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Commute time and subjective well-being in urban China

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ABSTRACT

Using data from the 2010 China Family Panel Studies, this study investigates the association between commute time and subjective well-being in a sample of 16- to 65-year-old employees in urban China. We find evidence that a longer commute time is associated with lower levels of both life satisfaction and happiness, especially when the commute times are extreme (≥ 1 hour per day). A multiple mediation analysis further indicates that the relation between commute time and happiness is partially mediated by the time spent on daily activities, particularly sleep. We also calculate the amount of income necessary to compensate an employee's loss in well-being at approximately 82 yuan per hour of commute time, implying that in urban China the annual loss of well-being amounts to around 10 billion yuan.

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1. Introduction

In contemporary urban societies, commuting to work is a routine but important aspect of daily life (Roberts, Hodgson, & Dolan, 2011; Stutzer & Frey, 2008). In China, the country's remarkable economic development has dramatically increased the share of the urban population, from 18% in 1978 to 54% in 2013, while also raising the ownership of private vehicles from approximately 0.28 million in 1985 to 105 million in 2013 (National Bureau of Statistics of China, 2014). This increase has given rise to a major burden for urban commuters, not only in megacities like Beijing but also in many medium and small cities (Fang, 2012). According to Fang (2012), the average one-way commute time for urban workers in 50 Chinese cities with populations over 1 million is 39 minutes per day. In Beijing, it is 52 minutes (Fang, 2012). These commuters' problems are further exacerbated by the substantial rise in housing prices coupled with the continued increases in migration from rural to urban areas (Man, 2011).

Despite the size of this problem, however, little research attention has been paid to analyzing the effects of commuting on commuter well-being (Roberts et al., 2011), although it seems reasonable to assume a priori that the impact of long commute times on well-being may be negative. On the other hand, as pointed out by Stutzer and Frey (2008), if urban commuters are fully compensated for their travel time (e.g., by living in an attractive suburb), we should find no systematic association between commute time (CT) and subjective well-being (SWB). Rather, a type of equilibrium should emerge. Unfortunately, the few studies that do investigate commute

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time's impact on SWB, mostly in Western settings, are inconclusive (Dickerson, Hole, & Munford, 2014; Humphreys, Goodman, & Ogilvie, 2013; Martin, Goryakin, & Suhrcke, 2014; Olsson, Gärling, Ettema, Friman, & Fujii, 2013; Roberts et al., 2011; Stutzer & Frey, 2008; Turcotte, 2011). Their results are also difficult to generalize to the Chinese population for several reasons: First, there is ample evidence that commute time in China is much longer – especially in megacities like Beijing and Shanghai (Ding, 2016; Nelson, 2015). Second, China has nearly one-third of the 50 most congested cities in the world (Wang, 2015). Third, traffic congestions in Chinese cities are known to cause severe smog problem that have been shown to affect health (Chen, Wang, Ma, & Zhang, 2013; Kan, Chen, & Tong, 2012). Such air pollution also affects city-dwellers' subjective well-being (Zhang, Zhang, & Chen, 2015). Finally, in the current market-oriented urban redevelopment process, the majority of city residents cannot afford new housing in their original neighborhoods because the original lower cost buildings have been replaced by high-priced commodity housing (Huang & Xu, 2005). These housing problems in many Chinese cities directly influence the SWB-CT equilibrium by restricting free choice of residency.

The purpose of this present study, then, is to use data from the 2010 China Family Panel Studies (CFPS) to examine the association between commute time and SWB among urban Chinese employees aged 16–65. Similar to Stutzer and Frey (2008), we employ SWB (including life satisfaction and happiness) as a proxy of individuals' experienced utility to directly assess the equilibrium framework of commute time. This proxy reflects the assumption that if urban commuters are fully compensated for their travel time, there should be no systematic association between commute time (CT) and SWB (Stutzer & Frey, 2008). Our paper contributes to the research stream by being the first to employ a nationally representative dataset of the Chinese population to explore this CT-SWB association in a non-Western context. A further contribution is that we adopt a multiple mediation technique (Preacher & Hayes, 2008) that introduces several important daily activities as intervening variables to identify potential mediators of the association. Additionally, following Dickerson et al. (2014), we estimate the monetary value of compensation for working commuters at the individual and national levels, which provides a useful quantitative evaluation of the loss in well-being associated with commute time. We develop the remainder of this discussion as follows: Section 2 reviews the background literature, Section 3 describes the data and methodologies, Section 4 reports the results, and Section 5 concludes the paper.

2. Prior literature

Although several studies analyze the association between commuting and well-being, little consensus exists on commuting's negative effects (Dickerson et al., 2014; Hilbrecht, Smale, & Mock, 2014; Kroesen, 2014; Office for National Statistics, 2014; Roberts et al., 2011). On the one hand, early research by Novaco and Collier (1994) does conclude that commuting satisfaction is significantly and negatively correlated with commute duration among full-time workers in southern California, while a more recent web-based survey by Smith (2013) of 828 workers in Portland, Oregon, negatively associates it with a commute by car that exceeds 40 minutes. These U.S. findings are echoed by two recent UK studies (Office for National Statistics, 2014; Roberts et al., 2011), the second of which uses British Household Panel Survey (BHPS) data to show that commute time has a significantly adverse impact on women's psychological well-being. Stutzer and Frey (2008), using the German Socio-Economic Panel Study (GSOEP), also find that a lengthy commute is correlated with decreased life satisfaction. Similarly, Martin et al. (2014), in an analysis of BHPS data, show that commute time spent walking slightly increases psychological well-being, whereas time spent driving decreases it.

Other studies, however, find no evidence that commuting has a negative effect on well-being. For example, Dickerson et al. (2014), using 1996–2008 BHPS data, demonstrate that commute time is unassociated with life satisfaction. Likewise, Humphreys et al. (2013), drawing on cross-sectional data from the Commuting and Health in Cambridge study, find no association between mental well-being and weekly time spent actively commuting. In fact, Olsson et al. (2013), using data from the three largest urban areas of Sweden, demonstrate that positive or neutral feelings (e.g., being relaxed or alert) dominate among most commuters. These findings echo Turcotte (2011) analysis of data from Statistics Canada's 2010 General Social Survey on Time Use, which finds that a majority (55%) of workers whose commute takes 45 minutes or longer claim to be satisfied or very satisfied with commuting.

The very small body of literature examining the mediation effects on the CT-SWB association tends to address three primary pathways (mediators) through which commute time might affect SWB: individual health, transfer effect, and individual lifestyle. As regards the first, Novaco, Stokols, and Milanese (1990) demonstrate that among employees in southern California, commute impedance (commute time and distance) is associated with several health problems, including colds, flu, and headaches. Likewise Christian (2012), using 2003–2010 data from the American Time Use Survey, link an additional hour of commuting to a 6% decrease in time spent on health-related activities. A second possible mediator is interdomain transfer effect (ITE, see Novaco et al., 1990), the spilling over of stress associated with adverse environmental contexts in one life domain (e.g., commuting) onto other domains such as work or home. For example, Novaco, Kliewer, and Broquet (1991) find that commute stress is negatively associated with residential and job satisfaction among drivers in California, a finding echoed by Stutzer and Frey (2008) for Germany. The third potential pathway is individual social lifestyle (Putnam, 2000), a notion that rests on the assumption that commuting reduces time spent on family, friends, and other social activities. For instance, by applying multiple mediation analysis to cross-sectional data from the 2010 Canadian General Social Survey, Hilbrecht et al. (2014) confirm that the CT-SWB association is mediated by reduced time for physically active leisure and experiences of traffic congestion. On the other hand, a recent Dutch study (Kroesen, 2014) finds that commute time by bicycle is correlated with a decreased level of happiness and that this effect is mediated by individual satisfaction with social contacts.

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