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Impact of Different Stakeholders of Bike-Sharing Industry on Users' Intention of Civilized Use of Bike-Sharing

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Abstract: It is important to put forward effective regulations since bike-sharing has both positive and negative impacts on sustainable development. This study distinguishes four stakeholders of the bike-sharing industry; these are bike-sharing companies, the public, the media, and government. A research model is proposed based on the Stimulus–Organism–Response framework to explore the impact of these four stakeholders on users' intention of civilized use. The model was tested using 250 questionnaires collected from an online survey. The results demonstrate the importance of user-interface (UI) design, social influence, and new media in affecting users' awareness of and attitude towards uncivilized behaviors, which in turn improve their intention of civilized use. The study also clarifies the moderation effect of firm and government controls on the relationship among different variables in the model.

Keywords: UI design; social influence; media communication; control mechanisms; intention of civilized use

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1. Introduction

> *There are nine million bicycles in Beijing, that's a fact.*
>
> *It's a thing we can't deny, like the fact that I will love you till I die.*
>
> —Katie Melua, nine million bicycles

The lyrics above partially reflects people's complex feeling towards bike-sharing with love and hate. Bike-sharing indeed brings us some great benefits and helps create a new sort of living and even a new sort of thinking [1,2]. For example, bike-sharing enhances users' likelihood to ride [3]. This reduces unnecessary public transportation rides, releases the extension of traffic jam, and decreases pollution discharge [4,5]. However, the significant growth of bike-sharing also brings forth several troubles, most of which are under the umbrella of users' uncivilized use of bike-sharing. *Uncivilized use of bike-sharing* means riding behaviors that violate relevant regulation and social norms because of absence of public morality. For example, many users park bicycles in restricted areas, damage bicycles, and use their own locks to occupy bicycles to exclude others from using the bicycles. Then, a question comes to our mind: should we abandon bike-sharing just because of the troubles? The answer probably should be not. Bike-sharing is an emerging artifact and it deserves our time to explore how to strengthen its management and encourage users to ride bike-sharing properly [6].

Past literature shows a consensus concerning the necessity of the involvement of different stakeholders in regulating the sharing economy. Miller [7] argues that each of diverse parties

should be considered in establishing a regulatory response. Unclear responsibility between different market participants is one element that prohibits the development of sharing economy [8]. Past literature also demonstrates the importance of collaboration between government, the public, media, and bike-sharing companies in the regulation of bike-sharing scheme. Ricci [9] mentioned that partnership working and continuing involvement of stakeholders and local communities serve as facilitators of bike-sharing scheme, and clear political, policy, and public support play an important role in sustaining bike-sharing scheme. Zhang et al. [10] demonstrated that government participation and bike-sharing firms' investment in operation management play an important role in the sustainable development of bike-sharing industry. Purtik and Arenas [1] also proposes the importance of formal and informal collaboration with the public sector and civil society in the development process of bike-sharing. Recently, Lan et al. [11] said that bike-sharing services rely on public resources such as parking places and road resources, and thereafter we should clarify the different roles of stakeholders for a better development of the industry. They viewed this the co-create value of the bike-sharing industry. However, past research just proposed some sparse suggestions on how to enhance the management of sharing economy from different perspectives. There is a lack of research that systematically explores the roles of different stakeholders in the management of sharing economy.

This study takes bike-sharing users as the start point and tries to bridge the gap mentioned above by proposing four stakeholders of bike-sharing industry, bike-sharing companies, the public, the media, and government, and exploring their impacts on users' intention of civilized use of bike-sharing. Based on the Stimulus–Organism–Response (SOR) framework, we use user-interface (UI) design, social influence, traditional media, new media, government controls, and firm controls to reflect the roles of different stakeholders. These variables serve as stimulus that will affect users' awareness of and attitude towards uncivilized use of bike-sharing, which in turn improve their intention of civilized use of bike-sharing.

Mobile applications of bike-sharing companies are the main approach for users to rent bike-sharing and interact with the companies. Bike-sharing companies should upgrade UI design to enhance users' perceived responsibility and thereafter improve users' intention of civilized use of bike-sharing [12]. Moreover, the public can exert influence on bike-sharing users because we are social beings and our perceptions and behaviors will be affected by important others, which is defined as social influence [13]. In addition, the media, including traditional media and new media, are important channels that will affect audiences' awareness of and attitudes towards uncivilized behaviors, which in turn impact their riding behaviors [14,15]. Bike-sharing companies and government can also launch control mechanisms to regulate users' behaviors. Considering the management practice of bike-sharing industry, there are mainly three categories of firm controls: credit, reward, and punishment. *Credit mechanism* means that bike-sharing companies will evaluate users' riding behaviors and give each of them a credit score, which is connected to the price of riding [16]. Users with low credit scores will pay a higher price, and the account is frozen if the user's credit is lower than a threshold. *Reward mechanism* means that bike-sharing firms would give price concessions or discounts to users who always use bike-sharing in a civilized way [17]. *Punishment mechanism* means that firms will punish users' uncivilized riding behaviors in terms of fine or accountability [18]. *Government control* refers to norms, regulations, and policies developed by the government, such as dividing parking lots for the bikes, limiting bike number, and introducing regulations to regulate the development of bike-sharing industry [19]. This study also explores the moderation effect of these control mechanisms.

Bike-sharing is an emerging artifact, and some ethic problems appear companied with the savage expansion of bike-sharing. However, the government lacks relevant management experience while bike-sharing firms do not have the motivation to stringent regulation because they are in the stage of seizing market shares. It is of great importance to conduct research on how to encourage consumers to use bike-sharing properly. This study suggests that managers should pay attention to UI design, social influence, and new media communication to encourage users to ride the bikes properly. In addition, the results demonstrate that firm and government controls affect users' intention

of civilized use of bike-sharing in different approaches. Firm control can directly improve users' awareness of uncivilized behavior and intention of civilized use while government control does not. The impact of government controls embodies in strengthening the relationship between awareness and attitude and between awareness and intention. This suggests that bike-sharing companies and government should cooperate to maximize the impact of control mechanisms.

The rest of the paper is organized as follows. The literature review is presented first. Then hypotheses are developed, and the methodology is explained. Finally, the results, and both academic and practical implications are discussed.

2. Literature Review

2.1. Bike-Sharing

Bike-sharing refers to bicycle rent services provided by different companies. The companies will put bicycles in public areas such as campuses, residential communities, subway stations, business districts, and bus stations. Bike-sharing services are separated into two modes, dock and dock-less bike-sharing, based on whether users need to rent and return bicycles in docking stations. This study focuses on dock-less bike-sharing, which is "a bike rental service with no docking stations; rather, each bike contains a microchip that enables the unit to be located anywhere within the cities' government-planned bike parking areas using a mobile phone-based app" [11].

Dock and dock-less bike-sharing are different in several aspects.

First, they use different technologies to rent and return bicycles. Dock bike-sharing stations are usually equipped with terminals, also termed "kiosks" [9]. Citizens need to apply for smart cards issued by service operator, and then they can rent and return bicycles through scanning their smart cards using radio-frequency identification (RFID) in the "kiosks" [9]. However, dock-less bike sharing users just need to download the applications of dock-less bike-sharing companies and rent bicycles by scanning the Quick Response (QR) code on bicycles. Users just need to lock bicycles to return them, and the applications will charge users' accounts to finish payments.

Second, users need to rent dock bikes from docking stations near their place of departure and return bicycles to dock stations near their destinations. However, users can open mobile applications to locate nearby dock-less bikes and rent bikes there. Users can rent dock-less bikes anywhere there is a bike and return bicycles anywhere by locking the bicycles [11].

Third, there is usually one organization or local government that operates dock bike-sharing service in a city. Thus, users cannot use the service if the organization or local government frozen their accounts because of uncivilized behaviors. However, there are many companies that provide dock-less bike-sharing service, and these companies do not share operation information. It is easy for users to transfer from one company to another if one company frozen their accounts. Also because of this, dock-less bike-sharing companies do not have the motivation to punish users who perform uncivilized behaviors.

Fourth, interaction mode between users and bike-sharing companies is different. For dock bike-sharing scheme, users get information, view the local and overall station network map, communicate with customer service, and in some cases make payment for use through 'kiosks' [9]. The interaction mode is 1-to-N, which means one terminal serves multiple users. For dock-less bike-sharing scheme, consumers use their application accounts to interact with companies. The interaction mode is 1-to-1, which means one account serves one user. This allows companies to convey more information to users and influence their riding behaviors.

The difference between dock and dock-less bike-sharing lead to different challenge and opportunity in regulation. However, past literature mainly focuses on dock bike-sharing while neglecting dock-less bike-sharing. Research on dock-less bike-sharing is still in the initial stage, and our understanding of dock-less bike-sharing is still limited [20]. This study focuses on dock-less bike-sharing, and hereafter refer bike-sharing to represent dock-less bike-sharing.

2.2. Challenges of Bike-Sharing Scheme

Bike-sharing scheme is offering several important benefits. First, bike-sharing enhances users' likelihood to ride and reduces unnecessary public transportation rides, releasing the extension of traffic jam [3]. Second, bike-sharing is environmental friendly and helps decrease emission of CO_2 and pollution discharge [5,9]. Bike-sharing will foster users to ride bicycles and reduce their frequency of using other transportation approaches such as taxis and private vehicles [4,21]. The decreasing in vehicle usage will reduce the consumption of fossil fuels and release environmental pollution. Third, bike-sharing usage will have positive impact on riders' health since it means more exercise.

However, many challenges are questioning the sustainability of this new business model.

First, bike-sharing companies should keep attracting potential users and maintain current users to guarantee cash flow. Some researchers explore factors affecting consumers' use of bike-sharing. Fishman et al. [22] adopt the content analysis approach and propose that a more accessible, spontaneous sign-up process and greater incentives can encourage more people to use bike-sharing. Efthymiou et al. [23] focus on personal characteristics and find that income, age and environment conscious influence people's intention to use. Zhang et al. [24] summarized 30 items to measure user satisfaction towards bike-sharing scheme and found that perceived satisfaction is an important antecedent of public bike-sharing usage.

Second, bike-sharing companies should optimize the deployment of bike-sharing. This helps fully utilize the limited number of bike-sharing and serve citizens better. In addition, there exists a tidal phenomenon of bike sharing usage. For example, users will ride bicycles to subway stations in the morning and ride them back to residential communities in the night. This leads to the unbalanced distribution of public bicycles and reduces consumers' use experience. Some researchers try to solve these problems using operations research models. For example, some studies explore how to optimize the deployment of bike-sharing [25,26]. Some others try to propose mathematical models to rebalance bicycles in different sites and release the tidal phenomenon [2,27,28].

Third, uncivilized use of bike-sharing may trouble citizens and the society, which will foster the government to restrict the number of public bicycles and thereafter impede the development of bike-sharing scheme. However, there is serious shortage of research on how to regulate users of bike-sharing. This is not good for healthy development of bike-sharing industry. It deserves our attention to explore factors affecting users' intention of civilized use.

As proposed in the report of Global Development of Bike-Sharing Scheme, ofo and Mobike are top two bike-sharing firms in China, and they comprise 90% of the market share. Recently, Hellobike moves up to the third place of China bike-sharing industry with help of investment from Alibaba. Chinese dock-less bike-sharing scheme proceeds to the condition of three tripartite confrontation [29]. This study summarizes five categories of uncivilized behaviors in using bike-sharing based on practice of top bike-sharing companies (Table 1).

First, the category of damaging the bikes includes behaviors that will cause damage to bicycles. It includes two types of behaviors: first, some individuals deliberately damage necessary parts of bicycles such as seat, pedal, and chain; and second, some others deliberately damage whole bicycle by throwing it from upstairs or throwing it into river, etc.

Second, the category of possessing the bike privately refers to behaviors that individuals conducted for the purpose of exclusive use of bicycles. Some people lock public bicycles using their own locks; some others do not lock the bicycles after use and take them to their apartments or even put them in their car boots. Then, only they can ride those bicycles.

Third, the category of parking in wrong places is ubiquitous because dock-less bike-sharing will stop billing after users lock the bicycles and users can park bicycles anywhere that is convenient for them. Wrong parking places include junctions, sidewalk, and blind lanes where bicycles will disrupt public traffic and private places and underground garages where it is not easy for other users to find the bicycles.

Table 1. Uncivilized behaviors in using bike-sharing.

Categories of Uncivilized Behaviors	ofo	Mobike	Hellobike
Damaging the bikes: Damaging bike numbers, seats and other parts deliberately.	√	√	
Possessing the bikes privately: Locking the bikes privately, damaging public locks, and other behaviors aimed at using only by fixed persons.	√	√	√
Parking in wrong places: Parking the bikes at junctions, sidewalk and other places where bikes will disrupt public traffic.	√	√	√
Lacking of safety awareness: Children under 12 years old ride the bikes, parents put their children in the baskets and other behaviors which can threaten users' security.	√	√	√
Harming others' interests: Replacing false QR codes to gain illegal profits, putting needles on bike seats and other behaviors which will harm others' bodies and interests.		√	

Note: "√" means that the bike-sharing firm embodies the relevant uncivilized behavior in its regulation.

Fourth, the category of lacking safety awareness refers to behaviors that may cause harm to themselves and their children. For example, some parents allow their children to use their mobile application accounts to open bicycles although children under 12 are not allowed to use bike-sharing in China. Some parents even let their young children sit in bicycle carriers when they ride bike-sharing.

Fifth, the category of harming others' interests is serious and may violate criminal law. For example, some people will use their own QR codes to cover original codes on bicycles. When users scan the codes, they will pay money or reveal private information to those criminals. Some people put needles in the seat of bicycles that will harm next user.

2.3. Stimulus–Organism–Response Framework

This study adopts the Stimulus-Organism-Response (SOR) framework to explore factors affecting users' intention of civilized use. The SOR framework was proposed by Mehrabian and Russell in 1974. In this framework, *stimulus* is the influence or cues from external environment; *organism* refers to individual's internal cognitions and emotions; *response* means individual's feedback and behaviors influenced by external stimulus and internal organism [30]. According to the framework, individuals will be exposed to stimulus from external environment, which will affect their organism and foster them to take actions as responses to the stimulus. The popularity of the framework is attributed, at least partially, to flexible scope of stimulus, organism, and response. Mehrabian and Russell [30] suggest that researchers should select variables to represent stimulus, organism, and response based on their research questions and context.

Stakeholders serve as external environmental elements that will affect user behaviors. This study first summarizes stakeholders of bike-sharing industry. Ricci [9] reviewed past literature on bike-sharing scheme and proposed several factors affecting the sustainability of bike-sharing scheme. It mentioned that partnership working and continuing involvement of stakeholders and local communities serve as facilitators of bike-sharing scheme, and clear political, policy, and public support play an important role in sustaining bike-sharing scheme. Midgley [31] and Shaheen et al. [32] said that bike-sharing scheme includes operators such as local government, public transport agencies, and for-profit and non-profit groups. Zhang et al. [10] explored the characteristics and commonalities of different bike-sharing systems in China and demonstrated the importance of government participation in the development of bike-sharing industry. They also mentioned that private companies are the main stakeholder of bike-sharing industry and it should invest in infrastructure and bicycles, system operation, and day-to-day operations management. In addition, the development of bicycle rental system involved formal and informal collaborations with the public sector and civil society [1]. This is because individuals tend to obey social norm and the public can exert social influence on bike-sharing

users [22]. Observing important others performing a behavior will increase the possibility of that person to perform the behavior himself or herself. Recently, Lan et al. [11] mentioned that business, social, and government organizations should work together to achieve a more sustainable sharing business and society. Thus, government, bike-sharing companies, and the public are three stakeholders of the industry. Moreover, Zanotto [33] demonstrated that information of bike-sharing disclosed in new media helps shape public opinion in bike-sharing scheme, and it will affect citizens' attitude towards the bike-sharing scheme. Traditional media is also an important channel to communicate information to the audience and affect their behaviors [15]. Thus, media, including traditional media and new media, is another stakeholder that can affect citizens' behaviors.

These four stakeholders, government, bike-sharing companies, the public, and the media, serve as stimulus that will affect users' psychological factors such as awareness of and negative attitude towards uncivilized behaviors and thereafter affect their behaviors. Past literature has paid attention to the impact of different psychological factors in changing behaviors of bike-sharing users [34]. Berthoû [35] noted that users' attitude towards bike-sharing will lead to a change in their riding behaviors. Kim et al. [36] found that awareness of positive consequences of bike-sharing in perspectives of environment, congestion, health, and travel costs will encourage users to use bike-sharing. Ahillen et al. [37] suggested that news, blog posts, and advertising will provide exposure to bike-sharing scheme, increase consumers' awareness of the program, and thereafter change their riding behaviors.

3. Research Model and Hypotheses

A research model was proposed based on the SOR framework (Figure 1). According to the model, UI design, social influence, traditional media communication, new media communication, firm control and government control serve as stimulus that bike-sharing users receive from stakeholders in external environment and are anticipated to affect their awareness of and attitude toward uncivilized use of bike-sharing. Awareness and attitude each have a positive relationship with users' intention of civilized use. Firm and government controls can not only influence users' awareness and attitude directly, but also moderate the relationship between awareness and attitude, between awareness and intension, and between attitude and intention. In the following section, we briefly explained each variable in the research model.
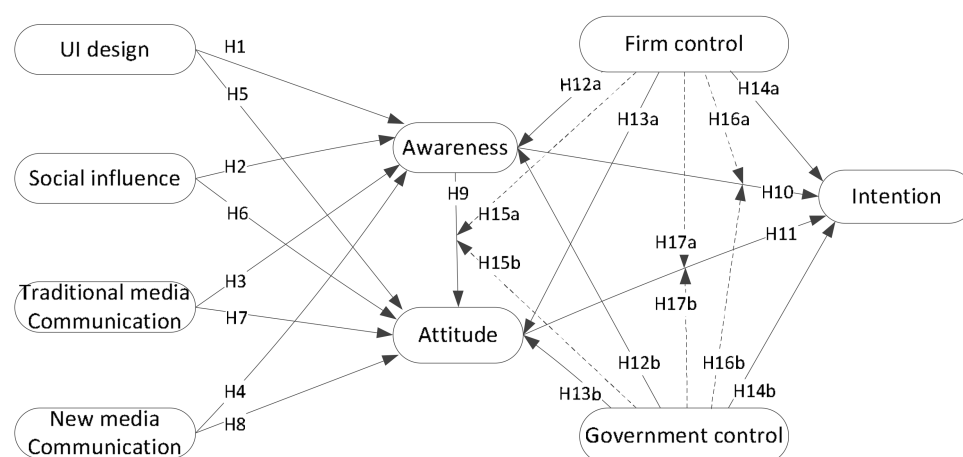

Figure 1. Conceptual Model. Awareness means awareness of uncivilized use; Attitude means attitude towards uncivilized use; Intention means intention of civilized use; Solid line means direct effect; dotted line means moderating effect.

Stimulus. This study focuses on four stakeholders, which are bike-sharing companies, the public, the media, and the government, and explores how different stakeholders of the industry affect users' intention of civilized use. Six elements were proposed to represent the impact of these four stakeholders,

with UI design and firm controls for companies, social influence for the public, traditional media and new media communication for the media, and government controls for the government.

UI design refers to the quality of user-interface design of bike-sharing applications [38]. Firms can enhance users' perceived responsibility and reduce violation intention by showing identifiability, expectation of evaluation, awareness of monitoring, and social presence in UI design [12,39]. Similarly, bike-sharing companies should consider how to enhance their UI design to improve their users' perceived responsibility and thus promote their civilized use of bike-sharing.

Social influence means that our behaviors will be affected by important others [13]. Important others include but not limit to friends, colleagues, or experts in a certain area [40]. The presence of social influence links individuals to the society and surrounding environment.

Media communication refers to communications about bike-sharing that aims to criticize uncivilized use and encourage civilized use [41]. Media is an important channel that is used to convey information to audience and is believed to affect attitude and behavior of audience. There are mainly two categories of media, which are traditional media (e.g., TV, radio, newspaper, and magazines) and new media (e.g., social media).

Controls. Apart from the four factors mentioned above, bike-sharing companies and government can exert external controls to regulate behaviors of bike-sharing users. Bike-sharing companies may take three types of control mechanisms: credit, reward, and punishment. These mechanisms help build a better transaction environment in the bike-sharing industry and encourage users to obey behavior norms [42,43]. In addition, government control has been proved to affect users' behaviors and promote healthy development of bike-sharing industry [44–46].

Organism. Human beings are social animals, and our inner cognition and emotional judgment of uncivilized behaviors are affected by information received and social norms [47]. This study uses awareness of and attitude towards uncivilized behaviors to represent organism. *Awareness of uncivilized behavior* is individuals' inner cognition of uncivilized behaviors [48]. *Attitude towards uncivilized behavior* refers to individuals' emotion towards uncivilized behaviors [49]. When bike-sharing users are exposed to external stimulus, they will make emotional judgments and form awareness of and attitudes toward uncivilized riding behaviors, which can affect their behavior intention [50].

Response. It is useful to take behavioral intention as dependent variable since behavioral intention is the main determinants of human behavior [51]. This study takes intention of civilized use as response factor since our final goal is to lighten uncivilized riding problems we meet in real life and improve users' intention of civilized use.

3.1. Antecedents of Awareness of Uncivilized Behaviors

Mobile applications of bike-sharing companies are the primary tools for users to interact with those companies. Companies can enhance their design of user-interface to increase users' awareness of uncivilized riding behaviors. For example, bike-sharing companies may show some notices to let users know what uncivilized riding behaviors are. This helps users aware of uncivilized behaviors. A good UI design can also make users realize that their behaviors can be traced back and thereafter they should be responsible for their bad behaviors [12,39]. This improves users' perceived responsibility. People who have a higher level of responsibility always have a stronger awareness of bad behaviors [52]. Thus, enhanced UI design will convey relevant information more efficient and improve users' perceived responsibility and thereafter increases users' need for forming a higher level of awareness of uncivilized riding behaviors.

H1. *UI design positively affects users' awareness of uncivilized behaviors.*

The public especially who are important to bike-sharing users is an important element of social environment around them. What important others do have a significant influence on their cognition and behavior [13,40]. If important others ride the bikes properly, users are more likely to realize that opposite behaviors are uncivilized. If important others also perform uncivilized riding

behaviors, users are less likely to consider these behaviors uncivilized. Users also exchange ideas with surrounding people, and this process helps users form criteria of judging right or wrong and thereafter influences their awareness of uncivilized behaviors [53,54]. Thus,

H2. *Social influence positively affects users' awareness of uncivilized behaviors.*

Individuals form awareness about one thing after getting exposed to information about it [55]. Traditional media mainly includes newspaper, television, radio and other printing and video media that has a long history and has already developed maturely, while new media refers to digital media, specifically interactive media and social media [56]. New media's influence has expanded fast because of its capability to offer the audience various forms and places to express their feelings [57]. New media also makes it easy for users to build connections and exchange ideas in an interactive approach [58]. This makes new media an important channel for information dissemination that has larger coverage and attracts more audience compared with traditional media. Although new media grows fast, traditional media is still an effective channel of information communication and has a significant influence on receivers' awareness of certain behaviors [15]. The media is anticipated to propagate right things while criticizing wrong ones. For example, the media can influence smokers' awareness of the danger of smoking [59]. When it comes to bike-sharing context, it is anticipated that traditional and new media communication tends to criticize uncivilized riding behaviors and exhibit serious outcomes of these uncivilized behaviors. This helps increase users' awareness of uncivilized riding behaviors.

H3. *Traditional media communication positively affects users' awareness of uncivilized behaviors.*

H4. *New media communication positively affects users' awareness of uncivilized behaviors.*

3.2. Antecedents of Attitude towards Uncivilized Use

A good UI design will cue users that their behaviors are recorded and traceable [12,39]. This demonstrates that users' uncivilized behaviors can be distinguished. Thus, enhanced UI design will boost users' perceived risk of performing uncivilized behavior. Perceived risk can influence individuals' attitude towards the behavior [60]. When users perceive the risk of getting distinguished if they ride the bikes inappropriately, they will be more likely to form a negative attitude towards uncivilized riding behaviors.

H5. *UI design positively affects users' negative attitude towards uncivilized behaviors.*

The opinion and behaviors of important others influence our emotion tendencies and change our attitudes towards an artifact [13]. Important others can serve as good examples and persuade us to perform as the public expects and thereafter influence our attitudes [61]. Thus, if important others use bike-sharing in a civilized and friendly approach, they can serve as good examples and encourage us to form a negative attitude towards uncivilized behavior.

H6. *Social influence positively affects users' negative attitude towards uncivilized behaviors.*

Individual forms new attitude by integrating former attitude with information he or she receives [62]. Traditional media is an indispensable information channel that helps audiences update and even their attitude [63]. New media has also become an important information channel that will affect the knowledge structure and attitude of audience because the interactivity of new media communication and the user-generated content in new media [64]. Thus, traditional and new media serve as important information sources and will help audience form attitude accepted generally by the society. In addition, when the consequences of uncivilized riding behaviors are disseminated through media, there will be a heated discussion and a fierce criticism towards the uncivilized behavior. This fierce criticism facilitates bike-sharing users form a negative attitude towards uncivilized riding behaviors [65].

H7. *Traditional media communication positively affects users' negative attitude towards uncivilized behaviors.*

H8. *New media communication positively affects users' negative attitude towards uncivilized behaviors.*

Strong awareness of something usually means deep understanding of it, and the objective of creating awareness to uncivilized behavior is to make users realize risks of performing the behaviors and their responsibilities concerning the behaviors [48]. They will have negative attitude towards the behaviors if those behaviors have serious results, especially when they are immersed in the thing [66,67]. For example, people with strong awareness of environmental pollution and destruction tend to have a stronger protection attitude and be more environmental friendly [68,69]. Also, the awareness of uncivilized behaviors and their harm will encourage users to take actions to against the happening of those behaviors [70]. When it comes to the bike-sharing context, the uncivilized riding behaviors happen just around us and bring troubles that really bother us, such as parking the bikes disorderly. Users with strong awareness have a clear understanding to the cause and results of these problems, so they are more likely to form a negative attitude towards uncivilized riding behavior and riding the bikes properly.

H9. *Users' awareness of uncivilized behaviors positively affects their negative attitude towards uncivilized behaviors.*

H10. *Users' awareness of uncivilized behaviors positively affects their behavior intention of civilized use of bike-sharing.*

Past literature well supports the impact of attitude on behavioral intention [71,72]. The relationship is also supported by the theory of planned behavior [50]. People's attitude towards uncivilized riding behaviors can affect their behavioral intention because individuals prefer to perform behaviors they love and avoid performing behaviors they hate. If users have a negative attitude toward uncivilized riding behaviors, they will be more likely to ride the bikes in a civilized way.

H11. *Users' attitude towards uncivilized behavior positively affects their behavior intention of civilized use of bike-sharing.*

3.3. Direct Influence of Firm and Government Controls

In this paper, the control measures are mainly divided into two categories: firm control and government control, which are the rules, regulations, reward and punishment provided by the government and firms for all users. These control mechanisms include both education and regulation approaches and meanwhile use both reward and punishment regulation to encourage users to comply with those regulation [73]. When bike-sharing companies and the government implements a certain policy, they send users a signal that compliance with the policy is expected [74]. Also, the control mechanisms usually reflect social norm of the public. For example, the public hates uncivilized riding behavior while hopes that everyone can ride the bikes in a civilized approach. Thus, it is an effective management tool that can be used to guide employees to know what is—and what is not—appropriate behavior, and hence helps users aware of uncivilized behaviors and form attitude that meets social norm of the public [47,75].

H12a. *Firm control positively affects users' awareness of uncivilized behaviors.*

H12b. *Government control positively affects users' awareness of uncivilized behaviors.*

H13a. *Firm control positively affects users' attitude towards uncivilized behaviors.*

H13b. *Government control positively affects users' attitude towards uncivilized behaviors.*

External controls reflect an organization's or the government's requirements or constraints on citizen behavior, facilitating citizens' goal-related activities and impact their behavior [76,77]. Posey et al. [78] viewed these activities as policy-driven actions. When it comes to bike-sharing behavior, users will reduce uncivilized behaviors and decrease violation intentions to avoid punishment. At the

same time, they will adopt more behaviors of civilized use to get rewards [42]. Lan et al. [11] mentioned that anticipated awards will help achieve more civilized use behaviors. Users tend to chase rewards while avoiding punishment when there are strict external controls. Thus, we anticipate that:

H14a. *Firm control positively affects users' behavior intention of civilized use.*

H14b. *Government control positively affects users' behavior intention of civilized use.*

3.4. Moderation Effect of Firm and Government Controls

Users' awareness of uncivilized behavior enhances their negative attitude through improving their perception of serious results and risks related to those uncivilized behaviors [48,67]. Also, the awareness of uncivilized behaviors and their harm will encourage users to take actions to against the happening of those behaviors [70]. External controls can influence these relationships. Control mechanisms use both reward and punishment regulations to encourage users to comply with those regulations [73]. When the level of firm and government controls are high, users will perceive that bike-sharing companies and the government are serious in punishing uncivilized riding behaviors, strengthening their perceptions on risks and serious results of uncivilized riding behaviors. Also, the level of external controls will have a positive impact on their tendency to avoid punishment and getting rewards and thereafter fosters their intention to ride the bikes in a civilized approach [79,80]. Thus, the level of external controls will positively moderate the impact of awareness on users' negative attitude toward uncivilized behavior and on their intention of civilized use.

H15a. *Firm control positively moderates the relationship between users' awareness of and attitude towards uncivilized behaviors.*

H15b. *Government control positively moderates the relationship between users' awareness of and attitude towards uncivilized behaviors.*

H16a. *Firm control positively moderates the relationship between users' awareness of uncivilized behaviors and behavior intention of civilized use.*

H16b. *Government control positively moderates the relationship between users' awareness of uncivilized behavior and behavior intention of civilized use.*

External controls have long been used as a moderator in individual behavior research [81,82]. When users hate uncivilized behaviors, they will tend to eliminate or avoid conducting such behaviors. However, this effect will be decreased if there are many people who conduct uncivilized behaviors. This may inhibit the positive impact of users' negative attitude toward uncivilized behavior on their intention to ride the bikes in civilized approaches. Firm and government controls aims to provide a strict external environment and constrain users' behaviors by offering rewards and punishments [83], which can prevent this from happening. Meanwhile, the intention to obey social norm serves as the main motivation for users to use bike-sharing in a civilized way after they have formed negative attitude towards uncivilized behaviors at first. Strict firm and government controls serve as another motivation to behavior well and thereafter strengthen the positive relationship between negative attitude towards uncivilized behaviors and users' intention of civilized use of bike-sharing.

H17a. *Firm control positively moderates the relationship between users' attitude towards uncivilized behavior and behavior intention of civilized use.*

H17b. *Government control positively moderates the relationship between users' attitude towards uncivilized behavior and behavior intention of civilized use.*

4. Methodology

4.1. Research Object

The public bicycling starts late in China compared with western countries. However, the fast popularization of dock-less bike-sharing helps China surpass other countries and opens a new market for bicycling industry [29]. This study uses Beijing as the research object. Beijing is the capital of People's Republic of China and the center of economic, politics, and culture of China [10]. It is also the world's second most populous city and the most populous capital city. Beijing locates in northern China and is surrounded by Hebei Province. Beijing suffers from heavy traffic jam in the city center because of the large number of private vehicles. Heavy pollution accompanies with the fast development of economy in Beijing. It is reported that the number of days that fail to meet the air quality requirement is 168 days in 2016. As an environmental friendly travel mode, bike-sharing scheme meets the expectation of citizens and Beijing municipal government to reduce pollutant emission. Bike-sharing scheme expands fast in Beijing after 2016. There is no official data source that regularly announces the number of bike-sharing in Beijing. However, some mainstream media in China will report the number from time to time. This study compiles those numbers as summarized in Figure 2. As mentioned before, ofo, Mobike, and Hellobike are the top three bike-sharing schemes in China and comprise most part of the market share. This study summarizes some of their basic characteristics (Table 2).
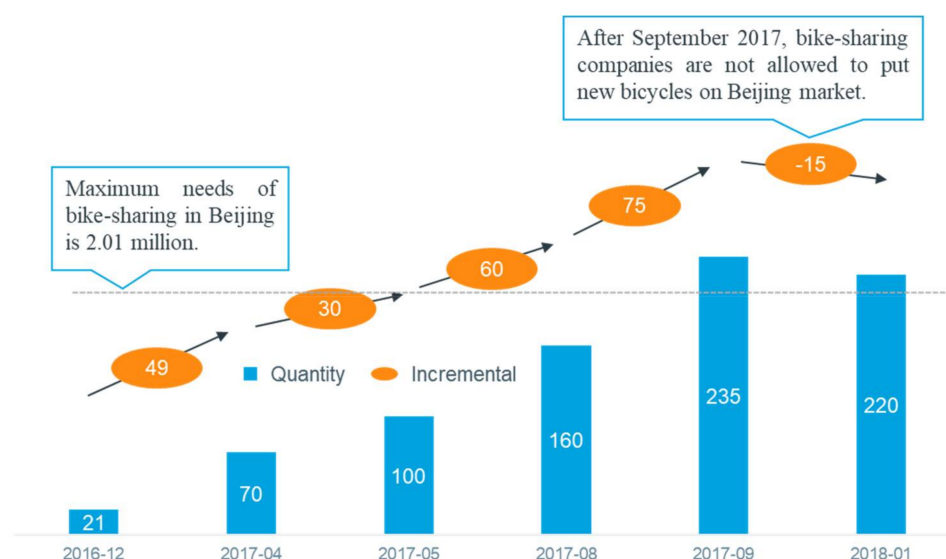

Figure 2. Number of Bike-Sharing in Beijing (unit: 10 k).

According to statistics from the Beijing Municipal Commission of Transport, there are 2.35 million bikes, nearly 11 million registered users, and about 7 million ridings every day in Beijing in September 2017. In September 2017, Beijing Municipal Commission of Transport issued a ban on sharing bicycles, according to which bike-sharing companies are not allowed to put new bicycles on the Beijing market. This ban helps reduce the number of bike-sharing in Beijing reduced to 2,200,000 in January 2018. This number is still above 2,010,000, the maximum needs of bike-sharing in Beijing as estimated by Beijing Municipal Institute of City Planning & Design. Companied with the savage growth of dock-less bike-sharing scheme, there exists negative effects of bike-sharing as summarized in Table 1. According to the 2017 Q1 report on bike-sharing of the research institute of Ministry of Transport of the People's Republic of China, Beijing ranked the second last among the twenty selected cities in performance of civilized riding behavior. It is of great practical importance to explore how to encourage users to ride the bikes in a civilized approach. The situation in Beijing also provides fertile background that allows us to explore how to achieve this goal.

Table 2. Basic Characteristics of Top Three Bike-Sharing Firms in China.

	ofo	Mobike	Hellobike
Launch date	2014-3	2015-1	2016-9
Guarantee deposit	99¥ (approximate 16$)	299¥ (approximate 48$)	199¥ (approximate 32$)
Payment process	Former: lock bicycle, open app, and make payment manually. Current: lock bicycle and app will charge you automatically.	Lock bicycle and app will charge you automatically.	Lock bicycle and app will charge you automatically.
Service area in Beijing	Aimed to serve students on university campus at first, and now covers most areas in Beijing.	Aimed to serve employees and cover the last mile of distance between public transportation stop and apartment or workplace. Now, covers most areas in Beijing excluding university campus.	Started from second-tier or third-tier cities, entered Beijing market with investment of Alibaba. One of its feature is serving users in tourist attractions. Now, it mainly serves users in Daxing district of Beijing.

4.2. Measures

This study aims to explore how UI design, social influence, traditional media communication, new media communication, firm controls, and government controls affect users' awareness of and attitude towards uncivilized behaviors and thereafter improve their intention of civilized use bike-sharing. Most variables are user perceptions and human-being psychology factors. The survey method is proper because it is helpful in exploring the underlining mechanisms of human behavior.

A survey questionnaire was developed to test the hypotheses. Wherever possible, items of the questionnaire were drawn from existing scales. Some minor modifications were made to adopted measures. The questionnaire contains four sections. The first section briefly describes the aim of this survey and provides some guidance to survey participants. The second section comprises two screening questions to assure that only bike-sharing users in Beijing were invited to participate in the survey. The third section is the main part of the questionnaire and contains 37 items. The items about UI design, social influence, traditional media and new media are adapted from Vance et al. [39], Kim et al. [84], Loibl et al. [85] and Wei et al. [41], respectively. Firm controls is a second order construct composed of credit, reward, and punishment. The items about firm and government controls are based on Spears and Barki [86]. The items for users' awareness, attitude and behavior intention are adapted from Bulgurcu et al. [48], Taylor and Todd [72], and Johnston and Warkentin [87], respectively. The fourth section includes five questions to collect information on respondents' age, gender, education background, frequency of users' past uncivilized riding behavior, and frequency of uncivilized riding behavior they see.

Human beings usually have a strong behavioral inertia and tend to keep future behaviors consistent with their past behaviors [88]. If an individual use bike-sharing in an uncivilized way in the past, he or she is more likely to perform uncivilized behaviors in the future. Meanwhile, human beings are social animals, whose behaviors are affected by important others [13]. If an individual observes uncivilized riding behaviors of other people, he or she should be more likely to perform uncivilized behavior. Therefore, this study uses the frequency of users' past uncivilized riding behavior and of uncivilized riding behavior they see as control variables.

A Chinese version of the original English instrument was developed by following a back-translation process with help of other researchers and colleagues. A pilot test was conducted using 30 volunteer respondents in China to test the wording and reliability of the items. Subsequently, some minor changes were made to the questionnaire. The questionnaire can be found in the Appendix A. All items are reflective and are measured using 7 point Likert scale from 1 strongly disagree to 7 strongly agree.

4.3. Data Collection

Data was collected using an online survey distributed with help of Sojump, the largest survey platform in China. Three hundred questionnaires were collected, and 50 questionnaires were deleted

because of high rate of same answers and short completion time. This makes the final sample size 250. The sample size meets the empirical guide that the sample size should be at least 15–20 times of the number of independent variables [34]. The demographic information of the sample is summarized in Table 3. In the respondents, 55.4 percent are male, and 60.8 percent are in the 21 to 30 age range. The users who have bachelor's degrees accounted for 68 percent. The population characteristics are in line with the bike-sharing industry market research report of China from iResearch, indicating that the sample is representative.

Table 3. Demographic Information.

	Items	Frequency	Percentage
Gender	male	136	54.4%
	female	114	45.6%
Age	Less than 20	64	25.6%
	21–30	152	60.8%
	31–40	26	10.4%
	More than 40	8	3.2%
Education	High school and below	13	5.2%
	Bachelor	170	68%
	Master	48	19.2%
	Doctor and above	19	7.6%

5. Data Analysis

SmartPLS 2.0 was used to analyze the data [89]. The partial least square (PLS) algorithm was chosen because it has fewer statistical identification problems compared to covariance-based structural equation modeling [90]. In addition, bike-sharing is an emerging scheme, and it is difficult to explain an emerging phenomenon involving different stakeholders. PLS can maximize the explained variance of dependent variables [91]. Given that our aim is to explain variance in consumers' intention of civilized use bike-sharing, we believe that PLS is proper method for data analysis.

5.1. Non-Response Bias

We separate the whole sample to early respondents (50%) and late respondents (50%) to test the non-response bias. A series of T-tests were performed on the demographic characteristics of the two parts to see whether there is difference between the two groups. No significant difference is found, indicating that there is no severe non-response bias [92].

5.2. Common Method Bias

All data was collected from the same source through a self-report survey, leading to a potential of common method bias. We first performed the Harmon's single factor analysis and found that nine factors were extracted from the unrotated factor analysis with the first factor only explained 30% of the covariance in the variables. Thus, no single factor accounts for the majority of variance. In addition, we compared correlations among constructs following the procedure established by Pavlou et al. [93] and found no constructs with correlations over 0.9. The results indicate that common method bias is unlikely to be a serious concern.

5.3. Measurement Model

The two-stage analytical procedure was adopted to analyze the data. Confirmative factor analysis was first performed to evaluate the measurement model, and then the structural model was assessed. As indicated in Table 4, Composite reliability ranged from 0.82 to 0.97, indicating valid internal consistency reliability [94]. All AVEs are larger than 0.5, indicating that convergent validity is met [95].

We tested the discriminant validity using two approaches. First, as shown in Table 5, all squared roots of the AVEs are greater than the correlation shared between the construct and other constructs in the model. Second, all correlations among the constructs are well below the 0.85 threshold [96]. Jointly, these findings suggest adequate convergent and discriminant validity. We also checked the variance inflation factors (VIFs) of all the independent variables. VIF ranged from 1.32 to 2.24, suggesting that multicollinearity is not a concern.

Table 4. Latent Variable Reliability and Validity Statistics.

Measures	R^2	CR	AVE
UI design	N/A	0.87	0.63
Social influence	N/A	0.97	0.91
Traditional media	N/A	0.93	0.77
New media	N/A	0.92	0.74
Awareness	0.31	0.82	0.61
Attitude	0.38	0.91	0.73
Firm controls	N/A	0.92	0.63
Government control	N/A	0.91	0.72
Intention	0.44	0.97	0.91
UI design	N/A	0.87	0.63

Table 5. Square Root of AVE and Correlation Matrix.

	UI	SI	TM	NM	AWA	ATT	FC	GV	BI
UI design (UI)	**0.80**								
Social influence (SI)	0.38	**0.95**							
Traditional media (TM)	0.12	0.14	**0.88**						
New media (NM)	0.26	0.22	0.62	**0.86**					
Awareness (AWA)	0.28	0.34	0.25	0.42	**0.78**				
Attitude (ATT)	0.41	0.37	0.17	0.3	0.39	**0.85**			
Firm controls (FC)	0.37	0.25	0.31	0.33	0.41	0.4	**0.79**		
Government control (GC)	0.38	0.24	0.25	0.29	0.36	0.39	0.7	**0.85**	
Behavioral intention (BI)	0.37	0.36	0.08	0.17	0.45	0.57	0.38	0.31	**0.95**

Note: Bold values are the square roots of average variance extracted; UI = UI design, SI = Social influence, TM = Traditional media, NM = New media, AWA = Awareness, ATT = Attitude, FC = Firm control, GC = Government control, BI = Behavioral intention.

5.4. Structural Model

No control variable has a significant influence on behavioral intention. Thus, structural model without control variables was displayed in Figure 3. The model explains 44% of the variance of users' intention of civilized use of bike-sharing. This indicates a good explanation power of the model.

The results indicate that social influence (b = 0.20, $p < 0.001$) and new media (b = 0.32, $p < 0.001$) will improve users' awareness of uncivilized behaviors while UI design and traditional media will not affect it, supporting H2 and H4 but not H1 and H3. UI design will encourage users to build a negative attitude toward uncivilized behaviors while none of social influence, traditional media, and new media will directly affect users' attitude. Thus, H5 is supported while H6, H7, and H8 are not. Users who has a higher level of awareness of uncivilized use will be more likely to form a negative attitude toward uncivilized use of bike-sharing (b = 0.18, $p < 0.05$). Both awareness (b = 0.25, $p < 0.001$) and attitude (b = 0.38, $p < 0.001$) have a positive impact on their intention of civilized use of bike-sharing. This means that H9, H10, and H11 are supported. Firm control has a positive impact on awareness (b = 0.21, $p < 0.05$) and intention of civilized use of bike-sharing (b = 0.15, $p < 0.05$) but not on attitude. Thus, H12a and H14a are supported but H13a is not. Meanwhile, government control does not directly affect awareness, attitude, and intention. Thus, H12b, H13b, and H14b are not supported.
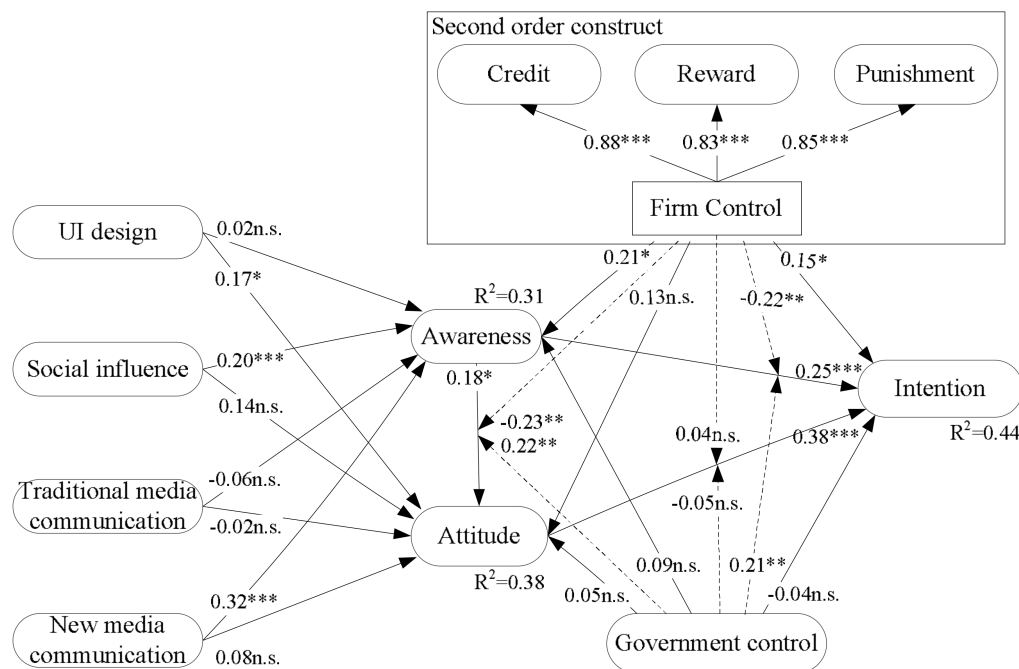
Figure 3. Structural Model. Awareness means awareness of uncivilized use; Attitude means attitude towards uncivilized use; Intention means intention to civilized use; Solid lines indicate direct effects; dotted lines indicate moderating effect; n.s. represents not significant, * represents $p < 0.05$, ** represents $p < 0.01$, and *** represents $p < 0.001$.

There are also some interesting findings about the moderation effects. Firm control negatively moderates the relationship between awareness and attitude ($b = -0.23$, $p < 0.01$) and between awareness and intention ($b = -0.22$, $p < 0.01$). However, government control positively moderates the relationship between awareness and attitude ($b = 0.22$, $p < 0.01$) and between awareness and intention ($b = 0.21$, $p < 0.01$). Thus, H15b and H16b are supported while H15a and H16a are reversely supported. None of firm control and government control significantly affects the relationship between attitude and intention. Thus, H17a and H17b are not supported.

6. Discussion

6.1. Findings

It is easy to understand that awareness of and negative attitude towards uncivilized behavior will encourage users to use bike-sharing in a civilized way. This is not the focus of this study. The point is how to improve users' awareness of uncivilized behavior and help them build negative attitude towards uncivilized behaviors.

The results indicate that social influence and new media communication are effective in improving users' awareness of uncivilized behavior. Ricci [9] realized that public support is an important element in maintaining a sustainable bike-sharing system. It is reasonable because users prefer to be consistent with social norm, which is riding public bicycles properly. New media can shape public opinion towards bike-sharing scheme [33]. First, there exists natural connection between bike-sharing scheme and new media. Users should rely on mobile internet and mobile phone-based technologies to open, lock, and pay for bike-sharing [97]. These technologies are technological infrastructure of new media. This natural connection makes it easy to affect users' perceptions. Second, new media has become an indispensable information channel for us and will facilitate the delivery of negative outcomes of uncivilized behaviors. The critics of the public will also be exaggerated in the new media, improving the impact of new media communication on consumers' awareness of uncivilized behaviors. Third,

the role of new media is becoming increasingly important with its capability to offer the audience various forms and places to express their feelings [57].

An interesting finding is that traditional media affects neither users' awareness of nor their attitude towards uncivilized behaviors. One possible reason is that the impact of traditional media is decreasing since new media is attractive and people spend more and more time on new media. Another possible reason is that traditional media does not pay much attention to criticizing uncivilized behaviors and encouraging civilized behaviors.

Zhang et al. [24] mentioned that vehicle tracking technology may play an important role in solving the problem of uncivilized behaviors. However, they neither explained why nor tested whether this is true. Our result justifies their suggestion. This study proposes that bike-sharing firms should improve UI design to track and monitor users' riding behaviors. Results indicate that only UI design has a significant direct impact on users' attitude towards uncivilized behaviors. This happens because most bike-sharing firms will display notice of uncivilized behaviors on their applications. Thus, when individuals use applications to open bikes, they will receive information on what are uncivilized behaviors. This helps users build correct attitude towards uncivilized behaviors. The impact of UI design reflects the importance of tracking technology in management of bike-sharing scheme.

This study also explores the importance of firm and government controls in improving users' intention of civilized use. From the perspective of direct impact, firm controls have a significant positive impact on users' awareness of uncivilized behaviors and intention of civilized use. However, firm controls cannot help users form negative attitude towards uncivilized behaviors. One possible reason is that the competition in bike-sharing industry is fierce. Seizing market share is of high priority for bike-sharing firms. Under this condition, bike-sharing firms do not have motivation to implement punishment and credit controls. In addition, government control does not affect awareness, attitude, and intention directly. This is reasonable because most government controls target at regulating firm behaviors but not user behaviors. Additionally, the government lacks knowledge to enact effective control mechanisms to regulate the development of the industry.

Results of moderation effects of firm and government controls are interesting. There are mainly two types of moderation effects, complementarity and substitutability. Complementary moderation effect exists if increasing in the level of moderator will increase the marginal impact of independent variable on dependent variable while substitutive moderation effect exists if increasing in the level of moderator will decrease the marginal impact of independent variable on dependent variable [98]. According to the results, government controls and users' awareness of uncivilized behaviors are complementarities. When government control is increasing, the marginal impacts of awareness of uncivilized behaviors on attitude and on intention of civilized use are strengthened. Firm controls and users' awareness of uncivilized behaviors are substitutability. The increasing in the level of firm control will decrease the marginal impact of awareness of uncivilized behaviors on attitude towards uncivilized use and intention to civilized use.

6.2. Theoretical Implications

Dramatically increased bicycles generate unexpected ethical issues, which are named uncivilized behaviors in this study. This becomes a challenge of bike-sharing companies and the government [99]. Malhotra and Alstyne [8] said that unclear responsibility of different market participants is an important barrier to solve this problem. However, few articles explore how different stakeholders should collaborate to encourage users to ride public bicycles properly. This study contributes to the management of bike-sharing industry by taking two steps. First, we distinguish four stakeholders of the industry and clarify their roles in improving users' intention of civilized use. These four stakeholders are bike-sharing firms, the public, the media, and government. UI design and firm controls, social influence, traditional and new media communication, and government control are used to represent their roles in industry management, respectively. Second, we use empirical data to test the impact of different stakeholders in facilitating users' civilized use of bike-sharing. The results

demonstrate that these factors affect intention of civilized use in different mechanisms excluding traditional media communication. Social influence and new media communication affect users' awareness of uncivilized behaviors and thereafter influences intention both directly and indirectly via attitude. UI design affects users' negative attitude towards uncivilized behaviors and thereafter impacts their intention of civilized use. These results help us clarify the responsibility of different participants in bike-sharing industry and provide directions to future research on sharing economy. Relevant conclusions can also be applied to other disciplines of sharing economy since bike-sharing scheme is an important format of sharing economy and other disciplines of sharing economy also involves different market participants. In the future, researchers of other forms of sharing economy can explore the importance of firms, the public, traditional media, new media, and government in maintaining sustainable development of sharing economy.

Past literature has discussed the importance of control mechanisms. For example, Lan et al. [11] support the importance of a credit-scoring system in facilitating good sharing behaviors and prohibiting bad sharing behaviors. However, there lacks systematic exploration of what control mechanisms should include and how they affect user behaviors. This study contributes to research on control mechanisms in three approaches. First, past literature usually views control mechanisms as a single variable. This study separates firm controls from government controls and explores their impacts on user behavior. Second, past literature sparsely discusses impact of different control mechanisms but lack of systematic summary of possible control mechanisms. This study summarizes different types of control mechanisms. Firm controls are composed of credit, reward, and punishment. Government control includes dividing parking lots for the bikes, limiting bike number, and introducing regulations to regulate the development of bike-sharing industry. Future researchers can refer to and further complete our mechanisms and explore their impacts on human behavior in different modes of sharing economy. Third, past literature mainly focuses on the direct impact of control mechanisms on human behavior. This study not only focuses on the direct impact of control mechanisms, but also explores their moderation effects in users' psychological process. The separation of firm controls and government controls and the exploration of both direct and moderation effects reveal that firm controls and government controls affect user behaviors in different approaches. Results indicate that firm controls mainly influence users' awareness and behavior intention directly while government control can positively moderate the relationships between users' awareness and attitude and between awareness and behavior intention. Government control can strengthen the impact of awareness of uncivilized behavior on attitude and on intention of civilized use although it does not affect awareness and intention directly. Also, firm controls have a substitutive relationship with awareness in affecting users' attitude towards uncivilized behaviors and intention of civilized use. These results deepen our understanding of what external controls can be used to manage the bike-sharing industry and how different control mechanisms can affect users' awareness of uncivilized behaviors, attitudes towards uncivilized behaviors and intention of civilized use and the relationships among these variables.

Past literature mentioned the importance of collaboration among different stakeholders of the bike-sharing scheme such as government, public and firms [1,9]. For example, Zhang et al. [24] emphasized the collaboration of government and bike-sharing firms in facilitating the sustainable development of bike-sharing scheme. However, few studies explained why collaboration is important and how government and bike-sharing firms should collaborate. The different functions of government and firm controls also help explain the importance of cooperation between transportation authority and bike-sharing firms. The results indicate that bike-sharing firms should focus on how to affect consumers' awareness of uncivilized behaviors when they design their control mechanisms. For example, bike-sharing companies may convey serious consequence of uncivilized behaviors, which will help improve users' awareness of uncivilized behaviors. Meanwhile, government or transportation authority should consider how to strengthen the relationship between awareness and attitude and between awareness and behavior intention. This supports the suggestion of Chen [100] to build information sharing mechanisms between transportation authority and bike-sharing firms to maximize

the impact of punishment in regulating user behaviors. Bike-sharing firms establish credit rules to reward good riding behaviors and punish bad riding behaviors. According to the results of this study, this will improve consumers' awareness of uncivilized behaviors. However, the mechanisms may not come into play because it is hard for bike-sharing firms to monitor users' riding behaviors. If there exists information sharing mechanisms between transportation authority and bike-sharing firms, transportation authority can share information of riders who violate regulations with bike-sharing firms. The collaboration will maximize the impact of control mechanisms and encourage users to ride bike-sharing in proper approaches.

6.3. Practical Implications

This study also has some practical implications for bike-sharing firms and government.

Bike-sharing firms should take the corporate social responsibility to manage the bike-sharing in the market since it is good for customer loyalty [101]. More specifically, bike-sharing firms should realize that their mobile applications are not only the tools through which users open the bikes, but also important communication channels that can be used to cue consumers to use bike-sharing in a proper way. Practical managers in the industry should pay attention to the design quality of their mobile applications. They should consider how to enhance users' perceived responsibility by showing identifiability, expectation of evaluation, awareness of monitoring, and social presence in UI design [12,39]. For example, the social presence of current bike-sharing mobile applications is weak. They should entice users to link their social network accounts to application accounts. Then, the applications can display whether their friends are currently riding the bikes or were riding the bikes. Currently, ofo starts to increase the social presence in its application. It will give out a rank of riders at the same time when they finish the riding based on criteria such as riding speed and distance.

Moreover, bike-sharing firms should not only focus on the design of mobile App, but also develop practical credit, reward, and punishment mechanisms. Bike-sharing firms should strictly implement their credit mechanism and perform their reward and punishment controls based on credit score of users. For those consumers with low credit scores, their riding behavior should be restricted, and their riding fee may be improved. For those consumers with high credit scores should be awarded price discount or free riding quota. This is consistent with the finding of Lan et al. [11]. However, bike-sharing firms do not have the motivation to perform stringent regulations because they are in the stage of attracting users and seizing market shares. We should combine firm regulation and government governance to effectively manage the bike-sharing industry. This research verifies that firm control and government control both have impacts on users' intention of civilized use, and the function mechanisms are different.

Third, the positive impact of social influence on intention of civilized use further demonstrates the underlying benefits of binding users' bike-sharing mobile application accounts with their social network accounts as listed above. For example, Mobike, one of the top two bike-sharing firms in China, may provide monetary or non-monetary rewards to entice users to sharing their rides and relevant evaluations to their social networks. This helps civilized users encourage their friends and followers to ride the bikes in a proper way. This is realizable since Mobike has get strategic investments from Tencent, and thereafter Mobike may allow its users to post their rides and relevant evaluations via social networking products of Tencent such as QQ and Wechat.

The study also provides some practical implications for the government. First, the government should reflect on the impacts of new media and traditional media communication on the management of bike-sharing industry. The results indicate that new media communication is an effect approach that can be used to encourage individuals to ride the bikes in a civilized way. Thus, the government should realize new media's power in shaping public opinion about the management of bike-sharing industry and consider how to effectively utilize new media to manage sharing economy. Traditional media has long been accepted as an important channel to affect citizens' attitudes and society management. However, traditional media communication does not have a positive impact on users' intention of

civilized use. The government should rethink why this happened and encourage traditional media to pay more attention on sharing economy management.

Moreover, government control reflects government's endeavor to restrict the quantity of total sharing bikes in a city, divide public parking lots, construct electronic fences, introduce punishment regulations, and punish users' violation behaviors to promote the healthy development of bike-sharing industry. The results indicate that government control can strengthen the impact of awareness of uncivilized behavior on negative attitude towards uncivilized behavior and intention of civilized use. This suggests that government control should not only regulate bike-sharing firms, on which government regulation pay much attention, but also improve media communication efforts to affect the behavior of bike-sharing users.

6.4. Limitations and Future Research

The results must be interpreted recognizing that this study has some limitations. First, this study focuses on bike-sharing in Beijing. This may affect the generalizability of the conclusions. However, Beijing is the most developed bike-sharing market in China, and existing problems are clear and severe. Also, bike-sharing users in Beijing are representative because Beijing is the capital of China and people from different provinces work and live in Beijing. This provides appropriate context to research on factors affecting users' intention of civilized use. In the future, researchers may consider the impact of geographical differences on the conclusions and compare difference between Beijing and other cities to test the adaptability of the conceptual model. Second, the sample size is relatively small compared with users of bike-sharing in Beijing. However, the sample size meets the empirical guide of 15–20 times of the numbers of independent variables, and our sample fits the characteristics of bike-sharing users according to the report of iResearch in China. Third, sharing economy is becoming critical in many industries such as transportation, finance, medical care, and housing. Bike-sharing is just one aspect of sharing economy. The generalization of our conclusions to other aspects of sharing economy may be limited. However, uncivilized behavior is especially serious in bike-sharing scheme, and bike-sharing scheme is an appropriate research context since our target is to explore factors affecting users' intention of civilized use. Future research is needed to discuss how to regulate uncivilized behaviors in other forms of sharing economy.

7. Conclusions

It is important to put forward effective regulatory measures since bike-sharing scheme has both positive and negative impacts on sustainable development. This study distinguishes four stakeholders of the industry and explores how they impact users' intention of civilized use. A conceptual model is proposed based on the stimulus-organism-response framework. The model is tested using 250 respondents collected from Beijing.

The study tries to clarify the responsibility of different market participants in bike-sharing industry. We summarize four stakeholders, which are bike-sharing firms, government, the public, and the media. This study proposes that firms should enhance their UI design and implement firm control mechanisms, government should implement government control mechanisms, the public should affect users through the effect of social influence, and the media should convey information to encourage users to ride public bicycles properly. We also test their impacts on users' intention of civilized use. Results demonstrates that social influence, new media communication, and firm control each have a positive influence on users' awareness of uncivilized behaviors. This indicates that important others, information on new media, and description of control mechanisms in mobile applications serve as main sources of information on what are uncivilized behaviors. Meanwhile, apart from awareness, only UI design can improve users' negative attitude towards uncivilized behaviors. This demonstrates the importance of good design of mobile application in helping users build negative attitudes towards uncivilized behaviors. Bike-sharing companies should consider how to improve the application design and thereafter help users form correct attitude towards uncivilized behaviors.

This study also explores the impact of control mechanisms on users' intention of civilized use. We summarize two categories of control mechanisms, which are government and firm controls. Results indicate that these two categories of controls affect users' perceptions of uncivilized behaviors and intention of civilized use in different approaches. Firm controls help users aware of uncivilized behaviors and facilitate users to ride bike-sharing in civilized approaches. Government control does not affect users' perception of uncivilized behaviors but will strengthen the impact of users' awareness of uncivilized behaviors on their attitude towards uncivilized behaviors and intention of civilized use. This is also one reason why the government and firms should collaborate in the management of bike-sharing scheme.

This study represents one of the first scholarly attempts to explore factors enabling users to ride bike-sharing in civilized approaches. This facilitates the orderly development of bike-sharing scheme and provides some guidance for the reference of sharing economy.

Author Contributions: L.J. conceived and designed the research; X.L. and Y.L. performed the online survey; L.J. analyzed the data; X.L. and Y.L. wrote the initial paper; L.J. prepared for the submission manuscript; L.J. oversaw the research and project funding and contributed ideas and revisions to subsequent iterations of the article.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Survey Items

UI design, adapted from Vance et al. [39]

UI1.   The mobile App of bike-sharing firms is a real-name registration system.
UI2.   The mobile App of bike-sharing firms can evaluate whether users' riding behavior comply with its rules.
UI3.   The mobile App of bike-sharing firms can record users' riding activities.
UI4.   The mobile App of bike-sharing firms can make users realize that there are other people using the App at the same time.

Social influence, adapted from Kim et al. [84]

SI1.   People who are important to me use bike-sharing in a civilized way.
SI2.   People who can influence my behavior use bike-sharing in a civilized way.
SI3.   People whose opinion I value use bike-sharing in a civilized way.

Traditional media, adapted from Loibl et al. [85] and Wei et al. [41]

TM1.   I often obtain information from newspaper to encourage citizens to civilized use bike-sharing.
TM2.   I often obtain information from magazines to encourage citizens to use bike-sharing in a civilized way.
TM3.   I often obtain the information from televisions to encourage citizens to use bike-sharing in a civilized way.
TM4.   I often obtain the information from radios to encourage citizens to use bike-sharing in a civilized way.

New media, adapted from Loibl et al. [85] and Wei et al. [41]

NM1.   I often obtain information from online news to encourage citizens to use bike-sharing in a civilized way.
NM2.   I often obtain information from online magazines to encourage citizens to use bike-sharing in a civilized way.

NM3. I often obtain information from social media to encourage citizens to use bike-sharing in a civilized way.

NM4. I often obtain information from other network channels to encourage citizens to use bike-sharing in a civilized way.

Users' awareness to uncivilized behavior, adapted from Bulgurcu et al. [48]

AW1. Overall, I am aware of uncivilized riding behavior and its negative consequences.

AW2. I have sufficient knowledge about the uncivilized behavior in using bike-sharing.

AW3. I know the public is concern with uncivilized behavior in using bike-sharing.

Users' attitude towards uncivilized behavior, adapted from Taylor and Todd [72]

ATT1. Using bike-sharing in an uncivilized way is a bad idea.

ATT2. Using bike-sharing in an uncivilized way is a foolish idea.

ATT3. I dislike the idea of using bike-sharing in an uncivilized way.

ATT4. Using bike-sharing in an uncivilized way would be unpleasant.

Credit mechanism, adapted from Spears and Barki [86]

CM1. Bike-sharing firms have adopted the policy to reduce consumers' credit scores for their uncivilized behavior.

CM2. Bike-sharing firms give riding concessions to the users with high credit points.

CM3. Bike-sharing firms restrict users with low credit points to ride their bikes.

Reward measures, adapted from Spears and Barki [86]

RM1. Bike-sharing firms reward users who report uncivilized behaviors in using bike-sharing.

RM2. Bike-sharing firms give points reward or price concessions to users who use bike-sharing in a civilized way.

Punishment measures, adapted from Spears and Barki [86]

PM1. Bike-sharing firms fine users who use bike-sharing in an uncivilized way.

PM2. Bike-sharing firms hold legal liability of users who use bike-sharing in an uncivilized way.

Government control, adapted from Spears and Barki [86]

GC1. The government divides parking areas or electronic fences for bike-sharing.

GC2. The government introduces regulations to punish uncivilized behavior in using bike-sharing.

GC3. The government caps the amount of bikes that the bike-sharing firms put on the market.

GC4. The government encourages bike-sharing firms to mark the allowed-parking areas and forbidden-parking areas on mobile App.

GC5. The government punishes bike-sharing users who violate traffic laws.

Behavior intention of civilized use, adapted from Johnston and Warkentin [87]

BI1. I intend to use bike-sharing in a civilized way in the next 3 months.

BI2. I predict I will use bike-sharing in a civilized way in the next 3 months.

BI3. I plan to use bike-sharing in a civilized way in the next 3 months.

References

1. Purtik, H.; Arenas, D. Embedding Social Innovation: Shaping Societal Norms and Behaviors throughout the Innovation Process. *Business & Society*, 12 September 2017.
2. Yahya, B. Overall bike effectiveness as a sustainability metric for bike sharing systems. *Sustainability* **2017**, *9*, 2070. [CrossRef]

3. Fuller, D.; Gauvin, L.; Dubé, A.S.; Winters, M.; Teschke, K.; Russo, E.T.; Camden, A.; Mee, C.; Friedman, S.M. Evaluating the impact of environmental interventions across 2 countries: The international bikeshare impacts on cycling and collisions study (IBICCS) study protocol. *BMC Public Health* **2014**, *14*, 1103. [CrossRef] [PubMed]

4. Campbell, K.B.; Brakewood, C. Sharing riders: How bikesharing impacts bus ridership in New York City. *Transp. Res. Part A Policy Pract.* **2017**, *100*, 264–282. [CrossRef]

5. Fishman, E. Bikeshare: A review of recent literature. *Transp. Rev.* **2015**, *36*, 92–113. [CrossRef]

6. Wu, X.; Zhi, Q. Impact of shared economy on urban sustainability: From the perspective of social, economic, and environmental sustainability. *Energy Procedia* **2016**, *104*, 191–196. [CrossRef]

7. Miller, S.R. First principles for regulating the sharing economy. *Harv. J. Legis.* **2016**, *53*, 147–202. [CrossRef]

8. Malhotra, A.; Alstyne, M.V. The dark side of the sharing economy and how to lighten it. *Commun. ACM* **2014**, *57*, 24–27. [CrossRef]

9. Ricci, M. Bike sharing: A review of evidence on impacts and processes of implementation and operation. *Res. Transp. Bus. Manag.* **2015**, *15*, 28–38. [CrossRef]

10. Zhang, L.; Zhang, J.; Duan, Z.Y.; Bryde, D. Sustainable bike-sharing systems: Characteristics and commonalities across cases in urban China. *J. Clean. Prod.* **2015**, *97*, 124–133. [CrossRef]

11. Lan, J.; Ma, Y.; Zhu, D.; Mangalagiu, D.; Thornton, T.F. Enabling value co-creation in the sharing economy: The case of mobike. *Sustainability* **2017**, *9*, 1504. [CrossRef]

12. Vance, A.; Lowry, P.B.; Eggett, D. Using accountability to reduce access policy violations in information systems. *J. Manag. Inf. Sys.* **2013**, *29*, 263–290. [CrossRef]

13. Wood, W. Attitude change: Persuasion and social influence. *Annu. Rev. Psychol.* **2000**, *51*, 539. [CrossRef] [PubMed]

14. Hennig-Thurau, T.; Malthouse, E.C.; Friege, C.; Gensler, S.; Lobschat, L.; Rangaswamy, A.; Skiera, B. The impact of new media on customer relationships. *J. Serv. Res.* **2010**, *13*, 311–330. [CrossRef]

15. Schultz, F.; Utz, S.; Göritz, A. Is the medium the message? Perceptions of and reactions to crisis communication via twitter, blogs and traditional media. *Public Relat. Rev.* **2011**, *37*, 20–27. [CrossRef]

16. Resnick, P.; Zeckhauser, R. Trust among strangers in internet transactions: Empirical analysis of eBay's reputation system. *Adv. Appl. Microecon.* **2002**, *11*, 127–157. [CrossRef]

17. Phillips, L.A.; Chamberland, P.; Hekler, E.B.; Abrams, J.; Eisenberg, M.H. Intrinsic rewards predict exercise via behavioral intentions for initiators but via habit strength for maintainers. *Sport Exerc. Perform. Psychol.* **2016**, *5*, 352–364. [CrossRef]

18. Warkentin, M.; Siponen, M. An enhanced fear appeal rhetorical framework: Leveraging threats to the human asset through. *MIS Q.* **2015**, *39*, 113–134. [CrossRef]

19. Miller, H.E.; Thomas, S.L.; Smith, K.M.; Robinson, P. Surveillance, responsibility and control: An analysis of government and industry discourses about "problem" and "responsible" gambling. *Addict. Res. Theory* **2015**, *24*, 163–176. [CrossRef]

20. Nikitas, A.; Wallgren, P.; Rexfelt, O. The paradox of public acceptance of bike sharing in Gothenburg. *Proc. Inst. Civ. Eng. Eng. Sustain.* **2016**, *169*, 101–113. [CrossRef]

21. Goodman, A.; Green, J.; Woodcock, J. The role of bicycle sharing systems in normalising the image of cycling: An observational study of London cyclists. *J. Transp. Health* **2014**, *1*, 5–8. [CrossRef] [PubMed]

22. Fishman, E.; Washington, S.; Haworth, N. Barriers and facilitators to public bicycle scheme use: A qualitative approach. *Transp. Res. Part F Psychol. Behav.* **2012**, *15*, 686–698. [CrossRef]

23. Efthymiou, D.; Antoniou, C.; Waddell, P. Factors affecting the adoption of vehicle sharing systems by young drivers. *Transp. Policy* **2013**, *29*, 64–73. [CrossRef]

24. Zhang, D.; Xu, X.; Yang, X. User satisfaction and its impacts on the use of a public bicycle system. *Transp. Res. Rec. J. Transp. Res. Board* **2015**, *2512*, 56–65. [CrossRef]

25. Lin, J.R.; Yang, T.H. Strategic design of public bicycle sharing systems with service level constraints. *Transp. Res. Part E Logist. Transp. Rev.* **2011**, *47*, 284–294. [CrossRef]

26. Lin, J.R.; Yang, T.H.; Chang, Y.C. A hub location inventory model for bicycle sharing system design: Formulation and solution. *Comput. Ind. Eng.* **2013**, *65*, 77–86. [CrossRef]

27. Dell'Amico, M.; Hadjicostantinou, E.; Iori, M.; Novellani, S. The bike sharing rebalancing problem: Mathematical formulations and benchmark instances. *Omega* **2014**, *45*, 7–19. [CrossRef]

28. Forma, I.A.; Raviv, T.; Tzur, M. A 3-step math heuristic for the static repositioning problem in bike-sharing systems. *Transp. Res. Part B Methodol.* **2015**, *71*, 230–247. [CrossRef]

29. Website of CheetaLab. Available online: http://cn.data.cmcm.com/report/detail/247 (accessed on 7 March 2017).

30. Mehrabian, A.; Russell, J.A. *An Approach to Environmental Psychology*; MIT Press: Cambridge, MA, USA, 1974; pp. 216–217.

31. Midgley, P. The Role of Smart Bike-sharing Systems in Urban Mobility. *Journeys* **2009**, *2*, 23–31.

32. Shaheen, S.A.; Guzman, S.; Zhang, H. Bikesharing in Europe, the Americas, and Asia: Past, present, and future. *Transp. Res. Rec. J. Transp. Res. Board* **2010**, *2143*, 159–167. [CrossRef]

33. Zanotto, M. Facilitators and Barriers to Public Bike Share Adoption and Success in a City with Compulsory Helmet Legislation: A Mixed-Methods Approach. Master's Thesis, Faculty of Health Sciences, Simon Fraser University, Burnaby, BC, Canada, 2014.

34. Yang, R.; Long, R. Analysis of the influencing factors of the public willingness to participate in public bicycle projects and intervention strategies—A case study of Jiangsu Province, China. *Sustainability* **2016**, *8*, 349. [CrossRef]

35. Berthoû, S.K.G. The everyday challenges of pro-environmental practices. *J. Transdiscip. Environ. Stud.* **2013**, *12*, 53–68.

36. Kim, J.; Choi, K.; Kim, S.; Fujii, S. How to promote sustainable public bike system from a psychological perspective? *Int. J. Sustain. Transp.* **2016**, *11*, 272–281. [CrossRef]

37. Ahillen, M.; Mateo-Babiano, D.; Corcoran, J. Dynamics of bike sharing in Washington, DC and Brisbane, Australia: Implications for policy and planning. *Int. J. Sustain. Transp.* **2015**, *10*, 441–454. [CrossRef]

38. Huang, T.K.; Fu, F.-L. Understanding user interface needs of e-commerce web sites. *Behav. Inf. Technol.* **2009**, *28*, 461–469. [CrossRef]

39. Vance, A.; Lowry, P.B.; Eggett, D.L. Increasing accountability through the user interface design artifacts: A new approach to addressing the problem of access-policy violations. *MIS Q.* **2015**, *39*, 345–366. [CrossRef]

40. Mavrodiev, P.; Tessone, C.J.; Schweitzer, F. Effects of social influence on the wisdom of crowds. *arXiv* **2012**, arXiv:1204.3463.

41. Wei, Y.; Frankwick, G.L.; Gao, T.; Zhou, N. Consumer adoption intentions toward the internet in China: The effects of impersonal and interpersonal communication channels. *J. Advert. Res.* **2011**, *51*, 594–607. [CrossRef]

42. Richards, M.; Egri, C.P.; Ralston, D.A.; Naoumova, I.; Casado, T.; Wangenheim, F.V.; Hung, V.T.; Pekerti, A.A.; Schroll-Machl, S. How can we better understand current and future workforce values in the global business environment? *Thunderbird Int. Bus. Rev.* **2012**, *54*, 609–623. [CrossRef]

43. Xue, Y.; Liang, H.; Wu, L. Punishment, Justice, and Compliance in Mandatory IT Settings. *Inf. Syst. Res.* **2011**, *22*, 400–414. [CrossRef]

44. Cheng, H.-H.; Huang, S.-W. Exploring antecedents and consequence of online group-buying intention: An extended perspective on theory of planned behavior. *Int. J. Inf. Manag.* **2013**, *33*, 185–198. [CrossRef]

45. Akyelken, N.; Banister, D.; Givoni, M. The sustainability of shared mobility in london: The dilemma for governance. *Sustainability* **2018**, *10*, 420. [CrossRef]

46. Zhao, X.; Zhao, Y.; Zeng, S.; Zhang, S. Corporate behavior and competitiveness: Impact of environmental regulation on Chinese firms. *J. Clean. Prod.* **2015**, *86*, 311–322. [CrossRef]

47. Butterfield, K.D.; Trevin, L.K.; Weaver, G.R. Moral awareness in business organizations: Influences of issue-related and social context factors. *Hum. Relat.* **2000**, *53*, 981–1018. [CrossRef]

48. Bulgurcu, B.; Cavusoglu, H.; Benbasat, I. Information security policy compliance: An empirical study of rationality-based beliefs and information security awareness. *MIS Q.* **2010**, *34*, 523–548. [CrossRef]

49. Ajzen, I.; Madden, T.J. Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. *J. Exp. Soc. Psychol.* **1986**, *22*, 453–474. [CrossRef]

50. Ajzen, I. *From Intentions to Actions: A Theory of Planned Behavior*; Springer: Heidelberg, Germany, 1985; pp. 11–39. ISBN 978-3-642-69748-7.

51. Dawkins, C.E.; Jamali, D.; Karam, C.; Lin, L.; Zhao, J. Corporate social responsibility and job choice intentions: A cross-cultural analysis. *Bus. Soc.* **2016**, *55*, 1–35. [CrossRef]

52. Wiebe, J. Public awareness of responsible gambling and gambling behaviours in Ontario. *Int. Gambl. Stud.* **2005**, *5*, 95–112. [CrossRef]

53. Ashforth, B.E.; Mael, F. Social identity theory and the organization. *Acad. Manag. Rev.* **1989**, *14*, 20–39. [CrossRef]

54. Wang, Y.; Hsiao, S.H.; Yang, Z.; Hajli, N. The impact of sellers' social influence on the co-creation of innovation with customers and brand awareness in online communities. *Ind. Mark. Manag.* **2016**, *54*, 56–70. [CrossRef]

55. Yoo, C.Y. Unconscious processing of Web advertising: Effects on implicit memory, attitude toward the brand, and consideration set. *J. Interact. Mark.* **2008**, *22*, 2–18. [CrossRef]

56. Ito, M.; Horst, H.; Bittanti, M.; Boyd, D.; Herrstephenson, B.; Lange, P.G.; Pascoe, C.J.; Robinson, L. *Living and Learning with New Media: Summary of Findings from the Digital Youth Project*; MIT Press: Cambridge, MA, USA, 2009; p. 58. ISBN 978-0-262-51365-4.

57. Turhan, T.A.D.M. Role of social media on purchasing behavior of consumers through digital marketing. *Eur. J. Bus. Soc. Sci.* **2016**, *5*, 21–29.

58. Murphy, D.G.; Loeb, S.; Basto, M.Y.; Challacombe, B.; Trinh, Q.D.; Leveridge, M.; Morgan, T.; Dasgupta, P.; Bultitude, M. Engaging responsibly with social media: The BJUI guidelines. *BJU Int.* **2014**, *114*, 9–11. [CrossRef] [PubMed]

59. Nagelhout, G.E.; Boer, D.D.K.; Kunst, A.E.; Meer, R.M.V.D.; Vries, H.D.; Gelder, B.M.V.; Willemsen, M.C. Trends in socioeconomic inequalities in smoking prevalence, consumption, initiation, and cessation between 2001 and 2008 in the Netherlands. Findings from a national population survey. *BMC Public Health* **2012**, *12*, 1–9. [CrossRef]

60. Juniwati Influence of perceived usefulness, ease of use, risk on attitude and intention to shop online. *Eur. J. Bus. Manag.* **2014**, *6*, 218–228.

61. Levitan, L.C.; Verhulst, B. Conformity in groups: The effects of others' views on expressed attitudes and attitude change. *Political Behav.* **2016**, *38*, 1–39. [CrossRef]

62. Anderson, N.H. *Contributions to Information Integration Theory*; L. Erlbaum Associates: Mahwah, NJ, USA, 1990; pp. 6269–6272.

63. Scheufele, D.A. Framing as a Theory of Media Effects. *J. Commun.* **1999**, *49*, 103–122. [CrossRef]

64. Kaplan, A.M.; Haenlein, M. Users of the world, unite! The challenges and opportunities of Social Media. *Bus. Horiz.* **2010**, *53*, 59–68. [CrossRef]

65. Lee, K. The role of media exposure, social exposure and biospheric value orientation in the environmental attitude-intention-behavior model in adolescents. *J. Environ. Psychol.* **2011**, *31*, 301–308. [CrossRef]

66. Dennis, B.S.; Buchholtz, A.K.; Butts, M.M. The nature of giving: A theory of planned behavior examination of corporate philanthropy. *Bus. Soc.* **2009**, *48*, 360–384. [CrossRef]

67. Priluck, R.; Till, B.D. The role of contingency awareness, involvement, and need for cognition in attitude formation. *J. Acad. Mark. Sci.* **2004**, *32*, 329–344. [CrossRef]

68. Forsyth, D.R.; Garcia, M.; Zyzniewski, L.E.; Story, P.A.; Kerr, N.A. Watershed pollution and preservation: The awareness–appraisal model of environmentally positive intentions and behaviors. *Anal. Soc. Issues Public Policy* **2004**, *4*, 115–128. [CrossRef]

69. Omoogun, A.C.; Odok, A.O. Influence of gender and environmental awareness on attitude of people towards forest conservation in ekuri communities in akamkpa local government area of cross river state. *J. Public Adm. Gov.* **2013**, *3*, 219. [CrossRef]

70. Dinev, T.; Hu, Q. The centrality of awareness in the formation of user behavioral intention toward protective information technologies. *J. Assoc. Inf. Syst.* **2007**, *8*, 386–408. [CrossRef]

71. Davis, F.D.; Bagozzi, R.P.; Warshaw, P.R. User acceptance of computer technology: A comparison of two theoretical models. *Manag. Sci.* **1989**, *35*, 982–1003. [CrossRef]

72. Taylor, S.; Todd, P.A. Understanding information technology usage: A test of competing models. *Inf. Syst. Res.* **1995**, *6*, 144–176. [CrossRef]

73. Ramsay, J.; Renaud, K. Using insights from email users to inform organisational email management policy. *Behav. Inf. Technol.* **2012**, *31*, 587–603. [CrossRef]

74. Koch, H.; Leidner, D.E.; Gonzalez, E.S. Digitally enabling social networks: Resolving IT–culture conflict. *Inf. Syst. J.* **2013**, *23*, 501–523. [CrossRef]

75. Sherman, S.J. Internal-external control and its relationship to attitude change under different social influence techniques. *J. Personal. Soc. Psychol.* **1973**, *26*, 23–29. [CrossRef]

76. Greenbaum, H.H. The audit of organizational communication. *Acad. Manag. J.* **1974**, *17*, 739–754. [CrossRef]

77.　Gupta, S.; Xu, H. Examining the relative influence of risk and control on intention to adopt risky technologies. *J. Technol. Manag. Innov.* **2010**, *5*, 22–37. [CrossRef]

78.　Posey, C.; Roberts, T.L.; Lowry, P.B.; Bennett, R.J.; Courtney, J.F. Insiders' protection of organizational information assets: Development of a systematics-based taxonomy and theory of diversity for protection-motivated behaviors. *MIS Q.* **2013**, *37*, 1189–1210. [CrossRef]

79.　Koo, D.M. The moderating role of locus of control on the links between experiential motives and intention to play online games. *Comput. Hum. Behav.* **2009**, *25*, 466–474. [CrossRef]

80.　Chiu, R.K. Ethical judgment and whistleblowing intention: Examining the moderating role of locus of control. *J. Bus. Ethics* **2003**, *43*, 65–74. [CrossRef]

81.　Siu, O.L.; Cooper, C.L. A study of occupational stress, job satisfaction and quitting intention in Hong Kong firms: The role of locus of control and organizational commitment. *Stress Health* **1998**, *14*, 55–66. [CrossRef]

82.　Sniehotta, F.F.; Scholz, U.; Schwarzer, R. Bridging the intention–behaviour gap: Planning, self-efficacy, and action control in the adoption and maintenance of physical exercise. *Psychol. Health* **2005**, *20*, 143–160. [CrossRef]

83.　Chiu, C.K.; Chien, C.S.; Lin, C.P.; Hsiao, C.Y. Understanding hospital employee job stress and turnover intentions in a practical setting. *J. Manag. Dev.* **2005**, *24*, 837–855. [CrossRef]

84.　Kim, C.; Jahng, J.; Lee, J. An empirical investigation into the utilization-based information technology success model: Integrating task-performance and social influence perspective. *J. Inf. Technol.* **2007**, *22*, 152–160. [CrossRef]

85.　Loibl, C.; Cho, S.H.; Diekmann, F.; Batte, M.T. Consumer self-confidence in searching for information. *J. Consum. Aff.* **2009**, *43*, 26–55. [CrossRef]

86.　Spears, J.L.; Barki, H. User participation in information systems security risk management. *MIS Q.* **2010**, *34*, 503–522. [CrossRef]

87.　Johnston, A.C.; Warkentin, M. Fear appeals and information security behaviors: An empirical study. *MIS Q.* **2010**, *34*, 549–566. [CrossRef]

88.　Kim, J.H. The impact of past behavior on intention to smartphone application piracy. *J. Serv. Res. Stud.* **2016**, *6*, 37–49. [CrossRef]

89.　Ringle, C.M.; Wende, S.; Will, S. *SmartPLS 2.0 (M3) Beta*; Hamburg, Germany, 2005.

90.　Hair, J.F.; Ringle, C.M.; Sarstedt, M. PLS-SEM: Indeed a silver bullet. *J. Mark. Theory Pract.* **2011**, *19*, 139–152. [CrossRef]

91.　Xu, J.D.; Benbasat, I.; Cenfetelli, R.T. The nature and consequences of trade-off transparency in the context of recommendation agents. *MIS Q.* **2014**, *38*, 379–406. [CrossRef]

92.　Armstrong, J.S.; Overton, T.S. Estimating nonresponse bias in mail surveys. *J. Mark. Res.* **1977**, *14*, 396–402. [CrossRef]

93.　Pavlou, P.A.; Liang, H.; Xue, Y. Understanding and mitigating uncertainty in online exchange relationships: A principal-agent perspective. *MIS Q.* **2007**, *31*, 105–136. [CrossRef]

94.　Chin, W.W. Issues and opinion on structural equation modeling. *MIS Q.* **1998**, *22*, 7–16.

95.　Fornell, C.; Larcker, D.F. Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* **1981**, *18*, 39–50. [CrossRef]

96.　Kline, R.B.; Santor, D.A. Principles & practice of structural equation modelling. *Can. Psychol.* **1999**, *40*, 381.

97.　Manzi, G.; Saibene, G. Are they telling the truth? Revealing hidden traits of satisfaction with a public bike-sharing service. *Int. J. Sustain. Transp.* **2017**, *12*, 253–270. [CrossRef]

98.　Choi, B.; Lee, J.N. Complementarities and substitutabilities among knowledge sourcing strategies and their impact on firm performance. *J. Assoc. Inf. Syst.* **2012**, *13*, 498–545. [CrossRef]

99.　Wu, F.; Xue, Y. Innovations of Bike Sharing Industry in China: A Case Study of Mobike's Station-Less Bike Sharing System. Master's Thesis, KTH, School of Industrial Engineering and Management (ITM), Industrial Economics and Management (Dept.), Industrial Marketing and Entrepreneurship, Stockholm, Sweden, 2017.

100.　Chen, B. How to Regulate the Bikesharing Industry. *Beijing Review*, 27 July 2017; 28.

101.　Schramm-Klein, H.; Zentes, J.; Steinmann, S.; Swoboda, B.; Morschett, D. Retailer corporate social responsibility is relevant to consumer behavior. *Bus. Soc.* **2016**, *55*, 550–575. [CrossRef]