Personality Traits, Sedentariness, and Personal Dilemma as the Dynamic Predictors of Intention to Use Public Transportation in Greater Jakarta

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Abstract

The management of mass public transportation requires the psychology of transportation in order to design and operate a transportation system which suits the social psychology dimension of urban citizens. The aim of this research is to examine the role of personality traits, sedentariness, and personal dilemma in predicting the intention of a particular group of urban citizens to switch from using private cars to using mass public transportation. This research uses the predictive correlational design, while the research data are analyzed using the multiple linear regression technique in order to identify the main effects and interaction effects of variables which may serve as the predictors of intention. This research involves 280 university students (111 males and 169 females, with M_{age} = 20.90 years old and SD_{age} = 1.943 years old) who live in Jakarta, the capital city of Indonesia, and its surrounding urban areas as samples. The research finds that, among the Big Five personality traits, conscientiousness is the only trait which can significantly predict the intention of private car users, while sedentariness is not capable of predicting such intention. The research also finds that losses in terms of time and safety incurred from the use of private cars can lead to a much stronger intention to switch to mass public transportation. The implications of this research on the development of policies regarding transportation are elaborated in the final section of this paper.

Personality Traits, *Sedentariness*, dan *Personal Dilemmas as the Dynamic Predictors of Intention* untuk Menggunakan *Public Transport* pada Mahasiswa Pengguna Mobil Pribadi di Jabodetabek

Abstrak

Manajemen transportasi umum massal urgen membutuhkan psikologi transportasi untuk merancang serta mengelola sistem transportasi yang kompatibel dengan *social psychological dimension* dari warga negara. Penelitian ini hendak menemukan peran *personality traits*, *sedentariness*, dan *personal dilemma* dalam memprediksikan intensi untuk beralih (*switching*) dari penggunaan mobil pribadi ke kendaraan umum massal. Desain penelitian ini adalah desain korelasional prediktif, dengan teknik analisis data berupa analisis regresi linear berganda, untuk melihat *main effects* dan *interaction effects* dari variabel-variabel prediktor terhadap intensi. Penelitian ini merekrut sampel 280 mahasiswa (111 laki-laki, 169 perempuan; M_{age} = 20.90 *years old*, SD_{age} = 1.943 *years*) di Jakarta, ibu kota Indonesia, dan sekitarnya (Jabodetabek). Ditemukan bahwa hanya *conscientiousness* yang mampu memprediksikan intensi dari antara *Big Five personality traits*. Di samping itu, *sedentariness* tidak mampu memprediksikan intensi. Persepsi kerugian dari sisi waktu dan keamanan dari penggunaan mobil pribadi telah mendorong intensi yang lebih besar untuk menggunakan kendaraan umum massal. Implikasi dari temuan riset ini terhadap pembuatan kebijakan di bidang transportasi dikemukakan dalam bagian akhir dari artikel ini.

1. Introduction

Studies of public transportation use have become a central and urgent issue due to the fact that big cities nowadays are increasingly plagued with traffic congestions. This problem is aggravated by the fact that construction of new roads cannot keep pace with the rapidly increasing numbers of vehicles which require those roads

to travel on. This condition can only be addressed by the optimization of public transportation use (Juneman, 2010). Previous studies have applied various concepts to explain the dynamics involved in people's intention to use public transportation, such as the hierarchical structure of public transportation (Dziekan, 2008), the theory of planned behavior (TPB) in the context of transportation (Chowdhury & Ceder, 2013), the psychology of waiting at the bus stop (Currie, 2012), prejudice against the users of public transportation (Mitrea & Kyamakya, 2013), heuristic approach (Innocenti, Lattarulo, & Pazienza, 2013), and the affective-symbolic and hedonistic aspects of car use (Sumaedi *et al.*, 2014).

This research is unique in comparison with the previous ones because, to the extent of our knowledge, this is the first research which seeks to investigate the predictive correlation between the OCEAN or Big Five personality traits (consisting of openness to experience, conscientious-ness, extraversion, agreeableness, and neuroticism) and the intention to use public transportation, especially in Indonesia. In its role as "the organization of all so-called mental contents, traits, capacities, and reaction tendencies" (Bridges, 1925, p. 117), personality plays a great role in shaping an individual's intention because subjective factors, both the cognitive and affective ones, as discussed in the previous studies, are organized within the notion of personality.

As one of the Big Five personality traits, openness to experience is characterized by originality, depth and breadth of knowledge, and great interest in generating new configurations within an individual's life space (John, Naumann, & Soto, 2008). Such tendency also affects an individual's choice of transportation modes. This trait is ever more relevant to our daily lives, especially when we consider the current fact that the government of Jakarta is actively engaged in numerous experimentations and modifications of various modes of mass public transportation (such as the "busway" system, MRT, and so on) in order to create a public transportation system which is capable of meeting the urban needs. Such innovations tend to be welcomed by individuals with a high degree of openness, which demonstrates that an individual's intention is strongly related to her/his psyche. Openness to experience is also related to the aspects of wisdom and nonconformity (Goldberg, as cited in John & Srivastava, 1999), both of which may encourage individuals with a higher degree of openness to change their habits, such as driving their own cars, in spite of the fact that these new habits are considered different from those practiced by their colleagues, family members, or other people around them—in this case, those who still drive their own cars. Therefore, based on this observation, it can be hypothesized that the higher an individual's level of openness, the greater the probability that the individual

will be willing to use mass public transportation as the substitute for private cars (H1).

Conscientiousness is marked by self-discipline and strong desire to accomplish tasks which one has been assigned (John, Naumann, & Soto, 2008). Individuals with high level of conscientiousness tend to be very thorough and diligent in doing their jobs and not to be easily distracted by spontaneous impulses. A field experiment conducted by Hernández, Mateo, Blazsek, and Jaca (2011) demonstrates that physical environments which are marked by a high level of irregularity, disorder, and disorganization tend to lower the motivation of individuals with higher level of conscientiousness—that is, those who place greater emphasis on orderliness and organization—to show their best performance. It is a fact that the condition of mass public transportation in big cities in Indonesia, especially in Jakarta, is still disorganized, unpredictable, and critical; its systems of infrastructure and public services are still fragmentary and incomplete, which might compromise the safety of citizens who have to rely on them. Such condition is clearly incompatible with all aspects of conscientiousness. Therefore, it can be hypothesized that the higher an individual's level of conscientiousness, the lower the probability that the individual will be willing to use mass public transportation as the substitute for private cars (h2).

Extraversion is marked by a great interest in the social world, assertiveness, firmness, and ability to garner energy from socializing with other people (John, Naumann & Soto, 2008). Nicholson, Soane, Fenton-O'Creevy, and Willman (2005) found that extraversion is associated with risk-taking. Such traits might encourage an individual to use mass public transportation. Jones, *et al.* (2012) asserts that "buses provide a key site for sociability and public engagement in the city". By using public transportation, active young passengers can improve their social competence which they deem beneficial for their mental health by, for instance, engaging in con-versations with other passengers (unplanned encounters) or arranging activities together (planned gatherings) (Jones, *et al.* 2012). For individuals with a high level of extraversion, the concept "the journey as purpose" (Mitrea, & Kyamakya, 2013) has become central. A journey in a public vehicle is not only a matter of transporting oneself to a particular destination or of doing a regular activity, but also an opportunity to perform a meaningful activity together with other people. In addition to that, in terms of risk-taking, extrovert individuals have more capacity to tolerate various potential risks associated with using public transportation (see, for instance, Backer-Grøndahl, Amundsen, Fyhri & Ulleberg, 2007). Such risks consist of criminal acts, sexual harassments, fire due to lack of maintenance, reckless drivers, and potential for accidents. Therefore, it can be hypothesized that the higher an individual's

level of extraversion, the greater the probability that the individual will be willing to use mass public transportation as the substitute for private cars (H3).

Inclination to agree or agreeableness is marked by orientation towards other people and community, humility towards other people, and trustfulness (John, Naumann & Soto, 2008). Meanwhile, it is generally accepted that public interest has been used as a rationale for promoting or campaigning the use of mass public transportation in terms of shorter travel time, environmental preservation, and so on. Such idea has frequently appeared in the government's political agenda (Mitrea & Kyamakya, 2013) or has become one of the strongest elements of injunctive norms. Many studies related to the notion of social dilemma refer to people who use public transportation as "cooperative" people as opposed to the "defective" ones. (see, for instance, Kitamura, Nakayama & Yamamoto, 1999). The question that arises from this observation is about whom those people are agreeable to—to the government, to their families, or to their colleagues— and how far this agreeableness influence their decision pertaining to the modes of transportation that they choose. A study by Darwish (2009) indicates that agreeableness is associated with utilitarianism, a kind of ethics which places great emphasis on general interests and postulates that anything (individuals, objects, events, or decisions) should bring as much happiness to as many people as possible (Sidgwick, as cited in Darwish, 2009). In this case, the decision to use public transportation is relevant to the interests of the majority of citizens. It is assumed that agreeableness to the public plays the most important role in such decisions, while "the public" here refers to the government (as the representations of the people) and their regulations which promotes the use of public transportation. Therefore, it can be hypothesized that the higher an individual's level of agreeableness, the greater the probability that the individual will be willing to use mass public transportation as the substitute for private cars (H4).

Neuroticism is characterized by negative emotions (fear, sadness, anxiety, or disappointment), mental instability, inability to relax, frequent complaints, difficulty to control oneself, and susceptibility to stress (John, Naumann & Soto, 2008). Maquilón, González-Calderón, and Henao (2010) found that individuals with a high level of anxiety tend to avoid driving their own cars. This might happen because physiological changes which are triggered by sudden anxiety can affect a driver's required minimum reaction time to road stimuli. Neuroticism is associated with negative driving behaviors such as aggressive driving (see, for instance, Jovanović, *et al.* 2011), and this tendency might endanger the driver, passengers and other people around them, especially when the roads are plagued with traffic congestions and

drivers who violate road safety regulations. Neurotic individuals are less capable of performing effective actions during crises, tend to avoid risky activities, tend to suffer from cognitive processing disorder, and are frequently worried that they might not be able to overcome challenging situations (Robinson & Tamir, 2005). Such characteristics have led to an assumption that these individuals are less capable of controlling their own behaviors when driving on public roads. Such assumption might lead these individuals to think that their own mental trait might endanger their own lives, so, through the process of self-regulation, they choose to use public transportation instead of driving their own vehicles. Using public transportation can significantly lift their cognitive and mental burdens because, by doing so, in a way they can delegate much of their personal responsibility to the drivers. Delegation of responsibility to other people is indeed one of the most salient characteristics of neurotics (Di Pietro & Mosak, 2014). From this observation, it seems that neuroticism might serve as a contributing factor in an individual's decision to choose between private or public transportation, insofar as the concern for personal safety is more salient than the concern for the safety of the general public, with regards to the use of public transportation. Therefore, it can be hypothesized that the higher an individual's level of neuroticism, the greater the probability that the individual will be willing to use mass public transportation as the substitute for private cars (H5).

Another variable which might serve as a predictor of an individual's intention to switch from using private cars to using public transportation is physical inactivity or sedentariness. Sedentary behavior is defined as "behaviors characterized by low energy expenditure" (Biddle, *et al.* 2003, p. 30). With regards to the use of private cars, sedentariness has become a significant issue because "people have become so habituated to using the car for everything that it would never occur to them to unfurl their legs and see what they can do" (Bryson, 1999). The habit of using private cars constitutes only one part of sedentary lifestyle, while other sedentary behaviors only serve to strengthen it because learned health-related behaviors (in this case, the habit of using private cars) within the same domain (in this case, the domain of physical inactivity) are subject to generalization or mutually transferrable (Peters, *et al.* 2009). Biddle, *et al.* (2003) found that, among British young generation, the use of cars has replaced physical activities which the young generation from previous periods used to do. Owen, *et al.* (2011) add that, in suburban areas, the use of cars has lengthened the period of sedentariness among citizens, which in this case refers to the amount of time spent on sitting in the cars to perform a journey to and from their workplaces, to spend time with family members, and to perform short journeys to cater to the demands of friends or family members. Due to

continuous habituation, those car users finally adopted a sedentary lifestyle, which is assumed to make private car drivers ever more reluctant to switch to mass public transportation because this alternative habit might require them to walk on foot to reach nearby bus stops or terminals or to switch from one bus to another—kinds of activities which are considered contrary to sedentary lifestyle. Therefore, it can be hypothesized that the more an individual is accustomed to sedentary lifestyle, the lower the probability that the individual will be willing to use mass public transportation as the substitute for private cars (H6).

Another variable which might serve as a predictor of an individual's intention to switch from using private cars to using mass public transportation is personal dilemma. The idea behind this assumption is that the situation in which we decide to use between a private car or public transportation is analogous to a situation known as "n-person prisoner's and chicken dilemma" (Van Vugt, Meertens, & Van Lange, 1995; Van Vugt, Van Lange, & Meertens, 1996). With regards to the use of private cars, this dilemma starts with an assumption that, at first, accessibility to various destinations is really enhanced by the use of private cars, and environmental consequences are relatively low, insofar as only one driver is taken into account. However, if the number of private cars increases, the accessibility will correspondingly decrease due to increased traffic congestions, and environmental consequences (such as air pollution) will also multiply. As a consequence, people's willingness to switch from using private cars to using public transportation will correspondingly strengthen, if we take account of both each individual's and other people's welfare in the long term. Proposed by Van Vugt, *et al.* this scenario serves as an illustration of a social dilemma. However, this research focuses on the concept of personal dilemma as a measurement of social dilemma which applies a psychological-individual approach or agent-based approach ("soft" measure), as proposed by Sunitiyoso and Matsumoto (2009, p. 94). Unlike the assumption about personality as illustrated above, personal dilemma is based on the general idea of human rationality which assumes that human beings possess an ability to use their cognitive faculties to take account of all available pieces of information in their effort to fulfill their personal desires. Six aspects are relevant to this type of personal dilemma: time, cost, safety, convenience, prestige, and egotism/empathy. Each of these aspects may have its own valence, that is, positive or negative value. For example, driving a private car may have a positive valence in terms of convenience but a negative valence in terms of time, usually because of the considerable amount of time spent in traffic congestions. Besides that, driving a private car may have a positive valence in terms of prestige but a negative valence in terms of empathy. Therefore, it can be hypothesized that there are different

levels of intention to switch from private cars to mass public transportation depending on different situations of personal dilemma which an individual is encountering (H7) and that situations of personal dilemma may serve as moderator variables which can strengthen or weaken the predictive relationship between the Big Five personality traits and the intention to switch from private cars to mass public transportation (H8).

2. Methods

Participants and design. 280 university students participate in this research, who consist of 111 males and 169 females with $M_{age} = 20.90$ years old and $SD_{age} = 1.943$ years old. These samples are obtained using the purposive convenience sampling method. These samples are then divided into eight groups, each of which consists of 35 participants (for more detailed information, see the explanation of the measurement instruments of personal dilemma below). The participants of this research are university students who regularly drive their own cars at least three day in a week, and this behavior has been taking place for at least six months prior to the research. This criterion is in line with Lally, van Jaarsveld, Potts, and Wardle (2010) who stipulate that a behavior develops into a habit at least after 66 days of continuous practice. Students who are accustomed to using private cars may serve as an interesting group of research subjects and should be considered as primary targets of intervention because they are part of those citizens who cannot be easily persuaded to switch from using private cars to using mass public transportation. Participants are the students of several universities in Jakarta which include Bina Nusantara University, Trisakti University, Atma Jaya Catholic University Jakarta, and YARSI University. A pilot study has been carried out to test the validity and reliability of the measurement instruments, involving 60 participants who fulfill the same criteria as listed above and who come from the same universities, but are not included in the field study proper.

This research applies quasi-experimental design and predictive-correlational design. The independent variables of this research consist of Big Five personality traits and sedentariness, which are also referred to as "predictors". The dependent variable of this research is the intention to switch from using private cars to using public transportation, which are also referred to as "criterion". The moderator variables of this research are various situations of personal dilemma, which are also referred to as "moderators". Data are processed using the multiple linear regression analysis in order to measure the predictive relationship between predictors and criterion, while the moderation effect is confirmed by testing the interaction between the predictors and moderators using regression analysis.

Instruments and procedures. Each participant is given a questionnaire which contains the scales for measuring the predictors, moderators, and criterion, all presented in Indonesian. The five principal personality traits are measured using the Big Five Inventory (BFI) as constructed by John, Donahue, and Kentle (as cited in John, Naumann, & Soto, 2008) based on the concept of Big Five personality traits proposed by Goldberg (as cited in Judge *et al.*, 2014), as well as Costa and McCrae (1995). The original inventory consists of 44 statements of specific traits, but we develop them into 65 statements based on our translation into Indonesian, according to the markers constructed by Goldberg.

Each scale is designed to begin with the statement "I see myself as someone who …." Participants are required to choose one response from "Strongly Disagree" (score 1) to "Strongly Agree" (score 6). Five dimensions are measured using this instrument. The first dimension is openness to experience (Cronbach's α = 0.831); example statements of specific traits are (1) … is original, comes up with new ideas and (2) … is curious about many different things. The second dimension is conscientiousness (α = 0.780); example statements of specific traits are (1) … does a thorough job and (2) … is a reliable worker. The third dimension is extraversion (α = 0.760); example statements of specific traits are (1) … is talkative and (2) … is outgoing, sociable. The fourth dimension is agreeableness (α = 0.707); example statements of specific traits are (1) … is helpful and unselfish with others and (2) … has a forgiving nature. The fifth dimension is neuroticism (α = 0.800); example statements of specific traits are (1) … is depressed, blue and (2) … can be tense. The number of statements of specific traits developed for the pilot study is 51.

Sedentary behavior is measured using the International Physical Activity Questionnaire (IPAQ) whose construction was initiated by Michael L. Booth and the International Consensus Group (as cited in Craig *et al.*, 2003) and was subsequently developed by Craig *et al.*. This questionnaire measures the level of activity performed by adults aged 18–65 and consists of four general components: "(1) during transportation, (2) at work, (3) during household and gardening tasks, and (4) during leisure time, including exercise and sport participation" (Hagströmer, Oja, & Sjöström, 2006, p. 755). This research uses the concise version of IPAQ called the "Short Last 7 Days Self-administered Format" which is designed to dig up information from the participants about vigorous activities (examples include "During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?" and "How much time did you usually spend doing vigorous physical activities on one of those days?"), moderate activities such as walking, and various sedentary activities. Online guidelines on IPAQ are available at https://sites.google.com/site/theipaq/

questionnaire_links. However, among twenty IPAQ versions available in different languages, no Indonesian version is available at this site. Because of this, we decided to use the Malay guidelines obtained from https://sites.google.com/site/theipaq/cultural-adaptation/questionnaires to construct our questionnaire because of the language's similarity to Indonesian. The participants' responses will be converted to scores and presented in ordinal scale based on these criteria: (1) Category 1: Low physical activity, (2) Category 2: Moderate physical activity, and (3) Category 3: High physical activity. The higher a physical activity is, the lower its sedentariness score is. For example, the sedentariness score for low physical activity is 3, while that for high physical activity is 1. The criteria for each category can be accessed at https://sites.google.com/site/theipaq/scoring-protocol. After this research, we found that Hastuti (2013), an Indonesian researcher, has actually demonstrated the reliability of IPAQ measurement instruments in Indonesian context with a repetition index of 0.95.

The instrument for measuring aspects of personal dilemma is inspired by the instrument for measuring social dilemma which was constructed by Van Vugt *et al.* (1996). Originally, this instrument consists of three aspects: (1) travel time, (2) pollution, and (3) variations of travel time incorporated into each situation. We adjust this measurement instrument based on different situational variations because it is assumed that different individuals might encounter different types of situation. Based on interviews with 35 university students who regularly use private cars, we find that there are various factors which might encourage an individual to choose between private cars and mass public transportation, but we select only six most significant factors (which consist of time, cost, safety, convenience, prestige, and egotism/empathy) which are to be combined with eight situations/scenarios of personal dilemma (see Table 1). These situations represent the losses and gains resulting from the use of private cars and public transportation in actual life. We formulate the emerging patterns based on the principle of analogy with permutation probability of True and False as shown in a truth table (see, for instance, Achilles, 2006), although not identical. We do not perform manipulation check (such as difference test) on these eight scenarios because of two reasons. Firstly, it is because such manipulation has been anticipated by a concluding sentence at the end of each scenario (see examples below) which performs the same function as the manipulation check; such sentence can therefore be referred to as a "manipulation confirmation". Secondly, it is because the message and its conclusion have already possessed a high degree of clarity, so further abstraction or deeper interpretation is unnecessary. According to O'Keefe (2003), a message with a high degree of clarity does not require a manipulation check. Then, we divide the eight situations of personal dilemma evenly in a random fashion to all of the 280 participants

Table 1. The Blue Print of Personal Dilemma Questionnaire as a Measurement Instrument

	S1	S2	S3	S4	S5	S6	S7	S8
Time	+	+	+	+	-	-	-	-
Cost	+	+	+	-	+	-	-	-
Safety	+	+	-	+	-	+	-	-
Convenience	+	-	-	-	+	+	+	-
Prestige	+	-	+	+	-	-	+	-
Egotism	+	-	+	-	+	-	+	-

Note: (+) indicate gains on the part of private car users, while (-) indicate losses on the part of private car users

For example, situation/scenario S7 reads as follows.

Please imagine that **10 YEARS** from now you will find yourself in this following situation.

You live in suburban Jakarta, while your university is located approximately 40 kilometers from your residence. Such distance can be traveled using either cars or mass public transportation. Each day, you have to decide whether you are going to use a private car or a mode of mass public transportation to reach your university.

If you use a private car, the travel **time** will be relatively **longer** because public buses can use a special lane, while private cars have to use regular lanes. Private car drivers also require additional time to park their cars.

In terms of **cost**, using private cars tends to be more **expensive**. In fact, each private car driver would spend up to 80 thousand Rupiahs in average per day, while public transportation users would only spend 25 thousand Rupiahs in average per day.

In terms of **safety**, private car users are under constant threat of various **criminal acts**. Criminal acts often occur at traffic lights during dark hours or when they are passing an empty road. Another usual threat to their vehicles is rear-view mirror thefts.

In terms of **convenience**, using private cars obviously offers **more comfort** and privacy. The users can also put their personal belongings in their cars, so they do not need to carry their belongings anywhere they go. Being in a car can also protect them from inconvenient weather such as rain or heat from the sun.

In terms of **prestige**, private car users will receive a better treatment and garner more respect when visiting public places such as malls, restaurants, cafes, ATMs, or banks. Such exclusive treatments will **boost the prestige or social status** of those private car users, which will in turn increase their self-confidence.

Private car users tend to display **a lower level of egotism** or, in other words, **a higher level of empathy**. They tend to give way to pedestrians and not to overtake other cars in a traffic jam. This shows that they are respectful of other people's interests and are willing to put aside their own interests.

Therefore, it can be concluded that (*Researcher's note: These statements function as manipulation checks*):
1) The amount of **time** spent on using public transportation is relatively **shorter** than on using private cars.
2) The **cost** incurred from using public transportation is **lower** than from using private cars.
3) In terms of travel **safety** and potential criminal acts, using private cars is **riskier** than using public transportation.
4) Using private cars offers **more convenience** during travel.
5) Private car users may acquire a **higher social status**.
6) Private car users show a **lower degree of egotism**.

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using Microsoft Excel's random generator, so that each scenario of personal dilemma is only experienced by 35 participants.

The intention to switch from using private cars to using mass public transportation is measured based on the response given by each participant to a question after reading one of the situations of personal dilemma as presented in the questionnaire. In this research, intention is defined as an act of of willing which reflects self-determination to perform an action or a source of commitment to perform the said action, which is considered as the best predictor of behavior (Gollwitzer, 1993). As a variable in this research, a participant's intention is measured by asking the participant to response to a question, an example of which is presented below.

Imagine that the above scenario is taking place at this present moment, that it is around six o'clock in the morning now, and that you have to attend a course at eight o'clock. Please determine how likely it is that you will perform the indicated intensity of behavior ranging from 1 to 10 where

1 = you will surely/obviously use a private car
10 = you will surely/obviously use public transportation

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

3. Results and Discussion

The demographical description of the research participants is as follows. All participants reside within the area of Greater Jakarta, which includes Jakarta proper and several suburban areas in its vicinity: Bogor, Depok, Tangerang, and Bekasi, which are commonly abbreviated to "Jabodetabek". The composition of participants based on their areas of residence is (a) Jakarta: 189 participants (67.5%), (b) Bogor: 6 participants (2.1%), (c) Depok: 50 participants (17.9%), (d) Tangerang: 11 participants (3.9%), and (e) Bekasi: 24 participants (8.6%). The composition of participants based on their fields of study or faculties is (a) Faculty of Psychology: 78 participants (27.9%), (b) Faculty of Economics: 67 participants (23.9%), (c) Faculty of Communication and Multimedia: 55 participants (19.6%), (d) Faculty of Engineering: 32 participants (11.4%), (e) Faculty of Medicine: 21 participants (7.5%), (f) Faculty of Computer Sciences: 12 participants (4.3%), (g) Faculty of Social and Political Sciences: 10 participants (3.6%), (h) Faculty of Law: 4 participants (1.4%), and (i) Faculty of Mathematics and Natural Sciences: 1 participant (0.4%). The composition of participants based on their marital status is (a) 275 participants (98.2%) are unmarried and 5 participants (1.8%) are married. 82 participants (29.3%) consider themselves as "migrants" while the other 198 participants (70.7%) consider themselves as "non migrants" or natives of Jabodetabek area. The composition of participants based on their monthly expense is (a) less than 1.5 million Rupiahs: 132 participants (47.1%), (b) more than 1.5 million up to 3.0 million Rupiahs: 90 participants (32.1%), (c) more than 3.0 million up to 4.5 million Rupiahs: 17 participants (6.1%), (d) more than 4.5 million up to 6.0 million Rupiahs: 12 participants (4.3%), and (e) more than 6 million up to 7.5 million Rupiahs: 2 participants (0.7%), while as many as 27 participants (9.6%) choose not to inform their monthly expense. The composition of participants based on their ethnicity is (a) Javanese: 119 participants (42.5%), (b) Sundanese: 35 participants (12.5%), (c) Chinese: 24 participants (8.6%), (d) Padangnese: 22 participants (7.9%), (e) Betawinese: 21 participants (7.5%), and (f) Bataknese: 16 participants (5.7%), which represent the majority of our research participants (84.7%). 69 participants (24.6%) use private cars three days in a week; 66 participants (23.6%) use private cars four days in a week; 42 participants (15.0%) use private cars five days in a week; 33 participants (11.8%) use private cars six days in a week; and 70 participants (25%) use private cars every day.

At the first stage of analysis, a regression analysis is applied to the predictors (consisting of the Big Five personality traits) and the criterion (the intention to switch from using private car to using mass public transportation). This analysis involves all 280 participants who have been divided into eight groups based on situations of personal dilemma, each of which consisting of 35 participants. This analysis seeks to identify whether the Big Five personality traits can affect an individial's intention regardless of and in spite of personal dilemma situations that the individual is encountering. Classical assumption test is also carried out, which shows that the data are normally distributed and free from multicolli-nearity and heteroscedasticity. The result of multiple linear regression analysis is $F(5, 279) = 2.281$, $p = 0.047$ ($p < 0.05$), and $R^2 = 0.040$. This proves that conscientiousness is the only factor that can predict an individual's intention to switch from using private car to using mass public transportation, with $\beta = -0.177$, $p < 0.01$ (see Table 2). In conclusion, H1, H3, H4, H5 are not proven by empirical data, while H2 is proven by empirical data.

At the second stage of analysis, a difference test is carried out using one-way ANOVA in order to identify whether there are different levels of intention to switch from using private car to using mass public transportation based on an individual's level of sedentariness ranging from low, moderate, to high. The result is $F(2, 279) = 2.277$, $p = 0.105$ ($p > 0.05$), which indicates that there is no such difference. This result also suggests that sedentary behavior does not contribute to intention. Therefore, H6 is not supported by empirical data.

Table 2. Multiple Linear Regression Analysis for Predicting the Intention to Use Mass Public Transportation (N=280)

Predictors	*B*	*SE B*	*β*	*t*	*p*
Openness to experience	-0.001	0.023	-0.002	-0.031	0.975
Conscientiousness	-0.062	0.024	-0.177	-2.647	0.009
Extraversion	0.011	0.022	0.033	0.516	0.606
Agreeableness	0.056	0.048	0.072	1.169	0.243
Neuroticism	-0.049	0.029	-0.108	-1.662	0.098

Note: $R^2 = 0.040$ ($p < 0.05$); SE = standard error

At the third stage of analysis, in order to further analyze the result, we decided to carry out an interaction test to find out whether the the interactions between each of the Big Five personality traits and sedentary behavior influence the intention to switch from using private car to using mass public transportation. This test is performed by defining the O / C / E / A / N personality traits and sedentary behavior as predictors and incorporating them into a regression model in order to identify the main effects of O / C / E / A / N personality traits and sedentary behavior, both separately and simultaneously. In order to anticipate multicollinearity in the interaction test, we only include predictor-variables which have been centered into the model, and this can be performed by subtracting the variables' average score from each variable's score. One of the predictor-variables is then treated as a moderator variable. If a simultaneous effect between predictor and moderator is detected, this interaction will then be demonstrated in the form of a graph. Further examination of this moderation effect yields a number of interesting findings.

The first moderation model is constructed by defining the variables of conscientiousness and sedentary behavior as predictor and moderator, respectively. The result of regression analysis is F (3, 279) = 0.021, p = 0.021 ($p <$ 0.05), R^2 = 0.035. This suggests that there is no interaction between conscientiousness and sedentary behavior which can serve as a predictor of intention (B = 0.015, $SE\ B$ = 0.027, $ß$ = 0.032, t = 0.546, p = 0.586). However, it is also found that the main effect of **conscientiousness tends to be negative** (B = -0.050, $SE\ B$ = 0.021, $ß$ = -0.143, t = -2.411, p = 0.017). Additionally, it is also found that, statistically, there is a main effect of sedentary behavior (B = -0.417, $SE\ B$ = 0.195, $ß$ = -0.127, t = -2.146, p = 0.033), but this effect cannot be confirmed before examining the main effect of sedentary behavior when it is combined with other dimensions (O/E/A/N) of the Big Five personality traits to find out whether such effect is consistent or not. Therefore, we cannot yet draw any definitive conclusion as to the main effect of sedentary behavior before any further analysis is carried out.

The second moderation model is constructed by defining the variables of openness to new experience and sedentary behavior as predictor and moderator, respectively. In the next analysis, sedentary behavior is defined as predictor, while personality traits are defined as moderators. A regression analysis which incorporates the variables of openness to new experience and sedentary behavior yields this result: F (3, 279) = 1.404, p = 0.242 ($p > 0.05$). Therefore, no main effect of openness to new experience and sedentary behavior is found in this model, and no interaction effect between both variables which influences their ability to predict the intention to switch from using private cars to using public transportation is found.

The third moderation model is constructed by defining the variables of sedentary behavior and extraversion as predictor and moderator, respectively. The result of regression analysis is F (3, 279) = 3.183, p = 0.024 ($p <$ 0.05), R^2 = 0.033. This means that **no main effect** is resulted from **sedentary behavior** (B = -0.360, $SE\ B$ = 0.194, $ß$ = -0.110, t = -1.852, p = 0.065) and **extraversion** (B = 0.024, $SE\ B$ = 0.021, $ß$ = 0.068, t = 1.137, p = 0.256). In spite of this result, there is an **interaction effect** between the variables of **sedentary behavior and extraversion in terms of their ability to predict intention** (B = -0.063, $SE\ B$ = 0.029, $ß$ = **-0.130, t = -2.178, p = 0.030**). This means that sedentary behavior **must be combined with extraversion in order to produce a negative effect on intention** because the Beta value is negative. Interactional graph shows that, *at first*, the higher the levels of sedentary behavior and extraversion are, the weaker the intention *not* to switch from using private car to using mass public transportation is. This is shown by a shift in the correlation between sedentary behavior and extraversion, that is from R = 0.100 (R^2 = 0.010) when the level of extraversion is low (n = 93, M = 35.656, SD = 3.643) to R = 0.084 (R^2 = 0.007) when the level of extraversion is moderate (n = 94, M = 43.277, SD = 1.282) (see Figure 1). However, the higher the level of extraversion is, the stronger the intention *not* to switch from using private car to using mass public transportation is. This is shown by a shift in the correlation between sedentary behavior and extraversion, that is from R = 0.084 (R^2 = 0.007) when the level of extraversion is moderate (n = 94, M = 43.277, SD = 1.282) to R = 0.345 (R^2 = 0.119) when the level of extraversion is high (n = 93, M = 50.527, SD = 4.398) (see Figure 1).

The fourth moderation model is constructed by defining the variables of sedentary behavior and agreeableness as predictor and moderator, respectively. The result of regression analysis is F (3, 279) = 3.372, p = 0.019 ($p <$ 0.05), R^2 = 0.035. This means that the main effect of sedentary behavior is found (B = -0.434, $SE\ B$ = 0.195, $ß$ = -0.132, t = -2.222, p = 0.027), but **the main effect of agreeableness is not found** (B = 0.068, $SE\ B$ = 0.046, $ß$ = 0.087, t = 1.463, p = 0.145). Besides that, **an interaction effect is also found between the variables of** sedentary behavior **and agreeableness in terms of their ability to predict intention** (B = -0.118, $SE\ B$ = 0.059, $ß$ = **-0.118, t = -2.001, p = 0.046**). This means that sedentary behavior **must be combined with agreeableness in order to produce an effect on intention**. Interactional graph shows that the higher the levels of sedentary behavior and agreeableness are, the stronger the intention *not* to switch from using private car to using mass public transportation is. This is shown by a shift in the correlation between sedentary behavior and agreeableness, that is from R = 0.055 (R^2 = 0.003) when the level of agreeableness is low (n = 93, M = 19.473, SD = 2.114), to R = 0.173 (R^2 = 0.030) when the level of agreeableness is moderate (n = 94, M = 23.351, SD = 0.864), and to R

= 0.226 (R^2 = 0.051) when the level of agreeableness is high (*n* = 93, *M* = 26.194, *SD* = 1.173) (see Figure 1).

The fifth moderation model is constructed by defining the variables of sedentary behavior and neuroticism as predictor and moderator, respectively. The result of regression analysis is *F* (3, 279) = 3.580, *p* = 0.014 (*p* < 0.05), R^2 = 0.037. This means that the main effect of sedentary behavior is found (*B* = -0.403, *SE B* = 0.194, *β* = -0.123, t = -2.083, *p* = 0.038), but **the main effect of neuroticism is not found** (*B* = -0.044, *SE B* = 0.027, *β* = -0.097, *t* = -1.628, *p* = 0.105). Besides that, **an interaction effect is identified between the variables of** sedentary behavior **and neuroticism in terms of their ability to predict intention** (*B* = 0.082, *SE B* = 0.037, **β = 0.130, *t* = 2.183, *p* = 0.030**). This means that sedentary behavior **must be combined with neuroticism in order to produce an effect on intention**. Interactional

graph shows that the higher the levels of sedentary behavior and neuroticism are, the weaker the intention *not* to switch from using private car to using mass public transportation is, because **the Beta value is positive**. This is shown by a shift in the correlation between sedentary behavior and neuroticism, that is from *R* = 0.257 (R^2 = 0.066) when the level of neuroticism is low (*n* = 93, *M* = 23.570, *SD* = 3.191), to *R* = 0.071 (R^2 = 0.005) when the level of neuroticism is moderate (*n* = 94, *M* = 29.266, *SD* = 1.079), and to *R* = 0.025 (R^2 = 0.0006) when the level of neuroticism is high (*n* = 93, *M* = 35.011, *SD* = 3.255) (see Figure 1).

Based on the first to the fifth moderation models, we can conclude that sedentary behavior is not consistently able to predict the intention to switch from using private car to using mass public transportation. This finding supports the result of the second analysis which asserts
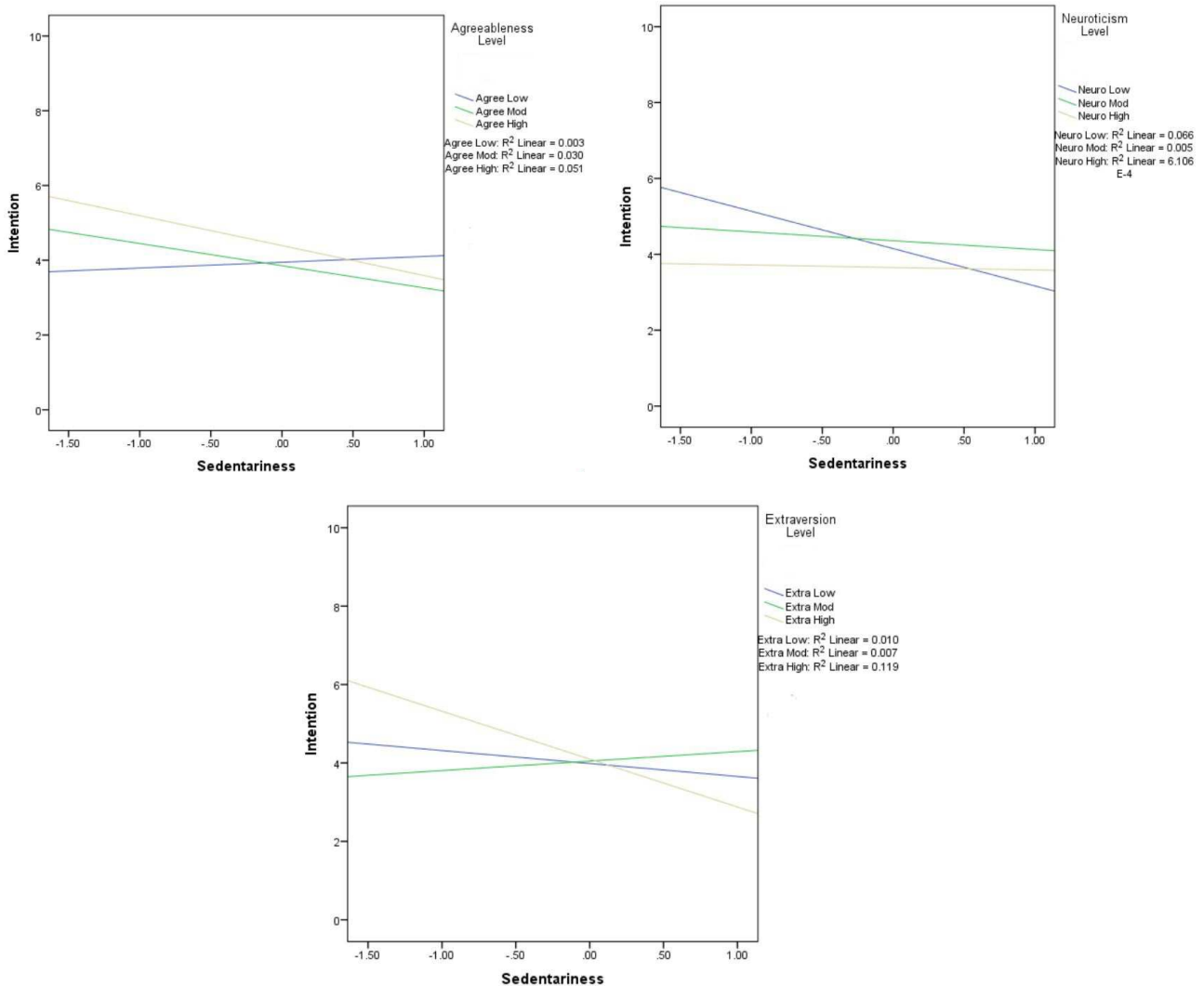
Note: "Agree" = Agreeableness; "Neuro" = Neuroticism; "Extra" = Extraversion

Figure 1. The Moderation Effects of Agreeableness (left), Neuroticism (right), and Extraversion (bottom) in Negative Predictive Relationship between Sedentary Behavior and Intention

that "sedentary behavior **does not contribute to intention**." In spite of that, significant interaction effects **between** sedentary behavior and **Big Five personality traits are found in three out of five (or 60% of all) moderation models**.

At the fourth stage of analysis, a difference test is performed using one-way ANOVA in order to find out whether there is a difference in the intention to switch from using private car to using mass public transportation based on various situations of personal dilemma (situation 1 vs. 2 vs. 3 vs. 4 vs. 5 vs. 6 vs. 7 vs. 8). The result is F $(7, 279) = 7.726$, $p = 0.000$ ($p < 0.01$), which means that there is at least one difference among those eight groups of participants in terms of intention. The effect size of this difference is $Eta\text{-}squared = SS_{between} / SS_{total} = 274.739/ 1656.568 = 0.17$, which is relatively moderate. This means that 17% of the total intentional variants are influenced by various situations of personal dilemma. The result of a post hoc test, using the LSD test, shows that participants who are involved in situation 8 consistently show a stronger intention to switch from private cars to mass public transportation than those who are involved in situation 1 ($MD = 3.714$, $SE = 0.539$, $p = 0.000$), situation 2 ($MD = 1.857$, $SE = 0.539$, $p = 0.001$), situation 3 ($MD = 1.857$, $SE = 0.539$, $p = 0.001$), situation 4 ($MD = 2.629$, $SE = 0.539$, $p = 0.000$), situation 5 ($MD = 1.600$, $SE = 0.539$, $p = 0.003$), situation 6 ($MD = 2.171$, $SE = 0.539$, $p = 0.000$), or situation 7 ($MD = 1.400$, $SE = 0.539$, $p = 0.010$). Besides that, participants who are involved in situation 1 consistently show a stronger intention *not* to switch from private cars to mass public transportation than those who are involved in situations 2 to 8. However, it must be borne in mind that situations 1 and 8 are not "intermediary" situations which can cause dilemma because, in situation/scenario 1, the private car users experience total gains, while in situation/scenario 8 the private car users experience total losses. Participants who experience gains in terms of all aspects of their personal dilemma situation (time, cost, safety, convenience, prestige, and egotism) show a significantly weaker intention to switch from using private cars to using mass public transportation ($MD = -3.714$, $SE = 0.539$, $p = 0.000$) than those who experience losses in terms of all aspects of personal dilemma situation.

An interesting finding concerning personal dilemma suggests that participants who are involved in situation 7 ($M = 4.54$, $SD = 2.292$) show a stronger intention than those who are involved in situation 4 ($M = 3.31$, $SD = 2.055$) ($MD = 1.229$, $SE = 0.539$, $p = 0.023$) in spite of the fact that both situations contain three aspects with positive value and three aspects with negative value experienced by private car users (see Table 1). This seems to suggest that, based on the results from situation 7, participants' intention to switch from private cars to mass public transportation is more strengthened by perceived losses in terms of time, cost, and safety when using private cars. This effect outweighs the effect of perceived gains in terms of convenience, prestige, and egotism. Based on situation 4, participants who maintain the habit of using private cars are those who experience gains in terms of time, safety, and prestige even though at the same time they experience losses in terms of cost, convenience, and egotism. By comparing between situation 4 and situation 7, it can be said that, provided that the cost and prestige resulted from using private cars and using mass public transportation are the same, the effect of the perceived losses in terms of time and safety when using private cars may outweigh the effect of the perceived losses in terms of convenience and egotism on strengthening the participants' intention to switch from private cars to mass public transportation. Therefore, for private car users, the situation in which using private cars is unsafe and time-consuming, albeit convenient and egotistic, strengthens their intention to switch from using their own vehicles to using mass public transportation more than the situation in which using private cars is safer and faster, albeit inconvenient and not egotistic (see Table 3). Therefore, it can be asserted that **H7 is supported by empirical data, on the grounds that there is a difference in intention according to different situations of personal dilemma, without taking account of personality trait factors**.

At the fifth stage of analysis, a regression analysis is carried out for each personal dilemma situational group—in this case, situational groups 4 and 7—in order to find out whether personality traits and sedentary behavior can interact with situations of personal dilemma. It is found that personality traits do not interact with situations of personal dilemma because the regression analyses of

Table 3. Final Comparison of Personal Dilemma Situations 4 and 7

	S4 (Effect: less interest in using mass public transportation/more interest in using private cars)	S7 (Effect: more interest in using mass public transportation/less interest in using private cars)
Time	+	-
Safety	+	-
Convenience	-	+
Egotism	-	+

Note: This comparison is true provided that, in both situations, the cost factor of using private cars is (-) and the prestige factor of using private cars is (+).

situations 4 and 7 which incorporate the OCEAN personality traits as predictors produce the same results: that they cannot predict intention. The result of the regression analysis of situation 4 ($n = 35$) is $F (5, 34) = 0.610$, $p = 0.693$ ($p > 0.05$), while the result of the regression analysis of situation 7 ($n = 35$) is $F (5, 34) = 2.337$, $p = 0.067$ ($p > 0.05$). The analysis also shows that sedentary behavior does not interact with situations of personal dilemma because the regression analyses of situations 4 and 7 which incorporate sedentary behavior as predictor produce the same results: that they cannot predict intention. The result of the regression analysis of situation 4 ($n = 35$) is $F (1, 34) = 1.233$, $p = 0.275$ ($p > 0.05$), while the result of the regression analysis of situation 7 ($n = 35$) is $F (1, 34) = 1.780$, $p = 0.191$ ($p > 0.05$). **However, no interaction is found between sedentary behavior and personality traits, and this means that H8 is not supported by empirical data.**

This research finds that **conscientiousness is able to negatively predict the intention to switch from using private cars to using public transportation**. This finding supports previous studies which prove that personality traits assert a direct influence on intention in various contexts (see, for instance, Jeswani & Dave, 2012; Wang & Yang, 2007). This finding also supports our hypothesis that private car users with a high degree of conscientiousness tend to avoid irregularity, disorder, and uncertainty which are plaguing the public transportation system in Jakarta and its surrounding suburban areas because they perceive that such condition can lower their productivity and even endanger their lives. This finding also confirms an analysis conducted by Duit (2015) which found that in Indonesia, the five biggest factors which discourage people from using public transportation, especially urban minibuses (or *angkot* in Indonesian), are drivers who spend too much time waiting for passengers, cigarette smoke, dirty or stinky minibuses, criminality in minibuses, and reckless drivers. Based on this research, we propose that the underlying factor of those five complaints is conscien-tiousness. This is not a surprising result because Indonesians, according to a survey conducted by Schmitt, *et al*. (2007), rank twenty-fifth ($M = 47.19$) of 56 nations ($M = 46.86$) throughout the world in terms of conscientiousness, which means that Indonesians' level of conscientiousness is above the average score of other nations which are included in the survey. Even though conscientiousness does not correlate with moral integrity, individuals with this trait place great concern over discipline and orderly schedule (Abraham & Pane, 2014), two qualities which cannot be used to describe the general experience of using mass public transportation in Jakarta and its surrounding urban areas. Ryan (2014) states that conscientiousness correlate with willpower, but, when things go wrong, this situation poses considerable challenge for individuals with low level of conscientiousness. Willpower is an ability to control oneself, which may undergo depletion

due to repetitive repressions of desires, including desire to get angry (American Psychological Association, 2012), for instance, when an individual has to cope with the inefficiency of mass public transportation system that s/he is using. The disorderly state of public transportation and road systems hold a greater potential for disrupting an individual's conscientiousness and willpower than driving personal cars.

This research also finds that extraversion, neuroticism, agreeableness, and openness to experience cannot serve as reliable predictors of an individual's intention to switch from using private cars to using mass public transportation. This inability is caused by two opposing tendencies inherent in all personal traits which can either encourage or discourage an individual from using mass public transportation, so, given the right conditions, the scores can diminish each other to produce a zero correlation rate or absence of correlation. Our explanation for this phenomenon is offered in the following four paragraphs.

We previously argued that individuals with a higher degree of extraversion show a greater intention to switch from using private cars to using mass public transportation because their desire for experimentation and taking risks is stronger than those with a lower degree of extraversion. Besides that, they also possess a higher degree of resilience and ability to cope with the disorderly state of urban public transportation system. In spite of this, extraversion can also lead to an entirely different result, that is, it may *weaken* an individual's intention to switch from using private cars to using mass public transportation because they may still be able to socialize with other people and seek sensation by using private cars. In fact, individuals with high degree of extraversion can engage in social activities by using their private cars (Gadbois & Dugan, 2015), for instance, by joining communities of private car drivers in Jakarta and participating in various intra- and inter-community activities organized by those communities (Falah, 2013). With regards to sensation-seeking behavior, Clarke and Robertson (2005) through their meta-analysis found that extraversion is a generalizable predictor of traffic accidents. One of the explanations they offer is that extraverts tend to search for self-stimulation, to seek for excitement, to show a great interest in thrilling and novel experiences when driving, and to have a high exhaustion threshold and a low aggressiveness threshold when driving (Clarke & Robertson, 2005; Thørrisen, 2013). The last two factors encourage extraverts to achieve self-actualization through the use of private cars.

Neuroticism is found as an unhealthy precondition for driving private cars, and this is realized by individuals having such trait, which discourages them from driving private cars in the first place (Maquilón *et al*., 2010).

This may drive neurotics to show more preference for using public transportation to reach their respective destinations. However, LPT Gondar Mental Health Group (2014) asserts that one of the anxiety symptoms of neurotic individuals is their avoidance of using public transportation because they believe that this activity might instigate anxiety. Criminality is one of the most obvious factors of anxiety, while sexual harassment and violence in public vehicles are not unusual, with women as their primary victims. Jakarta is the fifth most unsafe city for female public transportation users (Cable, 2014). Neuroticism is also correlated with the number of car accidents and risky driving (Dahlen & White, 2006; Kirkcaldy & Furnham, 2000).

Agreeableness may encourage an individual to use mass public transportation because, for instance, agreeable individuals tend to prioritize the interests of the public in general. However, based on the list of specific traits of agreeableness included in our questionnaire, agreeableness is also marked by an ability to trust, to forgive, and to cooperate with other people. The next question is "Who are these other people?" This question is relevant because "people use information about patterns in people's reactions to particular situational features (if–then signatures) to judge the level of agreeableness (but not extraversion) of other people" (Kammrath, Mendoza-Denton & Mischel, as cited in Denissen & Penke, 2008, p. 1286), which bears some empirical validity with regards to this research. This idea also bears some similarity to the concept of descriptive social norm, which is an individual's perception of what is actually done by the majority of other people in a particular situation (Cialdini, 2007). Such norms may serve as social control. With regards to this research, this might imply that, if individuals with a high level of agreeableness live in a social environment in which the majority of people around them agree that private car is the most effective and beneficial mode of transportation, their high level of agreeableness will *strengthen* their intention *not* to switch from using private cars to using mass public transportation, instead of weakening it.

Openness to experience can encourage an individual with this personality trait to seek for novel and authentic experiences, including using mass public transportation. In addition to that, previous research also shows a positive correlation between openness to experience and pro-environmental behaviors, which include using mass public transportation; such correlation might be direct or mediated by environmental attitude and connectedness with nature (Markowitz *et al.*, 2012). The reason for this is because openness to experience is also marked by a high appreciation for aesthetics and, by implication, for natural environment, which leads individuals with this trait to preserve the environment. As a type of environmental problem, air pollution (and global warming as its macro consequence) which is caused by carbon emission is one of the most significant consequences of the increasing number and frequent use of private cars. In short, the use of private cars has led to the degradation of, or a very damaging consequence for, environmental ecology in the air (caused by the emission of formaldehyde and benzene into the air), in the water (caused by wastes from car manufacturing process), and in the earth (caused by oil and gasoline spills on roads) (Chapman, Petersen, & Smith-Moran, 2008). However, aesthetics appreciation, which is supported by kinesthetic dispositions toward driving—as one facet of openness to experience trait—might also lead to an entirely different consequence, that is, an increasing use of private cars (Sheller, 2003). What happens is that the kinesthetic dimension of openness to experience has facilitated an individual's intention towards mobility, which includes "feeling/emotion about driving" or "automotive emotions"; such intention is supported by the use of private cars.

Furthermore, when making our hypothesis, we argued that sedentary lifestyle may undergo generalization to various human psychomotor aspects, which include the intention to switch from using private cars to using mass public transportation. In this case, the intention tends to be negative, which means that sedentary individuals tend to maintain the habit of using private cars. This tendency is supported by urban lifestyle which places great emphasis on time efficiency, while walking to nearby bus stops or changing trains are considered as wasting time (Mulley, 2014). Nonetheless, we subsequently found that sedentary behavior cannot predict an individual's intention to switch from using private cars to using mass public transportation. This means that an individual's intention does not depend on whether they are physically active or sedentary.

Such conclusion might be drawn based on the possibility that sedentary behavior may also encourage an individual to use mass public transportation. This proposition might also be explained in psychological terms, in which an individual's intention to switch from using private cars to using mass public transportation can regarded as a kind of compensatory dynamics which works within each individual. This psychological mechanism works within a number of participants who feel that they have been constantly involved in too many sedentary activities (such as listening to lectures, doing course assignments, working on computers, or sitting for a long period of time) and think that they can restore their physical health by using mass public transportation. In fact, Davies and Swan (2015) recently demonstrate that using public transportation is healthier than using private vehicles. This psychological attitude can also be theoretically explained using the concept of compensatory health beliefs (CHBs), which are "beliefs that the negative effects of a volitional unhealthy (but pleasurable) behavior can be compensated by engaging in a healthy

behavior" (Knäuper, as cited in Radtke & Rackow, 2014, p. 12413). This concept asserts that individuals who wish to be healthy but find that they are actually too much involved in unhealthy behaviors (such as sedentary lifestyle) will undergo a cognitive dissonance. Activation of CHBs is an effective method to solve their cognitive dissonance because, by means of doing compensatory activities, they can live a healthier life without feeling overly guilty about keeping their sedentary lifestyle. Based on these arguments, we propose that the absence of predictive correlation between sedentary behaviors and intention to switch from using private cars to using mass public transportation may be caused by the contradictive effects that sedentary behavior exerts on different individuals.

There are four other findings which need to be discussed with regards to the interaction between personality traits and sedentary behavior in predicting an individual's intention to switch from using private cars to using mass public transportation. Firstly, we find an interaction effect between sedentary behavior and extraversion in predicting intention. It begins with the fact that the higher the levels of sedentariness and extraversion are, the weaker the intention *not* to switch from using private cars to using mass public transportation is. However, if the level of extraversion gets much higher, the intention *not* to switch from using private cars to using mass public transportation strengthens. Individuals with a high level of extraversion tend to be spontaneous, easygoing, and disrespectful to rules (Renner & Anderle, 2000). A combination between a high level of extraversion and a high level of sedentariness may trigger spontaneity and libertarian attitudes which favor emotional impulses, and such drives can be satisfied by simply sitting on and driving their own cars. This inclination help strengthens an individual's intention *not* to switch from using private cars to using mass public transportation. However, when the level of extraversion is not very high or moderate, the combination between this trait and sedentariness may conversely weaken the intention. In our opinion, this might happen because those moderate extraverts are not yet fully engrossed in their inclinations. In other words, they have not exceeded a certain threshold value (Lajunen, 2001, p. 1371), a point where their behavior starts to produce negative consequences. For instance, they can still realize that their inclination towards spontaneous and impulsive actions might endanger their lives, so they decide to avoid doing such actions. This is also supported by the fact that, at a macro-state level, there is a positive correlation between extraversion and traffic fatalities (Lajunen, 2001). Those extravert but sedentary individuals might maintain their habit of using private cars, but they might have also been interested in using mass public transportation in order to avoid psycho-logical situations which may entice them into doing risky actions while driving their cars.

Secondly, we find an interaction effect between sedentary behavior and agreeableness in predicting intention. The higher the levels of sedentariness and agreeableness are, the stronger the intention *not* to switch from using private cars to using mass public transportation is (the Beta-value of the intention to switch from using private cars to using mass public transportation is negative). This finding can be explained by combining the abovementioned explanations. Agreeable individuals who have been accustomed to sedentary lifestyle tend to have a stronger intention *not* to switch to using mass public transportation when they are faced with a descriptive norm which supports the use of private cars.

Thirdly, we find an interaction effect between sedentary behavior and neuroticism in predicting intention. The higher the levels of sedentariness and neuroticism are, the weaker the intention to switch from using private cars to using mass public transportation is. Neurotic individuals are prone to certain psychological symptoms, such as loss of control, difficulties in coping with stress, attentional bias, depression, threat exaggeration, and fear of "going crazy" (Di Pietro & Mosak, 2014; O'Connor, 2008; Shapiro, 1973). Such symptoms actually pose a considerable danger to neurotic participants who choose to drive their own cars because they might increase the potentials for accidents. It is therefore understandable that people with higher level of neuroticism tend to be more interested in using mass public transportation (the Beta-value of the intention to switch from using private cars to using mass public transportation is positive). In spite of that, the intention to switch to switch from using private cars to using mass public transportation might weaken in individuals with higher level of neuroticism when it is combined with a high level of sedentariness. Individuals with a high level of neuroticism tend to maintain the habit of using private cars when they are faced with a chaotic public transportation system which they believe may threaten their personal safety or security, because they might become victims of criminal acts in public vehicles or of reckless drivers. This proposition is supported by the fact that external situations may influence sedentary behaviors (Buckley, *et al.* 2014).

Fourthly, based on the comparisons among eight situations of personal dilemma—cross-personality and cross-sedentary lifestyle—, we found that the perceived losses in terms of time (reliability) and safety resulted from the use of private cars are more effective in strengthening the participants' intention to switch from using private cars to using mass public transportation than the perceived losses in terms of convenience and egotism. In fact, the participants, who are the students of several universities in Jakarta, are actually expecting public transportation modes which are less time-consuming and safer than their private cars. However, as shown by our data, the most effective factor which can encourage participants to switch from using private

cars to using mass public transportation is their perception of the losses and deficits resulted from the use of private cars. This leads to one of the most important contributions of this research. If cost can be analogized with punishment and benefit can be analogized with reward, we can safely say that this conclusion is in line with Pérez and Kiss (as cited in Kurniadi, *et al.* 2014) who state that "people are better in anticipating punishment compared to rewards" (p. 1823). Such perception of loss and anticipation of that loss may significantly contribute to strengthening an individual's motivation to change her/his habitual behaviors such as driving private cars. Based on this observation, public policy makers need to demonstrate to the general public that they are actually suffering great losses in terms of time and safety if they keep using their private cars. Needless to say, such campaigns need to be supported by retrospective (mathematical and statistical) data and must be carefully delivered to the public so as not to generate unwarranted misinterpretations or controversies. Safety-related losses may take the forms of accidents and criminal acts. For instance, if more and more people are adopting the same habit as the participants are (that is, the habit of using private cars), the whole population of Jakarta will inevitably suffer a collective loss in terms of safety. In that way, a personal dilemma then develops into a social dilemma. A report in Florida attributes the increasing number of car accidents to the increasing number of vehicles ("Car Accident", 2011).

Perceived loss in terms of time is needed to strengthen private car users' intention to switch to using mass public transportation. This statement is supported by the fact that there is a negative predictive correlation between conscientiousness and the intention to use public transportation. If there are some improvements in the mass public transportation system (in terms of schedule, for instance), it is highly probable that urban individuals with a high level of conscientiousness will be more willing to use mass public transportation as their primary mode of transportation. Based on his study of travel time cost, Litman (2009) concludes that "travel time unreliability (uncertainty how long a trip will take, and unexpected delays) imposes additional costs." (Litman, 2009, p. 5.2–3). These costs do not only consist of objective costs but also subjective costs, such as opportunity to relax or enjoy entertainment, which are incurred from the amount of time spent on waiting for public vehicles or on using private cars. Gains in terms of time can generally lead to gains in terms of mobility. Therefore, based on the findings of this research, public policy makers need to emphasize and demonstrate to the public the loss in terms of mobility resulted from the use of private cars, which can be done by taking two actions. Firstly, they need to offer reliable data (from which a Value of Travel Time (VTT) index is generated) and disseminate such findings through various campaigns on television, radio, and social media

and to present the VTT index as a proof of the actual disadvantages of using private cars. Besides that, they also need to demonstrate that loss in terms of urban mobility also means loss in terms of quality of life because mobility may serve as a powerful means by which an individual may actualize or utilize her/his potentials and resources; such potentials and resources will in turn bring about meaningful and beneficial effects for oneself and one's surrounding environment (Nuvolati, 2009).

We admit that this research has several limitations, so we would like to offer some suggestions for future studies. Our first suggestion concerns personal dilemma as one of the most important measurement instrument in this research. This research only includes eight situations of personal dilemma, which obviously does not cover all possible situations. New methods may be developed to incorporate more combinations of personal dilemma situations to better identify the psychical preference of Indonesians for certain aspects of personal dilemma situations which can be used as a critical input for designing a more sophisticated mass public transportation system. Furthermore, even though in "Methods" section we have explained the reasons why we decide not to perform manipulation check (by applying, for instance, difference test on various situational scenarios), we suggest that future researchers perform it in order to generate a stronger evidence of the presence of intersituational differences. In addition to that, future researchers might also need to perform a factor analysis on the variables of convenience and egotism in order to find out whether the three aspects of convenience (privacy, room for personal belongings, and protection against weather) and the two aspects of egotism (willingness to prioritize pedestrians or inclination to overtake other vehicles) can equally determine an individual's intention to switch from using personal cars to using mass public transportation. Secondly, we also suggest future researchers who want to carry out a more rigorous examination of the Big Five personality traits to utilize IPIP (International Personality Item Pool). This scale consists of 50 points which are categorized into several sub-factors of personality. Our third suggestion concerns our method for measuring an individual's intention to switch from using private cars to using mass public transportation. This method has not been able to generate precise quantitative information about distance (in meters or kilometers) and about travel time (in minutes or hours) even though qualitative information resulted from subjective comparisons (which are marked by comparatives such as "faster" or "slower") between using private cars and using mass public transportation has been amply presented. Besides that, an individual's intention to use private vehicles or to use mass public transportation can also be measured separately, either before or after presenting the scenarios of personal dilemma to the participants. By adopting

this approach, future researchers can measure not only the participants' intention to switch to mass public transportation, but also their intention to keep using private vehicles.

This research has several implications. Firstly, in spite of the fact that personality traits, as an inherent part of any individual, is difficult to change, an empirical finding which prove that conscientiousness plays a significant role in predicting an individual's intention to switch from using private cars to using mass public transportation should encourage public policy makers to take account of all positive aspects of conscientiousness when formulating policies on mass public transportation system, such as cleanliness, punctuality in terms of schedule or operational hours, and minimum air pollution. The government should also adopt conscientious practices within their own management system, in which anticorruption is an elemental aspect. Such actions might produce practical implications, especially among individuals with a high level of conscientiousness. With regards to individuals with a low level of conscientiousness, public policy makers should introduce some interventions in order to increase the citizens' level of conscientiousness in the form of educational practices. Such measures might need to be taken to strengthen the citizens' intention to switch from using private cars to using mass public transportation. Optimum level of conscientiousness is required to achieve this end, and public policy makers have to take into considerations all factors which have been explored above. More extensive research which covers a larger sample might be required to find out the predictive correlation between various levels of conscientiousness (very low, low, optimum, high, and very high) and an individual's intention to switch from using private cars to using mass public transportation or to keep using private vehicles.

Secondly, the absence of any predictive correlation between sedentary behavior and the intention to switch from using private cars to using mass public trans-portation gives a great hope that, in spite of the fact that modern urban citizens are prone to the allure of sedentary lifestyle, those people can still be persuaded to switch from using private cars to using mass public transportation. Such possibility exists because this present study has proven that sedentariness does not always show a consistent correlation with an individual's intention to maintain the habit of using private cars. Public policy makers can, for instance, campaign for and instill compensatory health beliefs (CHBs) into their citizens as a means of directing them towards a more positive and healthy lifestyle. This campaign, of course, must be supported by developing an urban transportation system which can truly reflect and promote the CHBs. Thirdly, the practical implications resulted from the perceived losses in terms of time and safety for people's intention to switch from using

private cars to using mass public transportation must be taken into account by public policy makers when designing and conducting their campaigns.

4. Conclusions

This research concludes that there are two general types of dynamic factors which can serve as predictors of the intention of a group of university students in Jakarta and its surrounding areas to switch from using private cars to using mass public transportation: subjective and objective factors, even though we oftentimes cannot draw a definite line between those groups of factors. Subjective factors include (1) personality traits, especially conscientiousness which has been proven to play a great role in predicting the participants' inclination towards the negative aspect of their intention and (2) personal dilemma in the form of the participants' perception of the gains and losses resulted from each given scenario in which they are involved. A more objective factor is sedentariness or, conversely, the use of physical energy. To measure the participants' level of sedentariness, we use a more subjective method of self-report, not a more objective instrument such as an accelerometer. Such "more objective" instruments can generate exact information in the form of figures as the suitable responses to quantitative questions such as "how many days" or "how much time" which significantly reduce the multi-interpretative nature of the data. The phrase "more objective" here is used to describe a method which can generate non-perceptual or non-interpretative responses or data from the participants, whereas our personality trait questionnaire requires some degree of perception and interpretation on the part of the researchers.

More careful examination of statistical findings reveals that differing levels of most personality traits may produce opposing effects which might contribute to the absence of predictive correlation between the traits themselves and an individual's intention to switch from using private cars to using mass public transportation. This means that, given the right condition, both personality traits and sedentary behavior can strengthen or weaken an individual's intention. However, interactions between several personality traits (extraversion, agree-ableness, and neuroticism) and sedentary behavior produce various unique configurations in terms of their ability to predict an individual's intention to switch from using private cars to using mass public transportation. A number of theoretical explanations have been offered to account for those interactions. Such findings may help expand our knowledge on the psychological aspects of vehicle use and may serve as inputs for public policy makers on performing a cognitive-emotive-behavioral manipulation in an effort to strengthen citizens' intention to switch from using private cars and to increase the favorability of mass public transportation over private vehicles.

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