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The effect of commuting time on work-family conflict, is partially mediated through commuting stress: A case of Beijing

Maser thesis Human Resource Studies

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Abstract

The present study provided examinations that to what extent commuting time has direct influence on work-to-family conflict and to what extent gender moderate this relationship. Moreover, is there also an indirect mechanism, commuting stress, on the relationship between commuting time and work-to-family conflict? Data were gathered in Beijing, China, which has crucial traffic environment and commuting conditions. The results show that commuters who spend longer time on commute tend to experience more work-to-family conflict, which is partially explained by commuting stress. However, the study displays there is no significant moderating effect of gender on the relationship between commuting time and work-to-family conflict. The evidence of gender difference was only found between commuting time and commuting stress, which indicates that women have higher level of commuting stress than men does when they experienced same commuting time. Limitations and future research suggestions were discussed, which was followed by several practical implications for organizations and government.

Keywords: commute, commuting time, commuting stress, gender, work-family conflict

1. Introduction

Nowadays, almost everyone has the experience of being late at work because of heavy traffic jam or delays in public transportation on the way to and from work. A survey conducted in United Kingdom (Office for National Statistics, 2005) showed that 51% of participants' most frequent trip is the journey to work, and 34% of them experience traffic congestion most or all of their commuting time. Some studies tried to investigate the commuting experience of people and research the patterns of commuting (e.g. Hui & Lam, 2005) and how commuting affects people in different ways (Casinowsky, 2011; Bopp, Kaczynski, & Besenyi, 2012). Ory and colleagues (2004) pointed out that commuting can offer benefits to individuals sometimes. It is positive utility of commuting time if people conducting some activities during travelling, such as listening to music, reading, taking time to relax (Mokhtarian & Salomon, 2001). The act of commute itself can also be beneficial for individuals, because of for instance exposing someone to the environment or scenic beauty (Mokhtarian & Salomon, 2001), creating mobility, and offering a bridge between home and work (Wheatly, 2012). However, commuting is normally considered as a costly, stressful, and time-consuming experience for most of commuters (Ory et al., 2004). Koslowsky, Kluger and Reich (1995) pointed out that commuting can have negative impact on commuters' work, such as less concentration after a difficult commute, lateness, absence from work. It can also create physical and psychological stress, such as tiredness, illness, high blood pressure, which might be caused by a series of environmental or objective conditions during commuting, for example, a crowded bus, a complex and long lasting journey (Koslowsky et al., 1995). This was confirmed by a study from De Geus, Van Hoof, Aerts, and Meeusen (2008), who found that the transport mode of commuting that people chose has effects on their health and life quality. Stutzer and Frey (2008) also indicated that people with long trips to and from work reported significantly lower level of well-being.

Ory et al. (2004) said that 'commuting time is almost mechanically a function of distance, speed and mode.' The time that people spend on commuting can arouse great concerns. A study (Roberts, Hodgsona & Dolan, 2011) showed that average commuting time constantly increased every year, such as in UK, Spain, and Holland. This increase is also the case in metropolises, such as New York, Tokyo, where the congestion continuously grows (Ory et al., 2004). According to Turcotte (2011), the larger and more populous the region, the longer it takes to get to work. This is very much observable in

Beijing, where the average commute time for return trips increased from 76 minutes to 104 minutes from 2011 to 2012, the worst of all cities in China (China Daily, Aug. 24, 2013). Zhang and Yi (2006) believed that the dramatic increase in commuting time in Beijing had already caused serious problems affecting the quality of urban life. Thus, the current study chooses Beijing as a case to study how commuting conditions in Beijing impacts on people and their daily life.

Beijing is a typical modern city and a metropolitan area, where commuting is one of the biggest issues in recent years. With a total area of 16410 km^2, Beijing city proper consists of four urban districts, four inner suburban districts, and eight outer suburban districts. Until 2013, there are 21.15 million permanent populations (Beijing Municipal Bureau of Statistics) and 5.44 million registered vehicles, of which over three million are private cars (Beijing Traffic Management Bureau) for the city as a whole. Every day, there were 30.99 million passengers who had trips in the city in 2013, with the serious traffic congestion for two hours each day on average (Beijing Municipal Commission of Transport). This means that during the congestion, each trip for citizens takes twice as long as the usual trip length. Moreover, in March 2013, the amount of passengers on Beijing subways each day exceeded 10 million for the first time, and the passengers who traveled at peak time took up 40 percent of the number of total passengers that day (The World of Chinese, December 17, 2013). According to People's daily online (Dec. 27, 2012), people associate Beijing with the 'capital of traffic congestion'. Based on this information, it is not hard to imagine that commuting in this city takes commuters huge amount of time, which might be a nightmare.

Considering an individual's total time per day, an increase in commuting time may decrease the time available for other activities. As Hamilton and Burnett (1979) stated, '(the high) expenditures for commuting… imposes some restrictions on the desired quality of life, limiting workers' time with their families and diminishing their energy for other activities. This means that the work-family conflict, a type of inter-role conflict where participation in the work role is hindered on account of participation in the family role (Greenhaus & Beutell, 1985), might arise with the growth of commuting hours. Thus, the effect of commuting time on work-family conflict will be studied in this paper.

Besides the direct mechanism for work-family conflict by commuting time, the indirect mediation mechanism in this relationship was rarely discussed in existing studies. According to Koslowsky et al. (1995), commuting is full of stressors, such as crowded, noise, bad weather. As the increase of commuting time, the possibility of perceived stress from commuting grows. Commuting stress is one

of the consequences of long commuting time, which transfers to other domains in one's life (e.g. work, family) (Nocaco et al., 1990). Koslowsky et al. (1995) also believed that commuting and its effects, including commuting stress, can influence commuters' home life. Moreover, stress, including work- and family-related stress, is associated with work-family conflict (Greenhaus & Beutell, 1985; Frone, Russell, & Cooper, 1992a). It is reasonable to ask that whether commuting stress, which can transfer to work and family domain, is also a source of work-family conflict. Therefore, in this paper, the indirect mechanism, commuting stress, on the relationship between commuting time and work-family conflict will be studied.

Commuting is perceived somewhat differently by women and men (Koslowsky et al., 1995). In the study from Novaco et al. (1991), more women than men described their trip to work as dissatisfying and reported being late for work. Among those who were experiencing longer than average commuting time, women felt significantly negative about their commuting to work compared to men. Moreover, Koslowsky et al. (1995) pointed out that women need to harmonize the requirements from their domestic and those activities outside their home. When they experience long commute and perceive much more stress from their trip to work, it is harder for them to combine the responsibilities from different roles (Novaco et al., 1991). Hence, whether there is a gender difference on the relationship between commuting time, commuting stress, and work-family conflict is going to be examined in this paper.

Therefore, based on all illustrated above, the following research question is formulated:

Is there a relationship between commuting time and work-family conflict, is this relationship partially mediated through commuting stress, and are these relationships different for men and women?

The issues about work-family conflict have been realized and researched for a few decades in western countries. However, few studies have focused on the effects of commuting time as a disadvantage on contributing to an individual's work-family conflict. Furthermore, the amounts of studies about commuting or work-family conflict were conducted in western countries. Whether the findings can be also generalized in to China that has high population density and severe traffic conditions is doubtful. Specifically, in most of European countries, people can take trains to commute between different cities every day. There are sufficient and cozy space in trains, where commuters can

take a seat and do some readings or take a nap. In China, people do not take trains in daily life. Buses and subway are the most popular modes of transport every day, which are usually crowded. It is hard for commuters to have enough space and take a rest. Thus, the commuting patter and experience can be different in eastern and western countries. In the present study, the relationship between commuting time and work-family conflict will be examined in Beijing, a typical metropolis in an eastern country. This will make a contribution to the existing state of the art in the field. At the same time, practically, this study will help organizations, especially the ones from eastern countries, understanding the causes of work-family conflict from a new perspective, which, for example, can raise managers' awareness of the effects of commuting on individual's work and life.

In the next section, the empirical evidence, theoretical background, and conceptual model about commuting time, commuting stress and work-family conflict will be illustrated.

2. Theoretical Framework

2.1 Commuting time and work-family conflict

In order to build the relationship between commuting time and work-family conflict, the definitions of two variables are provided firstly. Commuting can be defined in terms of distance or time traveled (or average speed) (Koslowsky et al., 1995), which indicates that the regular travel between one's home and place of work. In the present study, commuting time is the focus, which is defined as the time one spends on the single trip between his or her home and place of work. Work-family conflict, according to Greenhaus and Beutell (1985), is 'a form of inter-role conflict in which the demands from the work and family domains are mutually incompatible in some respect'. This means that participation in the work (family) domain is more difficult due to the demands of participation in the family (work) domain. Three forms of role conflict between work and family were distinguished by Greenhaus and Beutell (1985), including (a) time-based conflict: time spent to meet the requirements of one domain is hard to fulfill the requirements of the other domain, (b) strain-based conflict: strain produced from one domain make it hard to fulfill the requirements of the other domain, and (c) behavior-based conflict: specific behaviors required by one domain make it hard to fulfill the requirements of the other domain. Based on the definition, two types of conflicts are further divided by Frone et al. (1992), namely, work-to-family conflict and family-to-work conflict.

In the present paper, only work-to-family conflict will be focused on. According to Wheatley (2012), the trip from home to work can be considered as necessary work-related activity, and the time of this trip is included in work-related time, which cannot be considered as leisure. Also, the perception of commuting is an extension of work time rather than of leisure time. Koslowsky and his colleagues (1995) believed that the trip to work is considered by most of people as a part of the work day, and some commuters can keep working via the laptop or mobile phone on the way to and from work. Specifically, if a commuter gets stuck in a traffic jam on the journey to work, the work time might be affected. If there is a delay on the way home, a commuter might think the loss of personal time is due to the job. Therefore, commuting time can be assumed as part of work-related time, which might affect the family-related time. Thus, this study focuses on work-to-family conflict and its antecedent, commuting time.

Commuting is an important component of time-use (Roberts et al., 2011). Although many studies have been done on the effects of commuting time on household responsibility (e.g. Turner & Niemeier, 1997), physical health (e.g. Koslowsky et al., 1995), and psychological health (e.g. Robertsa et al., 2011), there are few studies that focused on the impact of commuting time on work-to-family conflict and why it exists. Based on the Statistics Canada's 2010 General Social Survey on Time Use, which involved 6,988 respondents, Turcotte (2011) found that longer commuting time was associated with worse work-life balance. Among those whose commuting time was 45 minutes or more in Canada, people reported that their feeling of no time for family and friend increased with commuting time. 35% said they were unsatisfied with their balance between work and family life whereas only 21% of workers who had commuting time of less than 15 minutes reported their dissatisfaction. Moreover, commuters who have longer commuting time tend to experience more difficulties in fulfilling their family responsibilities (Turcotte, 2011). This is consistent with the argument by Koslowsky et al. (1995), who stated that commuting time and distance influence workers and their families, such as deciding where to live. Those workers who spent more time on commuting to work left home earlier and came back home later. Moreover, they had fewer hours for sleep and family related activities on workdays compared with those who spent shorter time on commuting to work (Umezaki, Ishimaru, & Ohtsuka, 1999). Novaco and his colleagues (1979; 1991) noted that, for the commuter, the ride to work and the effect of riding can influence his or her home-life. This might be due to that commuting to work or home is more likely to include other chores and activities, such as dropping off their children

to school and shopping (Spyridakis, Barfield, Conquest, Haselkorn, & Isakson, 1991), which requires commuters to meet work and family related activities at the same time. When the commuting time need take up a lot of time, people normally cannot fulfill the requirements from family domain, such as cooking breakfast, dropping their children to school. This means that less time can be spent on the family or leisure because of the long commuting time (Koslowsky et al., 1995). In other words, there is a time conflict between the work-related time (commuting time) and the family related time. When commuters want to meet the work demands, being at workplace on time, they have to sacrifice their personal time to some extent. During this process, work-to-family conflict, especially the time-based conflict, can be triggered or even increased.

The link between commuting time and work-to-family conflict can be explained through role theory (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964), which implied that both work and family roles are results from others' expectations. People behave what is believed appropriate in a particular position. It also states that it is more difficult for an individual to perform each role successfully because of conflicting demands on time and energy among different roles. In order to meet different role expectations at same time, the multiple roles conflict from work and family domain can be caused (Kahn et al., 1964). This is consistent with resource drain theory (Rothbard & Edwards, 2003), which demonstrated that resources can transfer from one to another domain, including time, attention and energy. However, it views the resources are finite. Applying it to this paper, when spending time on commuting to work to meet the expectations of work role, commuters have limited time to fulfill the expectations from their family domain. Then, work-to-family conflict, especially time-based conflict, can be created. As commuting time increases, the time for family domain decreases, which causes higher level of work-to-family conflict. Therefore, based on what mentioned above, the following hypothesis is formulated:

Hypothesis1: The longer the commuting time, the higher the work-to-family conflict.

However, some previous studies argued that there is gender difference in the relationship between commuting time and experienced work-to-family conflict. Commuting is much more complex for women than men because women take the most part of household responsibilities (Turner & Niemeier, 1997). This means that women usually spend much more time on daily family-related activity than

man, such as shopping groceries (Turner & Niemeier, 1997), which leaves less time for them to perform other activities. According to role theory (Kahn et al., 1964), people perform work or family role based on others' expectation. Women are socially defined as the care takers of the family, and the work role is seen by most people as women's extra role (Noor, 2004). To meet others' expectation, women normally spend more time to perform family role and to combine work and family activities than men. Thus, time is more valuable for women, especially working women. Compared to men, women are more sensitive to time use and more value the time spent on travel (Madden & White, 1980). This is consistent with the research from Roberts et al. (2011), which suggested that the greater sensitivity to commuting time among women might be due to their larger obligation for routine housekeeping tasks. Bailey and Kurland (2002) indicated that more women than men wanted to avoid long distance between home and work because of their need of being at home longer in the morning and earlier in the evening (Bailey & Kurland, 2002). According to Novaco et al. (1990), women assessed their commute much more negatively compared to men when they both experienced longer than average commuting time to work. Some commuting mothers said that they are struggling with the daily schedule of work and home, and the longtime of commuting makes their life harder (Lawson, 1991). Therefore, time-based work-to-family conflict showed up more in women's life rather than men's and long commuting time might lead to more work-to-family conflict for women than men. Hence, it is reasonable to provide the following hypothesis:

Hypothesis 1a: Gender is a moderator on the relationship between commuting time and work-to-family conflict, and the positive effect of commuting time on work-to-family conflict is stronger among women than men

2.2 Commuting stress as a partial mediator

The direct mechanism from commuting time to work-to-family conflict was discussed mainly from the perspective of time-based conflict. There is also an indirect relationship between commuting time and work-to-family conflict, which can be explained by commuting stress and from the view of stain-based conflict.

According to Koslowsky et al. (1995), commuting time can be considered as an independent variable that generates various effects on commuters. Commuting stress is one of the major consequences that was triggered by long commuting time and related to work-to-family conflict. People might feel stressful because of commuting. A research from Perrewe and Ganster (1989) showed that 58% of the commuters said their commuting experience was accompanied with stress. Brehm and Kassin (1990) identified that one category of stressful events in routine and daily life, called micro stressors, and is likely to arise stress, which includes fighting traffic. Epstein (1981) believed that chronic, repeated and annoying experiences are stressful. For commuters, they begin and follow the commuting at the same time each day and approximately confront the same stressors on the journey to and from work, including objective indicator of commuting itself (e.g. long time and distance) and other environmental factors involved in this period (e.g. bad weather, traffic congestion). This can be considered as a negative, repeated routine process with chronic stress, in turn, commuting stress might be triggered. When the commuting time becomes longer, individuals might have stronger negative feelings about the stressful experience. This was confirmed by some previous studies. Sposato, Röderer, and Cervinka (2012) found that duration of commuting to work is one of the most powerful predictors of commuting stress. Koslowsky et al. (1995) pointed out that commuters will feel greater stress when the situation is out of their control, such as being stuck in heavy traffic congestion for long time, especially during rush hours. The Statistics Canada's 2010 General Social Survey on Time Use (Turcotte, 2011) showed that longer commuting time is associated with higher stress. Hennessy and Wiesenthal (1999) found that the car drivers who were investigated in Canada reported that their stress during the journey became stronger with the increase of commuting time and high-congestion conditions.

This relationship can be explained through person-environment fit theory (Caplan, 1987), which has been quoted by many articles to illustrate the cause of different types of strain (Koslowsky et al., 1995). This theory argued that when the person has no sufficient abilities to deal with the demands from surrounding environment, the imbalance between demands and capabilities will lead to negative consequences, such as strain (Caplan, 1987). Applying this to the commuting stress process, it is reasonable to think that, for commuters, there are difficulties that they are often hard to deal with during commuting. As commuting time becomes longer, the possibility of being exposed to more stressors, such as crowded coach, and losing the control of the situation, such as traffic jam and delayed

train, will increase. Commuters has little capability to deal with these stressors, which creates pressure. Moreover, it is difficult for commuters to meet the job requirement to arrive on time in the morning. In the evening, they might feel anxious when they were trapped in the road and hardly to meet the family obligation. Under this circumstance, stress is produced. Therefore, based on all mentioned above, we can assume that commuting time is positively associated with commuting stress.

On the other hand, the work-family literature supports the notion that individuals who experience less stress will also experience less work-to-family conflict (Frone, Russell, & Cooper, 1992a; Parasuraman, Greenhaus, & Granrose, 1992). Specifically, Novaco et al. (1990) indicated that the perceived stress from commuting can transfer to another life domain (e.g. work domain). Commuting to work is viewed a needed process that people usually cannot avoid when they try to fulfill the responsibilities of work role, and commuting time is considered as part of work related time. Following this statement, it is reasonable to assume that the perceived stress on commuting can also be regarded as the strain that caused by fulfilling the work responsibilities. This point was shown in a survey study by Ohta, Mizoue, Mishima, and Ikeda (2007). They found that an individual's general health questionnaire score (including job stress) was influenced by the duration of time on commuting to work. Thus, the current paper supposes that commuting stress is part of work-related stress. In addition, Greenhaus and Beutell (1985) argued that pressures from one's work domain spill over into family life, which includes the perceived stress when the person trying to meet the job role expectations and responsibilities. The influence of this pressure on work-to-family conflict has been researched by many studies (e.g. Higgins, Duxbury, & Irving, 1992; Michel, Kotrba, Mitchelson, Clark, & Baltes, 2011; Bernas & Major, 2000), which strongly supported that work-to-family conflict, especially strain-based conflict, increases with the growth of perceived stress from one's work. Thus, we assume that commuting stress has positive impact on work-to-family conflict.

Based on the perspective of conservation of resources theory (Hobfoll, 1989), the effect of commuting stress can be explained more clearly. Hobfoll (1989) indicated that people strive for acquiring and maintaining exhaustible resources, such as energy, conditions, and personal characteristics. Energy referred to time, money and knowledge, which helps people to acquire other resources. Status and tenure are examples of conditions. Once they were spent, it is difficult for people to perform other tasks either in the same or other domains. When there is a feeling for people that they may or actually loss this resource, stress is caused (Grandey & Cropanzano, 1999). This leads to

negative consequences, such as dissatisfaction, turnover, inter-role conflict (Hobfoll & Shirom, 1993). In the current study, commuting stress is derived from spending energy (time) on commuting to work because commuters are fear of losing their conditions (work or status in workplace). This stress may force them to devote more resources to their work role, and makes them hard to fulfil family role with limited resources, which in turn renders role conflict.

To sum up, according to all above, it is reasonable to assume that commuting stress, increased with commuting time, ultimately can have great impact on individuals work and family life and cause work-to-family conflict. Therefore, the following hypothesis is formulated:

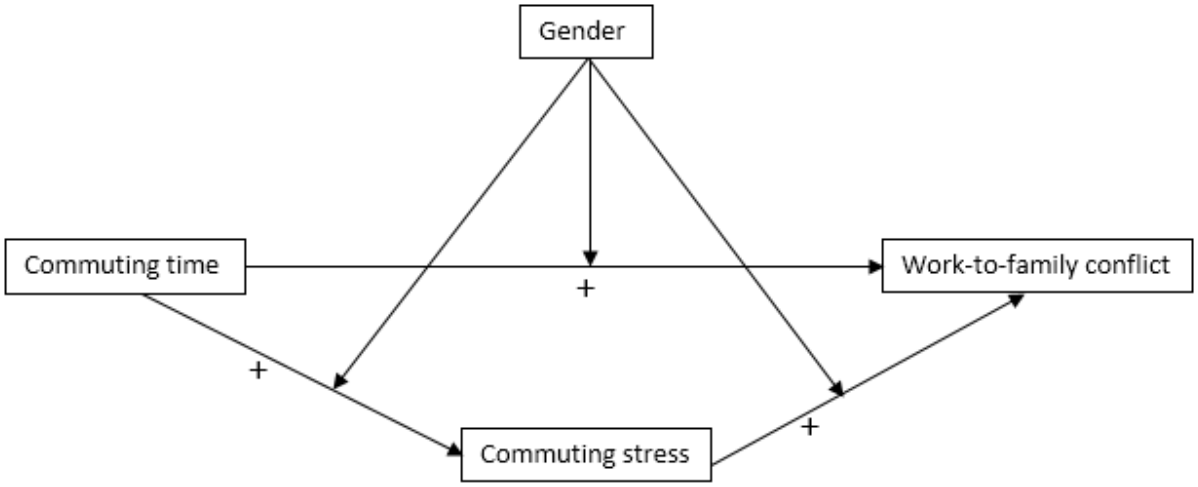
Hypothesis 2: Commuting stress is a partial mediator between commuting time and work-to-family conflict, which grows with the increase of commuting time and leads to more work-to-family conflict.

Robertsa et al. (2011) argued that long commuting is significantly harmful on women's psychological health, but in general not on men's psychological health because women reported lower levels of psychological well-being than men. Perrewe and Ganster (1989) also found that women perceived much more stress from their commuting to work than men. Novaco (1994) suggested that time pressures are more a part of life for women than men. Compared to men, those women who perform long distance (time) commuting had higher commuting stress and reported a greater negative effect on their family life. This phenomenon is more significant for mothers. Some commuting mothers said that it is very time-consuming and stressful that combining commuting to work and taking care of their children, such as children drop-off, shopping food for children and family (Lawson, 1991; Koslowsky et al., 1995). In applying the role conflict perspective of Kahn et al. (1964) to this, women, especially those who have children, take larger family responsibility and contribute more to their home. When they need to meet the obligations from both family and work and combine these duties properly, the stress and strain-based conflict are more likely to show up than men. Furthermore, Green (2001) believed that compared to men, telecommuting is more beneficial for women because it makes them avoid a range of stresses generating from such as long hours commuting, which in turn provides them greater control and flexibility of time for their family domain and lower work-to-family conflict. Another study (Diamond, 2002) showed that the avoidance of commuting to work decrease women's

pressure, allowing them to more easily perform family role and attaining work-life balance. Therefore, whether there really exists a gender difference on the mediation mechanism, the effect of commuting time on commuting stress, and the relationship between commuting stress and work-to-family conflict, is going to be examined. The following hypothesis is formulated:

Hypothesis 2a: The effect of commuting stress on the relationship between commuting time and work-to-family conflict is stronger among women than men.

Conceptual Model



3. Method

3.1 Research design

According to Ory et al. (2004), commuting time is a function of distance, speed, and transport mode. This means that commuting time can be seen as a representative result. The change of anyone of distance, speed, or transportation means will lead to the change of commuting time. Thus, in this paper, commuting time was designed as an independent variable to investigate the commuting experience of commuters. A cross-sectional design was applied in the present study to examine commuting time, commuting stress, and work-to-family conflict people experienced in Beijing, which in order to test the effect of commuting on people and their life in special national and traffic conditions.

3.2 Sample

Surveys were distributed to 373 commuters who were working at a variety of different organizations or companies across Beijing. Among all returned surveys, there were 359 valid questionnaires of them, yielding a valid rate of 96%. The sample composed of 150 men (41.8%) and 209 women (58.2%). The average age of the respondents was 34.21 years old (SD=10.24 years), ranging from 20 to 59 years old. There were 46.24% of them who are younger than 30 years old. In terms of the home situation, 15.88% of the respondents were living alone, 26.18% living with their parents together, and 34.82% of the respondents had child(ren) living at home.

3.3 Procedure

The scales of commuting time and commuting stress in the questionnaire were in English originally, which made translation into Chinese necessary. Translation, back-translation, and check by two Chinese people were conducted. Then, the Chinese questionnaire was ready to use. The scale of work-family conflict has an existing Chinese version, which was applied by previous study. Snowball sampling was used in this paper. Potential participants were found and contacted through personal social network. They were approached by using email. The survey information was sent as the attachment in an email to the respondents if they were interested, which contain a cover letter that explains the purpose of the study, the confidentiality of the study, and instructions for completing the questionnaire. It was ensured that the data will be used for the study purpose only. In the end, the completed surveys were returned to the author directly via email. All the data were collected in June 2014.

3.4 Measures

Commuting time. Two items used in the present study are measuring single commuting time to and from work separately, which were based on the items developed by Kluger (1995). An example item is "On the average, how much time does it take you to commute TO WORK? _____minutes". The commuting time used in following analyses is equal to the sum of the two single commuting time that spends on the way to and from work.

Work-to-family conflict. The scale used was developed by Netemeyer et al. (1995), which measures work-family conflict. There were eight items in total. The factor analysis showed that the scale measured two concepts, namely work-to-family conflict and family-to-work conflict. In this paper, only the first five items measuring work-to-family conflict were used. All items were rated on a Likert scale from 1 (strongly disagree) to 5 (strongly agree), with higher score representing higher levels of conflict. Sample item includes "The demands of my work interfere with my home and family life", "My job produces strain that makes it difficult to fulfill family duties". A reliability analysis of the work-to-family conflict scale was executed, which is reliable with the Cronbach's Alpha of .921.

Commuting stress. Seven items constituted the commuting stress indices, which derived from items used by Kluger (1998) and Novaco and Collier (1994). Sample items included "I resent the length of my commute", and "Overall commuting is stressful for me". A 5-point Likert scale (1=strongly disagree to 5=strongly agree) was used to measure the items. The higher the score, the stronger the stress people perceived on commuting to work. Factor analysis of this scale was conducted, which confirmed that this scale measured only one concept. Furthermore, the Cronbach's Alpha of this scale was .905. This means that the scale is reliable to use to measure commuting stress.

Gender. In order to analyze gender differences, a dichotomous variable for the respondent's gender is used (0=male, 1=female).

Control variables

- Age. This was asked by years directly.

- Home situation. The different living status participants applied may decide whether they need to take care of family responsibilities. For example, a lot of younger workers are still live with their parents, which reduces their burden of for example housekeeping. People who have children need much more time to taking care of children and their family. Thus, one item, "Which home situation you are applying now?" was used and six options were listed, including living alone, living with parent(s), living with partner, living with child(ren), living with partner and child(ren), and others.

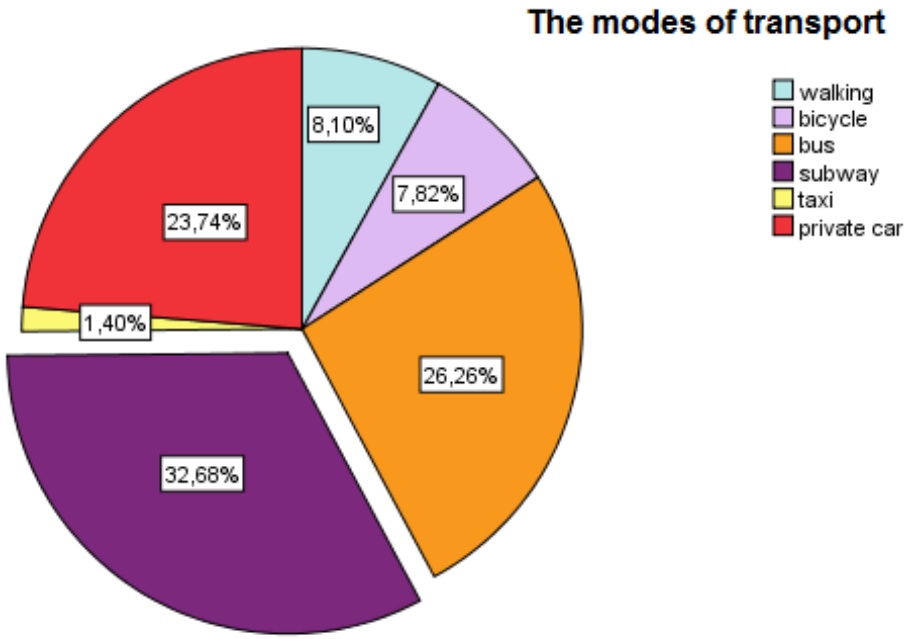
- Commuting mode. Two items were asked for participants to identify the mode they mainly used when they commute to and from work. Six options were listed, such as walking, bicycle, private car. According to the survey results, 94.4% of the participants used the same transport mode in the morning and evening. Therefore, only one item "Which mode of transportation you used commuting to work in the morning?" was used as a control variable in analysis.

4. Results

4.1 Descriptive Statistics

In terms of transport mode, among 358 respondents, merely few commuters chose taxi. The groups of walking and bicycle both took up about 8%, whereas car and bus were chosen as the modes of transport by 85 and 94 commuters respectively. Subway is the most popular transport mode for commuters in Beijing, about one third of all respondents took it every day. This information was showed in Graph 1.

Graph 1: The percentage of the groups of transport mode



In order to control the effect of home situation and transport mode, the category variables, multivariate analyses of variance (MANOVA) were conducted for these two variables firstly. According to the results of MANOVA, the different home situation did not affect commute time, commute stress, and work-to-family conflict. Thus, home situation was not added in all the next regressions. However, transport mode groups had significant difference on the independent and dependent variables (see Table 1), and Post Hoc Multiple Comparisons of transport mode was conducted to further test which transportation groups differ from the others. The result of the

comparisons showed that there are statistically significant differences between the groups of walking, bicycle, bus, subway, and car on independent and dependent variables. To be specific, the average age of the three groups of people who took bus, subway, and taxi is younger than those who commuted by walking, bicycle, and car. Moreover, people who commuted on foot took the shortest time, about 34 minutes for return trips ,whereas the commuters who took subway spend the longest time (133.14 minutes) on total commuting. In addition, the subway group had the highest level of commuting stress, compared with the lowest of the walking group. Finally, in terms of the work-to-family conflict, commuters who chose bicycle as the transport mode experienced the least amount of work-to-family conflict. Based on this result, the taxi group was chosen as reference group and the others were recoded into five dummy variables, which were used in hierarchical multiple regression analyses later.

Table 1

Mean, Standard deviation, and F-values for transport groups on Variables

Variables	**M(SD)**						**F(df)**
	Walking	**Bicycle**	**Bus**	**Subway**	**Taxi**	**Car**	
1. Age	34.90(10.87)	38.25(9.46)	33.19(10.47)	30.83(8.67)	26.40(3.29)	38.98(10.16)	8.74(357)*
2.Com. Time	33.52(38.84)	59.58(32.56)	113.36(33.15)	133.14(27.75)	76.98(23.34)	91.18(44.52)	23.44(357)*
3.Com. Stress	2.94(1.06)	3.15(.80)	3.60(.84)	3.82(.86)	3.31(.87)	3.42(.96)	6.37(354)*
4. WFC	3.16(.96)	2.80(.95)	3.41(.90)	3.38(.91)	3.64(.79)	3.36(.92)	2.28(344)*

Note. *. The difference is significant at the .05 level.

Correlations, means, and standard deviations for each of the measured variables are presented in Table 2. As it can be seen, the average commuting time spent on return trips for total respondents in Beijing was 103.58 minutes (105.58 and 102.16 minutes for men and women respectively). As the commuting time increased, people suffered more stress from commuting ($r = .407$, $p < .01$) and experienced more work-to-family conflict ($r = .266$, $p < .01$). Moreover, commuting stress was positively related to work-to-family conflict, which indicated that commuters who perceived more stress from commuting were more likely to have more work-to-family conflict ($r = .518$, $p < .01$).

Table 2

Mean, Standard Deviation, and Correlations between all variables

Variable	**M**	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1.Age	34.21	10.24									
2.Walking[1]	-	-	.019								
3.Bicycle[2]	-	-	.114*	-.086							
4.Bus[3]	-	-	-.061	-.177**	-.174**						
5.Subway[4]	-	-	-.232**	-.207**	-.203**	-.416**					
6.Car[5]	-	-	.259**	-.166**	-.163**	-.333**	-.389**				
7.Gender[6]	-	-	-.027	-.038	-.006	.095	.073	-.138**			
8.Com. Time	103.58	60.36	-.037	-.344**	-.212**	.099	.344**	-.133*	-.028		
9.Com. Stress	3.54	.92	-.143**	-.192**	-.122*	.042	.212**	-.069	-.024	.407**	
10.WFC[7]	3.22	.93	.031	-.054	-.163**	.052	.042	.024	-.219**	.266**	.518**

Note. **. Correlation is significant at the.01 level (2-tailed).

*. Correlation is significant at the.05 level (2-tailed).

1. Walking: 1=walking, 0=other modes

2. Bike: 1=bike, 0=other modes

3. Bus: 1=bus, 0=other modes

4.Subway: 1=subway, 0=other modes

5.Private Car: 1=private car, 0=other modes

6. Gender: 0=male, 1=female

7. WFC=work-to-family conflict

4.2 Regression Statistics

To test all the hypotheses in this study, hierarchical multiple regression analyses were conducted. For hypotheses 1 and 1a, the dependent variable was work-to-family conflict. Control variables, age and commute mode, were entered in the first step to control their possible influence. Then, independent variables, commuting time and gender, were entered in Step 2. Finally, the product of commute time x gender was entered in the third step to test the interaction effect. As Table 3 showed, among all control variables, work-to-family conflict commuters experienced differently between the bicycle group and others. From Model 2 and Model 3, it can be seen that work-to-family conflict is higher when the commute time is longer. Moreover, women had lower work-to-family conflic than men. However, the work-to-family conflict did not change significantly when the interaction variable was added ($\Delta R^2 = .3\%$). This means that commuting time positively related to work-to-family conflict, but the effect of commute time on work-to-family conlict was not different for women and men . Therefore, the hypothesis 1 is confirmed while hypothesis 1a is rejected.

Table 3

Relationship between commuting time and work-to-family conflict, and the moderation effect of gender

Variable	**Model 1**		**Model 2**		**Model 3**	
	β	**B**	***β***	**B**	***β***	**B**
Age	.064	.006	.048	.004	.049	.004
Walking[1]	-.172	-.583	-.105	-.357	-.103	-.348
Bicycle[2]	-.276*	-.950	-.232[#]	-.799	-.224[#]	-.773
Bus[3]	-.154	-.323	-.167	-.351	-.161	-.338
Subway[4]	-.169	-.334	-.229	-.452	-.227	-.447
Car[5]	-.183	-.398	-.189	-.411	-.165	-.401
Gender[6]			-.210*	-.393	-.308**	-.579
Com. Time			.251**	.008	.079	.002
Com. Time x Gender					.205	.004

ΔR^2	3.7%	9.8%	.3%
F change	2.141*	19.004**	1.297

Note. **. Significant at the.01 level (2-tailed).

*. Significant at the.05 level (2-tailed).

#. Significant at the.10 level (2-tailed).

1. Walking: 1=walking, 0=other modes

2. Bike: 1=bike, 0=other modes

3. Bus: 1=bus, 0=other modes

4.Subway: 1=subway, 0=other modes

5.Private Car: 1=private car, 0=other modes

6. Gender: 0=male, 1=female

Dependent Variable: Work-to-family conflict

Hypothesis 2 was tested to see if the commuting stress mediating the relationship from commute time to work-to-family conflict. Similarly, the first step was entering the control variables, including age and five kinds of transport mode. Then, independent variable, commute time, was entered as the second step. Commuting stress was added in the final model.

Table 4

The mediation effect of commuting stress between commuting time and work-to-family conflict

Variable	**Model 1**		**Model 2**		**Model 3**	
	β	**B**	***β***	**B**	***β***	**B**
Age	.064	.006	.044	.004	.105*	.009
Walking[1]	-.172	-.583	-.113	-.385	-.108	-.367
Bicycle[2]	-.276*	-.950	-.248#	-.855	-.259*	-.891
Bus[3]	-.154	-.323	-.220	-.463	-.261	-.549
Subway[4]	-.169	-.334	-.285	-.561	-.350#	-.690
Car[5]	-.183	-.398	-.199	-.434	-.241	-.524

Com. Time		.273**	.008	.088	.003
Com. Stress				.514**	.516
ΔR^2	3.7%	5.6%		21.4%	
F change	2.128*	20.503**		103.323**	

Note. **. Significant at the.01 level (2-tailed).

*. Significant at the.05 level (2-tailed).

#. Significant at the.10 level (2-tailed).

1. Walking: 1=walking, 0=other modes

2. Bike: 1=bike, 0=other modes

3. Bus: 1=bus, 0=other modes

4.Subway: 1=subway, 0=other modes

5.Private Car: 1=private car, 0=other modes

Dependent Variable: Work-to-family conflict

According to the results showed in Table 4 above,the effect of commuting time on work-to-family conflict is confirmed statistically significant, the longer the commute time, the higher the work-to-family conflict. When the variable of commute stress was entered, there was a significant improvement over the Model 2 ($\Delta R^2 = 21.4\%, p < 0.01$). This means work-to-family conflict increases with the growth of commute stress. Sobel test was following proceed to further test the partial mediation effect. The test statistic is equal to 7.528, with standard error 0.001. The p-value is equal to 0, which is statistically significant when assuming alpha in this case at .001. Thus, the partial mediation effect of commute stress on the relationship of commuting time and work-to-family conflict is statistically significant, and the hypothesis 2 is confirmed.

To test hypothesis 2a, whether there were a gender difference on the indirect effect of commute time on work-to-family conflict through commuting stress, two multiple regression analysis were conducted separately. In the first regression, commute time, gender as independent variables, commute time x gender as the product of moderation effect, and commuting stress as dependent variable were entered into the models, which were presented in Table 5. It shows that the longer commuting time, the stronger commuting stress people perceived. Moreover, adding the interaction term brought a

significant increase compared with the Model 2 ($\Delta R^2 = 1.3\%, p < 0.05$). Thus, gender does moderate the relationship between commute time and commuting stress. To know how the relationship different between men and women, information was displayed in Graph 2. Based on the data set, the commuting stress was estimated for four individuals, two man and two woman, with 60 and 180 minutes of round trip commute time. It can be observed that women perceived less stress from commuting than men when having short commute time. However, as the increase of commute time, commute stress that women experienced grows more quickly and even exceeded that the men perceived at around 120 minutes. When commute time is 180 minutes, commute stress for women is higher than that for men. Therefore, this result is align with the hypothesis 2a.

Table 5

The moderation effect of gender on commuting time and commuting stress

Variable	Model 1		Model 2		Model 3	
	β	**B**	***β***	**B**	***β***	**B**
Age	-.091#	-.008	-.118*	-.011	-.116*	-.010
Walking[1]	-.088	-.296	-.009	-.032	-.004	-.014
Bicycle[2]	-.016	-.055	.022	.076	.037	.127
Bus[3]	.168	.352	.086	.180	.098	.206
Subway[4]	.279	.549	.133	.262	.138	.272
Car[5]	.102	.222	.082	.177	.090	.196
Gender[6]			-.024	-.045	-2.275*	-.407
Com. Time			.358**	.011	.142	.001
Com. Time x Gender					2.359*	.007
ΔR^2	9.1%		9.8%		1.3%	
F change	5.812**		20.803**		5.563*	

Note. **. Significant at the .01 level (2-tailed).

*. Significant at the .05 level (2-tailed).

#. Significant at the .10 level (2-tailed).

1. Walking: 1=walking, 0=other modes

2. Bike: 1=bike, 0=other modes

3. Bus: 1=bus, 0=other modes

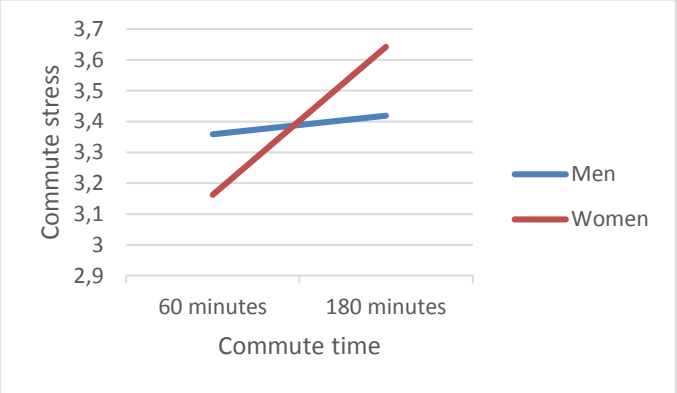
4.Subway: 1=subway, 0=other modes

5.Private Car: 1=private car, 0=other modes

6. Gender: 0=male, 1=female

Dependent Variable: Commute Stress

Graph 2 The moderation effect of gender of estimated commute stress on commute time between men and women commuters (N=358)



In the second regression, commuting stress and gender as independent variable, commuting stress x gender as interaction, and work-to-family conflict as dependent variable were added. As can be seen in Table 6 below, the positive relationship from commute time to work-to-family conflict is statistically significant. However, there is no significant relationship found between these two variables moderated by gender. Therefore, gender differences were only confirmed in the relationship between commuting time and commuting stress, but not in the relationship from commuting stress to work-to-family conflict. Hypothesis 2a was not confirmed.

Table 6

The moderation effect of gender on commuting stress and work-to-family conflict

Variable	Model 1		Model 2		Model 3	
	β	**B**	***β***	**B**	***β***	**B**
Age	.064	.006	-115*	.010	.116*	.010
Walking[1]	-.172	-.583	-.113	-.384	-.114	-.385
Bicycle[2]	-.276*	-.950	-.249*	-.859	-.249*	-.859
Bus[3]	-.154	-.323	-.196	-.413	-.197	-.414
Subway[4]	-.169	-.334	-.273	-.538	-.273	-.539
Car[5]	-.183	-.398	-.228	-.496	-.229	-.497
Gender[6]			-.202**	-.379	-.188	-.353
Com. Stress			.528**	.530	.540**	.542
Com. Stress x Gender					-.018	-.008
ΔR^2	3.7%		30.5%		.0%	
F change	2.128*		77.182**		.007	

Note. **. Significant at the .01 level (2-tailed).

*. Significant at the .05 level (2-tailed).

1. Walking: 1=walking, 0=other modes

2. Bike: 1=bike, 0=other modes

3. Bus: 1=bus, 0=other modes

4.Subway: 1=subway, 0=other modes

5.Private Car: 1=private car, 0=other modes

6. Gender: 0=male, 1=female

Dependent Variable: Work-to-family conflict

5. Discussion

Commute is inevitable for people's life. Workers are facing with problems fighting with trafic jam, rush time and all related diffictulties every morning and evening. People have to suffer all the results from long commuting time. The crucial impact of commuting time has been recogenized in Western countries and were involved in many researches. Whereas few studies have investigated this issue in Eastern countries, each day twenties of millions of workers commute between home and work in Beijing, China. The huge population and the tension of urban traffic conditions makes it much more difficult for workers who live in Beijing to commute every day. Moreover, according to the existing studies, the way in which commute affects the balance between work and family of people and in turn causes work-to-famiily conflict were neglected to some extent. The present study chose Beijing, a representative city of Eastern countries, as the case to explore the direct effect of commute time on work-to-family conflict of commuters. The main goal of this study was, firstly, to build the relation from commuting time to work-to-family conflict. In this direct mechanism, work-to-family conflict is more about time-based conflict. The second goal was to further explore wether commuting stress is a mediator, which partially explains the relationship between commuting time and work-to-family conflict. In this indirect mechanism, work-to-family conflict is maily about strain-based conflict. More importantly, given the lasting structure of gender roles assignating the main responsibility for the home and the family to women, this study investigated if gender has moderating effect on the relationship between commuting time and work-to-family conflict, in such a way that women might perceived more stress and work-to-family conflict from long time commute compared with men.

A cross-section method with 359 Chinese commuters was used to examine the four hypotheses for the present study. The overall results showed that commuting time causes work-to-family conflict, which means that people experience higher levels of work-to-family conflict when the commuting time becomes longer. This can be explained by the argument from Koslowsky et al., (1995) that people have less time for their home and family when they try to meet work demands to commuting long time. Moreover, this study confirmed that commuting stress partially explains the relationship from commuting time to work-to-family conflict. This means that commuting time leads to work-to-family conflict partially through commuting stress. More specific, as the increase of commuting time, people perceived greater level of stress from commuting, which ultimately causes more work-to-family

conflict. Therefore, Hypotheses 1 and 2 were both supported.

In terms of the effect of gender, although women and men reported different work-to-family conflict, there was no evidence that gender has moderation effect. In other words, women did not have more work-to-family conflict than men with commuting time they experienced becomes longer. This is not as expected, and Hypothesis 1a was rejected. This can be explained by several reasons. Firstly, in the present sample, women had slightly shorter commuting time, which can be considered as a sign that women can leave home to work later and arrive home from work earlier than men. This leaves women more time to take care of their family responsibilities, which results less work-to-family conflict. Secondly, although women are responsable for domestic demands, they are likely to chain household related trips to their daily commute sometimes, such as bringing their children to school, shopping geroceries, which can fulfill their family requirements to some extent. This cognition may influence them to consider that commuting time is not only work-related time but also family-related time. Thus when the commuting time becomes longer, women did not perceive it as a work doamin factor which has influence on their family role performan. Then, there was no more work-to-family conflict for women than men. Finally, with the continuous development of society, there is a growing emphasis on gender equality. More and more men start to share the house keeping task and family responsibility. Women do not have to spend a lot of time on their household duties, which at the same time gives them sufficient time to fulfill both work- and family-related requirements, and then experience less work-to-family conflict.

Hypothesis 2a, expressing that the partial mediation effect of commuting stress on the relationship between commuting time and work-to-family conflict is stronger among women than men, was not fully confirmed. More specific, this moderation effect of gender was tested by two steps. Firstly, the interaction effect was tested to see whether the effect of commuting time on commuting stress will be much greater for women than for men. The result was found to be significant. The increase of commuting time creats much more commuting stress for women than men. In the second step, it was not found significant moderating effect that gender differs the relation from commuting stress to work-to-family conflict. This means women did not experienced more work-to-family conflict than men when they perceived same stress from commuting. This can be explained in two ways. With the deveopment of social economy and the improvement of living standard in Beijing, women are not only satisfied with taking good care of family, but also pursuing success in work domain like men does.

Work is highly considered as equally important as the family by an increasing number of women. This implies that they are willing and capable to manage the duties from work and family domains properly. Commuting stress is also can be considered as one inevitable result, which could be coped properly by women and does not creat more work-to-family conflict compared with men. In addition, as mentioned above, men are required to share family responsiblities nowadays, which gives them as much family-related pressure as women. After perceiving stress from commuting, the work-to-family conflict men experienced may also be the same as women did.

Besides hypotheses, an interesting result was found. Commuters who take subway everyday experienced much more commuting time and stress than others. In Beijing, subway can be seen as the most convenient transport mode, which is fast and never delay. But, this advantage also makes subway becomes the crowdest transport mode. Commuters are like pies in the coach and cannot do readings or take a rest. Sometimes, the queue is quite long and people need to wait for two or three subway on the platform to get on the followed one. This might be the reason that commuters feel so stressful.

6. Limitations and Future research

Several limitations in the present study come to light when interpreting the findings. The first limitaion is that the data were collected through self-reported questionnaires. This can raise bias and limit the variability of the data. The answers people gave may not represent the state of mind of the participants, and it is hard to obtain more information only basing on the questionnaire. Thus, it is recommended for future studies to combine both qualitative and quantitative research in order to decrease the interpretation bias of participants, which is also helpful to get richer information to contribute researches.

Secondly, convenience sampling was used due to the limited time. The author got access to the respondents by using her personal social network, such as friends, parents, which limits the demography of the sample in the present study. For instance, there are more than 46% of respondents who are younger than 30 years old. Also, the number of men and women are not equal. The uneven distribution of age and gender decreases the representativeness and universality of the samples. To avoid this weakness, in future studies, probability sampling can be used to contain all respects of the target group. This kind of random selection can remove the possibility of investigator biases (Straits

& Singleton, 2011, p.114), and at the same time, adequately capture a representative sample.

Moreover, this paper only investigate the issues related to commute in Beijing, where people are facing much more serious traffic congestion and travel stress compared with the commuters in other cities. The results may not representative and generalize to other cities in Eastern countries, or even in China. Thus, it might be necessary to conduct some researches in other region of Eastern countries to obtain more comprehensive data, which is helpful to make a conclusion that has representativeness and can be generalized to other countries.

The present study only defined commute in terms of time traveled, which is relatively uncomprehensive and might have influence on the validity of the results. For example, both two respondents reported 120 minutes commuting time from home to work, whereas the reasons behind the same long time commute can be different. One might be due to long distance and the other one could be due to the heavy traffic jam. These deep reasons might be the actual antecedents of commuting stress rather than only time. Therefore, other factors that affects the goal to arrive at work or home, such as distance, speed, or traffic congestion, should be also took into account to value the commute experience in future.

Finally, based on the finding of this paper, men and women perceived commuting stress differently as the increase of commuting time. It is worthy to know if the family responsibility does contribute to this gender difference and what else factors also can be the reason to explain it. Furthermore, the questions of how do people combine commuting with other activities, such as picking up kids, and how can the combination influence people's perception and feeling of commuting can be included in the future studies. Lastly, the results showed that there are obvious differences on stress and work-to-family conflict between the groups of various transport modes. It will be interesting to do comparative studies in the future, which can provide more information about how transport modes affect people's life differently.

7. Conclusion and Implications

This sutdy, a case of Beijing, investigated the relation from commuting time to work-to-family conlict, the partial mediation effect through commuting stress, and the moderation effect of gender on those relationships. Strong evidence was found that long commuting time positively leads to work-to-

family conflict, which is parially through commuting stress. However, there is no significant gender difference on this process.

These findings have practical implications for organizations, especially those in Beijing. With the fluctuations of economy and the shortage of talent, orgnizations are facing with the problems for retaining their employes. Taking work-to-family conflict and commuting stress that employees experience into consideration and coming up relative policies are essential for organizations to increase employees's satisfaction as well as their own competitive advantages. Instead of developing friendly policies only in terms of work design, interprises should notice the effect of commuting, one of the work-related activities, on employees' life. Specifically, employees are suffering great stress, rmore than work-to-family conflict, due to commuting to work in rush hours every day. The policies, such as flexible work time, telecommute, can be design to help employees avoid the long commuting time during morning and evening peak time, which then reach the purpose of releasing employees' pressure.

Furthermore, the present study provides implications not only for organizations, but also for those relevant government institutions who are responsible for unban transport and construction. A large proportion of commuters, who rely on the mass transit, are stressful and suffering from the severe traffic conditions, including traffic congestion, every day in Beijing. It is crucial for government institutions to accelerate the construction of urban traffic and create a good environment for individulas, which then releases the stress that people perceived from commuting.

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