Larcker Criterion.

Table 8.10: Discriminant validity (Fornell-Larcker criterion) of the 8-item Health and Well-being Scale (N = 226)

	Physical Health	Psychological Well-being
Physical Health	**.792**	
Psychological Well-being	.568	**.819**

Discriminant validity can also be evaluated by comparing the outer loadings of an indicator on the associated constructs, which is supposed to be larger than all of its loading on the other constructs (Ngah et al., 2015). Table 8.11 shows that the discriminant validity of the constructs is achieved.

Table 8.11: Discriminant validity (cross loadings) of the 8-item Health and Well-being Scale (N = 226)

	Physical Health	Psychological Well-being
PH_i1	**.767**	.463
PH_i3	**.845**	.476
PH_i5	**.852**	.470
PH_i9	**.692**	.383
PW_i2	.315	**.685**
PW_i4	.543	**.876**
PW_i6	.488	**.862**
PW_i8	.475	**.837**

The Heterotrait-Monotrait Ratio (HTMT) is another way to test discriminant validity (Samar et al., 2017). Henseler et al. (2015) regarded .85 or .90 as useful starting points. Similarly, a threshold value of HTMT .85 is suggested by Kline (2011) and of .90 is suggested by Gold et al. (2001). Table 8.12 shows that all HTMT values are lower than the suggested threshold value, indicating that discriminant validity of the German version HWS is established.

Table 8.12: Discriminant validity (HTMT) of the 8-item Health and Well-being Scale (N = 226)

	Physical Health	Psychological Well-being
Physical Health		
Psychological Well-being	.679	

To sum up, all indices from the outputs of AMOS 22 show that the theoretical 2-factor model (8 items) of the HWS demonstrates acceptable fit to the data among Chinese samples. All evidences from output of SmartPLS 3 show that both the convergent validity and discriminant validity of the Chinese version HWS are established. Meanwhile, the internal

consistency reliability (Cronbach's alpha) and composite reliability (CR) of the Chinese version HWS are acceptable. So far, the construct reliability and construct validity of the HWS has been demonstrated**.** The correlation between these two subscales is moderate suggesting that these two subscales are related but distinct. These results support the model of the HWS as including two distinct dimensions in the German culture or context. Thus, both the reliability and the validity of HWS are established. HWS is a validated and reliable tool to measure physical health and psychological well-being related to workplace stress among Chinese samples.

8.4 Cross-cultural Equivalence Examinations of the HWS

In cross-cultural comparisons, it has become common to examine not only the reliability and validity, but also the equivalence (or lack of bias) of measures (He & Van de Vijver, 2012). When psychological and work-related measures are used in cross-cultural studies, it is pivotal to establish equivalence or comparability of the measures, because there will be no common basis to compare data across countries if there is an absence of equivalence (Beuckelaer et al., 2007).

To examine the cross-cultural equivalence of the Health and Well-being Scale (HWS) in German and Chinese samples, Structural Equation Modeling (SEM) is employed. As an applications of SEM to examine equivalence (Van de Vijver & Leung, 1997; Wang, 2014), Confirmatory Factor Analysis (CFA) can be carried out with SEM softwares such as LISREL, Mplus and AMOS. When a CFA model indicates an acceptable fit, it means that the proposed factor structure can be confirmed, therefore different levels of equivalence can be achieved (He & Van de Vijver, 2012).

According to the theories on bias and equivalence in cross-cultural studies (please refer to Chapter 5), the Construct Equivalence is achieved when the multigroup CFA yields an acceptable fit. This means that the same theoretical construct is measured and the construct has the same connotation across different cultural groups (He & Van de Vijver, 2012; Van de Vijver & Tanzer, 2004). The Measurement Unit Equivalence (Metric Equivalence) can be achieved if two metric measures have the same unit of measurement but different origins. That is to say, the scale of one measure is changed with a constant offset when compared one

measure to the other (Van de Vijver & Tanzer, 2004). An example can be given in the measurement of speed measured by miles per hour and meters per second. The Full Score Equivalence (Scalar Equivalence) is achieved if two metric measures have the same measurement unit and also the same origin (Van de Vijver & Tanzer, 2004). Under these situations, the obtained scores can be directly compared as they are bias free.

Based on the reports in Study 5 and Study 6, all indices from the outputs of AMOS 22 show that the 8-item HWS demonstrates acceptable fit to the data among either German samples or Chinese samples (see Table 8.13). At the same time, the two versions of HWS have the same measurement unit and the same origin. Therefore, the HWS have reached three equivalence levels (Construct Equivalence, Measurement Unit Equivalence, and Full Score Equivalence) across German and Chinese cultures. This also means that the meanings of the HWS are conveyed in a very similar way among German samples and Chinese samples.

Table 8.13: Cross-cultural equivalence examinations of Health and Well-being Scale (theoretical 2-factor model, 8 items) among German and Chinese samples

Confirmatory factor analysis in Study 5 (German samples, N = 258)

	x^2	x^2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Theoretical 2-factor Model (8 items)	24.939	1.467	.986	.977	.986	.950	. 0369	.043

Confirmatory factor analysis in Study 6 (Chinese samples, N = 226)

	x2	x2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Theoretical 2-factor Model (8 items)	31.274	1.737	.983	.972	.982	.932	.0396	.057

In conclusion，Chapter 8 has focused on the development and validation of the HWS with German and Chinese samples, including the theoretical foundation of the HWS, six empirical studies to develop and validate the HWS, and the cross-cultural equivalence examinations with German and Chinese samples. The softwares SPSS 22, Smart PLS 3 and

Amos 22 were used to examine the factor structure, reliability, convergent validity, discriminant validity, and cross-cultural equivalence. All evidences show that both the convergent validity and discriminant validity of the HWS are established. Meanwhile, the internal consistency reliability (Cronbach's alpha) and composite reliability (CR) of the HWS are acceptable. Thus, both the reliability (see Table 8.14) and the validity of HWS are established. HWS is a validated and reliable tool to measure physical health and psychological well-being related to workplace stress in both Chinese society and German society. At the same time, the HWS have reached three equivalence levels in German and Chinese cultures.

Table 8. 14: Reliability statistics: Health and Well-being Scale (HWS)

Factors	Number of Items	Cronbach's α				
		Study 2 (Chinese samples, N = 185)	Study 3 (German samples, N = 37)	Study 4 (German samples, N = 48)	Study 5 (German samples, N = 258)	Study 6 (Chinese samples, N = 226)
Physical Health	6 or 4	.781 (6 items)	.619 (6 items)	.610 (6 items)	.706 (4 items)	.799 (4 items)
		.713 (4 items)	.665 (4 items)	.647 (4 items)		
Psychological Well-being	4	.787	.686	.737	.738	.835

Note: Due to the fact that the HWS in Study 1 was the preliminary version and was very different from the final version, reliability statistics will not show the Cronbach's α of each subscale in Study 1.

9 Development and Validation of the Job Satisfaction Scale

This chapter is the development and validation of the Job Satisfaction Scale (JSS). First, it introduces the background of the JSS. Then, it describes the theoretical foundation of the JSS. Next, it introduces six empirical studies to develop and validate the JSS. Finally, it gives the examinations of Cross-Cultural Equivalence with German and Chinese samples.

9.1 Introduction

Job satisfaction is a widely used term in organizational studies (Agarwal & Sajid, 2017) as well as in daily life, however, there is still no consensus as regards its definition (Aziri, 2011). Different researchers have proposed various definitions of job satisfaction (Aziri, 2011).

Locke (1976) defined it as the pleasant and enjoyable feelings that an employee gets fulfilling one's important job values. Edwards, Bell, Arthur, and Decuir (2008) described that job satisfaction is a measure of the degree of affective and mental enjoyment an individual received from the job. According to Spector (1997, p. 2), job satisfaction is the degree to which individuals like (satisfaction) or dislike (dissatisfaction) their jobs. Spector's definition is one of the most widely cited ones (Aziri, 2011).

Some researchers have studied the features of different job satisfaction scales and found that most of the job satisfaction scales have noteworthy limitations (Bowling et al., 2018). Some scales were developed and validated in only one culture and some scales assess an employee's overall job satisfaction by using a single item.

In this chapter, a new multi-item scale to assess job satisfaction will be developed and empirically validated in both Western and Chinese societies. This scale was named Job

Satisfaction Scale (JSS). Specificly speaking, the JSS is developed to assess the extent to which an employee feels satisfied or dissatisfied with his or her job.

The softwares SPSS 22 and Amos 22 will be used to test the factor structure, reliability, construct validity, and cross-cultural equivalence.

9.2 Theoretical Foundation of the Job Satisfaction Scale (JSS)

Although there is no gold standard to assess job satisfaction (Kawada & Yamada, 2012), some scholars argued that job satisfaction can be conceptualized and assessed by two general approaches: the global one and the facet one (Bowling et al., 2018; Dalal, 2013; Judge, Parker, Colbert, Heller, & Ilies, 2001).

Global satisfaction measures evaluate an employee's overall attitude toward the job (Bowling et al., 2018) by using a single item (Neto & Fonseca, 2018). Such examples are items "Overall how satisfied or dissatisfied are you with your job?" (Warr & Inceoglu, 2012) and "Considering all aspects of this job, how satisfied are you with the job?" (Chowhan, Zeytinoglu, & Cooke, 2016). However, it is difficult to identify the internal consistency reliability of the construct (Neto & Fonseca, 2018) when a single item is used to assess an employee's overall job satisfaction. This is one of the limitations of single-item job satisfaction scales.

Facet satisfaction measures evaluate an employee's attitude toward specific aspects of the job (Bowling et al., 2018) by asking about separate aspects of satisfaction with key factors (e.g., pay, colleagues, and supervisor) (Neto & Fonseca, 2018; Warr, Cook, & Wall, 1979; Warr & Inceoglu, 2012). Different factors such as pay, benefits, rewards, superior-subordinate relationships, human resource regulations, promotion opportunities can affect a worker's job satisfaction (Agarwal & Sajid, 2017; Kanwar et al., 2012). Bowling et al. (2018) stated that the Job Descriptive Index assesses a worker's job satisfaction from five facets, namely satisfaction with job itself, supervision, coworkers, pay, and promotion opportunities. Similar facets are also evaluated by the Minnesota Satisfaction Questionnaire and the Job Satisfaction Survey (Bowling et al., 2018).

After studying the features of different job satisfaction scales, some researchers pointed out that many of the job satisfaction scales have noteworthy limitations (Bowling et al., 2018). For example, some scales developed and validated in Western countries tend to become problematic when used in Chinese cultural context. The theoretical models often indicate a poor goodness of fit to the data, and the reliability coefficients of some subscales are often unacceptably low.

The next section will concentrate on the development and validation of a new multi-item scale named Job Satisfaction Scale (JSS) based on some empirical studies in both Chinese culture and German culture.

9.3 Six Studies to Develop and Validate the JSS

10 empirical studies were conducted to develop and validate the JSS as well as to examine its psychometric properties. These empirical studies were carried out in both China and Germany from May 2014 to January 2018. However, six of them are more significant than the others. Thus, these six empirical studies carried out from April 2015 to January 2018 will be introduced in detail.

Originally created in English, the JSS was translated from English into Chinese and German versions. The forward and back translations (English, German and Chinese versions) of the scale were carried out repeatedly to ensure the meaning equivalence.

The refinement and clarity of each item in the English, German or Chinese version was discussed with at least two bilingual speakers, such as German native speakers majoring in English, English native speakers majoring in German, and Chinese native speakers majoring in English and German.

The internal consistency reliability, construct validity, and the model fit indices of the JSS among both Chinese and German samples will be provided.

9.3.1 Study 1: Initial Items Development of Chinese Version

9.3.1.1 Method

9.3.1.1.1 Participants

This survey was conducted from April 6, 2015 to July 4, 2015 in China. Participants were 181 employees working at Chinese companies. They were 89 males (49.17%) and 92 females (50.83%). 11.05% (N = 20) of them were less than 25 years old, 51.38% (N = 93) were 25 to 29 years old, 28.18% (N = 51) were 30 to 34 years old, 7.18 % (N = 13) were 35 to 39 years old, 0.55% (N = 1) were 40 to 44 years old, 1.66% (N = 3) were more than 44 years old (see Table 9.1).

Table 9.1: Demographic information of 181 Chinese employees

	China
Age	
≤ 24	20
25-29	93
30-34	51
35-39	13
40-44	1
≥ 45	3
Overall	181
Female	92
Male	89

9.3.1.1.2 Measures

According to the theoretical foundation and extensive literature review stated in section 9.2, a preliminary 8-item Job Satisfaction Scale (JSS) was written and pretested in China as the first version. Originally created in English, the JSS was translated from English into Chinese version. Each version had a back translation to ensure the meaning equivalence. The scale was first translated into Chinese by two bilingual speakers. Another two bilingual speaker was

asked to back-translate the scale from Chinese into English.

9.3.1.1.3 Procedure

This survey language was Chinese. The guideline of the JSS is as follows (displayed in English):

> "The following eight questions are about your job satisfaction. Please indicate the extent to which you feel satisfied or dissatisfied with your job with reference to your feeling in recent 6 months".

Respondents answer on a five-point Likert-type scale, ranging from 1 to 5 in the following order: Very dissatisfied, Somewhat dissatisfied, Neutral, Somewhat satisfied, and Very satisfied, where "Very dissatisfied" is scored as 1 and "Very satisfied" is scored as 5. For example, an item asks "How satisfied are you with your working environment?" Respondents should indicate that to which extent they feel satisfied or dissatisfied with their working environment.

Respondents were required to finish the questionnaire survey at the website https://www.wjx.cn/. The website was set to ensure that every participant finished all the survey on either smart phones or computers with no question missed.

9.3.1.1.4 Data Analysis

To test the factor structure of the 8-item scale, the explorative factor analysis (EFA) was done. A preliminary principal components analysis with varimax rotation was conducted. The number of factors was established by analyzing the scree plot using a conventional 1.0 eigenvalue cut-off (Faragher et al., 2004).

The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity are suggested by many scholars to test the suitability of the data collected for factor analysis (Williams, Onsman, & Brown, 2010). The KMO index ranges from 0 to 1, with a value greater than .50 deemed appropriate for factor analysis, and the Bartlett's Test of Sphericity should be significant ($p < .05$) for factor analysis (Williams et al., 2010).

Reliability is estimated by Cronbach's alpha (α), the most commonly quoted coefficient.

The widely accepted cut-off value for alpha coefficient is .70. However, lower thresholds as .60 are sometimes used (George & Mallery, 2003).

9.3.1.2 Results and Discussion

Table 9.2 is the result of factor analysis of Job Satisfaction Scale (JSS) with Chinese samples. It demonstrated that the KMO index was .888 and the Bartlett's Test of Sphericity was significant (p = .000), indicating that the data is suitable for factor analysis in Chinese samples.

Based on the eigenvalues greater than 1 (Siu et al., 2006), a one-factor solution emerged which accounted for 55.863% of the explained variance. Only one component was extracted. Eight items loaded on only one factor (JS = Job Satisfaction). The result of reliability analysis showed that Cronbach's alpha of JSS was .887, a very satisfactory value.

According to some participants' suggestions, the item "How satisfied are you with the management level in your organization?" was replaced with "How satisfied are you with the management level in your company?"

9.3.2 Study 2: Items Refinement and Reliability Analysis of Chinese Version

9.3.2.1 Method

9.3.2.1.1 Participants and Procedure

This survey took place from January 10 to July 26, 2016. Respondents were 85 employees (45 males, 40 females) working at Chinese companies. 17.65% (N = 15) of them were less than 25 years old, 51.76% (N = 44) were 25 to 29 years old, 14.12% (N = 12) were 30 to 34 years old, 9.41 % (N = 8) were 35 to 39 years old, 3.53% (N = 3) were 40 to 44 years old, 3.53% (N = 3) were more than 44 years old.

Table 9.2: Factor analysis of Job Satisfaction Scale (JSS) with Chinese samples (N = 181)

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.888
Bartlett's Test of Sphericity	Approx. Chi-Square	680.336
	df	28
	Sig.	.000

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.469	55.863	55.863	4.469	55.863	55.863
2	.861	10.768	66.631			
3	.711	8.890	75.522			
4	.527	6.585	82.106			
5	.454	5.670	87.777			
6	.413	5.163	92.940			
7	.320	3.994	96.934			
8	.245	3.066	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
JS-i5	.853
JS-i6	.802
JS-i7	.777
JS-i3	.727
JS-i1	.721
JS-i2	.714
JS-i8	.706
JS-i4	.661

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Rotated Component Matrix[a]

a. Only one component was extracted. The solution cannot be rotated.

9.3.2.1.2 Measures and Data Analysis

Respondents were requested to open a website and complete the questionnaire survey on either smart phones or computers. Reliability analysis was conducted to assess internal consistency.

9.3.2.2 Results and Discussion

The results of reliability analysis indicated that Cronbach alpha value of JSS was .804 and it will increase if an item is deleted. Thus, the item "How satisfied are you with the relationships at work with your colleagues and superiors?" was rewritten as "How satisfied are you with the relationships at work with others?" The 8-item Chinese version JSS was created with wording refined to represent the one dimension of job satisfaction. Table 9.3 indicates the items and item wordings of the 8-Item JSS (English version).

Table 9.3: Items and item wordings of Job Satisfaction Scale (JSS)

Job Satisfaction (JS)	
JS_i1	How satisfied are you with the pay and benefits?
JS_i2	How satisfied are you with your working environment?
JS_i3	How satisfied are you with the management level in your company?
JS_i4	How satisfied are you with the relationships at work with others?
JS_i5	How satisfied are you with the degree to which you can personally develop or grow in your work?
JS_i6	How satisfied are you with the job itself?
JS_i7	How satisfied are you with the opportunities for promotion at work?
JS_i8	How satisfied are you with the degree to which your abilities are recognized?

9.3.3 Study 3: Factor Analysis of German Version

9.3.3.1 Method

9.3.3.1.1 Participants and Procedure

The survey was carried out from May 18 to June 25, 2017. Participants were 104 employees at German companies. Some questionnaires were distributed by face-to-face talk after e-mail contact; some were distributed online. The sample consisted of 66 males (63.46%) and 38 females (36.54%). 5.77% (N = 6) of them were less than 25 years old, 19.23% (N = 20) were 25 to 29 years old, 16.35% (N = 17) were 30 to 34 years old, 17.31 % (N = 18) were 35 to 39 years old, 11.54% (N = 12) were 40 to 44 years old, 28.85% (N = 30) were more than 44 years old (see Table 9.4).

Table 9.4: Demographic information of 104 German employees

	China
Age	
≤ 24	6
25-29	20
30-34	17
35-39	18
40-44	12
≥ 45	30
Overall	104
Female	38
Male	66

9.3.3.1.2 Measures and Data Analysis

Initially created in English, the 8-item Job Satisfaction Scale (JSS) has been translated into German version named *"Arbeitszufriedenheit"*. In this process, the forward and back translations (English, German and Chinese versions) of the scale were carried out repeatedly to ensure the meaning equivalence. Participants were asked to answer the German version Job Satisfaction Scale.

The EFA was done to further validate the factor structure of the JSS. A preliminary principal components analysis with varimax rotation was conducted (see Table 9.5). Reliability analysis was carried out by Cronbach's alpha in SPSS 22.

Table 9.5: Factor analysis of Job Satisfaction Scale (JSS) with German samples (N = 104)

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.888
Bartlett's Test of Sphericity	Approx. Chi-Square	450.722
	df	28
	Sig.	.000

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.739	59.240	59.240	4.739	59.240	59.240
2	.811	10.139	69.379			
3	.680	8.496	77.875			
4	.555	6.937	84.812			
5	.418	5.222	90.034			
6	.324	4.053	94.088			
7	.269	3.360	97.447			
8	.204	2.553	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
JS-i5	.866
JS-i2	.833
JS-i8	.808
JS-i7	.799
JS-i3	.782
JS-i1	.701
JS-i6	.694
JS-i4	.647

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Rotated Component Matrix[a]

a. Only one component was extracted. The solution cannot be rotated.

9.3.3.2 Results and Discussion

Table 9.5 demonstrates that the KMO index was .888 and the Bartlett's Test of Sphericity was significant (p = .000). It means that the data is suitable for factor analysis in German samples.

Based on the eigenvalues greater than 1 (Siu et al., 2006), a one-factor solution emerged which accounted for 59.240 % of the explained variance. Only one component was extracted. Eight items loaded on only one factor (JS = Job Satisfaction). The result of reliability analysis showed that alpha of JSS was .900, a very satisfactory value.

9.3.4 Study 4: Further Reliability Analysis of German Version

9.3.4.1 Method

9.3.4.1.1 Participants and Procedure

This survey was conducted from June 28 to August 18, 2017. Respondents were 40 employees working at German companies. The sample consisted of 26 males (65.00%) and 14 females (35.00%). Participants were required to open a website and complete the online questionnaire survey on either smart phones or computers. The website settings ensured that every participant completed all the survey with no question missed.

9.3.4.1.2 Measures and Data Analysis

To assess internal consistency, reliability analysis was carried out by calculating Cronbach's alpha in SPSS Statistics.

9.3.4.2 Results and Discussion

Reliability analysis indicated that Cronbach alpha value of JSS was .780, a satisfactory value. Study 1 through Study 4 provided preliminary evidence for the factor structure and reliability of the JSS. Since validity is a continuous process (Cronin & Allen, 2017; DeVellis, 2016), it was necessary to confirm model fit and the factor structure with larger sample size. Evidence for model fit indices, construct validity and factor reliability will be assessed during the

subsequent studies (Cronin & Allen, 2017). The confirmatory factor analysis (CFA) will be used to validate the results obtained by EFA.

9.3.5 Study 5: Validation of the JSS with Chinese Samples

9.3.5.1 Method

9.3.5.1.1 Participants and Procedure

The survey was conducted from April 6, 2015 to July 27, 2016 in China. Participants were 298 employees working at Chinese companies, consisted of 150 (50.34%) males and 148 females (49.66%). 12.75% (N = 38) of them were less than 25 years old, 54.03% (N = 161) were 25 to 29 years old, 22.48% (N = 67) were 30 to 34 years old, 7.38 % (N = 22) were 35 to 39 years old, 1.34% (N = 4) were 40 to 44 years old, 2.01% (N = 6) were more than 44 years old (see Table 9.6).

Table 9.6: Demographic information of 298 Chinese employees

	China
Age	
≤ 24	38
25-29	161
30-34	67
35-39	22
40-44	4
≥ 45	6
Overall	298
Female	148
Male	150

Participants can finish either the paper-and-pencil version or the online version at a website. The website settings ensured that the online questionnaire could be submitted when all the questions were finished.

9.3.5.1.2 Measures

The 8-item Chinese version Job Satisfaction Scale (工作满意度量表) was used for this survey to assess the construct validity and factor reliability with large Chinese sample size (N > 200). Initially developed in English, the JSS was translated from English into Chinese. Each version of questionnaire survey had a back translation to ensure the meaning equivalence.

9.3.5.1.3 Data Analysis

SPSS 22 was used to assess internal consistency reliability by Cronbach's alpha coefficient.

To examine the fit and the construct validity of the theoretical 1-factor model (hypothesized model) of the JSS, the CFA was performed in Study 5 with the software AMOS 22, using data from 298 employees working at Chinese companies. Maximum likelihood estimation method was used to evaluate different models.

For a newly created scale the factor loading should be greater than or equal to .50 (Zainudin, 2012). Figure 9.1 indicates that each item of JSS had a factor loading value higher or close to .50. Item JS_i4 was kept because its factor loading value .49 was very close to .50.

The theoretical 1-factor model was tested and compared to the independent model. The independence model is one which assumes that all variables are independent of one another (Knoll et al., 2005).

Due to the sensitivity to sample size, some researchers in recent years have suggested that GFI is not necessary to be reported (Sharma et al., 2005). The following fit indices will be reported to evaluate model fit: chi-square (x^2), chi-square statistic divided by degrees of freedom (x^2/df), IFI, TLI (NNFI), CFI, AGFI, SRMR, and RMSEA.

The IFI, TLI (NNFI), CFI, and AGFI statistics range from 0 to 1 (Topcu & Erdur-Baker, 2010). Values of .90 or higher are generally seen as an acceptable model fit to the data for the NFI, TLI (NNFI), CFI, and a value over .80 is acceptable for the AGFI (Anderson & Gerbing, 1984; Cole, 1987; Conners et al., 1998; Conners et al., 1997; Ferris et al., 2005; Gefen et al., 2000; Marsh et al., 1988).

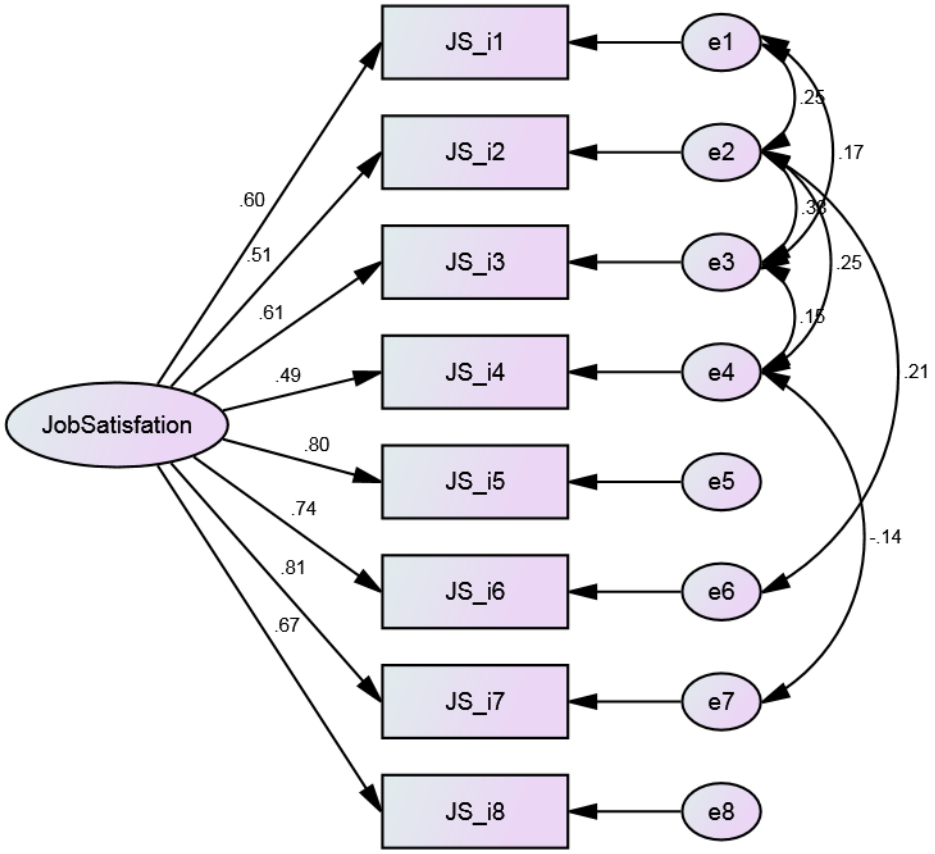

Figure 9.1: Confirmatory factor analysis for theoretical 1-factor model in Study 5 (Chinese samples, N = 298)

Note: JS = Job Satisfaction.

A lot of researchers suggest that the values below 5 imply acceptable model fit for the x^2/df ratio (Wheaton et al., 1977), and the values of 3 or less indicate adequate model fit (Byrne & Marsh, 1999).

For RMSEA, a value of .06 or less implies a close fit, below .08 is an acceptable fit, and over .10 indicates a poor fit. For SRMR, a cutoff value close to .08 represents acceptable (Ferris et al., 2005; Hu & Bentler, 1999). The SRMR can be calculated in AMOS 22 via the plugin function *Standardized RMR* (Wang, 2014).

9.3.5.2 Results and Discussion

Modification Indices (MI) in AMOS provide a strategy to improve the fit of the tested model by correlating selected parameters within the models (Muenjohn & Armstrong, 2008). Therefore, correlations between error terms of items 1-2, 1-3, 2-3, 2-4, 2-6, 3-4, 4-7 were added to increase the model fit (Topcu & Erdur-Baker, 2010) (see Figure 9.1).

Results of the CFA (see Table 9.7) indicated an acceptable model fit for the theoretical 1-factor model (x^2 = 13.281, x^2/df = 1.022, IFI=1.000, TLI=.999, CFI=1.000 AGFI =.971, SRMR = .0178, and RMSEA = .009). Results of the CFA indicated an unacceptable fit for the independent model (x^2 = 978.754, x^2/df = 34.956, IFI = .000, TLI = .000, CFI = .000, AGFI = .225, RMR = .439, and RMSEA = .338) which meant the independent model was rejected.

Table 9.7: Fit indices statistics for independent model and 1-factor model in Study 5

	x^2	x^2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Independent Model	978.754	34.956	.000	.000	.000	.225	*	.338
Theoretical 1-factor Model	13.281	1.022	1.000	.999	1.000	.971	.0178	.009

Note: N = 298.

* RMR of Independent Model = .439. The SRMR was calculated in AMOS 22 via the plugin function Standardized RMR, however, there was no result for SRMR of Independent Model.

The theoretical 1-factor model (see Figure 9.1) met the standards to demonstrate acceptable fit of the model. Thus, it was confirmed by the current study that the construct validity of the 8-item JSS is established and the theoretical 1-factor model is the best representation of the underlying dimensionality (Ferris et al., 2005) among Chinese samples.

The reliability coefficient of the Chinese version JSS is .872, an acceptable value.

To sum up, all indices from the outputs of AMOS 22 show that the theoretical 1-factor model (hypothesized model) of JSS demonstrates acceptable fit to the data among Chinese samples. Meanwhile, the internal consistency reliability (Cronbach's alpha) of the Chinese version JSS is acceptable. So far, the construct reliability and construct validity of the JSS has

been demonstrated**.** Thus, both the reliability and the validity of JSS are established. JSS is a validated and reliable tool to measure job satisfaction among Chinese samples.

9.3.6 Study 6: Validation of the JSS with German Samples

9.3.6.1 Method

9.3.6.1.1 Participants and Procedure

This survey was carried out from June 2017 to January 2018 in Germany. Respondents were 237 employees working at German companies, consisted of 131 males (55.27%) and 106 females (44.73%). 4.64% (N = 11) of them were less than 25 years old, 15.61% (N = 37) were 25 to 29 years old, 12.24% (N = 29) were 30 to 34 years old, 15.19 % (N = 36) were 35 to 39 years old, 18.99% (N = 45) were 40 to 44 years old, 33.33% (N = 79) were more than 44 years old (see Table 9.8).

Table 9.8: Demographic information of 237 German employees

	China
Age	
≤ 24	11
25-29	37
30-34	29
35-39	36
40-44	45
≥ 45	79
Overall	237
Female	106
Male	131

Survey questions were distributed either online or face-to-face. Online version could be found at a website. The website was set to ensure that the online questionnaire survey could be submitted upon the completion of all questions.

9.3.6.1.2 Measures

To further assess the construct validity and factor reliability, the 8-item German version Job Satisfaction Scale *(Arbeitszufriedenheit)* was used in this study for the validation with large German sample size (N > 200).

9.3.6.1.3 Data Analysis

SPSS 22 was used for reliability analysis by Cronbach's alpha. To further test the fit and the construct validity of the theoretical 1-factor model (hypothesized model) of the JSS from Study 5, CFA was performed with the software AMOS 22 in Study 6, using data from 237 employees working at German companies. Maximum likelihood estimation method was used to assess different models.

The theoretical 1-factor model was tested and compared to the independent model, which assumes that all variables are independent of one another (Knoll et al., 2005).

The following fit indices will be used to test model fit: chi-square (x^2), chi-square statistic divided by degrees of freedom (x^2/df), IFI, TLI, CFI, AGFI, SRMR, and RMSEA.

9.3.6.2 Results and Discussion

According to the modification indices examination, correlations between error terms of items 2-4, 3-6, 5-7, 6-8 were added to increase the model fit (Topcu & Erdur-Baker, 2010) (see Figure 9.2).

Staying consistent with Study 5, results of the CFA (see Table 9.9) in Study 6 indicated an acceptable model fit for the theoretical 1-factor model (x^2 = 21.344, x^2/df = 1.334, IFI = .994, TLI = .990, CFI = .994, AGFI = .952, SRMR = .0297, and RMSEA = .038). The CFA results showed an unacceptable fit for the independent model (x^2 = 976.780, x^2/df = 34.885, IFI = .000, TLI = .000, CFI = .000, AGFI = .173, RMR = .695, and RMSEA = .379) which meant that the independent model was rejected and all variables are not independent of one another.

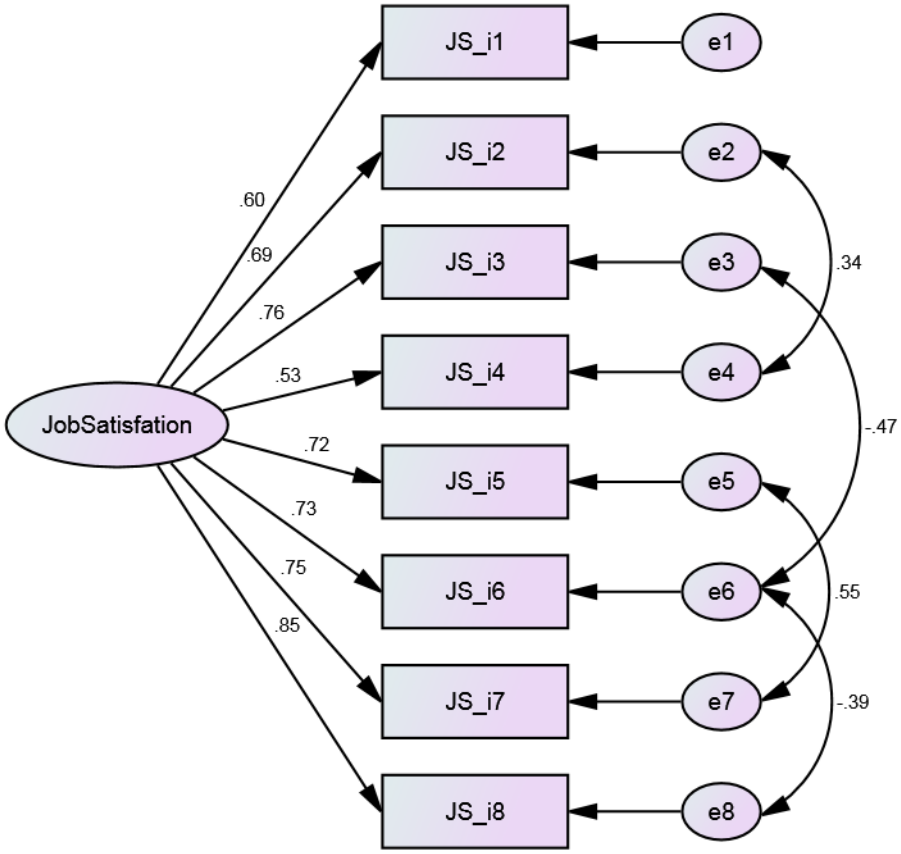

Figure 9.2: Confirmatory factor analysis for theoretical 1-factor model in Study 6 (German sample, N = 237)

Note: JS = Job Satisfaction.

The theoretical 1-factor model (see Figure 9.2) met the standards to demonstrate acceptable fit of the model. Thus, it was confirmed by the current study that the construct validity of the 8-item JSS is established and the theoretical 1-factor model is the best representation of the underlying dimensionality (Ferris et al., 2005). The examinations of cross-cultural equivalence of the 8-item JSS in German and Chinese cultural samples will be conducted in the subsequent section.

The theoretical 1-factor model met the standards to demonstrate acceptable fit of the model. Thus it was confirmed by the current study that the theoretical 1-factor model is the best representation of the underlying dimensionality (Ferris et al., 2005). The tests of

cross-cultural equivalence of the 8-item JSS in German and Chinese cultural samples will be conducted in the subsequent section 9.4 of this chapter.

Table 9.9: Fit indices statistics for independent model and 1-factor model in Study 6

	x^2	x^2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Independent Model	976.780	34.885	.000	.000	.000	.173	*	.379
Theoretical 1-factor Model	21.344	1.334	.994	.990	.994	.952	.0297	.038

Note: N = 237.

* RMR of Independent Model = .695. The SRMR was calculated in AMOS 22 via the plugin function Standardized RMR, however, there was no result for SRMR of Independent Model.

The reliability coefficient of the German version JSS was .888, a very satisfactory value.

To sum up, all indices from the outputs of AMOS 22 show that the theoretical 1-factor model (hypothesized model) of the JSS demonstrates acceptable fit to the data among German samples. Meanwhile, the internal consistency reliability (Cronbach's alpha) of the German version JSS is acceptable. So far, the construct reliability and construct validity of the JSS has been demonstrated**.** Thus, both the reliability and the validity of the JSS are established. The 8-item German version JSS is a validated and reliable tool to measure job satisfaction among German samples.

9.4 Cross-Cultural Equivalence Examinations of the JSS

In cross-cultural research, bias has become the common term for nuisance factors, whereas equivalence tends to be more related to issues of measurement level (Van de Vijver & Tanzer, 2004). When psychological and work-related measures are used in cross-cultural studies, it is essential to establish equivalence of the measures, because there will be no common basis to compare data across countries if there is a lack of equivalence (Beuckelaer et al., 2007).

Structural Equation Modeling (SEM) is employed to test the cross-cultural equivalence

of the Job Satisfaction Scale (JSS) in German and Chinese cultural samples. As an applications of SEM, CFA is a more advanced and scientifically oriented approach to examine equivalence (He & Van de Vijver, 2012). It can be carried out with SEM softwares such as LISREL, Mplus and AMOS. When a CFA model indicates an acceptable fit, this means that the proposed factor structure can be validated and therefore different equivalence levels could be achieved (He & Van de Vijver, 2012).

Based on the theories on bias and equivalence in cross-cultural research (please refer to Chapter 5), the Construct Equivalence will be achieved in a cross-cultural research when the multigroup CFA yields an acceptable fit. It means that the same theoretical construct is measured and the construct has the same connotation across groups (He & Van de Vijver, 2012; Van de Vijver & Tanzer, 2004). The Measurement Unit Equivalence (Metric Equivalence) can be reached if two metric measures share the same unit of measurement but with different origins. That is to say, the scale of one measure is changed with a constant offset as compared to the other measure (Van de Vijver & Tanzer, 2004). For example, the measurement of temperature measured by degrees Fahrenheit and degrees Celsius. The Full score equivalence (Scalar Equivalence) can be achieved when two metric measures share the same unit of measurement and the same origin (Van de Vijver & Tanzer, 2004). Under these conditions, the scores obtained can be compared directly as they are bias free.

Based on the reports in Study 5 and Study 6, all indices from the outputs of AMOS 22 show that the JSS (theoretical 1-factor model) demonstrates acceptable fit to the data among either Chinese samples or German samples (see Table 9.10). At the same time, the two versions of JSS have the same measurement unit and the same origin. Therefore, the JSS has reached three equivalence levels (Construct Equivalence, Measurement Unit Equivalence, and Full Score Equivalence) across the two cultural groups. This means that the connotation or significance of the JSS is conveyed in a very similar way in Chinese and German samples.

In conclusion，Chapter 9 has focused on the development and validation of the JSS with German and Chinese samples, including the introduction to develop a coping scale, the theoretical foundation of the JSS, six empirical studies to develop and validate the JSS, and the cross-cultural equivalence examinations with German and Chinese samples. The softwares SPSS 22, and Amos 22 were used to examine the factor structure, reliability, construct validity, and cross-cultural equivalence. All evidences show that both the construct validity is

established. Meanwhile, the internal consistency reliability (Cronbach's alpha) of the JSS is acceptable. Thus, both the reliability (see Table 9.11) and the validity of JSS are established. JSS is a validated and reliable tool to measure job satisfaction in both Chinese society and German society. At the same time, the JSS has reached the three equivalence levels in Chinese and German cultures.

Table 9.10: Fit indices statistics for the theoretical 1-factor model in Study 5 and Study 6

Confirmatory factor analysis in Study 5 (Chinese samples, N = 298)

	x^2	x^2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Theoretical 1-factor Model	13.281	1.022	1.000	.999	1.000	.971	.0178	.009

Confirmatory factor analysis in Study 6 (German samples, N = 237)

	x2	x2/df	IFI	TLI	CFI	AGFI	SRMR	RMSEA
Theoretical 1-factor Model	21.344	1.334	.994	.990	.994	.952	.0297	.038

Table 9. 11: Reliability statistics: Job Satisfaction Scale (JSS)

Factors	Number of Items	Cronbach's α					
		Study 1 (Chinese samples, N = 181)	Study 2 (Chinese samples, N = 85)	Study 3 (German samples, N = 104)	Study 4 (German samples, N = 40)	Study 5 (Chinese samples, N = 298)	Study 6 (German samples, N = 237)
Job Satisfaction	8	.887	.804	.900	.780	.872	.888

10 Core Results of the Comparative Study

This chapter will focus on the introduction to the surveys, method, and results of hypotheses testing.

10.1 Introduction

To obtain a relatively comprehensive and accurate comparison of stress management at the workplace between Chinese and German companies, four scales, namely Sources of Work Stress Scale, Coping with Stress Scale, Health and Well-being Scale, and Job Satisfaction Scale, have been developed and validated by empirical studies with German and Chinese samples.

It is pivotal to establish equivalence due to the fact that equivalence (or lack of bias) of measures is a prerequisite for any cross-cultural research (He & Van de Vijver, 2012; Van de Vijver & Tanzer, 2004) and a lack of measurement equivalence in data across countries (Beuckelaer et al., 2007) probably result in bias conclusions (Buil et al., 2012) (refer to Chapter 5).

SPSS 22, Smart PLS 3 and Amos 22 were used to examine the factor structure, reliability, construct validity and the cross-cultural equivalence for each scale. Content validity was based on a comprehensive literature review and expert consultation to develop the most suitable scale items (Glasberg et al., 2006). Face validity involved a consensus among experts and participants on the wording that the items of the scale were understandable by the participants with different educational backgrounds (Glasberg et al., 2006).

After the reliability, validity and cross-cultural equivalence were all established by the pre-surveys with Chinese and German samples, the formal questionnaire surveys with four scales were conducted. Quantitative and qualitative data were collected from various

industries in different cities of both China and Germany in order to compare the stress management at the workplace between Chinese and German companies.

10.2 Method

10.2.1 Participants and Procedure

The participants were employees working at companies. Survey questions were distributed either online or face-to-face. Participants can finish either the paper-and-pencil version or the online version. The website settings ensured that every participant completed all the survey on smart phones or computers.

In China, participants were randomly chosen from a variety of industries in different cities in mainland China. Correspondingly, German participants were randomly selected from various industries in different cities in Germany. Altogether, 253 Chinese employees and 289 German employees participated in the questionnaire surveys. To avoid method bias in this comparative study, the numbers of samples from each industry in both Chinese and German companies should be equal or roughly equivalent. Therefore, 226 Chinese samples and 225 German samples are used for the comparative study. Detail demographic information is presented in Table 10.1.

German survey was carried out from June 2017 to January 2018 in Germany. Respondents were 225 employees consisted of 134 males (59.56%) and 91 females (40.44%). 6.22% (N = 14) of them were less than 25 years old, 15.11% (N = 34) were 25 to 29 years old, 12.00% (N = 27) were 30 to 34 years old, 14.67 % (N = 33) were 35 to 39 years old, 18.67% (N = 42) were 40 to 44 years old, 33.33% (N = 75) were more than 44 years old.

Chinese survey was performed from October 2016 to January 2018 in China. Respondents were 226 employees consisted of 106 males (46.90%) and 120 females (53.10%) working at Chinese companies. 11.95% (N = 27) of them were less than 25 years old, 29.20% (N = 66) were 25 to 29 years old, 31.86% (N = 72) were 30 to 34 years old, 9.29 % (N = 21) were 35 to 39 years old, 10.18% (N = 23) were 40 to 44 years old, 7.52% (N = 17) were more than 44 years old.

Table 10.1: Demographic information of 226 Chinese samples and 225 German samples

	German samples	**Chinese samples**
Age		
≤ 24	14	27
25-29	34	66
30-34	27	72
35-39	33	21
40-44	42	23
≥ 45	75	17
Overall	225	226
Female	91	120
Male	134	106
Overall level of work stress		
Very little	9	15
Little	31	25
Moderate	84	89
Great	75	66
Very great	26	31
Turnover intention (Intention to quit)		
Never	20	33
Seldom	81	90
Sometimes	69	82
Ofter	45	15
Always	10	6
You have been engaged in the current job for	9.86 years (Mean)	6.33 years (Mean)
Your weekly working hours on average	44.35 hours (Mean)	54.17 hours (Mean)

10.2.2 Measures

Quantitative data were collected with four scales developed and validated by empirical studies with Chinese and German samples. Initially created in English, these four scales were translated from English into Chinese and German. In this process, the forward and back translations of the scales were performed to ensure the meaning equivalence.

Work stressors were measured by the 30-item Sources of Work Stress Scale. Some main sources of work stress were listed. Participants were asked to indicate how often they feel stressed by any of the sources of work stress. Participants answered on a five-point Likert-type scale, with response options ranged from 1 (Never) to 5 (Always).

Coping strategies were assessed by the 30-item Coping with Stress Scale. Some possible coping strategies were listed. Participants needed to answer how often they actually use them as ways of coping. Participants responded on a five-point Likert-type scale, with options ranged from 1 (Never) to 5 (Always).

Physical health and Psychological well-being was measured by the 8-item Health and Well-being Scale. Respondents were required to indicate their conditions of physical health and psychological well-being. Respondents answered on a five-point Likert-type scale, with options ranged from 1 (Never) to 5 (Always).

Job satisfaction was assessed by the 8-item Job Satisfaction Scale. Participants needed to indicate the extent to which they feel satisfied or dissatisfied with their job. Participants responded on a five-point Likert-type scale, with response options ranging from 1 (Very Dissatisfied) to 5 (Very Satisfied).

At the end of the questionnaires survey, demographic data concerning participants' gender, age, education level, weekly working hours, level of work stress and intention to quit were collected. Overall level of work stress was evaluated with a single item measure that asked "How do you think about your level of work stress in recent six months?" Turnover intention (intention to quit) was assessed with a single item measure that asked "How often have you had the turnover intention?"

10.2.3 Data Analysis

Reliability analysis was carried out by Cronbach's alpha which indicates that to what extent the items within a scale measure the same underlying construct (Glasberg et al., 2006).

The correlation analyses were conducted with the German and Chinese samples to observe the relationship between Health and Well-being and Job Satisfaction as well as the relationship between job satisfaction and turnover intention.

Independent-samples t test was examined to compare the stress management at the workplace between Chinese and German companies. The *p* value of the significance testing shows whether there is significant difference between German and Chinese samples. Both statistical significance (*p* value) and substantive significance (effect size) should be stated in reporting and analysis studies, as *p* value can only indicate that whether there is an effect but can not show the effect size (Sullivan & Feinn, 2012). Effect Size refers to "the normalized difference between a trained group and a comparison group" (Burke & Day, 1986, p. 237). Besides Hedges' *g* and Glass's Δ, the best-known method to measure effect size is Cohen's *d* (Wang, 2014; Wilcox, 2006) which is used to describe the standardized mean difference of an effect (Lakens, 2013).

Cohen's *d* is defined as a measure of the difference between the means, M_1 - M_2, divided by the standard deviation (SD) of the population that the groups were sampled from (Cohen, 1988). The pooled standard deviation, SD_{pooled}, is commonly used (Rosnow & Rosenthal, 1996). The formula of Cohen's *d* is below:

$$d = \frac{M_1 - M_2}{SD_{pooled}}$$

Where the numerator M_1 - M_2 is the mean difference between the two groups, the denominator is the SD_{pooled} (Lakens, 2013), which can be calculated as (Cohen, 1988, p. 67):

$$SD_{pooled} = \sqrt{\frac{\sum (X_1 - \bar{X}_1)^2 + \sum (X_2 - \bar{X}_2)^2}{n_1 + n_2 - 2}}$$

In practice, the simpler equation from Cohen (1988, p. 44) is commonly used:

$$SD_{pooled} = \sqrt{\frac{SD_1^2 + SD_2^2}{2}}$$

In this formula, the pooled standard deviation (SD_{pooled}) is the square root of the average of the squared standard deviations (Cohen, 1988).

For the independent-samples t test in the following sections, Cohen's *d* effect size will be calculated as a supplement using this simpler formula. That is to say, Cohen's *d* is calculated by the mean difference between German group and Chinese group, and then dividing the result by the SD_{pooled}, the square root of the average of the squared standard deviations. Based on the rules of thumb for effect sizes initially suggested by Cohen (1988) and expanded by Sawilowsky (2009), an absolute value of d = .01 is considered as a very small effect size, .20 is considered as a small effect size, .50 is regarded as a medium effect size, .80 means a large effect size, 1.20 indicates a very large effect size and 2.00 indicates a huge effect size. A larger absolute value of Cohen's d usually indicates a stronger effect. If the means of two groups don't have a difference of absolute value .20 standard deviations or more, they differ slightly, even if it is statistically significant (Cohen, 1988). Whether the Cohen's d effect size is positive or negative depends on how you label group 1 and group 2. If the mean of group 1 (M_1) is larger than the mean of group 2 (M_2), the effect size will be positive. In contrast, if M_2 is larger, the effect size will be negative. It’s important to know that the sign of Cohen’s d effect indicates the direction of the effect.

10.3 Results

The following sections will focus on the results of comparisons between Chinese employees and German employees regarding sources of work stress, coping with stress, health and well-being, job satisfaction. At the same time, the relationship between problems of health and well-being and job satisfaction, as well as the relationship between job satisfaction and turnover intention will be mentioned.

10.3.1 Sources of Work Stress: Chinese and German Employees

The reliability statistics, independent-samples t test and effect size statistics are presented in Table 10.2. The Cronbach's alpha (α) coefficient for each factor is above .70 which has met the widely accepted social science standard for alpha coefficient (George & Mallery, 2003; Hair et al., 2010). Cohen's *d* effect size is calculated according to the formula of Cohen's *d* mentioned in section 10.2.3. Based on the effect sizes, all the factors tested achieve a small to large effect except Work-Life Balance with a very small effect.

In German samples, the lowest Cronbach's α is .741 and the highest Cronbach's α is .887; in Chinese samples, the lowest Cronbach's α is .746 and the highest Cronbach's α is .832. The α coefficients in both German and Chinese samples indicate that the 30-item Sources of Work Stress Scale has maintained very satisfactory internal consistency across cultures and translations (Spector et al., 2004). Therefore, this scale can be used for the further analysis in Germany and China (Wang, 2014).

Based on the above information, the results of hypotheses testing of independent-samples t test are summarized in Table 10.3. It shows that all the hypotheses were supported except HS7.

The hypothesis HS1 is supported in that Chinese employees reported significantly more stress caused by workload than German employees and the Cohen's *d* effect size is between small and medium (d = .403). This hypothesis is further supported in the demographic information which reported that Chinese employees' weekly working hours on average are 54.17 hours (N = 226) and German employees' weekly working hours on average are 44.35 hours (N = 225).

The hypothesis HS2 is supported in that Chinese employees reported significantly more stress caused by competition and comparison than German employees and the effect size is between large and very large (d = 1.110).

Chinese employees reported significantly more stress caused by role uncertainty than German employees, supporting HS3. The effect size is medium (d = .513).

Table 10.2: Reliability statistics, independent-samples t test and effect size statistics for sources of work stress for German and Chinese employees

Factors	Items	Country	N	*α*	M	SD	*t*	*df*	*p*	Cohen's *d*
Workload	3	Germany	225	.741	2.7141	.78599	-4.274**	449	.000	.403
		China	226	.764	3.0354	.81026				
Competition and Comparison	4	Germany	225	.883	2.0044	.81249	-11.785**	449	.000	1.110
		China	226	.810	2.9015	.80415				
Role Uncertainty	3	Germany	225	.868	2.3837	1.01008	-5.445**	436	.000	.513
		China	226	.821	2.8628	.85164				
Control	3	Germany	225	.831	2.2741	.88104	-7.096**	449	.000	.668
		China	226	.792	2.8378	.80445				
Pay and Career Prospects	4	Germany	225	.853	2.4278	.95930	-9.320**	442	.000	.878
		China	226	.826	3.2223	.84758				
Competency	3	Germany	225	.807	1.8119	.77770	-15.870**	449	.000	1.495
		China	226	.746	3.0059	.81949				
Work-life Balance	3	Germany	225	.887	2.9481	.99939	.031	438	.975	-.003
		China	226	.793	2.9454	.85633				
Relationships at Work	4	Germany	225	.818	1.9178	.79963	-9.465**	449	.000	.891
		China	226	.832	2.6184	.77214				
Boredom at Work	3	Germany	225	.753	2.1659	.94812	-7.643**	449	.000	.720
		China	226	.821	2.8319	.90171				

Note: **p< .01.

Table 10.3: Results of hypotheses testing of independent-samples t test regarding sources of work stress

Hypotheses	Results	Explanation
HS1: Chinese employees will report more stress caused by workload than their German counterparts. Specifically, Chinese employees will report that they feel stressed by workload more often than their German counterparts.	Supported	There is significant difference between German and Chinese samples. Item mean in Chinese samples is larger than that in German samples.
HS2: Chinese employees will report more stress caused by competition and comparison than their German counterparts. Specifically, Chinese employees will report that they feel stressed by competition and comparison more often than their German counterparts.	Supported	There is significant difference between German and Chinese samples. Item mean in Chinese samples is larger than that in German samples.
HS3: Chinese employees will report more stress caused by role uncertainty than their German counterparts. Specifically, Chinese employees will report that they feel stressed by role uncertainty more often than their German counterparts.	Supported	There is significant difference between German and Chinese samples. Item mean in Chinese samples is larger than that in German samples.
HS4: Chinese employees will report more stress caused by lack of control over work than their German counterparts. Specifically, Chinese employees will report that they feel stressed by lack of control over work more often than their German counterparts.	Supported	There is significant difference between German and Chinese samples. Item mean in Chinese samples is larger than that in German samples.
HS5: Chinese employees will report more stress caused by pay and career prospects than their German counterparts. Specifically, Chinese employees will report that they feel stressed by pay and career prospects more often than their German counterparts.	Supported	There is significant difference between German and Chinese samples. Item mean in Chinese samples is larger than that in German samples.
HS6: Chinese employees will report more stress caused by competency than their German counterparts. Specifically, Chinese employees will report that they feel stressed by competency more often than their German counterparts.	Supported	There is significant difference between German and Chinese samples. Item mean in Chinese samples is larger than that in German samples.
HS7: Chinese employees will report more stress caused by lack of work-life balance than their German counterparts. Specifically, Chinese employees will report that they feel stressed by work-life conflict more often than their German counterparts.	Not supported	The hypothesis is rejected because the p value of the significance testing is larger than .05.
HS8: Chinese employees will report more stress caused by relationships at work than their German counterparts. Specifically, Chinese employees will report that they feel stressed by relationships at work more often than their German counterparts.	Supported	There is significant difference between German and Chinese samples. Item mean in Chinese samples is larger than that in German samples.
HS9: Chinese employees will report more stress caused by boredom at work than their German counterparts. Specifically, Chinese employees will report that they feel stressed by boredom at work more often than their German counterparts.	Supported	There is significant difference between German and Chinese samples. Item mean in Chinese samples is larger than that in German samples.

Consistent with hypothesis HS4, Chinese employees reported significantly more stress caused by lack of control over work than German employees and the effect size is between medium and large (d = .668).

HS5 is supported in that Chinese employees reported significantly more stress caused by pay and career prospects than German employees with a large effect size (d = .878).

Chinese employees reported significantly more stress caused by competency than German employees, supporting HS6. The effect size is very large (d = 1.495).

The hypothesis HS7 is not supported since the *p* value of the significance testing .975 is larger than .05 and there is no significant difference between Chinese employees and German employees in work-life balance and the effect size is also very small (d = -.003). This means that Chinese employees didn't report more stress caused by lack of work-life balance than German employees.

Consistent with HS8, Chinese employees reported significantly more stress caused by relationships at work than German employees. The effect size is large (d = .891).

The hypothesis HS9 is supported in that Chinese employees reported significantly more stress caused by boredom at work than German employees with an effect size between medium and large (d = .720).

10.3.2 Coping with Stress: Chinese and German Employees

Table 10.4 presents the reliability statistics, independent-samples t test and effect size statistics. The Cronbach's alpha (α) coefficient for each factor is above .70 in both German and Chinese samples which indicates that the 30-item Coping with Stress Scale (CSS) has maintained satisfactory internal consistency across cultures and translations (Spector et al., 2004). In German samples, the lowest Cronbach's α and the highest Cronbach's α is .707 and .943 respectively. In Chinese samples, the lowest Cronbach's α and the highest Cronbach's α is .733 and .935 respectively. Therefore, the CSS can be used for the hypotheses testing in Germany and China (Wang, 2014). In addition, the effect size is calculated based on the formula of Cohen's *d* mentioned in section 10.2.3.

Table 10.4: Reliability statistics, independent-samples t test and effect size statistics for coping strategies for German and Chinese employees

Factors	Items	Country	N	*α*	M	SD	*t*	*df*	*p*	Cohen's *d*
Future-oriented Coping	3	Germany	225	.737	3.3081	.76756	.831	449	.406	-.078
		China	226	.772	3.2478	.77463				
Positive Thinking	3	Germany	225	.707	3.4459	.79004	-2.195*	449	.029	.207
		China	226	.763	3.6032	.73125				
Physical Exercises	3	Germany	225	.932	3.1407	1.05946	4.172**	449	.000	-.393
		China	226	.935	2.7271	1.04599				
Social Support	3	Germany	225	.806	2.9333	.80425	-.045	449	.964	.004
		China	226	.781	2.9366	.72719				
Leisure and Relaxation	3	Germany	225	.897	3.4948	.86494	3.614**	449	.000	-.340
		China	226	.813	3.2094	.81127				
Religious Coping	3	Germany	225	.943	1.6474	1.03420	-1.379	449	.169	.130
		China	226	.879	1.7758	.94170				
Avoidance	3	Germany	225	.722	2.9215	.73142	-.284	449	.776	.027
		China	226	.752	2.941	.72586				
Acceptance	3	Germany	225	.714	3.5941	.72317	4.097**	449	.000	-.386
		China	226	.733	3.3215	.68915				
Self-blame	3	Germany	225	.833	2.1926	.87766	-3.128**	443	.002	.295
		China	226	.785	2.4381	.78589				
Problem-solving Coping	3	Germany	226	.803	3.6593	.73695	2.365*	449	.018	-.223
		China	225	.818	3.4897	.78513				

Note: **p< .01, *p< .05.

Based on the above information, the results of hypotheses testing of independent-samples t test regarding coping strategies are given in Table 10.5.

Consistent with hypothesis HC1, Chinese employees use positive thinking as a way to deal with stress significantly more often than German employees and the Cohen's *d* effect size is small (d = .207).

The hypothesis HC2 is supported since German employees do physical exercises as a way to deal with stress significantly more often than Chinese employees and the effect size is between small and medium (d = -.393).

HC3 is supported in that German employees use leisure and relaxation as a way to deal with stress significantly more often than Chinese employees and the effect size is between small and medium (d = -.340).

HC4 is not supported since there is no significant difference between Chinese employees and German employees in the use of religious coping and the effect size is also quite small (d = .130). The p value of the significance testing .169 is larger than .05. This means that German employees use religious coping as a way to deal with stress not significantly more often than Chinese employees.

Opposite to hypothesis HC5, there is a significant difference in acceptance with German employees reporting that they use acceptance as a way to deal with stress more often rather than less often compared with their Chinese counterparts and the effect size is between small and medium (d = -.386). This means that German employees use acceptance as a way to deal with stress more often than Chinese employees.

HC6 is supported in that Chinese employees use self-blame as a way to deal with stress significantly more often than their German counterparts and the effect size is small (d = .295).

German employees use problem-solving coping as a way to deal with stress more often than their Chinese counterparts, supporting HC7. The effect size is small (d = -.223).

Table 10.5: Results of hypotheses testing of independent-samples t test regarding coping strategies

Hypotheses	Results	Explanation
HC1: Chinese employees use positive thinking as a way to deal with stress more often than their German counterparts.	Supported	There is significant difference between Chinese and German samples. Item mean in Chinese samples is larger than that in German samples.
HC2. German employees do physical exercises as a way to deal with stress more often than their Chinese counterparts.	Supported	There is significant difference between German and Chinese samples. Item mean in German samples is larger than that in Chinese samples.
HC3. German employees use leisure and relaxation as a way to deal with stress more often than their Chinese counterparts.	Supported	There is significant difference between German and Chinese samples. Item mean in German samples is larger than that in Chinese samples.
HC4: German employees use religious coping as a way to deal with stress more often than their Chinese counterparts.	Not supported	The hypothesis is rejected because the p value of the significance testing is larger than .05. There is no significant difference between German employees and Chinese employees in the use of religious coping as a way to deal with stress.
HC5: Chinese employees use acceptance as a way to deal with stress more often than their German counterparts.	Not supported	Opposite to hypothesis HC5, there is a significant difference in acceptance with German employees reporting that they use acceptance as a way to deal with stress more often rather than less often compared with Chinese employees. Item mean in German samples is larger than the item mean in Chinese samples.
HC6: Chinese employees use self-blame as a way to deal with stress more often than their German counterparts.	Supported	There is significant difference between Chinese and German samples. Item mean in Chinese samples is larger than that in German samples.
HC7: German employees use problem-solving coping as a way to deal with stress more often than their Chinese counterparts.	Supported	There is significant difference between German and Chinese samples. Item mean in German samples is larger than that in Chinese samples.

10.3.3 Health and Well-being: Chinese and German Employees

The reliability statistics, independent-samples t test and effect size statistics are presented in Table 10.6. The Cronbach's alpha coefficients for physical health and psychological well-being in both German and Chinese samples are above .70, indicating that the 8-item Health and Well-being Scale has maintained satisfactory internal consistency across cultures and translations (Spector et al., 2004). Therefore, this scale can be used for the hypotheses testing and further analysis.

Table 10.6: Reliability statistics, independent-samples t test and effect size statistics for problems of physical health and psychological well-being for German and Chinese employees

Factors	Items	Country	N	*α*	M	SD	*t*	*df*	*p*	Cohen's *d*
Problems of Physical Health	4	Germany	225	.731	2.5067	.69030	-.607	438	.544	.057
		China	226	.796	2.5498	.81241				
Problems of Psychological Well-being	4	Germany	225	.732	2.9444	.68116	.940	449	.348	-.088
		China	226	.836	2.8794	.78465				

Based on the above information, the results of hypotheses testing of independent-samples t test are summarized in Table 10.7.

The hypothesis HH1 is not supported in that there is no significant difference between Chinese employees and German employees in physical health. The *p* value of the significance testing .544 is larger than .05. The Cohen's *d* effect size is also quite small (d = .057). It means that Chinese employees didn’t report significantly more problems of physical health than German employees.

Since the *p* value of the significance testing .348 is larger than .05, HH2 is not supported. There is no significant difference between Chinese employees and German employees in psychological well-being and the effect size is also quite small (d = -.088). This means that Chinese employees didn’t report significantly more problems of psychological well-being

than German employees.

Table 10.7: Results of hypotheses testing of independent-samples t test regarding problems of health and well-being

Hypotheses	Results	Explanation
HH1. Chinese employees will report more problems of physical health than their German counterparts.	Not Supported	The hypothesis is rejected because the p value of the significance testing is larger than .05. There is no significant difference between German employees and Chinese employees in physical health.
HH2. Chinese employees will report more problems of psychological well-being than their German counterparts.	Not Supported	The hypothesis is rejected because the p value of the significance testing is larger than .05. There is no significant difference between German employees and Chinese employees in psychological well-being.

10.3.4 Job Satisfaction: Chinese and German Employees

Table 10.8 presents the reliability statistics, independent-samples t test and effect size statistics. The Cronbach's alpha coefficient for job satisfaction in both German and Chinese samples are above .70, indicating that the 8-item Job Satisfaction Scale has maintained very satisfactory internal consistency across cultures and translations (Spector et al., 2004). This scale can be used for further analysis in Germany and China.

Table 10.8: Reliability statistics, independent-samples t test and effect size statistics for job satisfaction for German and Chinese employees

Factors	Items	Country	N	α	M	SD	t	df	p	Cohen's *d*
Job Satisfaction	8	Germany	225	.887	3.4367	.88862	5.231**	427.951	.000	-1.155
		China	226	.882	3.0398	.71244				

Note: **p<. 01.

The hypothesis HS is supported in that German employees reported significantly higher level of job satisfaction than Chinese employees. The *p* value of the significance testing .00 is less than .01. The Cohen's *d* effect size is also large (d = -1.155). It means that German employees are significantly more satisfied with their jobs than Chinese employees.

Based on the above table, the results of hypotheses testing of independent-samples t test are presented in Table 10.9.

Table 10.9: Results of hypotheses testing of independent-samples t test regarding job satisfaction

Hypotheses	Results	Explanation
HS. German employees will report higher level of job satisfaction than their Chinese counterparts.	Supported	There is significant difference between German and Chinese samples. Item mean in German samples is larger than that in Chinese samples.

10.3.5 Relationship: Problems of Health and Well-being and Job Satisfaction

The coefficient of correlation is used to analyze the relationship between two interval or ordinal variables. Based on the hypothesis that the data are distributed normally (Stemler, 2004), Pearson correlation coefficient can be used if both variables are interval and distributed roughly normally (McCrum-Gardner, 2008). However, if either variable is interval or ordinal and also skewed, the nonparametric counterpart is equivalent to the correlation coefficient of Spearman rank (McCrum-Gardner, 2008). The Spearman's rank coefficient gives an estimate of the Pearson correlation coefficient, which can be used when the data being analyzed are not distributed normally (Stemler, 2004).

The normal distribution of the variables was tested before doing the correlation analysis. Since not all the variables are distributed normally, Spearman correlation coefficients are chosen to analyze the relationship between the two variables.

Table 10.10 presents the correlation between level of health and well-being and level of

job satisfaction for the German and Chinese samples. In detail, the problems of psychological well-being (psychological stress responses) are negatively related to job satisfaction in both Germany and China. Although the problems of physical health (physical stress responses) are negatively related to job satisfaction in Germany, they are not significantly related to job satisfaction in China.

Table 10.10: Correlations between problems of health and well-being and level of job satisfaction for German and Chinese samples

German samples (N = 225)

Factors	1.	2.	3.
1. Problems of Physical Health	1	.585**	-.253**
2. Problems of Psychological Well-being		1	-.329**
3. Level of Job Satisfaction			1

**. Correlation is significant at the .01 level (2-tailed).

Chinese samples (N = 226)

Factors	1.	2.	3.
1. Problems of Physical Health	1	.527**	-.114
2. Problems of Psychological Well-being		1	-.240**
3. Level of Job Satisfaction			1

**. Correlation is significant at the .01 level (2-tailed).

Based on the above information, the results of hypotheses testing are summarized in Table 10.11. The hypothesis HR1 is partly supported.

Table 10.11: Results of hypotheses testing of Spearman correlations regarding the relationship between the problems of health and well-being and level of job satisfaction

Hypotheses	Results	Explanation
HR1: The problems of physical health and psychological well-being are negatively related to job satisfaction. The more problems of physical health and psychological well-being an employee reported, the lower level of job satisfaction the employee has.	Partly Supported	In German samples, the problems of physical health (physical stress responses) and the problems of psychological well-being (psychological stress responses) are both negatively related to the level of job satisfaction, correlation is significant at the .01 level (2-tailed). In Chinese samples, the problems of physical health (physical stress responses) are not significantly related to job satisfaction, only the problems of psychological well-being (psychological stress responses) are negatively related to the level of job satisfaction, correlation is significant at the .01 level (2-tailed).

10.3.6 Relationship: Job Satisfaction and Turnover Intention

Table 10.12 presents the correlation between job satisfaction and turnover intention for the German and Chinese samples. The level of job satisfaction is negatively related to turnover intention in both German and Chinese samples. Correlation is significant at the .01 level (2-tailed).

Based on the above information, the results of hypotheses testing are summarized in Table 10.13. The hypothesis HR2 is supported.

In conclusion, Chapter 10 focuses on the core results of the comparative study between Chinese employees and German employees. The introduction and the method have been given. The results of hypotheses testing regarding sources of work stress, coping strategies, health and well-being, job satisfaction, relationship between the problems of health and well-being and level of job satisfaction, and relationship between the level of job satisfaction and turnover intention have been presented.

Table 10.12: Correlations between job satisfaction and turnover intention for German and Chinese samples

German samples (N = 225)

Factors	1.	2.
1. Level of Job Satisfaction	1	-.485**
2. Turnover Intention		1

**. Correlation is significant at the .01 level (2-tailed).

Chinese samples (N = 226)

Factors	1.	2.
1. Level of Job Satisfaction	1	-.286**
2. Turnover Intention		1

**. Correlation is significant at the .01 level (2-tailed).

Table 10.13: Results of hypotheses testing of Spearman correlations regarding the relationship between the level of job satisfaction and turnover intention

Hypotheses	Results	Explanation
HR2: The job satisfaction is negatively related to turnover intention. Employees who report higher levels of job satisfaction will report lower intention to quit.	Supported	In German samples, the job satisfaction is negatively related to turnover intention; In Chinese samples, the job satisfaction is also negatively related to turnover intention. Correlation is significant at the .01 level (2-tailed).

11 Discussion and Conclusion

This chapter will concentrate on the discussion and conclusion of the current study. First, the main findings of the comparative study are introduced. Second, the contributions of this study are discussed. Then, the limitations of this study are mentioned. Next, the implications for future research and practice are provided. Finally, the conclusions are given.

11.1 Main Findings of the Comparative Study

Both quantitative and qualitative data on work stressors, coping strategies of work stress, physical health and psychological well-being, job satisfaction, and demographic data concerning participants' gender, age, education level, weekly working hours, level of work stress, and intention to quit were collected from many different industries in different cities of both China and Germany by questionnaire surveys.

Participants were 253 Chinese employees and 289 German employees. To avoid method bias in this comparative study, equal or roughly equivalent numbers of samples from each industry in Chinese and German companies were selected. As a result, 226 Chinese samples and 225 German samples were used for the comparative study.

Although some research hypotheses were not supported by the results of data analysis, most of the hypotheses were supported.

11.1.1 Chinese and German Employees' Sources of Work Stress

11.1.1.1 Workload

The quantitative result that Chinese employees reported significantly more stress caused by

workload than their German counterparts supported hypothesis HS1. This finding is consistent with the demographic information (see Table 10.1) from the current empirical surveys which reported that Chinese employees' weekly working hours on average are 54.17 hours (N = 226) and German employees' weekly working hours on average are 44.35 hours (N = 225).

This result is also consistent with previous studies (refer to section 4.2.1). Rosta and Aasland (2011) reported that the standard weekly working hours of full-time job is usually between the range of 40-42 hours in Germany. According to SOEP figures, Holst and Wieber (2014) showed that the actual weekly working time for men in Germany was 42.2 hours in 2013. For women, the average actual working time was 32.3 hours in 2013. The studies by So (2009) and Zhou (1997) argued that Chinese workers work long hours, particularly migrant workers. Most of them have to work 11 to 12 hours daily on average and have no work-free weekends despite of the labor laws. In another study, Chinese migrant workers' average weekly hours was 56 hours, whereas 75% of them worked over 48 hours weekly on average (Ngai, 2007; Smyth et al., 2013). As shown by a recent study, manufactured goods account for 41% of China's Gross National Product. Thus the demand for speedy delivery to customers' forces immigrant employees to work long hours to finish the orders and this engenders enormous stress and burnout for the workers (Brown & O'Rourke, 2003).

11.1.1.2 Competition and Comparison

The quantitative result that the Chinese employees reported significantly more stress caused by competition and comparison than their German counterparts supported HS2.

This finding is consistent with previous researches (refer to section 4.2.1). The study by (Birdie, 2017) noted that in a highly competitive atmosphere, people in developing countries such as China have much pressure to be one step ahead of others which brings about protracted stress. People are pressured to compete for the resources, job opportunities, money, promotion opportunities, status and power for functioning in social life or at workplace (Salmon et al., 2008). Another study by Ge et al. (2015) noted that Chinese people are driven by social comparison and temporal comparison (Ge et al., 2015). Owing to the symbiotic attributes of the Chinese organization, superiors make subordinates comparing along with colleague's better performance to expand efficiency increase productivity or comparisons by

colleague's poorest performance to use to introspect themselves, or also ask junior employees to compare with their own previous performances over a given period of time (Ge et al., 2015).

11.1.1.3 Role Uncertainty

Some work stress is caused by role uncertainty including role conflict and role ambiguity. However, different cultural societies or organizations have different orientations to avoid uncertainty. The quantitative result that Chinese employees reported significantly more stress caused by role uncertainty compared with their German counterparts supported HS3.

The finding is consistent with previous findings in the GLOBE study of 62 societies by House et al. (2004). This study has indicated that most of the countries with high reported uncertainty avoidance practices are developed countries; however, most of the countries with low reported practices are developing countries. For example, this study has indicated that China is a lower uncertainty avoidance country with practices score of 4.94 compared to western Germany with practices score of 5.22 and eastern Germany with a practice score of 5.16. (House et al., 2004).

11.1.1.4 Control

Consistent with HS4, the result indicated that Chinese employees reported significantly more stress caused by lack of control over work compared with their German counterparts.

This result is identical with previous findings. Lack of job control or autonomy has been regarded as a frequently reported work stressor. Collectivists tend to perceive lower control than individualists (Liu et al., 2007). Kühlmann and Rabl (2009) summarized that German people have a characteristic of individualism through autonomy and independence. Whereas collectivist Chinese tend not to give autonomy the highest priority (Triandis, 1988; Liu, Spector & Shi, 2007) and give priority to group needs, interests and compliance rather than to themselves. This result is quite similar to Liu et al.'s findings that Chinese employees reported a lower job autonomy than their American counterparts (Liu et al., 2007).

11.1.1.5 Pay and Career Prospects

The result that Chinese employees reported significantly more stress caused by pay and career prospects than their German counterparts supported HS5.

The finding is consistent with previous studies. Germany is famous for its social welfare system. The health care system of Germany is of good repute around the world. The Chinese health care system has being criticized for poor quality of health care services, inadequate health insurance coverage, soaring health care costs and inequality among urban and rural residents. Social pension system in China is also being criticized for its inequality across regions, limited and incomplete coverage and low benefit level. Moreover, about one third of Chinese families have only one child as a result of the infamous one-child policy, and growing numbers of married couples will have obligations for not only one child but also four old people (parents and parents-in-law) (Cai & Cheng, 2014; Chen & Standing, 2007). Under these circumstances, most of the Chinese people feel anxious and pressured by the growing costs of living. They expect to have more income and more career advancement opportunities for better life. These are the main reasons why most of the Chinese people work very hard in order to earn enough money for the future expenses, such as costs of education, housing, health care and other basic living necessities.

11.1.1.6 Competency

The result that Chinese employees reported significantly more stress caused by competency than their German counterparts supported HS6.

This finding is similar to the previous studies. The cross-cultural research of Liu et al. (2007) found that Chinese employees reported more about conditions of employment and lack of training than their American counterparts. Competency is an individual's level of being competent or qualified for his or her work. It includes relevant job skills, training experience or work experience.

11.1.1.7 Work-life Balance

The HS7 that Chinese employees will report more stress caused by lack of work-life balance

than their German counterparts was not supported by the results of data analysis.

This hypothesis is rejected in that there is no significant difference between Chinese employees and German employees in work-life balance because the *p* value of the significance testing is larger than .05. This means that Chinese employees do not have significantly more stress caused by lack of work-life balance compared with their German counterparts. This may due to the fact that most of Chinese people can gain the family members' understanding and support which can be a buffer against stress caused by work-life imbalance. Compared with their individualistic counterparts in German working populations, a large number of Chinese workers tend to regard work as contribution to the family and attach more importance to work than nonwork like leisure activities (Spector et al., 2007; Tang, Siu, & Cheung, 2014).

11.1.1.8 Relationships at Work

The result that Chinese employees reported significantly more stress caused by relationships at work than their German counterparts supported HS8.

The result is identical with previous researches. German people spend more time on executing the job assignments and their personal lives rather than forming elaborate social relationships. However, collectivist Chinese people have tendency to spend much time, energy and also money to protect group harmony and save "face" (in Chinese "mian zi 面子"). Chinese culture values interpersonal relationships and attaches great importance to "Guan Xi" among people (Liu et al., 2007). In order to achieve pleasant relationships and career advancement, Chinese people have been spending much time in dealing with complicated interpersonal relationships (Liu et al., 2007). The great efforts to deal with complicated interpersonal relationships, to avoid conflicts, to save "face", and to maintain group harmony will cause stress for the employees themselves.

11.1.1.9 Boredom at Work

The result that Chinese employees reported significantly more stress caused by boredom at work than their German counterparts supported HS9.

This finding can be supported by previous researches and the current surveys. The questionnaire surveys conducted in Chinese and German companies indicated that the weekly working hours on average of 226 Chinese employees and 225 German employees are 54.17 hours and 44.35 hours respectively. Chinese employees work significantly longer hours than German employees. Rzeszotarski et al. (2013) emphasized that employees in who work in human computation line of work probably feel boring over long work hours. Heavy workloads and long hours can lead to adverse impacts such as boredom and fatigue for employees (Rzeszotarski et al., 2013). Schuster and Rhodes (1985) thought that working overtime would cause fatigue and boredom (Savery & Luks, 2000).

11.1.2 Chinese and German Employees' Coping with Stress at Work

11.1.2.1 Positive Thinking

The finding that Chinese employees reported that they use positive thinking as a way to deal with stress more often than their German counterparts supported hypothesis HC1.

This may because Chinese people are more positive about the future of their work, life and country due to the unprecedented economic development and great social changes in China (Frijters et al., 2012). Most people in China benefit from the rapid economic growth and income growth and thus have continued optimistic expectations of the future. It is suggested that future researchers pay more attention to this topic.

11.1.2.2 Physical Exercises

The result that German employees reported that they do physical exercises as a way to deal with stress more often than their Chinese counterparts supported HC2.

This finding can be supported by previous studies. The investigation results of Smyth et al. (2013) pointed out that the weekly working hours of 36% participants in China was over 60 hours and around 12% "often" or "always" worked more than six days during the last three months. In this case, a lot of Chinese employees do not have sufficient time or energy for physical exercises or sports activities. However, German employees have more time to for

physical activities. The relation between employers and employees is regulated by the German laws as there are regulations on contract terms which includes the highest number of working hours allowed, holidays, part time jobs etc. (Lorenz & Falder, 2016).

11.1.2.3 Leisure and Relaxation

The result that German employees reported that they use leisure and relaxation as a way to deal with stress more often than their Chinese counterparts supported HC3.

This finding is consistent with the current study on workload which reported that Chinese employees' average working hours per week are 54.17 hours (N = 226) and German employees' average working hours per week are 44.35 hours (N = 225) (see Table 10.1). This finding can also be supported by previous literatures. So (2009) argued that majority of Chinese migrant workers have to work 11 to 12 hours per day on average and have no weekends off despite the Chinese labor laws. Although the situations have improved in recent years, many Chinese employees still do not have much time for leisure and relaxation because of work or taking care of the family. In contrast, German employees have more time to for leisure activities, relaxation, interests and hobbies because they usually have normal weekends off. As mentioned before, German employees are protected by some laws regarding working hours and holidays (Lorenz & Falder, 2016).

11.1.2.4 Religious Coping

The HC4 that German employees reported that they use religious coping as a way to deal with stress more often than their Chinese counterparts was not confirmed by the results of quantitative analysis.

There is no significant difference between Chinese employees and German employees in the use of religious coping. This means that German employees use Religious Coping as a way to deal with stress not significantly more often than Chinese employees. This may because more and more young German people do not have a real religious belief. Few researches have such a finding about the comparison on the use of religious coping between Chinese employees and German employees. It is suggested that future researchers pay more attention to this topic.

11.1.2.5 Acceptance

Opposite to hypothesis HC5, German employees reported that they use acceptance as a way to deal with stress more often rather than less often compared with their Chinese counterparts. There is a significant difference in Acceptance between Chinese employees and German employees with an effect size d = -.386 which is between small and medium.

This finding is not consistent with the result of previous studies that collectivist Chinese tend to emphasize group harmony and are more likely to accept and adapt to the reality or uncontrollable situations (Siu et al., 2006). One possible reason is that Chinese people's attitudes about acceptance coping have changed over time. With the rapid development of economy and the growth of income in recent years, more and more people in China try to change what they can change for a better life rather than only accept or adapt to the current situations. In contrast, German society has changed very slowly in recent years as a developed country and many German people choose to accept or adapt to the current situations due to a lack of motivation to change.

11.1.2.6 Self-blame

Chinese employees reported that they use self-blame as a way to deal with stress more often than their German counterparts. HC6 was supported and the effect size is small (d = .295).

This result is identical with previous findings that people in Confucian culture tend to seek in themselves rather than blame Heaven or others for their own failure (Tsai, 2001). For example, Chinese students are more likely to use self-blame as coping strategy than their Western counterparts when facing adversities (Shi & Zhao, 2014).

11.1.2.7 Problem-solving Coping

Consistent with former studies, German employees reported that they use problem-solving coping as a way to deal with stress more often than their Chinese counterparts. HC7 was supported.

As stated in section 4.2.2, collectivist Chinese people tend to avoid direct conflict, to save "face", and to maintain harmony (Liu et al., 2007). It will be beneficial to avoiding

unpleasant interpersonal situations but it is not beneficial to solving problems or conflicts. However, Germans use more direct verbal conversation to resolve issues rather than allow them linger. Brodbeck and Frese (2007) have argued "Social interaction in German companies tends to be more task oriented, straightforward […] than in many other countries" (Brodbeck & Frese, 2007, p. 165).

11.1.3 Chinese and German Employees' Health and Well-being

11.1.3.1 Physical Health

The HH1 that Chinese employees will report more problems of physical health than their German counterparts was not confirmed by the results of quantitative analysis.

This assumption is not supported in that there is no significant difference between Chinese employees and German employees in physical health problems because the *p* value of the significance testing is larger than .05. This means that Chinese employees didn't report significantly more problems of physical health than German employees.

11.1.3.2 Psychological Well-being

The HH2 that Chinese employees will report more problems of psychological well-being than their German counterparts was not supported by the results of quantitative analysis.

This assumption is rejected. There is no significant difference between Chinese employees and German employees in psychological well-being problems and the *p* value of the significance testing is larger than .05. This means that Chinese employees didn't report significantly more problems of psychological well-being than German counterparts.

11.1.4 Chinese and German Employees' Job Satisfaction

The result of quantitative analysis that German employees reported higher level of job satisfaction than their Chinese counterparts supported hypothesis HJ. There is significant difference between Chinese employees and German employees in level of job satisfaction.

The *p* value of the significance testing .00 is less than .01. This means that German employees are significantly more satisfied with their jobs than Chinese employees.

This result is quite similar to Liu et al.'s findings that American employees had higher job satisfaction than their Chinese counterparts (Liu et al., 2007). This result can also be supported by previous literatures. Spector (1997) found that level of pay correlates strongly with job satisfaction. As stated in in section 4.2.4, Chinese people are pressured by the growing costs of living, education, housing, and health care and so on. Many Chinese workers do not have enough pay and benefits for their basic needs or expectations. As a result, their satisfactions with the income (e.g., pay and benefits) are usually lower than German employees. Moreover, Chinese employees' satisfactions with relationships at work are lower than their German counterparts.

11.1.5 Relationship between Health and Well-being and Job Satisfaction

The hypothesis HR1 that the problems of physical health and psychological well-being are negatively related to job satisfaction was partly supported by the result of quantitative analysis (refer to section 10.3.5). The problems of psychological well-being (psychological stress responses) are negatively related to job satisfaction in both German and Chinese samples. Although the problems of physical health (physical stress responses) are negatively related to job satisfaction in German samples, they are not significantly related to job satisfaction in Chinese samples.

The result is consistent with previous finding. Faragher et al. (2005) found that low level of satisfaction is likely to lead to a low level of health (particularly mental health) of an individual. Employees who have low job satisfaction are likely to suffer emotional burn-out, decreased self-esteem and increased anxiety and depression (Voltmer, Rosta, Siegrist, & Aasland, 2012).

11.1.6 Relationships between Job Satisfaction and Turnover Intention

The quantitative result that the job satisfaction is negatively related to turnover intention supported hypothesis HR2 (refer to section 10.3.6 and table 10.11). The level of job satisfaction is negatively related to turnover intention in both German and Chinese samples. Correlation is significant at the .01 level (2-tailed). That means hypothesis HR2 is confirmed. Employees who report higher levels of job satisfaction will report lower intention to quit.

11.2 Contributions

This research has made some contributions to the development and validation of four new scales. It has also made some contributions to the comparative study on stress management at the workplace between Chinese and German companies.

11.2.1 Development and Validation of the Four New Scales

The advancement of the economy worldwide, globalization of labor market and also the competition among workers (Bamber, 2011, 2013) have led to amplified fear, uncertainty, and higher levels of stress (Abramowitz, 2012). More and more attention is being paid to work stress in developed and developing countries. However, most of the scales or questionnaires on stress and work stress were developed and validated in Western industrialized countries. They are probably to be problematic when used in Chinese cultural society. The theoretical models often indicate a poor goodness of fit to the data, and the reliability coefficients of some subscales are often unacceptably low (Siu et al., 2006). And most of them were developed before the year 2000, some even dating back to before 1990. These outdated scales or questionnaires do not include the new theories and practices in recent years.

Standing on the shoulders of prior researchers and practitioners, this research has developed and validated four new scales, namely Sources of Work Stress Scale, Coping with Stress Scale, Health and Well-being Scale, and Job Satisfaction Scale, by 10 or 12 empirical

studies with German and Chinese samples.

Sources of Work Stress Scale (SWSS): From March 2015 to January 2018, 10 empirical studies have been performed in many companies from various industries in both China and German to develop and validate the SWSS. In an attempt to contribute to the conceptual and theory-development of work stressors research, a nine-factor model has been proposed that the most common causes of work stress include workload, competition and comparison, role uncertainty, control, pay and career prospects, competency, work-life balance, relationships at work, and boredom at work. This is the first time that competition and comparison is proposed as one of the common causes of work stress and identified as a dimension in a scale. This is probably the first time that competency is proposed as a common cause of work stress and identified as a dimension in a scale. The SWSS has proposed to put role conflict and role ambiguity together as one concept named role uncertainty because both role conflict and role ambiguity will cause the state of being uncertain of fulfilling the job demands or expectations from others at work. Chapter 6 of this dissertation only introduced six of the studies in detail as they are more significant than the others. All indices have indicated that the theoretical 9-factor model (hypothesized model) of SWSS demonstrates acceptable fit to the data among Chinese and German samples. Both the convergent validity and discriminant validity of the Chinese and German versions SWSS are established. Meanwhile, the Cronbach's alpha reliability and composite reliability (CR) of the Chinese and German versions SWSS are acceptable. Thus, both the reliability and the validity of SWSS are established. SWSS is a validated and reliable tool to measure work stressors in both Chinese culture and Western culture (especially German culture).

Coping with Stress Scale (CSS)**:** 12 empirical studies were performed in many companies from a variety of industries in both China and Germany from May 2014 to January 2018. They were conducted to develop and validate the CSS to measure how people cope with stress at work. As coping develops, the coping scales or questionnaires should be updated with new coping strategies. However, many scales or questionnaires that developed in Western countries do not include the recently developed coping strategies. This research has proposed a ten-factor model that the strategies for coping with stress at work mainly include future-oriented coping, positive thinking, physical exercises, social support, leisure and relaxation, religious coping, avoidance, acceptance, self-blame, and problem-solving coping. The CSS includes some recently developed coping strategies, such as Future-oriented

Coping (e.g., proactive coping, preventive coping and anticipatory coping) and Leisure and Relaxation as a coping strategy. This is probably the first time that Future-oriented Coping and Leisure and Relaxation are proposed as two dimensions in a coping scale or questionnaire. Chapter 7 of this dissertation only introduced eight of the empirical studies in detail due to their significance. Confirmatory factor analysis has indicated that the theoretical 10-factor model (hypothesized model) of CSS demonstrates acceptable fit to the data from both German and Chinese samples. All evidences have indicated that both the convergent validity and discriminant validity of the CSS are established. The Cronbach's alpha reliability and composite reliability (CR) of the CSS are acceptable. Thus, both the reliability and the validity of the CSS are established. The CSS is a validated and reliable tool to measure coping strategies in both Chinese culture and Western culture (especially German culture).

Health and Well-being Scale (HWS): 10 empirical studies were performed to develop and validate the HWS as well as to examine its psychometric properties. These empirical studies were carried out from May 2014 to January 2018 in many companies from many different industries in both China and German. Chapter 8 of this dissertation only introduced six of them in detail because they are more significant than the others. All indices have shown that the theoretical 2-factor model (8 items) of the HWS demonstrates acceptable fit to the data among Chinese and German samples. Both the convergent validity and discriminant validity of the Chinese and German versions HWS are established. Meanwhile, the internal consistency reliability (Cronbach's alpha) and composite reliability (CR) of the Chinese and German versions HWS are acceptable. Thus, both the reliability and the validity of HWS are established. HWS is a validated and reliable tool to measure physical health and psychological well-being related to work stress in both Chinese culture and Western culture (especially German culture).

Job Satisfaction Scale (JSS): 10 empirical studies were conducted in many companies from various industries in both China and German to develop and validate the JSS as well as to examine its psychometric properties. These empirical studies were from May 2014 to January 2018. Chapter 9 of this dissertation only introduced six of them in detail due to their significance. The JSS is designed to measure the extent to which the employees feel satisfied or dissatisfied with their job. All indices from the outputs of AMOS 22 have shown that the theoretical 1-factor model (hypothesized model) of the JSS demonstrates acceptable fit to the data among Chinese and German samples. Meanwhile, the evidences from SPSS 22 have

indicated that the internal consistency reliability (Cronbach's alpha) of the German version JSS is acceptable. Thus, both the reliability and the validity of the JSS are established. The 8-item Chinese and German versions JSS is a validated and reliable tool to measure job satisfaction in both Chinese culture and Western culture (especially German culture).

The above four scales provide new and validated research tools in an attempt to contribute to the conceptual and theory-development of stress research and cross-cultural research, especially the comparative study on stress management at the workplace between Western and Chinese cultures. The softwares SPSS 22, Amos 22 and/or Smart PLS 3 were used to examine the factor structure, reliability, construct validity, and cross-cultural equivalence. The reliability, validity and cross-cultural equivalence of each scale have been established by a series of empirical studies with German and Chinese samples.

The four scales are developed and validated in both China and western industrialized countries at the same time and with the same method. It can contribute to the minimization of some biases; namely, construct bias, method bias and item bias. Equivalence (or lack of bias) of measures is a prerequisite for any cross-cultural research (He & Van de Vijver, 2012; Van de Vijver & Tanzer, 2004). There will be no common basis for any cross-cultural comparison if there is a lack of measurement equivalence (Beuckelaer et al., 2007). It is equivalent to comparing apples with oranges (He & Van de Vijver, 2012). Confirmatory factor analysis has indicated that each of the four scales has reached three equivalence levels (Construct Equivalence, Measurement Unit Equivalence, and Full Score Equivalence) in Chinese and German cultures. This means that the connotation or significance of each scale in Germany and China are conveyed in a very similar way, and the two versions of JSS have the same measurement unit and the same origin.

11.2.2 Comparison of Work Stress between Chinese and German Companies

As ever mentioned before, China is the biggest developing country and epitomizes a constantly growing economic power with 20% of global population, and Germany is a representative developed country. It must be of great significance to obtain data from Chinese employees and German employees to contribute to the improvement of concepts and methods

involved in work stress research (Lu et al., 2010).

So far, this is probably the first comprehensive and accurate comparative study on stress management at the workplace between Chinese and German companies. The data on work stressors, coping strategies of work stress, physical health and psychological well-being, and job satisfaction were collected from a variety of industries in different cities of both China and Germany by questionnaire surveys. The demographic data concerning participants' gender, age, education level, weekly working hours, level of work stress, and intention to quit were also collected.

The current comparative study collected data by four scales which were newly developed and validated by a series of empirical studies in both China and Germany at the same time and with the same method. This is very helpful to avoid biases and reach cross-cultural equivalence and thus lay a solid foundation for the comparative study between Chinese and German employees. However, many comparative studies on work stressors, coping, health and well-being, and job satisfaction tended to collect data by scales or questionnaires which were developed and validated before the year 2000 or even 1990 in Western industrialized countries using data from English-speaking countries (Gilboa et al., 2008). As mentioned before, these outdated scales or questionnaires do not include the new theories and practices in recent years and the theoretical models and some reliability coefficients probably become problematic when used in Chinese cultural society. The studies used outdated scales or questionnaires may lead to bias conclusions and threaten the validity of research (Deković et al., 2006).

11.3 Limitations of the Current Comparative Study

Questionnaire survey is a widely used research method in social science. This study has collected data through the use of four scales, the self-report questionnaires. However, some scholars claimed that self-report questionnaires have inherent limitations, most notably the limitation of common method variance (CMV) (Woszczynski & Whitman, 2004). CMV refers to "variance that is attributable to the measurement method rather than to the constructs the measures represent" (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003, p. 879). Researchers should do whatever they can to control for the CMV problem (Podsakoff et al.,

2003) because there may be a problem of CMV when self-report measures are used to collect data from the same participants at the same time (Chang, van Witteloostuijn, & Eden, 2010). To avoid or minimize any potential CMV, this study has taken some important steps, such as testing and demonstrating the reliability and validity of the four scales, randomizing the order of questions and collecting data from multiple sources.

Due to the cross-sectional nature of this comparative study (Hassan, Joshi, Madhavan, & Amonkar, 2003), it can only compare different population groups at a specific point in time or over a short period. However, it's difficult to derive definite information about causality from cross-sectional analysis (Setia, 2016), because the information is collected at a single point of time as an overall snapshot and there is no information about time course of variables of the population being studied. Routinely collected data normally can not provide information about cause-and-effect relationships**.** For example, it's difficult to know whether a specific coping strategy is used by an employee to cope with a certain source of stress at work.

Another limitation of this study is that there are some possibility of bias due to the use of self-reported questionnaires (Hassan et al., 2003) in the context of a cross-sectional study, such as responder bias, negative affectivity (NA) bias, and social desirability bias (SDB). Watson et al. (1987) stated that NA biased the measurement of job stressors and resultant job strains and those people who are high in NA are more likely to report high levels of stress even there is a lack of objective stressors (Spector, Zapf, Chen, & Frese, 2000). SDB is the tendency of participants to answer questions by presenting themselves in socially favorable norms or socially desirable terms to obtain the acceptance from others (King & Bruner, 2000). SDB is one of the identified factors affecting validity of self-report measurement (Guest, Bunce, Johnson, Akumatey, & Adeokun, 2005), such as the measurement of personality variables, attitudes, and self-reported behaviours (Fisher & Katz, 2000). As quoted in Gittelman et al. (2015), "some respondents may be reluctant to admit embarrassing attributes about themselves or may be motivated to exaggerate the extent to which they possess admirable attributes" (Baker et al., 2010, p. 735). To reduce SDB, participants were told that the questionnaire survey is anonymous and the personal information or data will be protected strictly. Moreover, the pre-surveys with four scales have been conducted before the formal questionnaire surveys. This led to the deletion or modification of several items in the preliminary versions which may cause SDB.

Many scholars have paid attention to the possible response biases related to cultural differences in cross-national studies (Leung, 1989; Leung & Bond, 1989; Rocereto, Puzakova, Anderson, & Kwak, 2011). Rocereto et al. (2011) has pointed out that Asian respondents are less likely to select extreme response categories when compared with Western respondents in responding to questions through a scale. Believing in the Confucian philosophy that one should avoid extremes and choose the doctrine of the mean (the way of moderation), Asian respondents are more likely to choose neutral points than Western respondents on Liker-type scales (Rocereto et al., 2011). Response bias can also happen because of the culture-specific factors or cultural specifies. For instance, a questionnaire survey on how German and Chinese people cope with stress which contains the item "I go to a Karaoke bar with friends for relaxation" showed that Chinese people have reported higher scores on this item than German people. It is because going to a Karaoke bar with friends is a common way to relax for Chinese people, however, German people seldom use this way for relaxation. Moreover, it is much easier to find a Karaoke bar in China than in Germany due to the fact that Karaoke bar is more popular in China. There will be an item bias and the response bias caused by low familiarity/appropriateness of item content since it favors one cultural group (Van de Vijver, 2003; Van de Vijver & Tanzer, 2004). To reduce item bias and response bias, this biased item had to be removed from the coping with stress scale when applied to both German and Chinese samples for a comparative study.

To ensure the accuracy of the research results, a sufficiently large sample size is typically required in a cross-sectional study compared to other types of studies because the population groups are being studied at a specific point in time or over a short period. However, it was quite difficult and time-consuming for an individual researcher to collect a large quantity of data from various companies in both China and Germany. The problem is due to the fact that stress is a private issue for employees to a certain extent, especially for German employees and companies. The employees are most often prohibited to participate in questionnaire surveys on work stress when the surveys come from external individuals. Therefore, one of the limitations of this study is that both the German sample size and the Chinese sample size are not very large (less than 300 samples). A larger sample size such as 500 or 1000 would be better for the representative of population groups being studied.

Another limitation of this study is the use of student samples for the development and modification of several items of the CSS in Chapter 7 because of the accessibility to collect

data from students and the difficulty to collect data from employees in both China and Germany. The use of student samples in empirical studies is usually discouraged, though there are exceptions to this rule, for example, it is acceptable to use student samples together with corresponding managerial samples to investigate differences in views and values across countries and cultures at the same time (Bello et al., 2009).

11.4 Implications for Future Research and Practice

The current study on Chinese and German employees' sources of work stress found that Chinese employees have significantly more stress caused by workload, boredom at work, pay and career prospects, and competition and comparison.

As a developing country, China is still a labor-intensive economy to a large degree. Working long hours and working intensively will result in heavy workload and boredom at work. In a highly competitive atmosphere, Chinese people are pressured to compete with others for the job opportunities, career prospects, money, resources, self-respect, status and power for functioning in social life or at workplace (Salmon et al., 2008). This situation may change a lot when China successfully reforms the income distribution system and social welfare system, and successfully carries out the economic restructuring and industrial upgrading.

Chinese society puts too much emphasis on gaining "face" (in Chinese "mian zi 面子") and Chinese people are driven by social comparison and also temporal comparison (Ge et al., 2015). Many people have to compete or compare themselves with others for the purpose of uncertainty reducing, self-enhancing (Festinger, 1954), and face-saving. Social comparison, temporal comparison and gaining "face" have brought about too much stress for Chinese. It is suggested that Chinese people spend less time, energy and money on social comparison, temporal comparison, and gaining "face". They should pay more attention to something more important, such as physical health, subjective well-being (e.g., happiness), meaning in life, and inner peace.

The current study also found that Chinese employees have significantly more stress caused by role uncertainty, lack of control, competency, and relationships at work. To avoid

or reduce stress caused by role uncertainty and lack of control, the company should provide sufficient information regarding their employees' job responsibilities, duties or the roles employees should play, a clear job description is necessary for employees. It is suggested that a company should give employees more autonomy to perform their work and more opportunities to participate in decision-making at the work-team level or a higher organizational level. Problems or any safety risks are assessed by the participants during the meeting to make operational plans or suggestions to solve the problems (Bhagat et al., 2012). Representative participation approach is common practice in Western Europe, especially in Germany (Aust & Ducki, 2004; Bhagat et al., 2012; Semmer, 2011).

Employees should figure out the job responsibilities, objectives and expectations from others at work. To avoid or reduce stress caused by competency, a company should provide their employees enough vocational training or job skills training. The employees should try to improve their job skills, knowledge, and abilities for the work. Compared with their German counterparts, whose social interaction at work tends to be more task-oriented, straightforward, Chinese employees have more stress from dealing with complicated and annoying interpersonal relationships. Probably Chinese employees will have less stress caused by relationships at work if they can spend more time, energy and money on job tasks, performance, direct communication and private life rather than intricate interpersonal relationships.

It is suggested that company offer a variety of counseling services through employee assistance programs (EAPs) for employees who have personal or work-related problems or stress (Bhagat et al., 2012; Dewe et al., 2010). Evidence has proved that EAPs can improve employees' well-being and company's productivity (Bhagat et al., 2012; Dewe et al., 2010).

The current study on Chinese and German employees' coping with stress at work found that German employees do physical exercises as a way to deal with stress significantly more often than their Chinese counterparts and German employees also use leisure and relaxation as a way to deal with stress significantly more often than their Chinese counterparts. To improve the health and well-being, it is suggested that Chinese people participate in more physical exercises and leisure activities rather than spend too much time on work.

The current study found that German employees use positive thinking as a way to deal with stress significantly less often than their Chinese counterparts. Compared with negative

thinkers, positive thinkers regard stress as less threatening and can cope with it more effectively (Naseem & Khalid, 2010). German employees should be more optimistic and positive when facing stressful situations at work or in life. As mentioned before, positive thinking can generate positive emotions or feelings such as hope, optimism, joy and well-being by focusing on the brighter side of situations (Naseem & Khalid, 2010).

The current study also found that German employees use problem-solving coping to deal with stress significantly more often than their Chinese counterparts. Problem-solving coping is an effective way to reduce stress by resolving the stressors rather than staying away from the problems or avoiding dealing directly with the stressful encounters (Dewe et al., 2010). The accumulated problems will probably make employees feel more pressure. It is suggested that Chinese employees use problem-solving coping more often to deal with stress.

The finding that Chinese employees have significantly lower level of job satisfaction than their German counterparts indicates that Chinese companies can make more efforts to improve employees' job satisfaction from some aspects such as working environment, management level, pay, benefits, vacation, paid leave, promotion opportunities, personal development prospects, and performance evaluation system. Semmer (2011) argued that it's possible to promote employees' health and well-being as well as job satisfaction by changing workload, task characteristics, ergonomics, time pressure, work conditions, role clarity, and interpersonal relationships (Bhagat et al., 2012; Semmer, 2011).

As discussed in earlier chapter, stress management interventions can be considered from the perspective of primary, secondary, and tertiary levels of interventions. Another way of considering intervention is from the perspectives of individual level intervention, job level intervention, organization level intervention, and supra-organization level intervention (Hurrell Jr & Sauter, 2013). Examples of individual level intervention include health promotion (diet and exercise), behaviour modification, relaxation, meditation, time management, stress management and treatment (Dewe et al., 2010; Hurrell Jr & Sauter, 2013). Examples of job level intervention are job design, job redesign, and training (Hurrell Jr & Sauter, 2013). Examples of organization level intervention include culture, leadership, and work-life balance, and accommodation (Hurrell Jr & Sauter, 2013). Examples of supra-organization level intervention are prevention regulation, prevention standards, and compensation resulting from work-related disability (Hurrell Jr & Sauter, 2013).

Due to the fact that a one-sided approach to manage stress will bring about limited and usually short-term effects, more comprehensive and holistic approaches need to be used in order to effectively deal with the increasing levels of stress for many employees (Bhagat et al., 2012; Dewe et al., 2010). A combination of stress management and stress prevention is recommended to deal with work-related stress. The preventive stress management model has proposed that some kinds of stressors are predictable and preventive (Dewe et al., 2010). It is recommended to combine individual level intervention (e.g., stress management training, cognitive-behaviour treatment, relaxation) with organizational level intervention (e.g., changing work environment, providing health promotion programs and employee assistance programs) (Dewe et al., 2010). Due to the fact that employee participation can improve the effectiveness of the intervention, it is also necessary for employees to participate and involve in intervention design and implementation (Dewe et al., 2010). In this way, it is possess to strengthen communication between management and employees and therefore enhance trust and commitment (Dewe et al., 2010).

Future researchers and practitioners who need to measure work stressors with the Sources of Work Stress Scale (SWSS), to measure coping strategies with the Coping with Stress Scale (CSS), to measure physical health and psychological well-being related to work stress with Health and Well-being Scale (HWS), or to measure job satisfaction with the Job Satisfaction Scale (JSS), can selectively use any of the four scales according to their objectives.

Future researchers and practitioners can either use a whole scale or selectively use some of the subscales that are of particular research interest in their samples.

Future researchers and practitioners can further validate any of the scales by confirmatory factor analysis (CFA) with a larger sample size ($N > 200$), such as, 300, 500 or 1000 samples before using any of them as a research tool.

Originally developed in English, the above four scales have been translated from English into Chinese and German versions. In this process, the forward and back translations (English, German and Chinese versions) of the scales were carried out repeatedly to ensure the meaning equivalence. Thus, future researchers and practitioners can respectively use the English, German and Chinese versions of each scale.

The above four scales are suitable for related cross-cultural studies between Chinese and Western cultural society. Of course, they can also be used for research in a single culture, either Chinese culture or Western culture (especially German culture).

It is hoped that more comparative empirical studies on workplace stress between China and Germany will be conducted.

11.5 Conclusions

Over the past decades, extensive scholarly and practical focus has been devoted to workplace stress in not only developed countries but also developing countries. However, the comparative studies on workplace stress between Chinese and German employees are relatively few in number. There are very limited comparative studies between Chinese and German employees on the work stressors, coping strategies, physical health and psychological well-being, and job satisfaction. Therefore, a comparative study on employees' workplace stress between Chinese and German companies should be of great theoretical and practical significance.

Four scales were well developed and validated using empirical studies with German and Chinese samples to achieve a reasonably detailed and accurate comparison of stress management at the workplace between Chinese and German companies.

Only when the reliability, validity and cross-cultural equivalence were all established by a series of pre-surveys in China and Germany, were the formal questionnaire surveys with four scales conducted in Chinese and German companies from many different industries. These important steps have laid a solid foundation for the current comparative study and have ensured the validity of the research results.

Compared with their German counterparts, Chinese employees reported significantly more stress caused by workload, competition and comparison, role uncertainty, lack of control, pay and career prospects, competency, relationships at work, and boredom at work. However, Chinese employees did not report significantly more stress caused by work-life balance compared with their German counterparts. The hypothesis HS7 is rejected in that there is no

significant difference between Chinese employees and German employees in work-life balance.

Chinese employees reported that they use positive thinking as a way to deal with stress significantly more often than their German counterparts. German employees reported that they do physical exercises as a way to deal with stress significantly more often than their Chinese counterparts. German employees also reported that they use leisure and relaxation as a way to deal with stress significantly more often than their Chinese counterparts. However, German employees did not report that they use religious coping as a way to deal with stress significantly more often than their Chinese counterparts. The HC4 is rejected in that there is no significant difference between Chinese employees and German employees in the use of religious coping. Opposite to HC5, German employees reported that they use acceptance as a way to deal with stress significantly more often rather than less often compared with their Chinese counterparts. Chinese employees reported that they use self-blame as a way to deal with stress significantly more often than their German counterparts. German employees also reported that they use problem-solving coping as a way to deal with stress significantly more often than their Chinese counterparts.

Chinese employees did not report significantly more problems of physical health than German employees. The hypothesis HH1 is not supported in that there is no significant difference between Chinese employees and German employees in physical health problems. Chinese employees did not report significantly more problems of psychological well-being than German employees. The hypothesis HH2 is rejected because here is no significant difference between Chinese employees and German employees in psychological well-being problems.

Compared with their Chinese counterparts, German employees reported significantly higher level of job satisfaction.

The correlation analysis has indicated that the problems of psychological well-being (psychological stress responses) are negatively related to job satisfaction in both German and Chinese samples. Correlation analysis has also indicated that the problems of physical health (physical stress responses) are negatively related to job satisfaction in only German samples, however, no significant correlation between them is found in Chinese samples.

The correlation analysis has indicated that the level of job satisfaction is negatively related to turnover intention in both German and Chinese samples. That means that employees who report higher levels of job satisfaction will report lower intention to quit.

In summary, this research has introduced the research background, put forward the research questions and objectives, built the research framework, reviewed the literature on stress and work stress, and proposed the research hypotheses. After developing and validating four scales by several empirical studies with German and Chinese samples, the formal questionnaire surveys for data collection were conducted to compare stress management at the workplace between Chinese and German employees. The Sources of Work Stress Scale, Coping with Stress Scale, Health and Well-being Scale, and Job Satisfaction Scale are four validated and reliable tools in German and Chinese cultures. Future researchers and practitioners are welcome to use these scales for research in more cultures providing more evidences of reliability and validity.

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Appendices

Appendix 1 Introduction to the Questionnaire Survey (English Version)

Dear Sir or Madam,

I am a PhD student at University of Bayreuth, majoring in Business Administration. My research project is “Stress Management at the Workplace: A Comparative Study between Chinese and German Companies”. May I ask you to help me with a questionnaire survey? It could also help you and your colleagues to understand your sources of work stress, coping strategies with work stress, health and well-being, and job satisfaction.

This is an anonymous questionnaire survey. The data obtained will be used for academic research only. I promise you that your personal information and company secrets will be protected strictly. Thank you very much for your participation! If you have any further questions, please don't hesitate to contact me.

Kind regards,

Dong Li

Appendix 2 Introduction to the Questionnaire Survey (German Version)

Sehr geehrte Damen und Herren,

ich bin derzeit Doktorand an der Universität Bayreuth mit dem Hauptfach Betriebswirtschaftslehre. Im Rahmen meiner Doktorarbeit führe ich eine Befragung durch zum Thema „Stressmanagement am Arbeitsplatz: eine vergleichende Studie zwischen chinesischen und deutschen Unternehmen“. Ich bitte Sie, mir durch die Beantwortung eines Fragebogens zu helfen. Diese Studie soll Ihnen und Ihren Mitarbeitern helfen, Stressquellen am Arbeitsplatz zu erkennen, angewandte Stress-Bewältigungsstrategien aufzudecken, und die Gesundheit, das Wohlbefinden und die Zufriedenheit der Mitarbeiter am Arbeitsplatz zu erhöhen.

Dies ist eine anonyme Umfrage. Die erfassten Daten werden nur für wissenschaftliche Forschungszwecke verwendet. Ich versichere Ihnen, dass Ihre persönlichen Daten und Geschäftsgeheimnisse vertraulich behandelt werden. Vielen Dank für Ihre Teilnahme! Sollten Sie weitere Fragen haben, stehe ich Ihnen jederzeit gerne zur Verfügung.

Mit freundlichen Grüßen

Dong Li

Appendix 3 Introduction to the Questionnaire Survey (Chinese Version)

尊敬的女士或先生！

我是德国拜罗伊特大学（Universität Bayreuth）的一名在读博士生，就读企业经济管理专业。我的研究课题是“职场压力管理：中德企业的对比研究”。可以请您帮我填写一份问卷吗？这将有助于您和您的同事们了解自己工作压力的来源、压力的应对策略、健康和幸福感以及工作满意度方面的情况。

这是一份匿名的问卷调查，所得数据仅用于学术研究。本人保证您的个人信息和公司商业机密将严格受到保护。非常感谢您的参与！如果您有任何疑问，请随时联系我。

致以友好地问候

栗冬

Appendix 4 Sources of Work Stress Scale (English Version)

A. Sources of Work Stress

The 30 questions below are about some main sources of work stress. Please indicate how often you feel stressed by any of them. For each item please tick ONE box only.

	Never	Seldom	Sometimes	Often	Always
1. Do you feel stressed by excessively long working hours?	○	○	○	○	○
2. Do you feel stressed by having to compare yourself to others?	○	○	○	○	○
3. Do you feel stressed by not having a clear job description?	○	○	○	○	○
4. Do you feel stressed by having no say in deciding how you do your work?	○	○	○	○	○
5. Do you feel stressed by the fact that your pay and benefits do not meet your expectations?	○	○	○	○	○
6. Do you feel stressed by not mastering necessary skills for your job?	○	○	○	○	○
7. Do you feel stressed by not having enough energy to deal with both work and your hobbies?	○	○	○	○	○
8. Do you feel stressed by bad relationships with others at work?	○	○	○	○	○
9. Do you feel stressed by boring work?	○	○	○	○	○

	Never	Seldom	Sometimes	Often	Always
10. Do you feel stressed by having heavy workload?	○	○	○	○	○
11. Do you feel stressed by role ambiguity?	○	○	○	○	○
12. Do you feel stressed by being isolated by others at work?	○	○	○	○	○
13. Do you feel stressed by competition with others at work?	○	○	○	○	○
14. Do you feel stressed by having insufficient opportunities for promotion?	○	○	○	○	○
15. Do you feel stressed by the time conflict between your private life and your work?	○	○	○	○	○
16. Do you feel stressed by a lack of interest in your work?	○	○	○	○	○
17. Do you feel stressed by working intensively?	○	○	○	○	○
18. Do you feel stressed by being not competent enough for your work?	○	○	○	○	○
19. Do you feel stressed by not receiving satisfactory rewards for your effort at work?	○	○	○	○	○

	Never	Seldom	Sometimes	Often	Always
20. Do you feel stressed by not having enough time for both work and leisure activities?	○	○	○	○	○
21. Do you feel stressed by the atmosphere of competition at work?	○	○	○	○	○
22. Do you feel stressed by a lack of influence on what you do at work?	○	○	○	○	○
23. Do you feel stressed by being not clear about the range of your job responsibilities?	○	○	○	○	○
24. Do you feel stressed by not having sufficient capabilities for your work?	○	○	○	○	○
25. Do you feel stressed by being subject to bullying by others at work?	○	○	○	○	○
26. Do you feel stressed by the competition in the workplace?	○	○	○	○	○
27. Do you feel stressed by lack of control over your work?	○	○	○	○	○
28. Do you feel stressed by monotonous work?	○	○	○	○	○
29. Do you feel stressed by strained relationships with others at work?	○	○	○	○	○
30. Do you feel stressed by not receiving recognition you deserve for your performance?	○	○	○	○	○

Appendix 5 Sources of Work Stress Scale (German Version)

A. Stressquellen bei der Arbeit

Die folgenden 30 Fragen betreffen die häufigsten Stressquellen. Bitte geben Sie an, wie oft Sie sich von diesen gestresst fühlen. Kreuzen Sie für jede Frage bitte nur EIN Kästchen an.

	Nie	Selten	Manchmal	Oft	Immer
1. Fühlen Sie sich durch überlange Arbeitszeiten gestresst?	○	○	○	○	○
2. Fühlen Sie sich dadurch gestresst, sich mit anderen vergleichen zu müssen?	○	○	○	○	○
3. Fühlen Sie sich durch eine ungenaue Beschreibung Ihrer Tätigkeit am Arbeitsplatz gestresst?	○	○	○	○	○
4. Fühlen Sie sich dadurch gestresst, dass Sie nicht mitbestimmen können wie Sie ihre Arbeit gestalten?	○	○	○	○	○
5. Fühlen Sie sich gestresst, weil Ihr Lohn und Ihre Zusatzleistungen nicht Ihren Erwartungen entsprechen?	○	○	○	○	○
6. Fühlen Sie sich dadurch gestresst, dass Sie nicht über die notwendigen Fertigkeiten für Ihre Arbeit verfügen?	○	○	○	○	○
7. Fühlen Sie sich gestresst, weil Sie nicht genug Energie für die Arbeit und Ihre Hobbies haben?	○	○	○	○	○
8. Fühlen Sie sich von schlechten Beziehungen zu anderen am Arbeitsplatz gestresst?	○	○	○	○	○
9. Fühlen Sie sich durch langweilige Arbeit gestresst?	○	○	○	○	○
	Nie	Selten	Manchmal	Oft	Immer
10. Fühlen Sie sich durch hohe Arbeitsbelastung gestresst?	○	○	○	○	○
11. Fühlen Sie sich gestresst, weil Ihr Arbeitsbereich nicht genau definiert ist?	○	○	○	○	○
12. Fühlen Sie sich gestresst, weil Sie von anderen am Arbeitsplatz isoliert werden?	○	○	○	○	○
13. Fühlen Sie sich dadurch gestresst, dass Sie mit anderen am Arbeitsplatz konkurrieren?	○	○	○	○	○
14. Fühlen Sie sich durch fehlende Möglichkeiten zur Beförderung gestresst?	○	○	○	○	○
15. Fühlen Sie sich durch den zeitlichen Konflikt zwischen Ihrem Privatleben und Ihrer Arbeit gestresst?	○	○	○	○	○
16. Fühlen Sie sich durch ein mangelndes Interesse an Ihrer Arbeit gestresst?	○	○	○	○	○
17. Fühlen Sie sich durch hohe Arbeitsintensität gestresst?	○	○	○	○	○
18. Fühlen Sie sich dadurch gestresst, dass Sie nicht kompetent genug für Ihre Arbeit sind?	○	○	○	○	○
19. Fühlen Sie sich gestresst, weil Sie keine zufriedenstellenden Belohnungen für Ihre Arbeit erhalten?	○	○	○	○	○

	Nie	Selten	Manchmal	Oft	Immer
20. Fühlen Sie sich gestresst, weil Sie nicht genug Zeit für Ihre Arbeit und Freizeitbeschäftigungen haben?	○	○	○	○	○
21. Fühlen Sie sich von der Konkurrenzatmosphäre am Arbeitsplatz gestresst?	○	○	○	○	○
22. Fühlen Sie sich gestresst, weil sie zu wenig Einfluss darauf haben, was genau Sie bei der Arbeit zu tun haben?	○	○	○	○	○
23. Fühlen Sie sich dadurch gestresst, dass Ihnen ihr Verantwortungsbereich Ihrer Arbeit nicht klar ist?	○	○	○	○	○
24. Fühlen Sie sich davon gestresst, dass Sie keine ausreichenden Fähigkeiten für Ihre Arbeit haben?	○	○	○	○	○
25. Fühlen Sie sich von Mobbing am Arbeitsplatz gestresst?	○	○	○	○	○
26. Fühlen Sie sich von dem Wettbewerb am Arbeitsplatz gestresst?	○	○	○	○	○
27. Fühlen Sie sich davon gestresst, dass Sie zu wenig Kontrolle über Ihre Arbeit haben?	○	○	○	○	○
28. Fühlen Sie sich von eintöniger Arbeit gestresst?	○	○	○	○	○
29. Fühlen Sie sich von angespannten Beziehungen zu anderen am Arbeitsplatz gestresst?	○	○	○	○	○
30. Fühlen Sie sich gestresst, weil Sie nicht genügend Anerkennung für Ihre Arbeit erhalten?	○	○	○	○	○

Appendix 6 Sources of Work Stress Scale (Chinese Version)

A. 工作压力的来源

下面的30个问题考察的是工作压力的一些主要来源。请指出各个压力源在多大频率上对您造成压力，为每个问题选出最符合的一项作答。

	从不	很少	有时	经常	总是
1. 工作时间过长让您感觉有压力吗？	○	○	○	○	○
2. 不得不将自己与他人作对比让您感觉有压力吗？	○	○	○	○	○
3. 没有清晰的工作职责说明让您感觉有压力吗？	○	○	○	○	○
4. 对如何开展自己的工作没有决定权让您感觉有压力吗？	○	○	○	○	○
5. 工资和福利不能满足您的期望让您感觉有压力吗？	○	○	○	○	○
6. 没有掌握工作所需的必要技能让您感觉有压力吗？	○	○	○	○	○
7. 没有足够的精力既处理工作又参与兴趣爱好让您感觉有压力吗？	○	○	○	○	○
8. 工作中跟别人的关系差让您感觉有压力吗？	○	○	○	○	○
9. 枯燥无聊的工作让您感觉有压力吗？	○	○	○	○	○
	从不	很少	有时	经常	总是
10. 工作量很大让您感觉有压力吗？	○	○	○	○	○
11. 工作角色不明确让您感觉有压力吗？	○	○	○	○	○
12. 工作中受到他人的孤立让您感觉有压力吗？	○	○	○	○	○
13. 工作中与他人的竞争让您感觉有压力吗？	○	○	○	○	○
14. 缺乏晋升的机会让您感觉有压力吗？	○	○	○	○	○
15. 个人生活和工作在时间安排上有冲突让您感觉有压力吗？	○	○	○	○	○
16. 工作中缺乏乐趣让您感觉有压力吗？	○	○	○	○	○
17. 工作强度大让您感觉有压力吗？	○	○	○	○	○
18. 不足以胜任自己的工作让您感觉有压力吗？	○	○	○	○	○
19. 工作中的付出没有得到满意的回报让你感觉有压力吗？	○	○	○	○	○

	从不	很少	有时	经常	总是
20. 没有足够的时间既处理工作又参与休闲活动让您感觉有压力吗？	○	○	○	○	○
21. 工作中的竞争氛围让您感觉有压力吗？	○	○	○	○	○
22. 对自己工作中要做什么缺乏影响力让您感觉有压力吗？	○	○	○	○	○
23. 不太清楚自己的工作职责范围让您感觉有压力吗？	○	○	○	○	○
24. 工作能力不足让您感觉有压力吗？	○	○	○	○	○
25. 工作中遭受别人的欺负冒犯让您感觉有压力吗？	○	○	○	○	○
26. 职场中的竞争让您感觉有压力吗？	○	○	○	○	○
27. 缺乏对自己工作的控制力让您感觉有压力吗？	○	○	○	○	○
28. 工作单调乏味让你感觉有压力吗？	○	○	○	○	○
29. 工作中跟他人关系紧张让您感觉有压力吗？	○	○	○	○	○
30. 自己的工作表现没有得到应有的认可让您感觉有压力吗？	○	○	○	○	○

Appendix 7 Coping with Stress Scale (English Version)

B. Coping with Stress

The following 30 items are about the ways people cope with stress. How do you cope with stress? Some possible coping strategies are listed below. How often do you actually use them as ways of coping with stress at work? For each item please tick ONE box only.

	Never	Seldom	Sometimes	Often	Always
1. I prepare for stressful situations that may occur in the future.	○	○	○	○	○
2. I believe that everything will turn out fine as time goes on.	○	○	○	○	○
3. I do physical exercises.	○	○	○	○	○
4. I seek comfort and understanding from someone.	○	○	○	○	○
5. I relax with recreational activities.	○	○	○	○	○
6. I try to find comfort in my religion or spiritual beliefs.	○	○	○	○	○
7. I occupy myself with something else to avoid thinking about the stressful situations.	○	○	○	○	○
8. I try to accept the reality.	○	○	○	○	○
9. I blame myself.	○	○	○	○	○

	Never	Seldom	Sometimes	Often	Always
10. I analyze the causes of the problem and find ways to solve the problem.	○	○	○	○	○
11. I seek advice and help from others.	○	○	○	○	○
12. I take preventive actions to avoid future problems or troubles.	○	○	○	○	○
13. I pray to God (Allah/Buddha/etc.).	○	○	○	○	○
14. I try to see problems with a positive attitude.	○	○	○	○	○
15. I relax through my interests and hobbies.	○	○	○	○	○
16. I participate in sports activities.	○	○	○	○	○
17. I try to avoid thinking about the problems or troubles.	○	○	○	○	○
18. I try to adapt to what I can not change.	○	○	○	○	○
19. I reduce tension through leisure activities.	○	○	○	○	○

	Never	Seldom	Sometimes	Often	Always
20. I make a plan of action to get out of the stressful situation.	○	○	○	○	○
21. I think it was my fault.	○	○	○	○	○
22. I seek help from God (Allah/Buddha/etc.).	○	○	○	○	○
23. I try to accept the things I can not change.	○	○	○	○	○
24. I do something else to distract my attention from the stressful events.	○	○	○	○	○
25. I think ahead and try to avoid stressful situations	○	○	○	○	○
26. I take active action to make the situation better.	○	○	○	○	○
27. I talk to others about my problems or troubles.	○	○	○	○	○
28. I partake in fitness activities.	○	○	○	○	○
29. I criticize or accuse myself.	○	○	○	○	○
30. I try to see problems optimistically and tell myself that situations are not worse than imagined.	○	○	○	○	○

Appendix 8 Coping with Stress Scale (German Version)

B. Umgang mit Stress

Die unten vorgegebenen 30 Angaben beziehen sich darauf, wie Menschen mit Stress umgehen. Wie gehen Sie mit Stress um? Einige mögliche Strategien sind unten aufgelistet. Wie oft verwenden Sie diese tatsächlich, um mit Stress umzugehen? Bitte kreuzen Sie für jede Strategie nur EIN Kästchen an.

	Nie	Selten	Manchmal	Oft	Immer
1. Ich bereite mich auf stressige Situationen, die in der Zukunft auftreten könnten, vor.	○	○	○	○	○
2. Ich glaube, dass mit der Zeit alles gut werden wird.	○	○	○	○	○
3. Ich betätige mich körperlich.	○	○	○	○	○
4. Ich hole mir Trost und Verständnis von anderen ein.	○	○	○	○	○
5. Ich entspanne mich durch Freizeitaktivitäten.	○	○	○	○	○
6. Ich versuche, Halt in meinem Glauben zu finden.	○	○	○	○	○
7. Ich beschäftige mich mit etwas anderem, um zu vermeiden, das ich über die stressigen Situationen nachdenken muss.	○	○	○	○	○
8. Ich versuche die Realität zu akzeptieren.	○	○	○	○	○
9. Ich gebe mir die Schuld.	○	○	○	○	○

	Nie	Selten	Manchmal	Oft	Immer
10. Ich untersuche die Gründe für das Problem und ich finde Wege, um das Problem zu lösen.	○	○	○	○	○
11. Ich hole mir Hilfe und Ratschläge von anderen ein.	○	○	○	○	○
12. Ich handle vorbeugend, um zukünftige Probleme oder Schwierigkeiten zu vermeiden.	○	○	○	○	○
13. Ich bete zu Gott (Allah/Buddha...).	○	○	○	○	○
14. Ich versuche Problemen mit einer positiven Einstellung zu begegnen.	○	○	○	○	○
15. Ich entspanne mich durch Interessen und Hobbys.	○	○	○	○	○
16. Ich nehme an sportlichen Aktivitäten teil.	○	○	○	○	○
17. Ich versuche zu vermeiden über die Probleme und Sorgen nachzudenken.	○	○	○	○	○
18. Ich versuche mich dem anzupassen, was ich nicht ändern kann.	○	○	○	○	○
19. Ich reduziere meine Anspannung durch Freizeitbeschäftigungen.	○	○	○	○	○

	Nie	Selten	Manchmal	Oft	Immer
20. Ich entwickle einen Plan, um aus der stressigen Situation herauszukommen.	○	○	○	○	○
21. Ich sehe es als meinen Fehler, für den ich selbst verantwortlich bin.	○	○	○	○	○
22. Ich hole mir Hilfe von Gott (Allah/Buddha/...).	○	○	○	○	○
23. Ich versuche die Dinge, die ich nicht ändern kann, zu akzeptieren.	○	○	○	○	○
24. Ich tue etwas anderes, das meine Aufmerksamkeit von den stressigen Ereignissen ablenkt.	○	○	○	○	○
25. Ich denke voraus und versuche stressige Situationen zu vermeiden.	○	○	○	○	○
26. Ich handle aktiv, um die Situation zu verbessern.	○	○	○	○	○
27. Ich spreche mit jemandem über meine Probleme und Sorgen.	○	○	○	○	○
28. Ich nehme an Fitnessaktivitäten teil.	○	○	○	○	○
29. Ich kritisiere oder beschuldige mich selbst.	○	○	○	○	○
30. Ich versuche die Probleme optimistisch zu sehen und sage mir, dass die Situationen nicht schlechter als gedacht sind.	○	○	○	○	○

Appendix 9 Coping with Stress Scale (Chinese Version)

B. 压力的应对方式

下面的30个条目考察的是人们面对压力事件时的应对方式。您平时是如何应对压力的呢？下面列出的是一些可用的压力应对方式，您在多大频率上使用这些方式来应对压力？请为每个问题选出最符合的一项作答。

	从不	很少	有时	经常	总是
1. 为未来可能出现的压力情况提前做准备。	○	○	○	○	○
2. 相信时间会让一切好起来的。	○	○	○	○	○
3. 进行体育运动。	○	○	○	○	○
4. 寻求他人的安慰和理解。	○	○	○	○	○
5. 通过娱乐活动放松自我。	○	○	○	○	○
6. 试着在宗教信仰中寻求安慰。	○	○	○	○	○
7. 让自己忙于别的事从而避免去想压力情况。	○	○	○	○	○
8. 试着接受现实。	○	○	○	○	○
9. 责怪自己。	○	○	○	○	○
	从不	很少	有时	经常	总是
10. 分析问题产生的原因，想办法解决问题。	○	○	○	○	○
11. 寻求他人的建议和帮助。	○	○	○	○	○
12. 采取预防性的行动以避免未来的问题或麻烦。	○	○	○	○	○
13. 向神（真主/佛.....）祈祷。	○	○	○	○	○
14. 试着以积极正面的态度看待问题。	○	○	○	○	○
15. 通过个人兴趣爱好放松自我。	○	○	○	○	○
16. 参加体育运动。	○	○	○	○	○
17. 尽量避免去想问题或烦恼。	○	○	○	○	○
18. 试着去适应自己所不能改变的。	○	○	○	○	○
19. 通过休闲活动减轻压力。	○	○	○	○	○

	从不	很少	有时	经常	总是
20. 制定行动计划以摆脱有压力的处境。	○	○	○	○	○
21. 认为这是自己的错。	○	○	○	○	○
22. 寻求神（真主/佛.....）的帮助。	○	○	○	○	○
23. 不能改变的事儿就试着接受。	○	○	○	○	○
24. 做一些别的事情来分散对压力事件的注意力。	○	○	○	○	○
25. 事先考虑问题以避免出现压力情况。	○	○	○	○	○
26. 采取积极行动让情况有所好转。	○	○	○	○	○
27. 向他人诉说自己的问题或烦恼。	○	○	○	○	○
28. 参与健身活动。	○	○	○	○	○
29. 批评或指责自己。	○	○	○	○	○
30. 乐观看问题，告诉自己事情没有想的那么糟糕。	○	○	○	○	○

Appendix 10 Health and Well-being Scale (English Version)

C. Health and Well-Being

The following 10 questions are about your health and well-being. For each question please tick ONE box with reference to your feelings in the past 6 months.

	Never	Seldom	Sometimes	Often	Always
1. How often have you felt weak?	○	○	○	○	○
2. How often have you been irritable?	○	○	○	○	○
3. How often have you had a headache?	○	○	○	○	○
4. How often have you been worried?	○	○	○	○	○
5. How often have you had dizziness?	○	○	○	○	○
6. How often have you felt a lack of confidence in yourself?	○	○	○	○	○
7. How often have you had tinnitus?	○	○	○	○	○
8. How often have you been stressed?	○	○	○	○	○
9. How often have you felt a lack of sleep?	○	○	○	○	○
10. How often have you had poor appetite?	○	○	○	○	○

Appendix 11 Health and Well-being Scale (German Version)

C. Gesundheit und Wohlbefinden

Die folgenden zehn Fragen betreffen Ihre Gesundheit und Ihr Wohlbefinden. Kreuzen Sie für jede Frage bitte nur EIN Kästchen an und beziehen Sie sich auf Ihre Wahrnehmungen der letzten sechs Monate.

	Nie	Selten	Manchmal	Oft	Immer
1. Wie oft haben Sie sich kraftlos gefühlt?	○	○	○	○	○
2. Wie oft fühlten Sie sich gereizt?	○	○	○	○	○
3. Wie oft haben Sie Kopfschmerzen gehabt?	○	○	○	○	○
4. Wie oft haben Sie sich Sorgen gemacht?	○	○	○	○	○
5. Wie oft war Ihnen schwindelig?	○	○	○	○	○
6. Wie oft haben Sie Probleme mit Ihrem Selbstvertrauen gehabt?	○	○	○	○	○
7. Wie oft haben Sie Ohrensausen gehabt?	○	○	○	○	○
8. Wie oft haben Sie sich gestresst gefühlt?	○	○	○	○	○
9. Wie oft haben Sie Schlsfmangel verspürt ?	○	○	○	○	○
10. Wie oft haben Sie wenig Appetit gehabt?	○	○	○	○	○

Appendix 12 Health and Well-being Scale (Chinese Version)

C. 个人健康和幸福感

以下10个问题考察您的健康和幸福感状况。请根据过去6个月的感受，为每个问题选出最符合的一项作答。

	从不	很少	有时	经常	总是
1. 您经常感觉身体虚弱乏力吗？	○	○	○	○	○
2. 您经常感觉容易发脾气吗？	○	○	○	○	○
3. 您经常头痛吗？	○	○	○	○	○
4. 您经常忧虑吗？	○	○	○	○	○
5. 您经常头晕吗？	○	○	○	○	○
6. 您经常感觉对自己缺乏信心吗？	○	○	○	○	○
7. 您经常感觉耳鸣吗？	○	○	○	○	○
8. 您经常感觉有压力吗？	○	○	○	○	○
9. 您经常睡眠不足吗？	○	○	○	○	○
10.您经常食欲不佳吗？	○	○	○	○	○

Appendix 13 Job Satisfaction Scale (English Version)

D. Job Satisfaction

The following 8 questions are about your job satisfaction. Please indicate the extent to which you feel satisfied or dissatisfied with your job with reference to your feeling in recent 6 months.

	Very dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Very satisfied
1. How satisfied are you with the pay and benefits?	○	○	○	○	○
2. How satisfied are you with your working environment?	○	○	○	○	○
3. How satisfied are you with the management level in your company?	○	○	○	○	○
4. How satisfied are you with the relationships at work with others?	○	○	○	○	○
5. How satisfied are you with the degree to which you can personally develop or grow in your work?	○	○	○	○	○
6. How satisfied are you with the job itself?	○	○	○	○	○
7. How satisfied are you with the opportunities for promotion at work?	○	○	○	○	○
8. How satisfied are you with the degree to which your abilities are recognized?	○	○	○	○	○

Appendix 14 Job Satisfaction Scale (German Version)

D. Arbeitszufriedenheit

Die nachfolgenden acht Sätze betreffen Ihre Zufriedenheit am Arbeitsplatz. Markieren Sie bitte, in welchem Maße Sie sich mit Ihrer Arbeit in Hinblick auf die vergangenen sechs Monate zufrieden oder unzufrieden fühlen.

	Sehr unzufrieden	Etwas unzufrieden	Neutral	Etwas zufrieden	Sehr zufrieden
1. Inwieweit sind Sie mit dem Lohn und den Zusatzleistungen zufrieden?	○	○	○	○	○
2. Inwieweit sind Sie mit Ihrem Arbeitsumfeld zufrieden?	○	○	○	○	○
3. Inwieweit sind Sie mit dem Leistungsniveau des Managements in Ihrem Betrieb zufrieden?	○	○	○	○	○
4. Inwieweit sind Sie mit Ihrem Verhältnis zu anderen am Arbeitsplatz zufrieden?	○	○	○	○	○
5. Inwieweit sind Sie mit den Möglichkeiten für persönliches und berufliches Wachstum, die Ihnen im Rahmen Ihrer Arbeit zur Verfügung stehen, zufrieden?	○	○	○	○	○
6. Inwieweit sind Sie mit Ihrer beruflichen Tätigkeit an sich zufrieden?	○	○	○	○	○
7. Inwieweit sind Sie mit den Beförderungsmöglichkeiten an Ihrem Arbeitsplatz zufrieden?	○	○	○	○	○
8. Inwieweit sind Sie zufrieden mit dem Ausmaß der Anerkennung für Ihre Fähigkeiten?	○	○	○	○	○

Appendix 15 Job Satisfaction Scale (Chinese Version)

D. 工作满意度

以下8个问题考察您对工作的满意程度。请根据过去6个月的情况，指出您对工作满意或不满意的程度，为每个问题选出最符合的一项作答。

	很不满意	有些不满意	中立	有些满意	很满意
1. 您对自己的工资福利满意吗？	○	○	○	○	○
2. 您对自己的工作环境满意吗？	○	○	○	○	○
3. 您对公司的管理水平满意吗？	○	○	○	○	○
4. 您对工作中自己与他人的人际关系满意吗？	○	○	○	○	○
5. 您对工作中的个人发展和成长的程度满意吗？	○	○	○	○	○
6. 您对工作本身满意吗？	○	○	○	○	○
7. 您对自己晋升的机会满意吗？	○	○	○	○	○
8. 您对自己的能力被认可的程度满意吗？	○	○	○	○	○

Appendix 16 Personal Information (English Version)

E. Personal Information

1. Your gender:

○ Female ○ Male

2. Your age:

○ ≤ 24 ○ 25-29 ○ 30-34 ○ 35-39 ○ 40-44 ○ ≥ 45

3. Your highest educational level:

○ No graduation
○ Primary school certificate
○ Secondary school certificate
○ Vocational training
○ Advanced technical college entrance qualification
○ Higher education (university) entrance qualification

4. Your highest professional qualification:

○ keine abgeschlossene Berufsausbildung
○ Abschluss einer anerkannten Berufsausbildung
○ Meister/ Techniker/ gleichwertiger Fachschulabschluss
○ Bachelor
○ Diplom/ Magister/ Master/ Staatsexamen
○ Promotion

5. How do you rate your current level of work stress?

○ Very little ○ Little ○ Moderate ○ Great
○ Very great

6. How often have you had the turnover intention?

○ Never ○ Seldom ○ Sometimes ○ Often ○ Always

7. Which industry do you work in?

- ○ Manufacturing
- ○ Financial and insurance activities
- ○ Information and communication
- ○ Construction
- ○ Wholesale and retail trade
- ○ Arts, entertainment and recreation
- ○ Real estate activities
- ○ Transportation, storage and postal service
- ○ Accommodation and food service activities
- ○ Electricity, gas, steam and air conditioning supply
- ○ Mining and quarrying
- ○ Administrative and support service activities
- ○ Repair and other service activities
- ○ Education
- ○ Professional, scientific and technical activities
- ○ Human health and social work activities
- ○ Water supply; sewerage, waste management and remediation activities
- ○ Public administration and defence; compulsory social security
- ○ Agriculture, forestry and fishing
- ○ Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
- ○ Activities of extraterritorial organizations and bodies
- ○ Other industry (please specify) _____

8. You have been engaged in the current job for ____ year(s). You work ____ hours per week on average.

Appendix 17 Personal Information (German Version)

E. Persönliche Angaben

1. Ihr Geschlecht?

○ weiblich ○ männlich

2. Ihr Alter beträgt?

○ ≤24 ○ 25-29 ○ 30-34 ○ 35-39 ○ 40-44 ○ ≥45

3. Ihr höchster Schulabschluss?

○ kein Abschluss
○ Hauptschul- /Volksschulabschluss
○ Mittlere Reife oder gleichwertig
○ Berufsausbildung
○ Fachhochschulreife/ Abitur
○ Hochschulreife

4. Ihre höchste berufliche Qualifikation?

○ keine abgeschlossene Berufsausbildung
○ Abschluss einer anerkannten Berufsausbildung
○ Meister/ Techniker/ gleichwertiger Fachschulabschluss
○ Bachelor
○ Diplom/ Magister/ Master/ Staatsexamen
○ Promotion

5. Wie schätzen Sie Ihren Arbeitsstress derzeit ein?

○ Sehr gering ○ Gering ○ Angemessen ○ Erheblich
○ Sehr erheblich

6. Wie oft haben Sie einen Arbeitsplatzwechsel beabsichtigt?

○ Nie ○ Selten ○ Manchmal ○ Oft ○ Immer

7. In welcher Branche sind Sie tätig?

- ○ Verarbeitendes Gewerbe
- ○ Erbringung von Finanz- und Versicherungsdienstleistungen
- ○ Information und Kommunikation
- ○ Baugewerbe
- ○ Gross- und Einzelhandel
- ○ Kunst, Unterhaltung und Erholung
- ○ Grundstücks- und Wohnungswesen
- ○ Verkehr, Lagerei und Postdienste
- ○ Gastgewerbe
- ○ Energieversorgung
- ○ Bergbau und Gewinnung von Steinen und Erden
- ○ Erbringung von sonstigen wirtschaftlichen Dienstleistungen
- ○ Erbringung von Reparaturen und von sonstigen Dienstleistungen
- ○ Erziehung und Unterricht
- ○ Erbringung von freiberuflichen, wissenschaftlichen und technischen Dienstleistungen
- ○ Gesundheits- und Sozialwesen
- ○ Wasserversorgung; Abwasser- und Abfallentsorgung und Beseitigung von Umweltverschmutzungen
- ○ Öffentliche Verwaltung, Verteidigung, Sozialversicherung
- ○ Land- und Forstwirtschaft, Fischerei
- ○ Private Haushalte mit Hauspersonal; Herstellung von Waren und Erbringung von Dienstleistungen durch private Haushalte für den Eigenbedarf ohne ausgeprägten Schwerpunkt
- ○ Exterritoriale Organisationen und Körperschaften
- ○ Andere Branche (bitte angeben) _____

8. Im aktuellen Beruf sind Sie seit ____ Jahr(en) tätig. Sie arbeiten durchschnittlich ____ Stunden in der Woche.

Appendix 18 Personal Information (Chinese Version)

E. 个人信息

1. 您的性别？

○ 女 ○ 男

2. 您的年龄？

○ ≤ 24 ○ 25-29 ○ 30-34 ○ 35-39 ○ 40-44 ○ ≥ 45

3. 您的最高学历？

○ 小学及以下 ○ 初中 ○ 高中/中专/技校/中职 ○ 专科/高职 ○ 本科 ○ 硕士及以上

4. 您是否获得过职业技能培训？

○ 没有 ○ 较少 ○ 有一些 ○ 较多 ○ 非常多

5. 您觉得最近6个月的工作压力水平如何？

○ 压力非常小 ○ 压力比较小 ○ 压力一般 ○ 压力比较大 ○ 压力非常大

6. 您每隔多久有一次辞职换工作的意向？

○ 从不 ○ 很少 ○ 有时 ○ 经常 ○ 总是

7. 您目前从事的行业？

○ 制造业
○ 金融和保险业
○ 信息和通信业
○ 建筑业
○ 批发和零售业
○ 艺术、娱乐和文娱活动
○ 房地产业
○ 交通运输、仓储和邮政服务
○ 住宿和餐饮业

- ○ 电、煤气、蒸气和空调的供应
- ○ 采矿和采石业
- ○ 行政和辅助活动
- ○ 修理及其他服务活动
- ○ 教育
- ○ 专业、科学和技术活动
- ○ 人体健康和社会工作活动
- ○ 供水；污水处理、废物管理和补救活动
- ○ 公共管理和国防；强制性社会保障
- ○ 农业、林业及渔业
- ○ 家庭作为雇主的活动；家庭自用、未加区分的物品生产和服务活动
- ○ 国际组织和机构的活动
- ○ 其他行业（请注明）_____

8. 您从事现在的工作有 ___ 年了，平均 每星期 工作 ___ 小时。