Job satisfaction of international PhD students in Flanders : a matter of acculturation ?

Word count: 13.713

Katrien Van Overbeke

Student number: 01610142

Supervisor: Prof. Dr. Katia Levecque

A dissertation submitted to Ghent University in partial fulfilment of the requirements for the degree of Master of Industrial Psychology

Academic year: 2019 - 2020

Preamble concerning COVID-19

This thesis was partly written during the Covid-19 pandemic of 2020. I hereby declare that the investigative process of this thesis was not affected by the imposed measures to fight the further spread of the virus.

Abstract

As the mobility of researchers increases, the diversity of the PhD population is becoming more and more prominent. As of 2018, international PhD students occupied 47 percent of the entire PhD population in Flanders. Levecque and colleagues (2019) showed that the international PhD student population in Flanders has a significantly lower job satisfaction than the non-international population. This thesis investigates the determinants of international PhD student's job satisfaction in Flanders, while also investigating the role of acculturation and cultural distance (compared to Belgian culture), as these are variables that specifically apply to international PhD students. Based on the existing literature, we predicted that identification with the host country culture would have a positive effect on international PhD student's job satisfaction and that this association would be even stronger when the heritage culture identification was also high. In addition, we expected a negative association between cultural distance and job satisfaction, mediated by the host culture identification of the PhD student. We analysed data from the Survey of Junior Researchers of 1193 international PhD students, collected in 2018 at five Flemish universities. We found a significant positive main effect of host culture identification on international PhD student's job satisfaction. When controlled for the degree of host culture identification, international PhD students are more likely to be satisfied with their job (1) when they receive more social support, (2) when they receive more support from their promotor, (3) when they experience a high degree of job control (4) and a low degree of job demands, (5) when they experience a high degree of work-life balance and (6) when there is a low degree of closed decision-making in the team. There was no evidence found for the influence of heritage culture identification and cultural distance on job satisfaction. Theoretical and practical implications are discussed.

Abstract (NL)

Naarmate de mobiliteit van onderzoekers toeneemt, wordt de diversiteit van de doctoraatspopulatie steeds prominenter. Vanaf 2018 bezetten de internationale doctoraatsstudenten 47 procent van de hele doctoraatspopulatie in Vlaanderen. Levecque en collega's (2019) toonden aan dat de internationale doctorandipopulatie in Vlaanderen een significant lagere jobtevredenheid heeft dan de niet-internationale populatie. Deze masterproef onderzoekt de determinanten van de jobtevredenheid van internationale doctorandi in Vlaanderen, alsook de rol van acculturatie en culturele afstand (t.o.v. de Belgische culture), aangezien dit variabelen zijn die specifiek van toepassing zijn op internationale doctorandi. Op basis van de bestaande literatuur voorspelden we dat identificatie met de cultuur van het gastland een positief effect zou hebben op de jobtevredenheid van internationale doctorandi en dat deze associatie nog sterker zou zijn wanneer de identificatie van de cultuur van het thuisland ook hoog was. Daarnaast verwachtten we een negatieve associatie tussen culturele afstand en werktevredenheid, gemedieerd door de identificatie met de cultuur van het gastland van de internationale doctorandi. We analyseerden gegevens uit de *Survey of Junior Researchers* van 1193 internationale doctorandi, verzameld in 2018 aan vijf Vlaamse universiteiten. We vonden een significant positief hoofdeffect van identificatie met de cultuur van het gastland op de jobtevredenheid van internationale doctorandi. Gecontroleerd voor de mate van identificatie met de cultuur van het gastland, zullen internationale doctorandi meer kans hebben om tevreden te zijn met hun werk (1) wanneer ze meer sociale steun ontvangen, (2) wanneer ze meer steun krijgen van hun promotor, (3) wanneer ze een hoge mate van *job control* ervaren (4) en een lage mate van *job demands*, (5) wanneer ze een hoge mate van balans tussen werk en privé ervaren en (6) wanneer er een lage mate van gesloten besluitvorming in het team is. Er werd geen bewijs gevonden voor de invloed van identificatie met de cultuur van het thuisland en culturele afstand op werktevredenheid. Theoretische en praktische implicaties worden besproken.

Deze masterproef werd deels geschreven tijdens de Covid-19 pandemie van 2020. Hierbij verklaar ik dat het onderzoeksproces van deze masterproef geen invloed ondervond van de opgelegde maatregelen ter bestrijding van de verdere verspreiding van het virus.

Preface

First of all, I want to thank my promotor, Katia Levecque, for the guidance, advice and critical feedback on my drafts. It was a pleasure to work with someone who also has a sociological background and who let me incorporate this aspect into my thesis, while also keeping me on the right track. As I have a bachelor's degree of sociology, I find the interplay between society and individual important. In my opinion, we cannot see the psyche of an individual and the broader society separately from each other. I therefore tried to incorporate a broader vision while investigating processes on the level of the individual in the field of Industrial and Organizational Psychology in this thesis.

I also want to thank my friends and family for their constant support and words of encouragement. Especially my mom who is always so proud of me and believes in me. Thank you to my friend Raffa, who always offered a helping hand. And finally, I want to thank my library buddies, whom made the examination periods of the recent years bearable.

Content

Introduction

In recent decades, there has been a shift in the global economy. Technological and scientific innovations, such as digitalisation, have increased the importance of knowledge, especially in Western countries. Intellectual input has become more valuable than physical labour or natural input (Powell & Snellman, 2004). The transition to a global, knowledge-based economy influences governmental policies all around the world. Policymakers have been focused on increasing scientific research and innovation on a national and international level in response to these new demands.

At the international level, as part of the Lisbon Strategy, the European Commission developed the Horizon 2020 programme. The aim is to increase Europe's global competitiveness by stimulating scientific research and innovation. The programme focusses on the creation of a dynamic network of researchers (the European Research Area) to enhance the effectiveness and innovation of research activities in Europe. Investing nearly 80 billion euros, the programme offers funding to researchers and projects while stimulating international partnerships and improving coordination (European Commission, 2011). We refer to this increased mobility of researchers as *brain circulation*. The aim is to exchange ideas and knowledge, create a network and enhance overall research quality (Millard, 2005). In 2017, Flanders was the fourth strongest participant of the programme, using it to fund doctoral scholarships of Belgian and international PhD students, among other things (Sileghem & Van Langenhove, 2017). At the national level, the Flemish government has set the objective to spend at least 3% of the Gross Domestic Product (GDP) on Research and Development (R&D) by 2020 (Debackere, Delanote, Hoskens, Verheyden, & Viaene, 2017). The aim of the Flemish government is to contribute 1%, while the business community takes on 2% of this goal. From 2006 to 2016, public investment has grown from 0,59% of the GDP to 0,84%. This number is still rising every year in order to achieve the goal of 1% by 2020.

Alongside the economic changes, there is a shortage of knowledgeable graduates in certain fields of work and research. Especially the STEM disciplines (Science, Technology, Engineering, Maths) experienced a decline in graduates at the master's degree level in Flanders (Groenvynck et al., 2011; Pelfrene & Van Peer, 2014). Competitiveness between universities to recruit the most talented graduates for academic research, as well as in the private job market, is rising. This could be a reason why universities are recruiting PhD candidates internationally and why we find the highest proportion of international PhD students in the STEM disciplines.

A consequence of the increased availability in research funding and the demand for high-level graduates is the internationalization of Belgium's higher education. This thesis will be looking into the Universities of the Flemish region in Belgium specifically. There has been a rise in incoming and outgoing mobility in PhD students. Here, we focus on incoming mobility, which are international junior researchers staying at Belgian Universities to attain a doctoral degree or complete a part of their doctoral research (known as the 'sandwich-scholarships') (Pelfrene & Van Peer, 2014). According to the official

Statistical Yearbook of Flemish Education (Flemish Government, 2019), 11.137 international PhD students and 12.538 PhD students with a Belgian nationality were registered at a Flemish University in the academic year of 2017 - 2018. International PhD students occupied 47 percent of the PhD researcher community in Flanders in 2018, and this number is rising every year, as merely a decade before that only 25 percent was an international PhD student. This increase shows the importance of taking a closer look at this population and gives rise to a lot of questions. How do they manage in a new country and culture? What is important for their adjustment to a new working environment? Do they experience similar job satisfaction?

It is important that these international PhD students experience job satisfaction, as job satisfaction has been linked to several critical outcomes such as higher employee performance and productivity (Petty, McGee, & Cavender, 1984) and lower turnover (Eby, Freeman, Rush, & Lance, 1999; Kosteas, 2011). These relationships have also been shown to be robust across different countries, as the cross-cultural meta-analysis of job satisfaction by Judge and colleagues (2001) confirms. Aside from organizational factors, job satisfaction is also linked to personal well-being and related concepts such as happiness and life satisfaction (Argyle, 1989; Judge & Watanabe, 1993). Campbell, Converse and Rogers (1976) found that job satisfaction accounted for a fifth to a quarter of the variation in life satisfaction of American adults. A similar result has recently been found in the Belgian population. The *National Happiness Research* by Lieven Annemans and T'jaeckx (2018) showed that one's job in general contributes an average of 18% to the happiness of Belgian employees. In addition, job satisfaction is commonly used as an indicator of mental health (e.g. De Lange, Taris, Kompier, Houtman, & Bongers, 2004).

What do we actually know about the job satisfaction of PhD students in Flanders? ECOOM, the centre for research and development monitoring in Flanders, has organised multiple surveys that focus on the well-being of PhD students in Flanders. Results of the *Survey of Junior Researchers* (SJR) in 2018, including all PhD students of five Flemish universities, suggest significant differences in the global job satisfaction of Belgian, European and non-European PhD students (Levecque et al., 2019). The results show Belgian PhD students and PhD students from within the EU28 are the most satisfied, with respectively 78,2% and 77,2% being satisfied or very satisfied with their job in general. However, there is a significant difference when we compare the numbers of PhD students from outside the EU28, of which 70,8% reported being satisfied or very satisfied with their job. In addition to that, the job satisfaction of the Belgian PhD population in Flanders has significantly decreased in comparison to the 2013 SJR. These results emphasize the growing importance of taking a deeper look into the determinants of PhD students' job satisfaction. Especially international PhD students, as they seem to be the least satisfied with their job. This raises the question as to what influences their job satisfaction and how it is related to the way they get used to a new environment. However, as will be explained below, little is known about their acculturation process. Does leaving their familiar environment and adapting to an entirely new scenery have an influence on the way they perceive and evaluate their job? By researching

job satisfaction, this thesis aims to contribute to the literature of international PhD students and perhaps answer these questions. Additionally, we will argue that greater cultural distance will make it harder for international PhD students to adjust to their new environment compared to PhD students coming from a culture of which values are closer to the Belgian culture. The main research question of this thesis reads as follows:

What is the relationship between acculturation and job satisfaction among international PhD students in Flanders and is this relationship similar for all international PhD student, considering the difference in cultural values?

Literature

There seems to be no clear consensus on the definition of job satisfaction in academic literature. In general, we can describe it as a subjective feeling of contentment (or discontentment) about one's job in general or regarding different aspects of the job (Aziri, 2011). To understand how job satisfaction is established and how determinants influence the satisfaction or dissatisfaction with one's job, a psychological theoretical framework is needed.

The Job Demands-Control-Support Model (J-DCS Model), developed by Karasek and Theorell (1990), is a well-known theoretical framework about employee well-being. The model first contained only two dimensions, job demands and job control (Karasek, 1979). Job demands are workload demands of the working environment. Job control is the decision latitude or the decision-making freedom one has over job demands. According to the JD-C Model, working environments with high demands and low control lead to job dissatisfaction and negative mental health outcomes. Later, a third dimension 'workplace social support' was added. The 'isostrain hypothesis' suggests that jobs with high demands, low control and low social support have the highest risk of negative mental health outcomes. According to the 'active learning hypothesis', jobs with high demands, but high job control and social support will lead to an optimal situation in which an individual can learn and develop. Job satisfaction is thus an outcome of the interaction between high job demands, high job control and substantial social support.

Job demands and job control are broad dimensions and contain different determinants of job satisfaction. We will categorize these determinants based on the review of job satisfaction about migrant workers of Wang and Jing (2018). Job satisfaction is a well-researched subject and evidence is scattered. Determinants of job satisfaction can be related, as well as unrelated to the job (An, Cha, Moon, Ruggiero, & Jang, 2016; Flap & Völker, 2001; Gazioglu & Tansel, 2006; Hagedorn, 2000). Reviewing the literature, Wang and Jing categorized all existing evidence on migrants' job satisfaction into different work and non-work related factors. Later, the determinants of job satisfaction will be structured according to this categorization.

Work-related factors include work environment factors, job characteristics and work-specific personal factors. Firstly, environmental factors are more specific aspects of the working environment. Management practices, climate and social relationships are covered by this category. Discrimination, among others, is a much-researched phenomenon in the migrant worker population and is therefore an important factor of the working environment as it affects mental well-being and job satisfaction. Wang and Jing also include High Performance Work Systems and workplace support as factors in the workplace environment that influence migrant workers' job satisfaction. Secondly, job characteristics are rather individual work-related factors, which may lead to perceived meaningfulness and a feeling of responsibility on the job. According to Wang and Jing (2018), migrant workers' job satisfaction is influenced by salary, job demands, job control and learning opportunities. Finally, work-specific personal factors are related to the characteristics of the workers themselves. These characteristics include competency-related factors, work-related psychological states and work-specific characteristics.

As migrant employees do not have the same background as native employees, there are a lot of factors influencing their job satisfaction which stand apart from their job. These non-work related factors include three categories: general demographic factors, culture-related factors and society- or community-related factors. Research about demographic factors shows age, gender, length of residency and cultural background are significant predictors of job satisfaction. Culture-related factors influence job satisfaction because there are barriers between different cultural backgrounds. These barriers include language skills, cultural traits such as values and work expectations, and the degree of acculturation to a new culture. Society- and community-related factors are non-work factors that relate to the social environment and networks of the migrant worker. The general attitudes of society towards migrants influence the perceived acceptance, trust and support, both during the job-seeking process and on the job itself. This, in turn, may affect job satisfaction.

Determinants of International PhD Students' Job Satisfaction

When assessing job satisfaction of international PhD students in Flanders, we first need to know which predictors have already been identified in the literature. The literature suggests many variables related to job satisfaction. However, we will limit our literature review to variables that are relevant to international PhD students, which are the subjects of this study. It is important to highlight their specific situation within the population of international employees and how this could affect their job satisfaction.

As we have discussed, there are different work-related and non-work related determinants of job satisfaction of migrant workers (Wang & Jing, 2018). While searching through literature about the job satisfaction of individuals who move to other countries to work, we find a lot of work on low skilled and low-paid workers (e.g. Baum, Kralj, Robinson, & Solnet, 2016; Datta et al., 2007; Loi, Ao, & Xu, 2014; Zhu et al., 2012). As PhD students are typically highly educated and have a high salary, we might form false assumptions when we ignore the difference in education. Instead, we will discuss research

on expatriates, highly educated employees, academic personnel and non-international PhD students. Thus, despite limited research about job satisfaction of international doctoral researchers in Flanders specifically, there is some research about factors that might also be applicable to the population of this study.

Career aspirations. PhD students often start a PhD because they aspire a career in academic research (Boosten, Vandevelde, Derycke, te Kaat, & Van Rossem, 2014). Research on Dutch PhD students (Waaijer, Heyer, & Kuli, 2016) shows 60 percent would prefer to work as an academic (or non-academic) researcher after their PhD, although the majority perceived the possibility of this career prospect as 'difficult' or 'very difficult'. It is interesting to note that 47 of 100 surveyed PhD respondents were international students. Results of the SJR 2018 show that interest in an academic career is a significant predictor of job satisfaction amongst PhD students at universities in the Flemish regions (Levecque et al., 2019). Research on international PhD students in Australia (Harman, 2003) shows that 77.7% of international PhD students are interested in an academic career, whereas only 63.8% of Australian PhD students are interested in an academic career. The higher interest in an academic career could mean that this is also an important predictor for international PhD student's job satisfaction.

Appointment type. The aforementioned study of Waaijer and colleagues (2016) compares Dutch internal PhD students, which are paid and employed by the university, and external PhD students, which have a scholarship or personal funds and are not employed by the university. Their findings suggest that appointment type affects the PhD experience. The type of appointment depends on the type of funding a PhD student receives. The results of the SJR 2018 show a significant difference in job satisfaction for students who are not appointed to a research project or personal scholarship, but have other funding (these funds can be from inside or outside of the university) compared to students appointed as an assistant (Levecque et al., 2019). PhD students who were appointed as an assistant were significantly more satisfied compared to these two types of funding. It is important to note there were no significant differences in the comparison with other types of appointment or funding. Do these differences also play an important role for international PhD students? In Flanders, the population of international PhD students is diverse in terms of appointment and funding (Groenvynck et al., 2011). PhD students can be appointed to a bigger research project or work on a research subject funded by a personal scholarship. In contrast to Flemish PhD students, they are rarely appointed as an educational assistant because of the language legislation in Flanders.

The degree of social security of international PhD students also varies by appointment type (Leyman et al., 2009). International PhD students only have the full right on social security if they come from either within the European Economic Area, Switzerland, a country with which Belgium has a bilateral agreement and are not appointed with a personal scholarship. Researchers who do not meet these conditions are covered for the most part, but do not build up social security rights for pensions and unemployment. Half of international PhD students are from within the EU (Flemish Government, 2019), which means a significant share of international PhD students at Flemish universities may receive less

social protection than their colleagues. This could also affect their job satisfaction, especially if they intend to stay after finishing their doctoral degree.

Social support. In the expatriate literature, we find evidence on the positive influence of social support on job satisfaction (Johnson, Kristof-Brown, Van Vianen, De Pater, & Klein, 2003). There is also evidence of a positive relationship between social support and job satisfaction of university faculty (Ward & Sloane, 2000). For international PhD students, social support can be facilitated from two different sources. Social support from their friends or family in their country of origin can help in compensating the loss of their familiar environment (Brett, 1980). On the other hand, they can also receive social support from people in their new environment (Albrecht & Adelman, 1987). Both have a positive effect on mental well-being and adaptation to the new environment (e.g. Finch & Vega, 2003; García, Ramírez, & Jariego, 2002). As far as the job satisfaction of expatriates and university faculty is concerned, there is evidence that social support is a predictor, but there is little known about the relationship between social support and job satisfaction in the international PhD student population.

While here we discuss social support as a predictor of job satisfaction, we do need to acknowledge it could also be a moderating factor. According to the J-DCS Model, social support may act as a job resource and buffer the negative effects of high job demands on health outcomes and job satisfaction (Karasek & Theorell, 1990).

Promotor support. Stroppa and Spiess (2011) found a significant influence of supervisor social support on expatriate's job satisfaction. Specifically, support of the supervisor was a significant predictor. In this light, we would expect support of the promotor of international PhD students to have a significant influence on their job satisfaction. However, there is a lot of variability between disciplines. Survey research on Flemish doctoral students (Leyman et al., 2009) shows students in Natural Sciences perceive less social support from their promotor than students in the Human Sciences. PhD students in Natural Science disciplines also report more problems with their promotor, which could be a possible cause. Concerning the leadership style of the promotor, there has been evidence found that an inspirational leadership style is associated with better mental health of PhD students (Levecque, Anseel, De Beuckelaer, Van der Heyden, & Gislef, 2017).

Job characteristics. According to Wand and Jing (2018), other work-related determinants of migrants' job satisfaction are job characteristics such as salary, job demands, job control and learning opportunities. When researching the literature, we find not all of these are also determinants of international PhD students' job satisfaction. Salary might not be a significant determinant because of its extrinsic character. Antecedents of job satisfaction can be categorized into intrinsic and extrinsic motivations. Intrinsic aspects are self-motivated, based on what the individual considers as valuable. On the other hand, pay is a typical example of an extrinsic motivator. Extrinsic aspects are externally constituted rewards. Bozeman and Gaughan (2011) point out the importance of intrinsic motivational aspects for university faculty because they are intrinsically driven by a professional calling, and thus value intrinsic rewards more than extrinsic rewards. Results from a study on 307 university employees

in the U.K. confirmed this, showing intrinsic rewards significantly predicted higher job satisfaction (Mark & Smith, 2012).

We do find evidence that job demands and job control might be a determinant of job satisfaction of international PhD students. For instance, research about the work pressure of highly educated employees in Europe shows work pressure is the main reason for low job satisfaction (Lopes, Lagoa, & Calapez, 2014). Autonomy, which is an aspect of job control, has been proven to influence job satisfaction among highly educated employees (Cohrs, Abele, & Dette, 2006) and university faculty (Bentley, Coates, Dobson, Goedegebuure, & Meek, 2013). The results of the SJR 2018 also show Belgian PhD students who have high job demands are less likely to be satisfied with their jobs, whereas job control increases the chances (Levecque et al., 2019). The results also showed a negative relationship between closed decision making in a team and job satisfaction of PhD students. Participative decision making gives employees the opportunity to participate in decisions, and thus increase the control over the working environment. Conversely, closed decision making decreases job control.

We must note that there are certain aspects of the international PhD student's circumstances which may indicate that they have even higher job demands than their non-international colleagues. International PhD students complete their research in the least amount of time, compared to Belgian PhD students. This may indicate that international researchers experience higher work pressure (Groenvynck et al., 2011). International PhD students might experience pressure due to administrative and contractual obligations, such as stress about an expiring visa or the obligation to return home after completing their research. In 2005 the European Commission issued a directive to simplify and accelerate the procedure for non-EU researchers to attain a visa (Belspo, 2018). The Scientific Visa is valid for five years and can be extended for another five years by submitting an application at least two months before the expiration date. That is only if researchers can get more funding, because the fellowship with the longest duration time is five years. This may put some pressure on the doctoral researchers to complete their PhD. However, the time-to-degree may be shorter because of other reasons. They often have already done a part of their research in their home country (Pelfrene & Van Peer, 2014).

Job demands and job control vary across disciplines (Groenvynck et al., 2011). The degree of task autonomy and the working environment can be different between disciplines. PhD students in STEM-disciplines work within broader research groups on a pre-defined project, are more supported by senior researchers, and have less autonomy over decisions regarding their research. PhD students in Human Sciences work individually on their research and have a lot of task autonomy where they can make individual decisions. This means they have more job control as they don't have to rely on others. Despite these differences, survey research of Flemish PhD students (Leyman et al., 2009) shows overall job demands are high and job control is high. According to Karasek and Theorell's J-DCS Model (1990), this is a favourable situation, which leads to positive health outcomes and higher job satisfaction.

There is also evidence of a curvilinear effect of job control on well-being (Kubicek, Korunka, & Tement, 2014). Too much autonomy can lead to irritations and uncertainty. Having a significant

amount of autonomy over decisions may lead to lower job satisfaction in the first few months because newcomers are faced with uncertainty concerning their new roles and tasks (Katz, 1978). This could be applicable to PhD students specifically. A lot of PhD students recently graduated before starting their PhD, which means their doctoral research is their first experience in a working environment. However, more recent research about young workers on their first job shows the positive effect of job autonomy on job satisfaction, confirming Karasek and Theorell's isostrain and active learning hypotheses (De Witte, Verhofstadt, & Omey, 2007).

Gender. A first possible demographic, non-work related determinant of job satisfaction is gender. There is a lot of research about the differences in job satisfaction between males and females, but only little is known specifically about international PhD students. Therefore, we need to examine literature based on related populations. International PhD students are highly educated, as you need a master's degree to start a doctoral research at a Flemish university. Thus, it might be interesting to look at the gender differences in job satisfaction of the highly educated. Bender and Heywood (2006) derive determinants of job satisfaction of a sample of 31.845 American PhD graduates. Job satisfaction of the highly educated is determined by comparison of salary, the institution of tenure, sector of employment, and gender. They state that females and males evaluate earnings and tenure in a different way. Specifically, women will trade part of their salary for job characteristics that offer more flexibility. Other research confirms men and women differ in job satisfaction because they prefer different aspects of the job. A study of Australian PhD students (Kifle & Desta, 2012) shows males are more satisfied with intrinsic aspects of job satisfaction, such as worked hours, career opportunities and workload. Females reported higher satisfaction with co-worker relationships and societal contribution, which are part of the extrinsic dimension of job satisfaction. Because of this, we might expect a difference in job satisfaction between males and females. Though, we should acknowledge results of the 2018 SJR (Levecque et al., 2019) showed no significant differences.

Age. The same 2018 SJR analysis also showed that older Flemish PhD students have lower job satisfaction (Levecque et al., 2019). This confirms earlier research on Flemish doctoral students (Groenvynck et al., 2011) which shows turnover is positively correlated with the age at which the student started their doctoral research. So, we know this is the case for Flemish PhD students, but is this also relevant for international PhD students?

Work-life balance. Work-life balance is an important determinant of job satisfaction overall (World Health Organization, 2010). Research on Flemish PhD students shows family situation influences the time-to-degree, work-life balance and later career choices (Groenvynck et al., 2011). We also know work-family conflict is the most important predictor of mental health issues of Flemish PhD students (Levecque et al., 2017). The results of the 2018 SJR also show a significant influence of work-family conflict on job satisfaction (Levecque et al., 2019). The influence of work on family life and family on working life should be considered when looking into job satisfaction, but is this applicable in the same way on international PhD students? Although there is not enough data available about the family

situation of international PhD students, we should consider this variable. Some might leave their family behind, which means they are unable to take on their role of son, daughter, mother, father, … Others may bring their family to Belgium, which means they have to find schools for the children and a job or pastime for their significant other. All of these challenges can be stressful and can cause some sort of work-family or family-work conflict, resulting in lower job satisfaction (Kossek & Ozeki, 1998).

<p style="text-align:center">Acculturation</p>

There is one determinant of job satisfaction the literature suggests is distinctive for international employees that we have not yet discussed. Acculturation could be an important factor influencing international PhD's job satisfaction. First, we will explain the term 'acculturation' and how it is relevant for international PhD students. Secondly, we will review existing literature about acculturation of international employees and expatriates, as literature about acculturation of international PhD students specifically is non-existent.

Conceptualisation

Acculturation is the subject of many studies in the field of anthropology and cross-cultural psychology. According to Redfield, Linton and Herskovits (1936), acculturation describes phenomena which occur when groups of individuals with different cultures come into contact with each other for a longer period of time. These phenomena involve changes in the cultural patterns of an individual's self-identity, such as attitudes, values and behaviours. The unidimensional perspective of acculturation places the cultural identity of individuals on a continuum, going from retaining one's heritage culture, to adopting the 'new' cultural patterns (Gordon, 1964). However, this perspective is incomplete, as individuals are capable of having more than one self-identity. Bidimensional models of acculturation expand the perspective, by assuming acculturation is always a bicultural process (J. W. Berry, 1997; J. W. Berry, Kim, Power, Young, & Bujaki, 1989). There are always two cultures involved, and thus two independent cultural identifications as individuals can adopt aspects of both cultures. Both the individual's identification with their heritage and the host culture are important in this framework. The individual is free to choose which aspects he/she adopts. The dimensions are independent from each other. *Cultural distance* is a concept used to refer to the dissimilarity between characteristics of the heritage and host culture.

In this thesis we will be approaching the concept of acculturation according to the bidimensional approach of Berry (1997). His bidimensional model describes four acculturation strategies, based upon two fundamental questions individuals ask themselves: "Is it of value to maintain my cultural heritage?" and "Is it of value to maintain relations with other groups?". In regard to the heritage culture, the *assimilation* strategy is used when individuals don't want to maintain their original cultural identity and seek contact and participation with the host culture. In contrast, *separation* involves holding onto the heritage culture while avoiding contact with new cultures. When individuals are interested in maintaining one's heritage culture, while also making contact with other cultures, they adopt the

integration strategy. Lastly, *marginalisation* is adopted when there is no interest in both cultural maintenance and participation in other cultures.

Acculturation of International PhD Students

As a consequence of moving to a new country for a certain period of time, every international researcher that is pursuing a doctoral degree at a Flemish university will go through a certain acculturation process. Research about the acculturation of international PhD students focuses primarily on academic acculturation (e.g. Elliot, Reid, & Baumfield, 2016; Floyd, 2015), which is limited to the adaptation to the academic working environment. This research highlights the importance of informal learning support, apart from formal support systems organized by the university, for successful academic acculturation. However, this is primarily focused on a PhD student's performance. We will be adopting a broader perspective and focus on their overall acculturation.

As cultural identities are important to shape a 'sense of self', acculturation also involves psychological adaption to the acculturation process, which leads to psychological outcomes (J. W. Berry, 1997). Coping with the psychological changes of acculturation shows variability, depending on the context and time period. How an individual adapts determines how psychological adjustment can lead to behavioural shifts, acculturative stress or mental disease. Measuring an individual's acculturation is important when investigating cross-cultural variation, otherwise inaccurate conclusions may be drawn (Lonner & Berry, 1986).

Despite the lack of literature about the acculturation of international PhD students, we do find some interesting studies on the relationship between acculturation and job satisfaction of expatriates. This is an interesting comparison as international PhD students also move abroad for a certain period of time to work and are faced with a new environment. A meta-analysis of 44 empirical studies on expatriates shows a causal relationship between overall adjustment (consisting of interaction, general and work adjustment) and job satisfaction (Hechanova, Beehr, & Christiansen, 2003), explaining that adjustment to the host culture influences attitudes towards the job in the host culture. In addition, a meta-analysis on 66 studies about expatriate adjustment also confirmed that adjustment to the host country affects job satisfaction (Bhaskar-Shrinivas, Harrison, Shaffer, & Luk, 2005). This study adds job satisfaction as an outcome of expatriate adjustment to the expatriate adjustment framework of Black, Mendenhall and Ouddu (1991), stating that maladjustment will create a negative evaluation towards the stimulus that created it. Thus, poor adjustment to a new and unknown environment may lead to a negative evaluation of the working environment, resulting in low job satisfaction.

According to Berry (1997), acculturation involves changes in the identification with host and heritage culture, the more an individual is adjusted to their new environment, the more his identification with the host culture grows. In this light, we suggest the following hypothesis:

H1: Identification towards the host culture is positively associated with job satisfaction.

Research shows integration is the most successful acculturation strategy and marginalisation is the least successful acculturation strategy (J. W. Berry & Berman, 1990; J. W. Berry & Sam, 1997). The importance of adopting an integration strategy has been confirmed by other researchers in more recent studies in other populations. There is evidence for the positive outcomes of adopting an integration strategy among immigrants (Chen, Benet-Martinez, & Bond, 2008; Phinney, Horenczyk, Liebkind, & Vedder, 2001; Sullivan et al., 2007; Yoon et al., 2013), international nurses (Goh & Lopez, 2016), adolescent refugees in Australia (Kovacev & Shute, 2004) and American students studying abroad (Nguyen, 2010). These studies suggest that not only identification towards the host culture, but also the preservation of identification with the heritage culture leads to positive outcomes. An integration strategy is only adopted when identification with both cultures simultaneously is high. In this light, we build further upon our first hypothesis and predict that identification with the heritage culture enhances the positive effect of host culture identification on job satisfaction.

H2: The positive effect of identification with the host culture on job satisfaction is even stronger when identification towards the heritage culture is also high.

Berry (1997) also stated that the dissimilarity between the two cultures in contact affects the adjustment of an individual. Greater cultural distance implies a larger adjustment and less positive outcomes. The 'cultural distance hypothesis' states the greater the cultural distance, the more difficulties one will have adjusting to the host culture (Babiker, Cox, & Miller, 1980). Cultural distance is not the same as the geographical distance between two countries. It is based on cultural values. A well-known framework to describe cultures is Hofstede's (1980) cultural dimension framework. This aims to explain how a national culture influences the values and behaviours of individuals. He analysed survey data of 117.000 IBM employees of 40 different countries and identified four statistically independent dimensions that explained the variance between the respondents. He classified them as 'power distance', 'individualism', 'uncertainty avoidance' and 'masculinity'. Later, two more dimensions 'Confucian dynamism' and 'self-restraint' were added (Hofstede & Bond, 1988; Hofstede, Hofstede, & Minkov, 2010). These dimensions have been widely used to explain differences in behaviours and attitudes in working environments (e.g. Krjukova, Schalk, & Soeters, 2009; Liou, Tsai, & Cheng, 2013; Parkes, Bochner, & Schneider, 2001).

There is evidence for the cultural distance hypothesis in literature. However, most of this research operationalised cultural distance as a subjective measure, namely as 'perceived cultural distance' (e.g. Babiker et al., 1980; Demes & Geeraert, 2014; Galchenko & Van De Vijver, 2007; Searle & Ward, 1990). The operationalisation of this measurement raises concerns about the validity of the measurement because respondents tend to overestimate or underestimate cultural distance due to cognitive bias. Respondents who experience no difficulties adapting to a new culture will remember similarities more easily and vice versa. A few objective measures of cultural distance have been developed (Håkanson & Ambos, 2010), of which Kogut and Singh's Index (1988) is the most commonly

used. The evidence of the cultural distance hypothesis using an objective measurement is limited and only includes research on expatriates. Waxin (2004) found direct effects of the heritage culture on expatriate's interaction adjustment, which includes socializing and interacting with host country nationals, using an objective measure of cultural distance based on Hofstede's cultural dimension scores. Froese (2011) also found cultural distance had a direct negative impact on expatriate's job satisfaction. He argued that culture-based differences in work-values and behaviour made intercultural interaction more difficult, causing stress and anxiety. As a consequence, job satisfaction decreased. Froese used an objective measurement, based on Kogut and Singh's Index (1988). More research on populations relevant to international PhD students is missing. This is where this thesis would like to fill the gap in the literature. We know the international PhD population in Flanders consists of a wide variety of nationalities, which all have their own cultural values. Some PhD students might experience a greater cultural distance between their heritage culture and the Belgian culture than others. Based on the cultural distance hypothesis, we expect that more dissimilarities between the international PhD student's heritage culture and Belgium, and thus greater cultural distance, to have lower job satisfaction. Therefore, we propose the following hypothesis:

H3: The negative association between cultural distance and job satisfaction is mediated by host culture identification.

The following conceptual model is proposed:
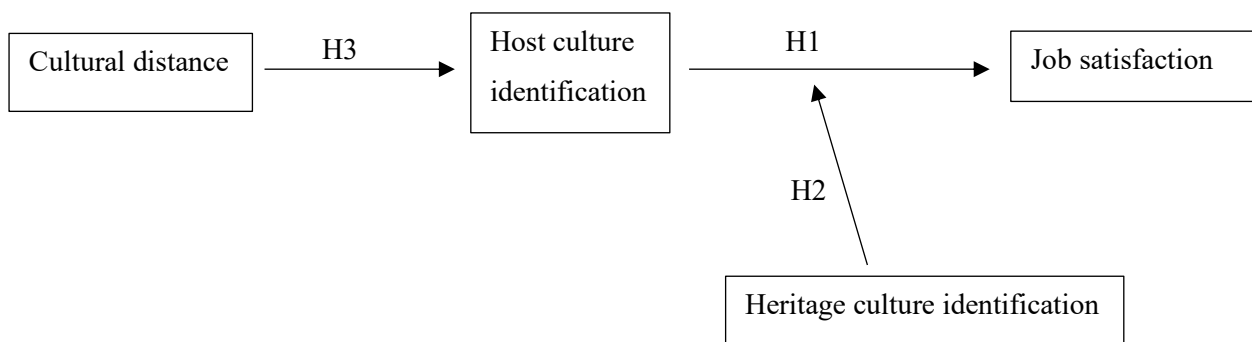
Conclusion

This thesis will examine the nature of the relationship between acculturation attitudes, cultural distance and job satisfaction, while controlling for potential determinants of job satisfaction. By including known predictors in our model, we want to examine the unbiased effect of acculturation on international PhD student's job satisfaction. We expect a positive relationship between international PhD student's identification with the Belgian culture and job satisfaction. In addition, we expect this relationship to be even stronger for international PhD students who also have a high heritage culture identification. Lastly, we expect PhD students who come from a country with more cultural

dissimilarities to have lower job satisfaction, as they have more difficulties adjusting to the host culture. Through studying the processes of acculturation in this population, we hope to gain more insights into what they require in an academic working environment, to further develop appropriate and effective policies and fill the gaps in the literature.

Method

Sample

In this study, we use secondary data, obtained from the Survey of Junior Researchers (SJR). This is a survey conducted by the Expertise Centre for Research and Development Monitoring (ECOOM), which is a cooperation between Flemish universities. The survey investigates academic careers in Flanders and was conducted in 2018 at five Flemish universities. For this study, we selected only international PhD students and those who were, at the time of the survey, conducting their doctoral research. Therefore, this study contains a total of 1193 (=n) respondents, of which 739 come from countries outside the EU-28, while 454 international PhD students originate from EU-28 countries. The sample consists of 568 male and 625 female PhD students. The biggest age category is 33 years old or older. More descriptive statistics are displayed in Table 1 and Table 2.

Measuring instruments and variable characteristics

Job satisfaction. The dependent variable job satisfaction is measured in the SJR by the question "How satisfied are you with your current job in general?" on a five-point Likert scale, ranging from "very unsatisfied" to "very satisfied". According to Scarpello and Campbell (1983) overall job satisfaction contains more than the sum of satisfaction with different aspects of one's job. Therefore, we choose to measure overall job satisfaction by a single-item measure instead of a multiple-item scale. A single-item measure has been proven to be a reliable measure of global job satisfaction (Dolbier, Webster, McCalister, Mallon, & Steinhardt, 2005; Tavani, Botella, & Collange, 2014; Wanous, Reichers, & Hudy, 1997). For the interpretation of the dependent variable, we have dichotomized job satisfaction into low job satisfaction (0 = 'very unsatisfied' to 'neither satisfied, nor dissatisfied') and high job satisfaction (1 = 'satisfied' to 'very satisfied').

Acculturation. As mentioned, acculturation is a bidimensional concept, consisting of a heritage culture and a host culture. We used the Vancouver Index of Acculturation (VIA) included in the 2018 SJR, a questionnaire that measures acculturation according to these two dimensions (Ryder, Alden, & Paulhus, 2000). Although there is no research on the cross-cultural validity, the scale showed strong internal consistencies across samples of Chinese, non-Chinese East Asian and non-English speaking (not Chinese or East Asian) respondents when it was developed by Ryder and his colleagues. In addition, the VIA shows high correlations with proxies of acculturation, confirming the concurrent validity of the scale (Kennedy, Parhar, Samra, & Gorzalka, 2005). The VIA consists 10 items measuring the degree of

identification with one's heritage culture and 10 items measuring the identification with the new, host culture they are embedded in. The items were modified to reflect identification with the respondent's heritage culture and the Flemish culture. Examples are "I often participate in cultural traditions of my own culture" and "I enjoy doing social activities with Flemish people". Participants were asked to indicate to what extent they agree with the statements on a five-point Likert scale, ranging from "strongly disagree" to "strongly agree". This resulted in two subscales, the heritage subscale and the host subscale through summation of the scores for both subscales respectively. The internal reliability of these two subscales was assessed by computing Cronbach's Alpha in SPSS. The alpha coefficients were $\alpha =.79$ for the host subscale and $\alpha =.85$ for the heritage subscale.

Cultural distance. Earlier, we conceptualized cultural distance according to Hofstede's cultural dimensions. In the literature, cultural distance is widely computed according to a formula by Kogut and Singh (1988), using these dimensions. However, in more recent years there has been a lot of criticism. Several studies show the Kogut and Singh formula is not accurate enough, questioning the validity of the measure (Konara & Mohr, 2019; Shenkar, 2012). Therefore, we used a modified version of the formula by Konara and Mohr (2019). Their findings show Kogut and Singh's formula overestimates large distances over small distances. To correct this, Konara and Mohr propose a small adjustment to the formula based on the Euclidean distance formula. The formula is based on the four main cultural dimensions of Hofstede, namely individualism, power distance, masculinity and uncertainty avoidance. In the formula below, the subtraction $I_{ki} - I_{kj}$ is the difference between the scores of the host country (Belgium) and the country of heritage on dimension k and V_k stand for the variance of the cultural dimension k.

$$Euclidean\ distance\ (standardized) = \sqrt{\sum_{k=1}^{4} \frac{\left(I_{ki} - I_{kj}\right)^2}{V_k}}$$

We used the nationality of the respondent to determine the country of origin. This was a question in the SJR 2018: "what is your nationality?". The scores for every country on the four cultural dimensions were obtained through the 'compare cultures application' on the online website *Hofstede Insights* (Hofstede, 2001; Hofstede et al., 2010). The website is licensed by Geert Hofstede to use the information and data from his research and books. As scores for the two other dimensions 'Confucian dynamism' and 'self-restraint' were not present for all countries in the dataset, we did not use these dimensions for the measurement of cultural distance.

Gender. The value 0 represents male respondents and the value 1 represents the female respondents. The ratio of the gender is 47.6% male and 52.4% female PhD students.

Age. The variable 'age' is categorized into four groups. The biggest share of the population (32.1%) is 33 years old or older, followed by 28 years old or younger (28.1%), 29 to 30 (22.7%) and 31 to 32 years old (17.1%).

Children. The respondents were asked how many children are in their household, from them and/or their partners. This variable was categorized into two categories, namely 0 = no children and 1 = at least one child. The majority of international PhD students in our sample had no children at the time of the survey (82.4%), while 17.6% had at least one child.

Partner. Respondents were asked about their relationship status. This variable was categorized to make a difference between respondents who had a partner and single respondents. The value 0 represents single respondents and the value 1 represents respondents who are married/have a partner they live with/have a partner but live separately.

Social support. Social support was measured by adopting part of the Medical Outcome Study Social Support Scale (MOS-SS) scale (Sherbourne & Stewart, 1991) in the 2018 SJR. As the name predicts, the scale was originally developed to measure social support in a longitudinal study of patients with chronic diseases. However, the instrument has been proven psychometrically sound in a non-clinical population (Giangrasso & Casale, 2014). The instrument operationalises social support as the perceived availability of different types of social support.

Twelve items of the MOS-SS scale were adopted in the SJR, as not all of the original items are relevant for junior researchers. A full list of the items used can be found in Appendix A. Respondents were asked "If necessary, someone is available to…". The items were measured using a five-point Likert-scale, with answers ranging from "never" to "always". A scale score was computed by using a mean score of all twelve items. The scale in our sample was found to be highly reliable ($\alpha = .962$).

Promotor support. The SJR contained 13 questions about the formal working relationship between the PhD student and the promotor. Examples of items can be found in Appendix A. When respondents had multiple promotors, they were asked about the relationship with their head promotor. A mean scale score was computed over all 13 items. Cronbach's Alpha for the 13 items of this scale was .936.

Work-life balance. Work-life interference was measured by gauging family-work conflict and work-family conflict. The items are from the scales developed and validated by Netemeyer, Boles and McMurrian (1996). Based upon factor analysis on the SJR 2013 data, it was decided to only adopt four items in the SJR 2018. Two items measuring work-family conflict (WFC) and two measuring family-work conflict (FWC). The items were measured using a five-point Likert scale, with answers ranging from "strongly disagree" to "strongly agree". At first, we computed two separate scales using the mean item scores of WFC and FWC. However, these scales were moderately correlated (.438, p < .001). This is why we combined the scores to achieve a score for work-life balance. The scores on the items were first coded in the opposite direction, so that a high item score represented low WFC or FWC. Then, the mean item score over all four items was computed. In our sample, Cronbach's Alpha of the work-life balance scale was .794.

Job demands and job control. These variables were measured using items from the Dutch VBBA quality of labour questionnaire (Vanroelen, Levecque, & Louckx, 2009). The scale has been

tested and found to be one-dimensional, reliable and valid (Evers, van Vliet-Mulder, & Groot, 2000). Six items about work pressure and work pace were used to measure job demands. Job control was measure using nine items about job variation, autonomy and learning opportunities. All items were scored through a four-point Likert scale, ranging from "never" to "always". The items used can be found in Appendix A. Scores for job demands and job control were obtained by calculating the mean of the respective items. Reliability for the job demands scale was α = .879, and the job control scale was α = .833.

Closed decision-making culture. This variable was measured using two items: "When decisions are taken, everyone's opinion is taken into account" and "there are only a limited number of people involved in the decision-making process". Items were scored using a five-point Likert scale, going from "totally disagree" to "totally agree". To obtain a scale score, first, the items were coded in the same direction, so that a high score reflected closed decision-making, while low scores reflected a more democratic way of decision-making. Finally, the mean item score was computed. The Cronbach's Alpha was .699.[1]

Table 1

Descriptive statistics: mean, standard deviation, minimum, maximum, missing values

	Mean (S.D.)	Minimum	Maximum	Missing
Heritage	36.39 (5.43)	4	50	169
Host	33.14 (5.42)	2	50	168
Cultural distance	10.66 (3.60)	0	17.19	202
Social support	3.59 (.90)	1	5	159
Promotor support	3.05 (.95)	1	5	58
Work-life balance	2.86 (1.04)	1	5	134
Job demands	2.17 (.85)	1	4	100
Job control	2.98 (.50)	1.22	4	102
Closed decision making	2.47 (.68)	1	5	104

---

[1] The low reliability score is due to the low number of items in the scale. Therefore, we still included the variable in the analysis.

Table 2

Frequencies in %

	Frequency (%)
Job satisfaction	
Low	26.3
High	73.7
Gender	
Male	47.6
Female	52.4
Age	
≤ 28	28.1
29-30	22.7
31-32	17.1
≥ 33	32.1
Children	
No Children	82.4
At least one	17.6
Having a partner	
Single	38.4
Partner	61.6

Analysis

In this thesis we used SPSS Statistics 25 to analyse our data. First, we ran a preliminary analysis to explore the data and to test multicollinearity between variables. Second, we did a missing data analysis. Then, we tested our hypotheses using binary logistic regression.

A binary logistic regression is used because the dependent variable is dichotomous: high job satisfaction or low job satisfaction. For interpretation of the binary logistic analysis results it is important to note that the first categories of the categorical variables and dummy variables were used as reference categories. We used a stepwise approach by building different logistic regression models to test our hypotheses. Model 0 includes the zero-order odds ratios for every variable in the final model to test for suppressor effects. Model 1 includes all control variables. In Model 2 the independent variable 'cultural distance' is added. In Model 3 the second independent variable, host culture identification, is added to test the first and second hypothesis. Lastly, in Model 4 we add the interaction term between heritage and host culture identification to test the interaction effect. Table 4, Table 5 and Table 6 show the results of the binary logistic regression, reporting the odds ratios (OR), the confidence intervals, the levels of

significance of the effects and the Nagelkerke R Square. We will use the latter and the chi-square test to evaluate the fit of our models, along with the Wald test for variables in the model.

Results

Multicollinearity

To test our data for multicollinearity, zero-order correlations were examined between the variables in this study. Table 3 shows Pearson correlations between the continuous variables in this study, namely social support, promotor support, work-life balance, job control, job demands, closed decision-making, cultural distance, the host and heritage subscale. For the categorical variables (gender, age, children, having a partner, interest in an academic career) and the continuous variables, a Spearman correlation was computed. When the correlation coefficient is 0, there is no relationship at all between the two variables. An absolute correlation of .10 is considered a weak correlation and a correlation of .30 is a moderate correlation. Correlations are strong from .50 or higher (Cohen, 1988). Table 3 shows a moderate negative correlation between closed decision-making and promotor support ($r = -.423$, $p < .001$), a moderate positive correlation between age and the presence of children in the household ($r = .371$, $p < .001$) and a moderate positive correlation between heritage and host culture identification ($r = .390$, $p < .001$). Lastly, there is a strong negative correlation between job demands and work-life balance ($r = -.520$, $p < .001$). All other correlations are lower than .30.[2] The generally used cut-off variable for multicollinearity is .80 (W. D. Berry & Feldman, 1985). Then, we also computed the variance inflation factor (VIF) for all continuous variables as an extra check for multicollinearity. After an iterative process, we found no VIF values higher than 1.358. When the VIF value is higher than 10, there is multicollinearity (Kutner, Nachtsheim, Neter, & Li, 2005). We conclude there is no multicollinearity and we can move forward to binary logistic regression.

---

[2] The variable 'inspirational leadership style of the promotor' showed high correlations ($r = .717$, $p < .001$) with 'promotor support' and was therefore removed from the analysis.

Table 3

Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender[a]	1												
2. Age[a]	-.046	1											
3. Children[a]	-.04	.371**	1										
4. Partner[a]	.106**	.137**	.157**	1									
5. SS	.166**	-.058	-.098*	.227**	1								
6. PS	-.064*	.018	.084**	-.054	.132**	1							
7. WLB	.057	-.185**	-.222**	-.106**	.138**	.098**	1						
8. Job control	.038	-.006	.038	.068**	.236**	.231**	.157**	1					
9. Job demands	-.018	.149**	.123**	.069*	-.105**	-.102**	-.520**	-.098	1				
10. CDM	-.057	.065*	-.025	.036	-.112**	-.423**	-.142**	-.186**	.178**	1			
11. CD	-.031	.124**	.234**	-.102**	-.103**	.131**	-.005	-.087**	-.007	-.058	1		
12. Host	-.021	-.006	-.023	.022	.189**	.158**	.005	.074*	.037	-.062*	-.013	1	
13. Heritage	.063*	-.07*	.012	.01	.131**	.037	.032	.012	-.024	-.017	.039	.39**	1

** $p < 0.05$; * $p < 0.01$

[a] Spearman correlation

SS: social support, PS: promotor support, WLB: work-life balance, CDM: closed decision making, CD: cultural distance

Missing Data Analysis

   A missing data analysis was performed on the dependent variable, job satisfaction, as it counts 136 missing data points. This means 11.4% of the respondents in our sample do not have an answer on the question about job satisfaction. It is important to make sure this data is missing at random, to ensure this has no effect on the analysis. To test if there is a relation between the missing data and any other variable, we conducted a binary logistic regression, using the missing data points. The variable 'job satisfaction' was coded to 0 representing all respondents with a score on job satisfaction, and 1 representing all respondents who didn't respond. The binary logistic regression analysis showed no significant effect, with odds ratios ranging from .994 to 1.000. Therefore, we can conclude that the data is missing completely at random (Rubin, 1976).

   We also did a missing data analysis for the variable 'cultural distance', as 16.9% of the respondents have no score for this variable. The binary logistic regression showed that international PhD students who score higher on the host identification variable, have less chance to have a missing on cultural distance (OR = .925, p = .017). In addition, international PhD students between 31 and 32 years old have a significantly higher chance of having a missing value on cultural distance (OR = 2.735, p = .022). We should keep in mind that the cultural distance variable is based on the question in the survey "what is your nationality?". It is important that we take these relations into account when we interpret further analyses.

Binary Logistic Regression Models

   Model 0. First, the zero-order odds ratios between all variables in our final model and the dependent variable are shown in Table 4. The effects reflect the bivariate relationship between the variable and job satisfaction. We do this to check for suppressor effects which are predictors who have a zero correlation with the dependent variable, but still contribute to the predictive validity of the model (Lancaster, 1999). Based on the analysis we found no suppressor effects. The effects shown in model 0 are the effect sizes when there was not controlled for any other variables. There are significant effects of identification with the host culture, social support, promotor support, work-life balance, job control, job demands and a closed decision-making culture in a team. The age categories '29 to 30 years old' and '31 to 32 years old' were also significant compared to the reference category. However, because uncontrolled effects can be biased, we continue to the next models to discuss the effects of the variables in more depth.

   Model 1. The first model is a model where only the control variables are included. This way we can see how much of the variance is accounted for by the control variables. To test if the model fits the data, we first look at the Chi-square test of the model. The test is significant ($\chi^2(12) = 287.613$, p < .001), meaning it is a better fit than the null model (a model without any of the variables). The Hosmer & Lemeshow test is a second test we can use to evaluate model fit. This test is significant (p = .026), which indicates that our model with only control variables is not a good fit for the data. The Nagelkerke

R Square is .394, which means 39.4% of the variance is explained by the model. We see significant positive effects for the social support variable (OR=1.569, p < .001) and the promotor support variable (OR=2.930, p < .001). This means international PhD students who receive more social support and support from their promotor have a higher chance to be satisfied with their job. These effects are very strong. We also see a strong significant relationship between social support and job satisfaction (OR=1.569, p < .001). In addition, we see slightly less strong effects for work-life balance, job demands and a closed-decision making culture in the team. Respondents who score high on work-life balance have more chance to be satisfied with their job (OR=1.392, p = .017). Respondents who have high job demands (OR=.711, p = .043) and work in teams where the decision-making is more closed (OR=.808, p = .046) have a lower chance to be satisfied with their job.

Model 2. The first independent variable, cultural distance, is added. To test our third hypothesis, we need to check for a mediator effect of host culture identification between cultural distance and job satisfaction. Therefore, we first need to find a main effect of cultural distance on job satisfaction. In the next step we add host culture identification to test the third hypothesis. Model 2 is significantly better than the null model ($\chi^2(13)$=288.581, p < .001). The Hosmer & Lemeshow test is not significant (p = .127), from which we can deduce that model 2 is a good fit for the data. The Nagelkerke R Square is .395, which means model 2 explains 39.5% of the variance. This is only 0.1% more than model 1. This increase is not significant, as model 2 is not significantly better than model 1 ($\chi^2(1)$=.968, p = .325). The results show no main effect of cultural distance on job satisfaction (OR=.975, p = .326). The significant effects of the control variables remain the same.

Model 3. Next, the second independent variable, identification with the host culture, was added. The chi-square test ($\chi^2(14)$=292.698, p < .001) and Hosmer & Lemeshow test (p = .057) indicate a good model fit. The Nagelkerke R Square is .399, which is an increase of 0.4% compared to the model without host culture identification. This is a significant increase compared to model 2 without the social host culture identification variable ($\chi^2(1)$=4.027, p = .045). We see a significant main effect of host culture identification with job satisfaction. International PhD students with a higher degree of identification with the host culture are more likely to be satisfied with their job (OR=1.039, p = .046). This confirms our first hypothesis. On the other hand, we see no difference in the cultural distance variable. As there is no main effect of cultural distance, nor an effect when host culture identification is added, we find no evidence to confirm the third hypothesis. The significant effects of social support, promotor support, work-life balance, job control, job demands and closed decision making culture remain largely the same.

Model 4. In model 4 we added the interaction between host and heritage culture identification. The Chi-square test is significant ($\chi^2(16)$=295.078, p < .001) and the Hosmer & Lemeshow test is not significant (p = .060), indicating a good model fit. This model predicts 40.2% of the variance in the data, which is an increase of 0.3% compared to the model without the interaction term, but the increase is not significant ($\chi^2(2)$=2.476, p < 2.91). Contrary to model 3, there is no significant effect of host culture

identification (OR=1.040, p = .719). The main effect of heritage culture identification is also not significant (OR=.968, p = .727), as well as the interaction term (OR=1.000, p = .954). We find no evidence to support the second hypothesis. The effect sizes for the control variables seem to remain robust throughout the analysis.

Table 4

Binary Logistic Regression Models: satisfied to very satisfied with the job. (N = 927)

Variables	Model 0				Model 1		
	zoOR	CI	p	R^2	OR	CI	p
				.394			
Constant					.003		***
Host	1.064	(1.064-1.093)	***				
Heritage	1.006	(.983-1.031)	N.S.				
CD	1.000	(.960-1.040)	N.S.				
Gender[a] (female)	.885	(.672-1.165)	N.S.		0.825	(.571-1.192)	N.S.
Age[a] (≤28)			N.S.				N.S.
29-30	.631	(.426-.934)	*		.705	(.429-1.158)	N.S.
31-32	.618	(.406-.940)	*		.713	(.412-1.235)	N.S.
≥33	.785	(.541-1.140)	N.S.		1.169	(.690-1.979)	N.S.
Children[a] (≥1)	.988	(.690-1.416)	N.S.		1.056	(.618-1.804)	N.S.
Partner[a] (yes)	1.021	(.771-1.353)	N.S.		1.035	(.704-1.521)	N.S.
Social support	1.712	(1.459-2.008)	***		1.569	(1.268-1.942)	***
Promotor support	3.421	(2.841-4.119)	***		2.930	(2.326-3.689)	***
Work-life balance	1.761	(1.471-2.109)	***		1.392	(1.060-1.828	*
Job control	4.142	(3.038-5.647)	***		2.545	(1.712-3.783)	***
Job demands	.496	(.397-.620)	***		.711	(.511-.989)	*
Closed decision making culture	.490	(.418-.575)	***		.808	(.656-.996)	*

zoOR zero-order odds ratios, N.S. not significant, OR odds ratios, CI confidence interval (95%); *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

[a] Reference category: female (gender), ≤28 (age), at least one child (children), yes (partner)

Table 5

Binary Logistic Regression Models: satisfied to very satisfied with the job. (N = 927)

Variables	R^2	OR	CI	P	R^2	OR	CI	P
		Model 2				**Model 3**		
	.395				.399			
Constant		.004		***		.002		***
Host						1.039	(1.001-1.078)	*
CD		.975	(0.926-1.026)	N.S.		.974	(.925-1.025)	N.S.
Gender[a] (female)		0.823	(0.569-1.189)	N.S.		.825	(.570-1.194)	N.S.
Age[a] (≤28)				N.S.				N.S.
29-30		0.716	(0.436-1.178)	N.S.		.710	(.431-1.170)	N.S.
31-32		0.725	(0.418-1.257)	N.S.		.718	(.413-1.248)	N.S.
≥33		1.181	(0.697-2.001)	N.S.		1.157	(1.961-.683)	N.S.
Children[a] (≥1)		1.122	(0.647-1.944)	N.S.		1.157	(.665-2.014)	N.S.
Partner[a] (yes)		1.015	(0.689-1.495)	N.S.		1.020	(.692-1.502)	N.S.
Social support		1.555	(1.256-1.925)	***		1.497	(1.206-1.858)	***
Promotor support		2.970	(2.353-3.748)	***		2.899	(2.294-3.663)	***
Work-life balance		1.403	(1.068-1.843)	*		1.398	(1.064-1.837)	*
Job control		2.510	(1.688-3.733)	***		2.554	(1.715-3.804)	***
Job demands		0.708	(0.509-0.985)	*		.683	(.489-.952)	*
Closed decision making culture		0.807	(0.655-0.996)	*		.801	(.649-.988)	*

N.S. not significant, OR odds ratios, CI confidence interval (95%)

*** p < 0.001; ** p < 0.01; * p < 0.05

[a] Reference category: female (gender), ≤28 (age), at least one child (children), yes (partner)

Table 6

Binary Logistic Regression Models: satisfied to very satisfied with the job. (N = 927)

Variables			Model 4	
	R^2	OR	CI	P
	.402			
Constant		.128		**
Host		1.040	(.841-1.286)	N.S.
CD		.976	(.927-1.027)	N.S.
Heritage		.968	(.807-1.161)	N.S.
Host*Heritage		1.000	(.995-1.006)	N.S.
Gender[a] (female)		.843	(.582-1.221)	N.S.
Age[a] (≤28)				N.S.
29-30		.699	(.424-1.152)	N.S.
31-32		.709	(.408-1.235)	N.S.
≥33		1.122	(.659-1.908)	N.S.
Children[a] (≥1)		1.167	(.668-2.040)	N.S.
Partner[a] (yes)		1.026	(.696-1.513)	N.S.
Social support		1.517	(1.220-1.885)	***
Promotor support		2.902	(2.294-3.670)	***
Work-life balance		1.407	(1.070-1.850)	*
Job control		2.555	(1.710-3.816)	***
Job demands		.685	(.490-0.956)	*
Closed decision making culture		.799	(.647-0.987)	*

N.S. not significant, OR odds ratios, CI confidence interval (95%);

*** p < 0.001; ** p < 0.01; * p < 0.05

[a] Reference category: female (gender), ≤28 (age), at least one child (children), yes (partner)

<center>**Discussion**</center>

Results

       Identification with the host culture. According to Berry (1997), adjustment leads to psychological adaptation, which includes changes in an individual's self-identity. According to Black, Mendenhall and Ouddu's (1991) expatriate adjustment framework, maladjustment will create a negative stimulus towards the stimulus that created it. In this way, adjustment can influence job satisfaction. The importance of host culture identification has been confirmed in research on expatriates (Bhaskar-Shrinivas et al., 2005; Black et al., 1991; Hechanova et al., 2003). This thesis investigated and confirmed the importance of identification with the host culture for international PhD students in terms of job satisfaction. We found a positive association between identification with the host culture and job satisfaction in our sample, confirming the first hypothesis. When international PhD students identify with the Flemish culture, this means that they for example engage in social interactions with Flemish people, feel at ease and participate in typical Flemish traditions. Changes in attitudes, values and behaviours take place to a certain degree. It is important to place this on a continuum. As the world is not black and white, nor is someone's cultural identity. This degree to which one identifies with the host culture seems to influence one's job satisfaction.

       Identification with the heritage culture. Berry (1997) argued that acculturation is always a bicultural process as an individual can have more than one cultural identity. In a cross-cultural context, there is an identification with the host and the heritage culture. These two dimensions translate into four different acculturation strategies. This thesis examined the relationship between job satisfaction and the integration strategy. This is the acculturation strategy where identification with the host culture is high, while identification with the heritage culture is also preserved. The hypothesis that integration leads to the most positive outcomes out of all acculturation strategies in a cross-cultural context has been confirmed in various populations, such as immigrants (Chen et al., 2008; Phinney et al., 2001; Sullivan et al., 2007; Yoon et al., 2013), international nurses (Goh & Lopez, 2016), adolescent refugees in Australia (Kovacev & Shute, 2004) and American students studying abroad (Nguyen, 2010). This thesis investigated the influence on job satisfaction in a sample of international PhD students. However, we found no significant effect of an interaction between heritage and host culture identification. The zero-order odds ratio in model 0 showed no significant effect of heritage culture identification on job satisfaction. It is thus not surprising that we found no interaction effect because there is no bivariate relationship between the two variables. As acculturation is a bicultural process, the question of the role of identification with the heritage culture remains. One reason why the heritage culture identification does not affect job satisfaction can be found in the expatriate adjustment framework of Black, Mendenhall and Ouddu (1991). Maladjustment creates a negative stimulus towards the stimulus that created it. The heritage culture identification is an identification that was present before the international PhD student was faced with a new environment. Changes in this identification can occur due to

psychological adaption (J. W. Berry, 1997), but these are not due to contact with the host culture. More so due to the absence of the presence of the heritage culture. We can therefore argue that one's identification with the heritage culture alone cannot influence satisfaction with the job in the host culture.

Cultural distance. Despite evidence of the cultural distance hypothesis using an objective measure in the literature (Froese & Peltokorpi, 2011; Waxin, 2004), we could not find evidence in the international PhD population regarding job satisfaction. Differences in cultural values are not related to the job satisfaction of international PhD students. There are several possible explanations for these results, beginning with the measurement of cultural distance. As we have mentioned in the method section, the measurement of cultural distance is a much-discussed topic in the literature. There is no agreement among scholars on how to calculate cultural distance. We have used the four dimensions developed by Hofstede (1980) to compute a cultural distance measure (Konara & Mohr, 2019). Other operationalisations of cultural distance use alternative classifications, such as Schwartz' framework (Ng, Lee, & Soutar, 2007), Inglehart's (1997) value dimensions or even combinations of different frameworks such as the Compound Culture Index (Yeganeh, 2013). Shenkar (2001) proposed including other related factors in the calculation, such as language and geographical distance. In addition, some argue that the Gross Domestic Product (GDP) and the UN's Human Development Index (HDI) of a country are also valuable measures of cultural distance (Geeraert & Demoulin, 2013). Perhaps, an effect of cultural distance can be found with other operationalizations of cultural distance.

We have also discussed the concept of 'perceived cultural distance' and its disadvantages in measuring cultural distance. It might be valuable to look at these mechanisms from a different perspective, as we could not find the effect that we expected based on the literature. It could be that the cultural distance between one's heritage and host country is large according to an objective measure, while the individual itself does not perceive it that way. As acculturation involves psychological changes in one's self-identity, it might be more accurate to look at how the individual experiences the cultural distance, which is why we don't see results using an objective measure.

Control variables. The evidence of determinants of international PhD student's job satisfaction is very limited. Therefore, literature about comparable populations was used to determine the control variables. Research on the job satisfaction of non-international PhD students, university faculty, expatriates and highly educated employees was discussed in the literature review. In addition, we complemented these studies with research on the specific characteristics of international PhD students. What distinguishes them from non-international PhD students and other related populations? We took this information to determine possible predictors of international PhD student's job satisfaction. This resulted in the confirmation of very robust predictors in our analysis on an international PhD student sample in Flanders. The significant effects of social support, promotor support, job control, job demands, work-life balance and a closed decision-making culture on job satisfaction were shown in all of our models. However, we can only confirm the effects of predictors in models that fit with the data. We

found a good model fit in the second, third and fourth model. The control variables on its own did not match the data. Consequently, we can only make valid statements when controlled for other variables, such as host culture identification in model 3. This emphasizes again the importance of the first hypothesis. The second and fourth model, including cultural distance and heritage culture identification, were also a good fit with the data, but these variables did not add a significant amount of explainable value to the model. Thus based on model 3, we can conclude that international PhD students are more likely to be satisfied with their job (1) when they receive more social support, (2) when they receive more support from their promotor, (3) when they experience a high degree of job control (4) and a low degree of job demands. Also (5) when they experience a high degree of work-life balance and (6) when there is a low degree of closed decision-making in the team.

In the literature overview we discussed participative management (the opposite of a closed decision-making culture) as an aspect that gave PhD students more control over their jobs. However, the correlation between closed decision-making and promotor support ($r = -.423$, $p < .001$) is stronger than the correlation with job control ($r = -.112$, $p < .001$). This indicates that the promotor is important in the decision-making process.

One reason why work-life balance is an important predictor specifically for international PhD student's job satisfaction could be because adjustment of the family affects the adjustment of the PhD student when they bring along their partners or family. This hypothesis has been researched and confirmed in research on expatriates (Caligiuri, Hyland, Joshi, & Bross, 1998). The family's adjustment created a spillover effect on the expatriate's adjustment to working in the host country. This spillover effect may also be present in the international PhD population.

The demographic control variables gender, age, the presence of children in the household and having a partner, had no significant influence on job satisfaction. The evidence of differences between males and females regarding job satisfaction in the literature is mixed. No differences were found in the SJR 2018 data for the total PhD student sample (Levecque et al., 2019), while other research of PhD students did confirm differences in gender (Kifle & Desta, 2012). There were also differences in gender found in a study by Bender and Heywood (2006) in a sample of highly educated employees. This research did emphasize that males and females differ in job satisfaction because they value other aspects of their work. Thus, it could be that male and female international PhD students evaluate their job satisfaction differently, but have similar levels of global job satisfaction, which is why we did not find a significant effect of gender.

The finding that age was not a significant predictor for job satisfaction was contrary to the expectations based on the literature (Levecque et al., 2019). We did see a significant effect of age in model 0. However, this disappeared when other variables were added, which means the effect may be due to other variables. In addition, the presence of children in the household and having a partner were also not significant.

Theoretical Implications

The confirmation that acculturation processes, such as identification with the host culture, influence the job satisfaction of international PhD students contributes to the existing literature about cross-cultural adjustment and international PhD student's job satisfaction, which is very limited. This thesis also adds determinants of international PhD student's job satisfaction to the literature, emphasizing the importance of social support, promotor support, job control, job demands, work-life balance and a closed decision-making culture.

Out findings have theoretical implications for future research on job satisfaction of international PhD students. We found no influence of adopting an integration strategy on job satisfaction, which entails the combination of two acculturation dimensions. Our results indicate that host culture identification is an important predictor when it comes to job satisfaction, but not when combined with heritage culture identification. We find a possible explanation for this in the expatriate adjustment framework of Black, Mendenhall and Ouddu (1991), as described above. This indicates that not the combination of acculturation dimensions influence job satisfaction. Berry (1997) argued that host and heritage culture identifications are independent from each other. Consequently, both dimensions can have separate outcomes. Our findings confirm this. Research and theories on this subject should pay more attention to the differences in acculturation dimensions separately, in addition to the combination of both dimensions.

The results fit Karasek's J-DCS model, as the 'support' dimension seems to be of great importance for job satisfaction in the international PhD population. According to the J-DCS model, social support acts as a job recourse and buffers the negative outcomes of high job demands. Although we found a main effect of social support and promotor support, it's likely that support fulfills a moderating function because PhD students are generally faced with high job demands (Leyman et al., 2009). However, as we stated that international PhD students can receive social support from different sources (Albrecht & Adelman, 1987; Brett, 1980), it is unclear how and to what extent these two sources influence the relationship between job demands and psychological and health outcomes.

Practical Implications

We know the job satisfaction of international PhD students is lower than non-international PhD students (Levecque et al., 2019). It is of importance that we understand what influences job satisfaction, as it is linked to several important organizational outcomes (Eby et al., 1999; Judge et al., 2001; Kosteas, 2011; Petty et al., 1984), as well as well-being, life satisfaction and happiness (Annemans & T'Jaeckx, 2018; Argyle, 1989; Campbell et al., 1976). In addition, the investments in brain circulation are high and the proportion of international PhD students in Flanders keeps rising every year (Flemish Government, 2019). It is important for policymakers and universities to know what is important to increase job satisfaction. The biggest contribution of this thesis is the importance of certain aspects, such as maintaining a work-life balance. The strong significant positive effects of social support and promotor

support emphasizes the importance of receiving support, both in a social context and in a work context. The positive effect of job control and the negative effects of job demands and a closed decision-making culture are also aspects that policymakers and universities should focus on.

When we compare the results of this thesis to an analysis of job satisfaction on the entire PhD sample in Flanders (Levecque et al., 2019), we see a few similarities and differences in the results[3]. This study replicated the effects of job control and job demands in the international PhD sample. Differences between males and females, as well as differences between the presence of children in the household and having no children were not found in both samples. Contrary, the effects of age and having a partner were not found in the international PhD population. These differences emphasize the importance of a differentiated approach to international and non-international PhD students.

Limitations

It is important to acknowledge the limitations in this study for interpretation of the results. First, the results of this study can only be generalised to the population of international PhD students in Flanders. Interpretation of the results regarding other populations should be done mindfully. Second, because this is a cross-sectional research, the relationships between the dependent and independent variables is not causal. Also, the direction of the effects cannot be determined with certainty. Only longitudinal or experimental research can establish causal effects and the direction of effects.

Third, in deciding a measurement or operationalization of a concept, there are always different options to choose from. Every method has its advantages and limitations. In this thesis, we investigated job satisfaction in general. Is an individual satisfied with their job overall? This limits the research in getting more detailed information about job satisfaction. We argued that overall job satisfaction is more than the different facets of job satisfaction (Scarpello & Campbell, 1983). Towards the development of specific regulations, it is helpful to know what specific job aspects need improvement. This is also a recommendation for future research. In addition, the source of social support was not specified in the measurement. As we discussed in the literature review, international PhD student's social support can come from different sources (Albrecht & Adelman, 1987; Brett, 1980). Consequently, it is not possible to fully understand the mechanisms underlying this predictor. Specifying the source of social support gives access to more details and understanding about why social support is an important predictor for international PhD student's job satisfaction.

Lastly, there are also limitations to measuring constructs across different cultures. When we want to make valid conclusions about concepts in a diverse population, as we did in this study, the concepts and measurements must have the same meaning and relevance in every culture. The literature lacks profound research on the cross-cultural validity of the scales and concepts used in this study. Consequently, it is not possible to guarantee cross-cultural validity. Respondents from different cultures

---

[3] It is important to note that the results of Levecque and colleagues (2019) were obtained through a logistic regression model that included different predictors, as the model in this study includes variables that are relevant for international PhD students specifically.

might interpret items in the scales used for measurement in different ways due to their cultural background. We have to take this into account and be careful when interpreting and generalizing the results.

Suggestions For Future Research

The results of this thesis might show adopting an integration strategy does not influence job satisfaction of international PhD students, but it might influence other outcomes. A meta-analysis of 325 showed that adopting an integration strategy is the strategy that is most strongly related to better mental health (Yoon et al., 2013). Integration has also been proven in other populations to have positive outcomes, such as higher ratings of self-worth (Kovacev & Shute, 2004) and better academic performance (Nguyen, 2010). Future research on acculturation should focus on the relationship between integration and mental health or performance of international PhD students.

Not everyone seems to benefit in the same way of contact with other cultures. Here comes another factor into play which this thesis didn't account for, namely personality. Caligiuri's (2000) research on expatriates showed that having the personality trait 'openness' is a condition to benefit from contact with other cultures. Only when individuals are open to learn about and interact with other cultures, they will learn and benefit from it. Another study on expatriates shows an interaction effect of host culture and personal characteristics on job satisfaction (Peltokorpi & Froese, 2014). The 'cultural fit hypothesis' states that expatriate workers' adaptation is dependent on the cultural fit between their personality traits and the culture of the host country (Searle & Ward, 1990). Other research about expatriates also emphasizes the influence of core self-evaluations on adjustment to the job, influencing their satisfaction with the job (Johnson et al., 2003). The interplay between personality and acculturation of international PhD students should be further investigated in future research.

We suggest investigating the influence of cultural distance using a combination of subjective and objective measures. As we argued earlier, it could be that the perceived cultural distance is more important than the objective cultural distance when assessing psychological mechanisms. However, due to the cognitive biases of individuals, comparison between measures of perceived cultural distance is impossible. This is why we suggest using a combination of both measurements.

The results pointed to social support as an important determinant of job satisfaction of international PhD students. However, a lot of questions remain unanswered. Does the source of social support of international PhD students mainly come from ties with family and friends in their home country or do they develop a new social support network in Belgium? Which kind of social support is most important? A limitation of this thesis is that we measured social support in general. There could be a significant difference between the social support received from social connections of the home country and new social connections in the country of residence. More research into the importance of the source of social support is needed to understand this mechanism fully.

The results of this thesis showed that maintaining a work-life balance is important for the job satisfaction of international PhD students. From research on expatriates (Hechanova et al., 2003) we know adjustment of spouses and family is important for the adjustment of the expatriate, but there is little information about the family situation of the PhD students. We did control for having children and having a partner, but how many of them bring their family or partner to the host country and how does their acculturation process unfold? How does this affect their experience? And what about PhD students did not (or could not) bring their families to the host country? How does this influence their job satisfaction, their acculturation process and their mental health in general? Is there a big difference between leaving and bringing family? These are all potentially interesting avenues for future research. This might bring more clarity to the influence of work-life balance on job satisfaction as well.

Lastly, we have earlier touched upon the limited information due to measuring global job satisfaction. It could be helpful for policymakers if the different aspects of job satisfaction of international PhD students are analysed.

Conclusion

The growing importance of brain circulation leads to increasing diversity in the higher education institutes of Flanders. When we want to investigate this population, we need to take psychological processes into account that are specific for a culturally diverse group. Lonner and Berry (1986) already argued that investigating cross-cultural variation requires controlling for the acculturation of individuals. This thesis confirms the importance of the degree of identification with the host country for the job satisfaction of international PhD students. Along with the finding that PhD students are more likely to be satisfied with their job if their degree of identification with the host country is high, we also found important effects of other job satisfaction predictors for this population. When controlled for differences in identification with the host culture, international PhD students are more likely to be satisfied with their job (1) when they receive more social support, (2) when they receive more support from their promotor, (3) when they experience a high degree of job control (4) and a low degree of job demands, (5) when they experience a high degree of work-life balance and (6) when there is a low degree of closed decision-making in the team. We know international PhD students are significantly less satisfied than their non-international colleagues (Levecque et al., 2019). When universities and policymakers focus on these factors, they can act as levers to boost international PhD student's job satisfaction.

References

Albrecht, T. L., & Adelman, M. B. (1987). *Communicating social support*: Sage Publications, Inc.

An, J.-Y., Cha, S., Moon, H., Ruggiero, J. S., & Jang, H. (2016). Factors affecting job satisfaction of immigrant Korean nurses. *Journal of Transcultural Nursing, 27*(2), 126-135. doi:10.1177/1043659614539175

Annemans, L., & T'Jaeckx, J. (2018). Persdossier Resultaten Nationaal Geluksonderzoek over werk en geluk [Press release]. Retrieved from https://gelukkigebelgen.be/nationaal-geluksonderzoek/

Argyle, M. (1989). *The psychology of happiness*. London: Routledge.

Aziri, B. (2011). Job satisfaction: A literature review. *Management Research and Practice, 3*(4), 77-86.

Babiker, I. E., Cox, J. L., & Miller, P. M. (1980). The measurement of cultural distance and its relationship to medical consultations, symptomatology and examination performance of overseas students at Edinburgh University. *Social Psychiatry, 15*(3), 109-116.

Baum, T., Kralj, A., Robinson, R. N. S., & Solnet, D. J. (2016). Tourism workforce research: A review, taxonomy and agenda. *Annals of Tourism Research, 60*, 1-22. doi:10.1016/j.annals.2016.04.003

Belspo. (2018). About Scientific visa.

Bender, K. A., & Heywood, J. S. (2006). Job satisfaction of the highly educated: The role of gender, academic tenure, and earnings. *Scottish Journal of Political Economy, 53*(2), 253-279. doi:10.1111/j.1467-9485.2006.00379.x

Bentley, P. J., Coates, H., Dobson, I. R., Goedegebuure, L., & Meek, V. L. (2013). Introduction: Satisfaction around the world? In *Job satisfaction around the academic world* (pp. 1-11): Springer.

Berry, J. W. (1997). Immigration, acculturation, and adaptation. *Applied psychology, 46*(1), 5-34. doi:10.1111/j.1464-0597.1997.tb01087.x

Berry, J. W., & Berman, J. (1990). Cross-cultural perspectives: Nebraska symposium on motivation. In: University of Nebraska Press Lincoln, NE.

Berry, J. W., Kim, U., Power, S., Young, M., & Bujaki, M. (1989). ACCULTURATION ATTITUDES IN PLURAL SOCIETIES. *Applied Psychology-an International Review-Psychologie Appliquee-Revue Internationale, 38*(2), 185-206. doi:10.1111/j.1464-0597.1989.tb01208.x

Berry, J. W., & Sam, D. L. (1997). Acculturation and adaptation. *Handbook of cross-cultural psychology, 3*(2), 291-326.

Berry, W. D., & Feldman, S. (1985). *Multiple regression in practice*: Sage.

Bhaskar-Shrinivas, P., Harrison, D. A., Shaffer, M. A., & Luk, D. M. (2005). Input-based and time-based models of international adjustment: Meta-analytic evidence and theoretical extensions. *Academy of Management Journal, 48*(2), 257-281. doi:10.5465/amj.2005.16928400

Black, J. S., Mendenhall, M., & Oddou, G. (1991). Toward a comprehensive model of international adjustment: An integration of multiple theoretical perspectives. *Academy of management review, 16*(2), 291-317. doi:10.2307/258863

Boosten, K., Vandevelde, K., Derycke, H., te Kaat, A. J., & Van Rossem, R. (2014). Careers of doctorate holders survey 2010. In (Vol. 13): Belgian Science Policy Office.

Bozeman, B., & Gaughan, M. (2011). Job satisfaction among university faculty: Individual, work, and institutional determinants. *The Journal of Higher Education, 82*(2), 154-186.

Brett, J. M. (1980). The effect of transfer on employees and their families. In *Current concerns in occupational stress*: wiley.

Caligiuri, P. M. (2000). Selecting expatriates for personality characteristics: A moderating effect of personality on the relationship between host national contact and cross-cultural adjustment. *MIR: Management International Review*, 61-80.

Caligiuri, P. M., Hyland, M. M., Joshi, A., & Bross, A. S. (1998). Testing a theoretical model for examining the relationship between family adjustment and expatriates' work adjustment. *Journal of Applied Psychology, 83*(4), 598.

Campbell, A., Converse, P. E., & Rodgers, W. L. (1976). *The quality of American life: Perceptions, evaluations, and satisfactions*: Russell Sage Foundation.

Chen, S. X., Benet-Martinez, V., & Bond, M. H. (2008). Bicultural identity, bilingualism, and psychological adjustment in multicultural societies: Immigration-based and globalization-based acculturation. *Journal of Personality, 76*(4), 803-837. doi:10.1111/j.1467-6494.2008.00505.x

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd Edition ed.): Routledge.

Cohrs, J. C., Abele, A. E., & Dette, D. E. (2006). Integrating situational and dispositional determinants of job satisfaction: Findings from three samples of professionals. *The Journal of psychology, 140*(4), 363-395.

Datta, K., McIlwaine, C., Evans, Y., Herbert, J., May, J., & Wills, J. (2007). From coping strategies to tactics: London's low-pay economy and migrant labour. *British Journal of Industrial Relations, 45*(2), 404-432. doi:10.1111/j.1467-8543.2007.00620.x

De Lange, A. H., Taris, T. W., Kompier, M. A. J., Houtman, I. L. D., & Bongers, P. M. (2004). The relationships between work characteristics and mental health: Examining normal, reversed and reciprocal relationships in a 4-wave study. *Work & Stress, 18*(2), 149-166.

De Witte, H., Verhofstadt, E., & Omey, E. (2007). Testing Karasek's learning and strain hypotheses on young workers in their first job. *Work and Stress, 21*(2), 131-141. doi:10.1080/02678370701405866

Debackere, K., Delanote, J., Hoskens, M., Verheyden, L., & Viaene, P. (2017). Totale O&O-uitgaven: GERD.

Demes, K. A., & Geeraert, N. (2014). Measures matter: Scales for adaptation, cultural distance, and acculturation orientation revisited. *Journal of Cross-Cultural Psychology, 45*(1), 91-109.

Dolbier, C. L., Webster, J. A., McCalister, K. T., Mallon, M. W., & Steinhardt, M. A. (2005). Reliability and validity of a single-item measure of job satisfaction. *American Journal of Health Promotion, 19*(3), 194-198.

Eby, L. T., Freeman, D. M., Rush, M. C., & Lance, C. E. (1999). Motivational bases of affective organizational commitment: A partial test of an integrative theoretical model. *Journal of occupational and organizational psychology, 72*(4), 463-483.

Elliot, D. L., Reid, K., & Baumfield, V. (2016). Beyond the amusement, puzzlement and challenges: an enquiry into international students' academic acculturation. *Studies in Higher Education, 41*(12), 2198-2217. doi:10.1080/03075079.2015.1029903

European Commission. (2011). *Horizon 2020 - The Framework Programme for Research and Innovation*. Brussels Retrieved from https://ec.europa.eu/programmes/horizon2020/en

Evers, A., van Vliet-Mulder, J. C. v., & Groot, C. J. d. (2000). Documentatie van tests en testresearch in Nederland.

Finch, B. K., & Vega, W. A. (2003). Acculturation stress, social support, and self-rated health among Latinos in California. *Journal of immigrant health, 5*(3), 109-117.

Flap, H., & Völker, B. (2001). Goal specific social capital and job satisfaction: Effects of different types of networks on instrumental and social aspects of work. *Social networks, 23*(4), 297-320. doi:10.1016/s0378-8733(01)00044-2

Flemish Government. (2019). *Statistical Yearbook of Flemish Education*. Brussel

Floyd, C. B. (2015). Closing the gap: International student pathways, academic performance and academic acculturation. *Journal of Academic Language and Learning, 9*(2), A1-A18.

Froese, F. J., & Peltokorpi, V. (2011). Cultural distance and expatriate job satisfaction. *International Journal of Intercultural Relations, 35*(1), 49-60.

Galchenko, I., & Van De Vijver, F. J. R. (2007). The role of perceived cultural distance in the acculturation of exchange students in Russia. *International Journal of Intercultural Relations, 31*(2), 181-197.

García, M. F. M. n., Ramírez, M. G. a., & Jariego, I. M. (2002). Social support and locus of control as predictors of psychological well-being in Moroccan and Peruvian immigrant women in Spain. *International Journal of Intercultural Relations, 26*(3), 287-310.

Gazioglu, S., & Tansel, A. (2006). Job satisfaction in Britain: individual and job related factors. *Applied economics, 38*(10), 1163-1171. doi:10.1080/00036840500392987

Geeraert, N., & Demoulin, S. (2013). Acculturative stress or resilience? A longitudinal multilevel analysis of sojourners' stress and self-esteem. *Journal of Cross-Cultural Psychology, 44*(8), 1241-1262.

Giangrasso, B., & Casale, S. (2014). Psychometric Properties of the Medical Outcome Study Social Support Survey with a General Population Sample of Undergraduate Students. *Social Indicators Research, 116*(1), 185-197. doi:10.1007/s11205-013-0277-z

Goh, Y. S., & Lopez, V. (2016). Acculturation, quality of life and work environment of international nurses in a multi-cultural society: A cross-sectional, correlational study. *Applied Nursing Research, 30*, 111-118. doi:10.1016/j.apnr.2015.08.004

Gordon, M. M. (1964). *Assimilation in American life*: Oxford University Press.

Groenvynck, H., Vandevelde, K., Van Rossem, R., Leyman, A., De Grande, H., Derycke, H., & De Boyser, K. (2011). Doctoraatstrajecten in Vlaanderen: 20 jaar investeren in kennispotentieel: een analyse op basis van de HRRF-databank (1990-2009). In: Academia Press.

Hagedorn, L. S. (2000). Conceptualizing faculty job satisfaction: Components, theories, and outcomes. *New directions for institutional research, 2000*(105), 5-20. doi:10.1002/ir.10501

Harman, G. (2003). International PhD students in Australian universities: Financial support, course experience and career plans. *International Journal of Educational Development, 23*(3), 339-351.

Hechanova, R., Beehr, T. A., & Christiansen, N. D. (2003). Antecedents and consequences of employees' a justment to overseas assignment: A meta-analytic review. *Applied Psychology-an International Review-Psychologie Appliquee-Revue Internationale, 52*(2), 213-236. doi:10.1111/1464-0597.00132

Hofstede, G. (1980). *Culture's consequences*: Beverly Hills, Sage Publications.

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations*: Sage publications.

Hofstede, G., & Bond, M. H. (1988). The Confucius connection: From cultural roots to economic growth. *Organizational dynamics, 16*(4), 5-21.

Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: software of the mind: intercultural cooperation and its importance for survival*: McGraw-Hill.

Håkanson, L., & Ambos, B. (2010). The antecedents of psychic distance. *Journal of International Management, 16*(3), 195-210.

Inglehart, R. (1997). *Modernization and postmodernization: Cultural, economic, and political change in 43 societies*: Princeton university press.

Johnson, E. C., Kristof-Brown, A. L., Van Vianen, A. E. M., De Pater, I. E., & Klein, M. R. (2003). Expatriate social ties: Personality antecedents and consequences for adjustment. *International Journal of Selection and Assessment, 11*(4), 277-288. doi:10.1111/j.0965-075X.2003.00251.x

Judge, T. A., Parker, S., Colbert, A. E., Heller, D., & Ilies, R. (2001). Job satisfaction: A cross-cultural review. *Handbook of industrial, work and organizational psychology, 2*, 25-52.

Judge, T. A., & Watanabe, S. (1993). Another look at the job satisfaction-life satisfaction relationship. *Journal of applied psychology, 78*(6), 939.

Karasek, R. (1979). Job decision latitude, job demands, and mental strain: Implicationsfor job redesign. *Administrative Science Quarterly, 24*, 285-308. doi:10.2307/2392498

Karasek, R., & Theorell, T. (1990). *Healthy work: stress, productivity and the reconstruction of working life.* (Vol. 18). New York: Basic Books.

Katz, R. (1978). JOB LONGEVITY AS A SITUATIONAL FACTOR IN JOB SATISFACTION. *Administrative Science Quarterly, 23*(2), 204-223. doi:10.2307/2392562

Kennedy, M. A., Parhar, K. K., Samra, J., & Gorzalka, B. (2005). Suicide ideation in different generations of immigrants. *The Canadian Journal of Psychiatry, 50*(6), 353-356.

Kifle, T., & Desta, I. H. (2012). Gender Differences in Domains of Job Satisfaction: Evidence from Doctoral Graduates from Australian Universities. *Economic Analysis & Policy, 42*(3). doi:10.1016/s0313-5926(12)50032-9

Kogut, B., & Singh, H. (1988). The effect of national culture on the choice of entry mode. *Journal of international business studies, 19*(3), 411-432.

Konara, P., & Mohr, A. (2019). Why we should stop using the Kogut and Singh Index. *Management International Review, 59*(3), 335-354.

Kossek, E. E., & Ozeki, C. (1998). Work-family conflict, policies, and the job-life satisfaction relationship: A review and directions for organizational behavior human resources research. *Journal of Applied Psychology, 83*(2), 139-149. doi:10.1037/0021-9010.83.2.139

Kosteas, V. D. (2011). Job satisfaction and promotions. *Industrial Relations: A Journal of Economy and Society, 50*(1), 174-194.

Kovacev, L., & Shute, R. (2004). Acculturation and social support in relation to psychosocial adjustment of adolescent refugees resettled in Australia. *International Journal of Behavioral Development, 28*(3), 259-267.

Krjukova, I., Schalk, R., & Soeters, J. (2009). Local/foreign status, cultural background, and organizational citizenship behaviour: A study among foreign and local workers in The Netherlands. *European Journal of Work and Organizational Psychology, 18*(4), 464-476. doi:10.1080/13594320802615614

Kubicek, B., Korunka, C., & Tement, S. (2014). Too much job control? Two studies on curvilinear relations between job control and eldercare workers' well-being. *International Journal of Nursing Studies, 51*(12), 1644-1653. doi:10.1016/j.ijnurstu.2014.05.005

Kutner, M. H., Nachtsheim, C. J., Neter, J., & Li, W. (2005). *Applied linear statistical models* (Vol. 5): McGraw-Hill Irwin New York.

Lancaster, B. P. (1999). Defining and Interpreting Suppressor Effects: Advantages and Limitations.

Levecque, K., Anseel, F., De Beuckelaer, A., Van der Heyden, J., & Gislef, L. (2017). Work organization and mental health problems in PhD students. *Research Policy, 46*(4), 868-879. doi:10.1016/j.respol.2017.02.008

Levecque, K., De Beuckelaer, A., Van Overbeke, K., & Mortier, A. (2019). Hoe tevreden zijn doctorandi met hun job? Een blik op Vlaanderen 2013-2018: ECOOM Brief 18.

Leyman, A., De Grande, H., Jidkova, S., Van der Goten, G., Jacobs, S., De Boyser, K., & Vandevelde, K. (2009). *OnderZOEKEN= onderVINDEN: resultaten van de 'Survey of junior researchers' aan de UA, UGent, UHasselt en VUB*: Universiteit Gent. Expertisecentrum O&O Monitoring (ECOOM-UGent).

Liou, S. R., Tsai, H. M., & Cheng, C. Y. (2013). Acculturation, collectivist orientation and organisational commitment among Asian nurses working in the US healthcare system. *Journal of Nursing Management, 21*(4), 614-623. doi:10.1111/j.1365-2834.2012.01447.x

Loi, R., Ao, O. K. Y., & Xu, A. J. (2014). Perceived organizational support and coworker support as antecedents of foreign workers' voice and psychological stress. *International Journal of Hospitality Management, 36*, 23-30. doi:10.1016/j.ijhm.2013.08.001

Lonner, W. J., & Berry, J. W. (1986). *Field methods in cross-cultural research*: Sage Publications, Inc.

Lopes, H., Lagoa, S., & Calapez, T. (2014). Work autonomy, work pressure, and job satisfaction: An analysis of European Union countries. *Economic and Labour Relations Review, 25*(2), 306-326. doi:10.1177/1035304614533868

Mark, G., & Smith, A. P. (2012). Effects of occupational stress, job characteristics, coping, and attributional style on the mental health and job satisfaction of university employees. *Anxiety, Stress & Coping, 25*(1), 63-78. doi:10.1080/10615806.2010.548088

Millard, D. (2005). The Impact of clustering on scientific mobility: a case study of the UK. *Innovation, 18*(3), 343-359. doi:10.1080/13511610500186714

Netemeyer, R. G., Boles, J. S., & McMurrian, R. (1996). Development and validation of work–family conflict and family–work conflict scales. *Journal of applied psychology, 81*(4), 400.

Ng, S. I., Lee, J. A., & Soutar, G. N. (2007). Are Hofstede's and Schwartz's value frameworks congruent? *International marketing review*.

Nguyen, A.-M. D. (2010). Expatriate effectiveness and cultural intelligence among multiculturals and monoculturals abroad.

Parkes, L. P., Bochner, S., & Schneider, S. K. (2001). Person-organisation fit across cultures: An empirical investigation of individualism and collectivism. *Applied Psychology-an International Review-Psychologie Appliquee-Revue Internationale, 50*(1), 81-108. doi:10.1111/1464-0597.00049

Pelfrene, E., & Van Peer, C. (2014). *Internationale migraties en migranten in Vlaanderen*: Studiedienst van de Vlaamse Regering.

Peltokorpi, V., & Froese, F. (2014). Expatriate personality and cultural fit: The moderating role of host country context on job satisfaction. *International Business Review, 23*(1), 293-302. doi:10.1016/j.ibusrev.2013.05.004

Petty, M. M., McGee, G. W., & Cavender, J. W. (1984). A meta-analysis of the relationships between individual job satisfaction and individual performance. *Academy of management Review, 9*(4), 712-721.

Phinney, J. S., Horenczyk, G., Liebkind, K., & Vedder, P. (2001). Ethnic identity, immigration, and well-being: An interactional perspective. *Journal of social issues, 57*(3), 493-510.

Powell, W. W., & Snellman, K. (2004). The knowledge economy. *Annual Review of Sociology, 30*, 199-220. doi:10.1146/annurev.soc.29.010202.100037

Redfield, R., Linton, R., & Herskovits, M. J. (1936). Memorandum for the study of acculturation. *American anthropologist, 38*(1), 149-152. doi:10.2307/2791001

Rubin, D. B. (1976). Inference and missing data. *Biometrika, 63*(3), 581-592.

Ryder, A. G., Alden, L. E., & Paulhus, D. L. (2000). Is acculturation unidimensional or bidimensional? A head-to-head comparison in the prediction of personality, self-identity, and adjustment. *Journal of personality and social psychology, 79*(1), 49.

Scarpello, V., & Campbell, J. P. (1983). Job satisfaction: Are all the parts there? *Personnel psychology, 36*(3), 577-600.

Searle, W., & Ward, C. (1990). The prediction of psychological and sociocultural adjustment during cross-cultural transitions. *International journal of intercultural relations, 14*(4), 449-464. doi:10.1016/0147-1767(90)90030-z

Shenkar, O. (2001). Cultural distance revisited: Towards a more rigorous conceptualization and measurement of cultural differences. *Journal of international business studies, 32*(3), 519-535.

Shenkar, O. (2012). Beyond cultural distance: Switching to a friction lens in the study of cultural differences. *Journal of International Business Studies, 43*(1), 12-17.

Sherbourne, C. D., & Stewart, A. L. (1991). The MOS social support survey. *Social science & medicine, 32*(6), 705-714.

Sileghem, M., & Van Langenhove, M. (2017). Vlaams Indicatorenboek 2017.

Stroppa, C., & Spiess, E. (2011). International assignments: The role of social support and personal initiative. *International Journal of Intercultural Relations, 35*(2), 234-245. doi:10.1016/j.ijintrel.2010.09.008

Sullivan, S., Schwartz, S. J., Prado, G., Huang, S., Pantin, H., & Szapocznik, J. (2007). A bidimensional model of acculturation for examining differences in family functioning and behavior problems in Hispanic immigrant adolescents. *The Journal of Early Adolescence, 27*(4), 405-430.

Tavani, J. L., Botella, M., & Collange, J. (2014). Validity of a single-item measure of job satisfaction? *Pratiques Psychologiques, 20*(2), 125-142. doi:10.1016/j.prps.2014.03.001

Vanroelen, C., Levecque, K., & Louckx, F. (2009). Psychosocial working conditions and self-reported health in a representative sample of wage-earners: A test of the different hypotheses of the demand–control–support–model. *International archives of occupational and environmental health, 82*(3), 329-342.

Waaijer, C. J. F., Heyer, A., & Kuli, S. (2016). Effects of appointment types on the availability of research infrastructure, work pressure, stress, and career attitudes of PhD candidates of a Dutch university. *Research Evaluation, 25*(4), 349-357. doi:10.1093/reseval/rvw008

Wang, Z. M., & Jing, X. L. (2018). Job Satisfaction Among Immigrant Workers: A Review of Determinants. *Social Indicators Research, 139*(1), 381-401. doi:10.1007/s11205-017-1708-z

Wanous, J. P., Reichers, A. E., & Hudy, M. J. (1997). Overall job satisfaction: how good are single-item measures? *Journal of applied Psychology, 82*(2), 247.

Ward, M. E., & Sloane, P. J. (2000). Non-pecuniary advantages versus pecuniary disadvantages; Job satisfaction among male and female academics in Scottish universities. *Scottish Journal of Political Economy, 47*(3), 273-303. doi:10.1111/1467-9485.00163

Waxin, M. F. (2004). Expatriates' interaction adjustment: The direct and moderator effects of culture of origin. *International Journal of Intercultural Relations, 28*(1), 61-79.

World Health Organization. (2010). Health impact of psychosocial hazards at work: an overview.

Yeganeh, H. (2013). A compound index of cultural dimensions: implications and applications. *International Journal of Organizational Analysis*.

Yoon, E., Chang, C.-T., Kim, S., Clawson, A., Cleary, S. E., Hansen, M., . . . Gomes, A. M. (2013). A meta-analysis of acculturation/enculturation and mental health. *Journal of counseling psychology, 60*(1), 15.

Zhu, C. Y., Wang, J. J., Fu, X. H., Zhou, Z. H., Zhao, J., & Wang, C. X. (2012). Correlates of quality of life in China rural-urban female migrate workers. *Quality of Life Research, 21*(3), 495-503. doi:10.1007/s11136-011-9950-3

Appendix A

Items used to measure social support:

    If necessary, someone is available…

1. … to have fun with.
2. … to whom I can ask how I have to deal with a personal problem.
3. … that understands my problems.
4. … that listens to me when I feel the need to talk.
5. … that can give me good advice on a crisis.
6. … that can give me information that helps me to understand a situation.
7. … that I can entrust things to or to whom I can talk about myself or my problems.
8. … with whom I can meet up to relax.
9. … whose advise I truly want.
10. … to do things together to help change my senses.
11. … to share my most personal worries and fears with.
12. … to do something enjoyable with.

A few examples of items used to measure promotor support:

- My (head)promotor helps me to develop my communication skills (e.g. presenting and writing).
- My (head)promotor helps me build my reputation by introducing me to his/her networks.
- My (head)promotor enhances my job satisfaction.
- My (head) promotor gives me feedback on work related issues.

Items used to measure work-life balance:

1. The job demands disturb my private and family life.
2. The amount of time my work demands makes it difficult to take on my family responsibilities
3. I have to postpone things at work because of the demands at home.
4. Things I want to do at work do not get done because of the demands of my family or spouse/partner.

Items used to measure job demands:

1. Do you have too much work?
2. Do you have to work extra hard to finish something?
3. Do you work under time pressure?
4. Do you have to rush?
5. Do you have a problem with the working pace?
6. Do you have a problem with the working pressure?

Items used to measure job control:

1. Is your work divers?
2. Does your work sufficiently rely on all your skills and abilities?
3. Do you have enough variety in your work?
4. Do you have any influence on the planning of your work?
5. Do you have any influence on your work pace?
6. Can you decide how you do your work?
7. Can you determine the order of your work yourself?
8. Can you organize your work yourself?
9. Can you determine the content of your activities yourself?