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Motivations to Reuse Smart Mobility: Unpacking Behavioral Dynamics through a Multi-Analytical Approach

Abstract

Purpose – The goal of this research is to identify which intrinsic motivations (ride comfort, safety, app convenience) and extrinsic motivation (monetary value) are sufficient and necessary to stimulate the reuse intention of smart mobility services. It also aims to understand the effect of gender on the impacts of these motivations on reuse intention.

Design/methodology/approach – This research utilized a multi-analytical approach with the combination of survey and qualitative analysis methods to enquire into the roles of intrinsic and extrinsic motivations influencing the reuse intention of smart mobility among different gender groups. Specifically, the study was conducted through the application of partial least squares structural equation modeling (PLS-SEM), multigroup analysis (MGA), and fuzzy-set Qualitative Comparative Analysis (fsQCA).

Findings – The findings of this research revealed that monetary value and ride comfort have a positive impact on travel consumers' intention to reuse smart mobility for both gender groups. While ride comfort was the sole necessary factor for male users, ride comfort and app convenience were necessary conditions for females in their intention to reuse smart mobilities. Moreover, results indicated that females tend to rate safety and app convenience higher than males in their decision to reuse smart mobility.

Originality/value – Using an analytical research approach enables the development of in-depth insights into how different relationships and configurations of motivational factors impact travel consumers' reuse intentions based on different gender roles. This is the first empirical research to identify the necessary motivations for reusing smart mobility services.

Keywords: Smart mobility, Intrinsic motivation, Extrinsic motivation, Gender comparison, PLS-fsQCA

1. Introduction

The 21st century has heralded the proliferation of the experience economy, in which experience-oriented services offer recipients unique, novel experiences (Pine and Gilmore, 1998). The advancement of innovations such as information and communication technology (ICT) has provided numerous benefits such as sustainability, enriched novel experiences, and efficiency, especially in the travel industry (Azis et al., 2020; Gretzel and Koo, 2021). These benefits have been applied and become renowned particularly in the tourism sector, influencing a new form of transformation within the tourism mobility sectors, which is also referred to as "smart mobility." Smart mobilities encompass a range of mobility alternatives that incorporate Internet connectivity, telecommunications, real-time data, and the latest technologies. These mobilities are essential for the provision and operation of services that prioritize safety, comfort, and sustainability for local communities (Singh, 2020; Vanolo, 2014).

Although the concept of smart mobility has been proposed to provide efficient, sustainable services to residents, many destinations are implementing smart mobility as the core strategy in tourism planning development (Marchesani et al., 2023). The linkage between smart mobility and incoming travel that produces new types of services and personalized offers to travelers has been constantly developed to draw in and control the influx of travelers (Wang et al., 2020). The concept of smart mobility extends to car-sharing services (Singh, 2017), ride-hailing services (Lee et al., 2021), and mobility as a service (Signorile et al., 2018). Smart mobility is considered an important means of achieving sustainability by integrating the use of environmentally friendly fuels with active transport solutions together with the participation of residents (Karakas and Atay, 2023; Paiva et al., 2021). Hence, smart mobility has become a fundamental aspect for

tourism destinations in inducing travelers, and many attempts have been made to maximize the effect of smart mobility (Marchesani et al., 2023).

Along the components of tourism mobility, safety has always been a key component of mobilities such as public transport (Ouali et al., 2020). Additionally, Dell'Olio et al. (2011) claimed that comfort, cleanliness, and waiting time are among the most significant variables in relation to the use of public transportation. Many tourism destinations provide numerous transport services along with smart technologies that enable travelers to have greater accessibility and comfort in traveling to outlying areas (Kim et al., 2021).

Although pertinent studies have focused on several types of smart mobilities and their influence on the travel industry (Lee et al., 2021; Singh, 2017), less attention has been given to traditional mobility components such as safety and ride comfort in the context of smart mobility. Incidents such as sexual harassment and traffic deaths from ride-hailing drivers have been among the indicators that aggravate the safety and comfort of passengers (Mao et al., 2021). Additionally, this study undertakes the approach of the resident's perspectives, which have been highly overlooked in the previous literature. Residents use different forms of transport based on their work and social activities, but diverse mobilities in general have led to an increase in travel-related activities, leisure, and migration in daily life (Hannam, 2008). Moreover, changing the transportation infrastructure just for tourists is considered challenging because it was meant to be convenient and useful to locals (Maneze and Pacheco, 2018). Accordingly, a novel approach should be considered in determining from the locals' perspectives, which are also considered travel consumers for this study, the use of smart mobility for their commuting needs.

Moreover, perception evaluations of smart mobilities in terms of the convenience of mobile apps are to be taken, which enable users to manage their journey schedule by looking for

shorter or specific routes to reach their destination and calculating the estimated time of arrival (Kim et al., 2021). Innovations such as booking platforms are convenient for accessing desired destinations (Chen and Chen, 2023). Hence, this study adopts motivation theory to assess the different motivational factors (ride comfort, safety, app convenience, and monetary value) that underscore intention to reuse smart mobility and find any insightful outcome that will provide potential insights for firms to target travel consumers. To the best of our knowledge, scholars have paid scant attention to this phenomenon in the context of smart mobility.

Moreover, this study applies gender comparisons, assuming that males and females have different perceptions, especially in relation to tourism technology. For instance, smartphone app usage along with the existence of AI have highlighted a significant difference between genders in tourists' intention to use transportation (Kim et al., 2023a) or travel to a specific destination (Melo et al., 2024). In the case of public transport, female travelers highly rate customer service, security, convenience, and environmental conditions (Zheng et al., 2022). In the context of smart mobility, Singh (2020) conducted an exploratory study to investigate how gender roles influence an individual's intention to use mobility services. However, this study highlighted the need for further empirical analysis to identify the key factors that significantly affect an individual's intention to reuse such services (Singh, 2020). Hence, this study addresses the research gap raised by Singh (2020).

This study aims to provide a comprehensive research framework on the roles of intrinsic motivations (ride comfort, safety, and app convenience) and extrinsic motivation (monetary value) and their effects on the travel consumers' intention to reuse smart mobility depending on their gender roles. Understanding that the concept of smart mobility is broad by encompassing many types of transportation, this study narrows down the type of smart mobility to ride-hailing

services, which has been widely adopted especially in South Korea (Lee et al., 2019). This study utilizes a multi-analytical approach consisting of partial least squares structural equation modeling (PLS-SEM), multigroup analysis (MGA), and fuzzy-set qualitative comparative analysis (fsQCA). Tourism scholars have used fsQCA to solve these complex connections between the behavior variables (Olya and Al-Ansi, 2018). Our study proposes two research questions: 1) Do the roles of intrinsic and extrinsic motivation positively influence smart mobility users' intention to reuse? 2) Do these influences differ based on gender?

2. Theoretical background

2.1 Motivation theory

Motivation theory states an individual's desire, will, want, and need are distinguished into intrinsic motivation and extrinsic motivation. Intrinsic motivation refers to certain behaviors to be acquired for the fulfillment of desires and needs based on certain tendencies and propensities. Extrinsic motivation refers to actions taken to achieve external outcomes and achievements by the reflection of individuals' regulations and norms (Ryan and Deci, 2000). Monetary cost, which is renowned as an external indicator of retrieving rewards of an individual's action, generally loses intrinsic motivation, which is related to receiving nonrewarded outcomes. Intrinsic motivation is distinguished from extrinsic motivation in that it relates to one's psychological behavior, which includes personal expressiveness, attraction, self-determination, and realization (Deci et al., 1999).

Based on this notion, many studies have utilized intrinsic and extrinsic motivations in the tourism context to identify different antecedents for performing such behaviors and attitudes. For instance, Dedeoglu et al. (2023) highlighted the effect of consumer-generated content and its

subsequent influence on different intrinsic motivations, which further indicate the desire and intention to visit. Cole et al. (2019) assessed intrinsic motivation as a sole variable alongside other motivational factors such as "identified," "introjected/external," and "amotivation" in explaining the travel intentions of disabled tourists. Gong and Tung (2017) examined the effect of mini movies on tourism destination image while considering travel motivations and advertising disclosure. According to Iso-Ahola (1982), travel motivation is associated with imbalances in a person's sociopsychological surroundings and internally motivated pursuits as well as the evasion of motives for intrinsic and personal benefits in different destinations and preferred backgrounds. The current study contends that the allocations of intrinsic and extrinsic motivation variables differ in tourism backgrounds and settings.

In the context of public transport for tourism purposes, intrinsic and extrinsic motivations are aligned in attracting and inducing travelers to use public transport (Istianto and Djajasinga, 2021). Enjoying a stable travel speed and being provided with comfortable seats in a clean travel environment are considered important safety attributes of travel. External factors, such as the cost of using public transportation, are considered extrinsic variables in moving from one place to another (Launtu et al., 2022). Building upon the framework of Launtu et al. (2022) with Istianto and Djajasinga (2021), this study posits that safety, along with app convenience and ride comfort, serves as intrinsic motivators for smart mobility. By contrast, monetary cost acts as the disparity incurred when moving from one destination to another. In this regard, this study elaborates on the fundamentals of the intrinsic and extrinsic motivation variables in the context of smart mobility by providing new insights into travel consumers' intention to use smart mobility services.

2.2 Smart mobility

In the past decade, the introduction of smart mobility in residential areas has influenced the general mobility of travel consumers by the utilization of newest technology, which offers comfortable, convenient access toward transport usage (Singh, 2020). Innovated by ICT technologies, smart mobilities have enhanced the quality of life of residents; these advancements contribute to efficient city management and promote sustainable tourism (Roda et al., 2017). Moreover, the widespread use of smartphones enables easy access to diverse types of smart mobility solutions through app access (Singh, 2020), which can lead to their positive intention toward the services. Hence, mobility apps are considered crucial in providing convenient travel planning, along with instant payments.

Regarding the antecedents of using smart mobilities, several studies have adopted different perspectives and theories in checking travelers' behaviors (Lee et al., 2021; Vătămănescu et al., 2023). Vătămănescu et al. (2023) assessed attitudinal perspectives, such as environmental consciousness and embracing technology, and their effect on travelers' car-sharing behaviors. For the case of ride-hailing services, Lee et al. (2021) evaluated the influence of perceived value on the usage intention of millennial travelers. However, scholars have recently called for further research to provide more ample potential antecedents that affect such behavioral intentions (Han et al., 2024; Lee et al., 2021). To address these calls, this study uses motivation theory to investigate the major motivational factors influencing intention to reuse smart mobility.

2.3 Mobilities in tourism

With the expansion of innovations and technology, mobilities, which are considered all types of transport, are essential travel services (Signorile et al., 2018). Such mobilities include walking

and cycling (Kim and Hall, 2022), public transport (e.g., subways, taxis, and trains; Kim et al., 2023a), and cruises (Buhalis et al., 2022), which are well known as crucial transportation services for travelers to reach their destinations. Mobilities in the travel context specify advanced transportation services that support the movement of travelers to a destination from their original place (Kim et al., 2021; Signorile et al., 2018). Hence, identifying the effects of different antecedents on mobility services is crucial to ensure tourist satisfaction with their experiences (Paiva et al., 2021).

Several studies have identified antecedents that influence travelers' intention to utilize tourism mobilities. For instance, the antecedent factors in affecting travelers' attitude toward cruise tourism are generated not only for its innate mobility purposes but also for providing hospitality services above the ocean (Meng et al., 2011). Antecedents influencing travelers' attitudes toward participating in cycling and walking differ within the context of cruise tourism because cycling and walking motivations are generated based on their individual values such as mental health, social connection, and self-improvement (Kim and Hall, 2022). Despite the growing establishments of antecedents of tourism mobilities, such cases have been rarely evaluated in the context of smart mobility. Therefore, this study indicates the intrinsic and extrinsic motivational factors in determining the major antecedents of travel consumers' intention to reuse smart mobility.

2.4 Gender difference in tourism mobility

Studies have recently compared the different perspectives of males and females toward travel and hospitality services (Han et al., 2017; Kim et al., 2023b). For instance, Han et al. (2017) assessed the attributes of bike tourism and its further effect on value, satisfaction, and desire.

They found that males are more likely to pursue the desire toward bike traveling, whereas females are more likely to value numerous bike amenities such as overnight accommodations, F&B restaurants, and rest areas. In travelers' perception of space tourism, Kim et al. (2023b) found several risk factors that influence travelers' intention to participate. The results indicated that males focus solely on the physical risk, whereas females are more concerned about the physical and privacy risks involved in space travel.

Scholars have identified several gender differences in the mobility research context (Zheng et al., 2022; Kim et al., 2023a). Gender comparison in the tourism mobility industry is crucial because significant results show that many females feel unsafe when using public transport such as metros and buses (Ouali et al., 2020). In the cycling context, females experience intense anxiety while using public transportation; therefore, they need to take precautions to stay safe, such as making friends, staying away from lonely areas, refraining from riding at night, or being alone (Yuan et al., 2024). Additionally, females prioritize factors such as "customer service," "customer information," "security," "comfort at integration terminals," and "speed" when using public transportation (Zheng et al., 2022). In the smart mobility context, Singh (2020) highlighted the distinct travel requirements between men and women and addressing this concern warrants an empirical analysis employing a mixed analytical approach to discern gender differences within the smart mobility context.

3. Hypothesis development

Safety, convenience, and comfort encourage the use of public transport (Stopher et al., 1974). Accordingly, mobility practitioners have been innovative by employing different marketing strategies and management skills to improve service quality, which leads to the provision of

accessible experiences and eventually intention to reuse (Nguyen-Phuoc et al., 2020). Smart mobility not only provides positive, enjoyable experiences for travelers through app usage but also improves accessibility by delivering real-time information and suggestions that enhance the comfort and safety of smart mobility users (Kim et al., 2021). Although several studies have researched diverse antecedents from other mobility backgrounds, scant research has examined the influence of intrinsic motivators such as safety, app convenience, and ride comfort on travel consumers' intention to reuse smart mobility. Hence, this study states the following hypotheses:

H1*: Ride comfort has a positive influence on travel consumers' intention to reuse smart mobility.*

H2*: Safety has a positive influence on travel consumers' intention to reuse smart mobility.*

H3*: App convenience has a positive influence on travel consumers' intention to reuse smart mobility.*

Reasonable transport fares have been among the indicators used to measure the quality of transportation services and attract transport consumers (Stopher et al., 1974). The reasonable cost of transportation toward tourism destinations is one of the most significant factors affecting travelers' positive behaviors (Suanmali, 2014). Accordingly, this study proposes the application of an identical approach to retaining travel consumers by monetary value in the smart mobility context. Hence, this study proposes the following hypothesis:

H4: *The monetary value of smart mobility has a positive influence on travel consumers' intention to reuse smart mobility.*

In the case of finding antecedents in the use of public transport, vulnerable groups such as females, minors, and the elderly place more importance on safety than males. Additionally, females care more about seat comfort, road safety, and service distribution when riding on a bus, whereas male passengers are more concerned about the time spent on the journey, noise, and hygiene on the bus (Rojo et al., 2011). The above literature reveals different perceptions toward transport between genders. Hence, this study assumes that different perceptions exist between males and females with regard to using smart mobility. Therefore, this study states the final hypothesis:

H5: *The effects of ride comfort, safety, app convenience, and monetary value on travel consumers' intention to reuse differ significantly between males and females.*

The following research model illustrates the stated relationships of the listed variables (Fig. 1).

Insert Figure 1 around here

4. Methodology

4.1 Data collection and questionnaire development

Data were collected from one of the biggest smart mobility organizations in Korea. The current company is one of the fastest-growing smart mobility companies in Korea. In the early days of service in approximately 2020, the number of application downloads drastically increased by 2700% within three months of its launch. Online invitation links were sent to 500 active users, and stratified random sampling was applied to the firm's smart mobility users to ensure that various subgroups within the population were proportionally represented (Korean Statistical Information Service (KOSIS, 2022). Responses were collected from November 17, 2022, to November 24, 2022. To target the correct sample, the survey first applied the screening question, "Do you have any experience using smart mobility within the past six months?" Survey respondents who replied "No" were excluded from this study (see Supplementary A). Survey respondents who provided incoherent or inconsistent answers were also excluded. As a result, 320 respondents were selected for the current study, resulting in a 64% response rate. The analytical approach included the application of PLS-SEM, MGA, and fsQCA.

A survey questionnaire that included multiple measures was adopted. The questionnaire consisted of 22 questions covering five variables: ride comfort, safety, app convenience, monetary value, and reuse intention. Specifically, four questions stating one's monetary value were retrieved from Sharma and Klein (2020) and Sweeney and Soutar (2001). Five questions on safety were retrieved from Cho and Lee (2016), and five questions for ride comfort and app convenience were accessed from Cho and Lee (2016) and Yao and Ding (2011). Finally, three items to evaluate consumers' reuse intention were retrieved from Nguyen-Phuoc et al. (2020) and Park and Namkung (2022). For the confirmation of reliability and discriminant validity, all the questionnaires were assigned a five-point Likert scale, which ranged from "strongly disagree" (1) to "strongly agree" (5). Moreover, the survey included questions related to sociodemographic

characteristics, which consisted of gender, age, educational level, occupation, monthly income, and marital status (Supplementary A).

4.2 Content validity

The survey was initially created in Korean for Korean locals to respond to. After finalizing the questionnaire design, three experts specializing in research in smart tourism and mobility, proficient in Korean and English, participated in the translation. This step aimed to guarantee consistency between the original and back-translated versions of the survey (Olya et al., 2024). After the evaluation of the questionnaire, the survey proceeded to a smart mobility company for further survey progress. The survey was conducted by the travel consumers who used the company's smart mobility services that are listed in the company's internal database.

4.3 Data analysis

A multiple analytical approach consisting of a symmetrical approach (PLS-SEM, MGA) and an asymmetrical approach (fsQCA) was adopted to capture an in-depth view of the behaviors of smart mobility users. Symmetric factors indicate the influence of the input variables (X) on the outcome variables (Y) and the suitability of the relationship (Olya and Al-Ansi, 2018). The asymmetrical approach reveals that the input variable of X does not necessarily indicate a better relationship with Y (Ragin, 2017). By utilizing these analyses, this study claims that the four input variables (ride comfort, safety, app convenience, and monetary value) are sufficient factors for providing insights into intention toward reusing mobility services. PLS-SEM and MGA methods aims to identify the significant input variables affecting the output variables and to evaluate their relationship, whereas fsQCA provides numerous combinations of configurational

models, which reveal the significant behavior and attitudes of the travelers (Kim et al., 2023a; Olya, 2023).

The symmetrical approach of PLS-SEM and MGA, which is a composite-based method toward SEM that explains the variance of the target constructs in the structural model by using linear combinations of indicator variables as proxies of the conceptual variables under inquiry, is highly recommended (Rigdon et al., 2017). Hence, SmartPLS 4.0 was used in this study to endorse the measurement and structural models (Ringle et al., 2015).

The asymmetrical approach is used to assess the complex behaviors of human beings; complicated phenomena can hardly be explained by the traditional analytic approach (Olya and Al-Ansi, 2018). In the context of the asymmetrical approach, fsQCA is employed to analyze the configurations that elucidate the conditions and circumstances under which travel consumers reuse smart mobility services. This approach aims to offer comprehensive insights into the influences of sufficient and necessary factors as well as the configurational effects generated by the combination of the intrinsic and extrinsic motivations in stimulating the reuse intention of smart mobility services (Kim et al., 2023a). Hence, fsQCA has been highly recommended for tackling complex phenomena and providing insights, even though the relationship between the input and output variables does not require a symmetrical relationship (Olya and Al-Ansi, 2018; Ragin, 2017).

Overall, fsQCA 3.0 software was used in this study to identify adequate causal combinations of components along with the necessary condition requirements. The configuration modeling was conducted in three distinct stages (Ragin, 2017). In the dataset, the Likert scale data were transformed into three-point data, where seven were assigned the full member value of 1, four were converted to the intersection value of 0.5, and one was considered the nonmember

value of 0 (Ragin, 2017). Thus, the usage of fsQCA presented deeper insights by understanding the complex motivational factors of smart mobility that influence travel consumers' intention to reuse. Lastly, to determine any common method variance for this study, the single-factor method was undertaken (Podsakoff et al., 2003). The results indicate that common method variance is not an issue for this study (Supplementary B).

5. Results

5.1 Demographic information

This study presents the demographic profiles and supplementary information on the entire group of both genders (Supplementary C), and the sociodemographics indicate a significant difference in the diverse disciplines and factors. The two gender groups comprise 145 males and 175 females. More than half the female respondents are in their 30s, whereas the ages of the male respondents are evenly distributed in their 30s and 40s. Males generally have a higher monthly income than females, although a higher proportion of females have a university degree (Supplementary D).

5.2 Measurement model

The factor loadings for 21 measurement items are practically significant, with a value higher than 0.5 (Hair et al., 2021). One item for monetary value ("Smart mobility is reasonably priced.") was removed due to a low factor loading (below 0.5). The multicollinearity of the variables was assessed by applying the variance inflation factor (VIF). The results indicate that the VIF ranges from 1.6 to 3.7, which shows that multicollinearity is not considered a drawback (Hair et al., 2021), as presented in Supplementary E. Additionally, composite reliability, Cronbach's alpha,

and Rho_A exceed 0.7 with the average variance extracted over the value of 0.5, which confirms construct reliability and validity. Discriminant validity is confirmed with the square root of the AVE of each variable, indicating a higher value of the square correlation of the other variables (Fornell and Larcker, 1981). Finally, the endogenous variables representing the Q^2 values are greater than 0, which establishes predictive relevance (Supplementary F).

5.3 Structural model

With the bootstrapping method of increasing up to 5,000 samples, PLS-SEM was used to validate the four hypotheses (Hair et al., 2021). Among the hypotheses, monetary value has the highest significant influence on intention to reuse smart mobility (H4: t value = 4.403, p value <0.001), followed by ride comfort (H1: t value = 3.036, p value<0.01). However, safety (H2: t value = 1.054, p value = 0.292) and app convenience (H3: t value = 1.620, p value = 0.105) have no influence on the intention to reuse smart mobility. Reuse intention toward smart mobility is explained by the R^2 (variance explained) with a value of 48.4% (Hair et al., 2021), as shown in Fig. 2. Hence, hypotheses 1 and 4 are supported, whereas hypotheses 2 and 3 are not.

Insert Figure 2 around here

5.4 MGA

MGA for additional insights (Ringle et al., 2015) was utilized to compare the gender roles of males and females. The results indicate monetary value toward smart mobility reuse intention, and significant differences exist between the gender groups, where males exhibit a higher

influence toward the reuse intention in their monetary value (path difference = 0.236, p value < 0.05). Ride comfort toward reuse intention has no significant difference between gender roles (path difference = −0.198, p value = 0.122), as shown in Supplementary G.

5.5 fsQCA analysis

The essential factors leading to behavioral intentions between males and females have been indicated (Kim et al., 2023a; Supplementary H). Based on the consistency cut-off of a higher value than 0.9 (Ragin, 2017), ride comfort in this study is the sole key factor in males' intention to reuse smart mobilities. Ride comfort and app convenience are necessary conditions for females' intention to reuse smart mobilities. Monetary value and safety are not necessary conditions for males' and females' intention to reuse. While the necessary condition analysis determines the variables that highlight retaining such behaviors, the truth table analysis in the fsQCA model provides multiple configuration models and solutions that lead to the desired outcome (Ragin, 2017).

Moreover, the results of the truth table analysis between genders reveal several configuration models to reach the desired outcome of the study based on asymmetrical access (Kim et al., 2023a). The configurational model of monetary value and ride comfort shows that in both genders, the presence of these attributes in smart mobility leads to intention to reuse the given services. For the case of males, monetary value along with safety and app convenience positively influence travel consumers' intention to reuse smart mobility. A similar stimulation indicates males pursue high levels of safety, ride comfort, and app convenience. Females seek a high level of monetary value with a low level of app convenience in deciding to reuse smart mobility. However, even when females perceive the monetary value to be low, a high perception

of safety and app convenience leads them to reuse smart mobility (Supplementary I). Thus, H5 is supported.

6. Conclusion and implications

6.1 Conclusion

Pertinent studies have assessed the influence of various intrinsic and extrinsic factors on travel consumers' intentions to use different modes of transportation, such as public transit and bicycles (Launtu et al., 2022). In the smart mobility context, studies have shown that smart mobility solutions are crucial for revitalizing tourism destinations. However, academic inquiry into the factors that influence travel consumers' intentions to reuse these services has been limited (Baggio et al., 2020; Karakas and Atay, 2023). Thus, this study extends prior research on smart mobility by identifying the sufficient, necessary factors and elucidating the role of gender in complex interactions of motivations influencing smart mobility reuse intention.

This type of multi-analytical approach consisting of PLS-SEM and fsQCA contributes to the methodology of hospitality and tourism studies, which can provide unique, deeper findings and induce future researchers to undertake a mixed approach to generate deeper insights. This approach is eligible along with the application of motivation theory in the mobility context because travel consumers engage with various modes of transport for different travel purposes and may pursue a more intrinsic or extrinsic benefit depending on their designated situations (Fussell, 2001; Mokhtarianet al., 2015). Based on set-theoretic approach principles utilizing Boolean algebra, necessary factors are identified, and sufficient conditions (a combination of the factors) are calculated to predict specific outcomes (Kan et al., 2016). Unlike statistical analytical approaches, which assess the net effect of individual factors, this study is the first empirical

research that utilizes both methodologies to generate new knowledge on necessary factors and sufficient conditions driving the intention to reuse smart mobility services.

6.2 Theoretical Implications

This study contributed to the existing knowledge of smart mobility by evaluating four major variables comprising three intrinsic variables (ride comfort, safety, and app convenience) and a sole extrinsic variable (monetary value) in identifying smart mobility users' intention to reuse. We found that ride comfort has a significant influence on travel consumers' intention to reuse smart mobility. This finding aligns with previous studies that investigated comfort's effect on attitudes toward tourism mobilities (Dell'Olio et al., 2011). Moreover, the same influence was found for monetary value assigned as a positive determinant of travel consumers' intention to reuse smart mobilities, which aligns with previous research identifying cost and monetary value as important indicators for travel consumers using tourism mobilities (Suanmali, 2014). However, the analysis indicated that safety and app convenience do not significantly affect travel consumers' intention to reuse smart mobilities, which contradicts the hypothesis stated for this study. MGA indicated meaningful differences between the gender groups for monetary value, where the effect of monetary value on smart mobility reuse intention is higher among male consumers. A practical explanation of this phenomenon states that males are more likely to use cars and private vehicles to drive further compared with females, which leads male to value more on the infrastructure of the vehicle on the money spent (Sovacool et al., 2019)

Along with the necessary condition analysis, the findings indicate that ride comfort is a significant indicator for males and females. App convenience is also an indicator of females' intention to use smart mobility. However, for males, app convenience and safety are not

necessary conditions, and monetary value is not significant for both genders. This necessary condition analysis is consistent with previous research, which found that females care more about service, seat comfort, and situational convenience, whereas males are more concerned about general comfort, sensitivity to noise, and the level of hygiene of their conveyance during their journey (Rojo et al., 2011; Zheng et al., 2022).

The findings from fsQCA indicate that monetary value and ride comfort can significantly influence both genders' intention to reuse smart mobility. For females, the intention to reuse mobility services is indicated by the effect of monetary value on the absence of app convenience. This finding is consistent with the result of Susilo and Cats (2014), who discussed that monetary value is achieved when transport services are satisfactory and travel time is accurate. However, men are more likely to emphasize travel time and distance traveled, which are not specifically correlated with the satisfaction of smart mobility services. Regardless of monetary value, safety and app convenience are important variables for females leading to such intentions. The findings align with previous research that found females seek safety when using tourism mobilities (Rojo et al., 2011; Sovacool et al., 2019). Furthermore, the user-friendliness of an app is a significant factor in their intention to reuse a given transport and its applications (Kim et al., 2023a). The user-friendliness of an app is important because supportive systems like smartphones can directly lead to personal safety and stress management, which is crucial for females, especially in the smart mobility context (Chandrakala et al., 2024). For males, our study found an even distribution of intrinsic and extrinsic motivators in the configurational models. Safety and app convenience significantly influence attitudes, similar to ride comfort and monetary value. Men are more inclined to pursue services given by smart mobility depending on their individual needs

and desires in a holistic view, whereas females pursue peripheral benefits, such as social and hedonic benefits (Frank et al., 2014).

6.3 Practical implications

This research highlights the importance of monetary value in intention to reuse mobility services. Therefore, smart mobility marketers should ensure consistent, enhanced service provision to guarantee value for the payments made by travel consumers. Moreover, ride comfort has a significant influence on reuse intention, so practitioners should pay particular attention by ensuring services are consistent and hygienic. However, safety and app convenience do not affect travel consumers' reuse intention and must be guaranteed in the first place rather than playing a major role in sustaining their loyalty. These two factors do not necessarily lead to a direct effect on travel consumers' reuse intention. According to the MGA results, male consumers are more inclined to value the cost of smart mobility compared with female consumers. Hence, marketers in their target marketing plans should consider that males are more likely to value the infrastructure and provide appealing compositions and characteristics.

Males value smart mobility as a ubiquitous perspective based on different intrinsic and extrinsic motivations. Females also value the cost and comfort experienced during their travel but emphasize safety and app convenience, regardless of their monetary value. For smart mobility practitioners, this implies that even though innovations and technologies have advanced, females still rate the safety and convenience of smart mobility over its monetary value. This outcome provides further marketing implications related to the different gender roles.

6.4 Limitations and future research

Although the current study provides practical, significant insights, several limitations exist. First, the provision of practical and theoretical contributions through multi-analytical approaches may require an additional qualitative approach, such as in-depth interviews, to understand travel consumers' reuse intention better. Moreover, this study was taken from the data of a Korean company. Future research could include a cross-country, cultural approach by unveiling different motivational factors and examining which factors should be prioritized. Finally, this research covers only reuse intention, whereas the study of other behavioral intentions, such as word of mouth, avoidance intention, and engagement, could provide more insights into the behaviors of travel consumers.

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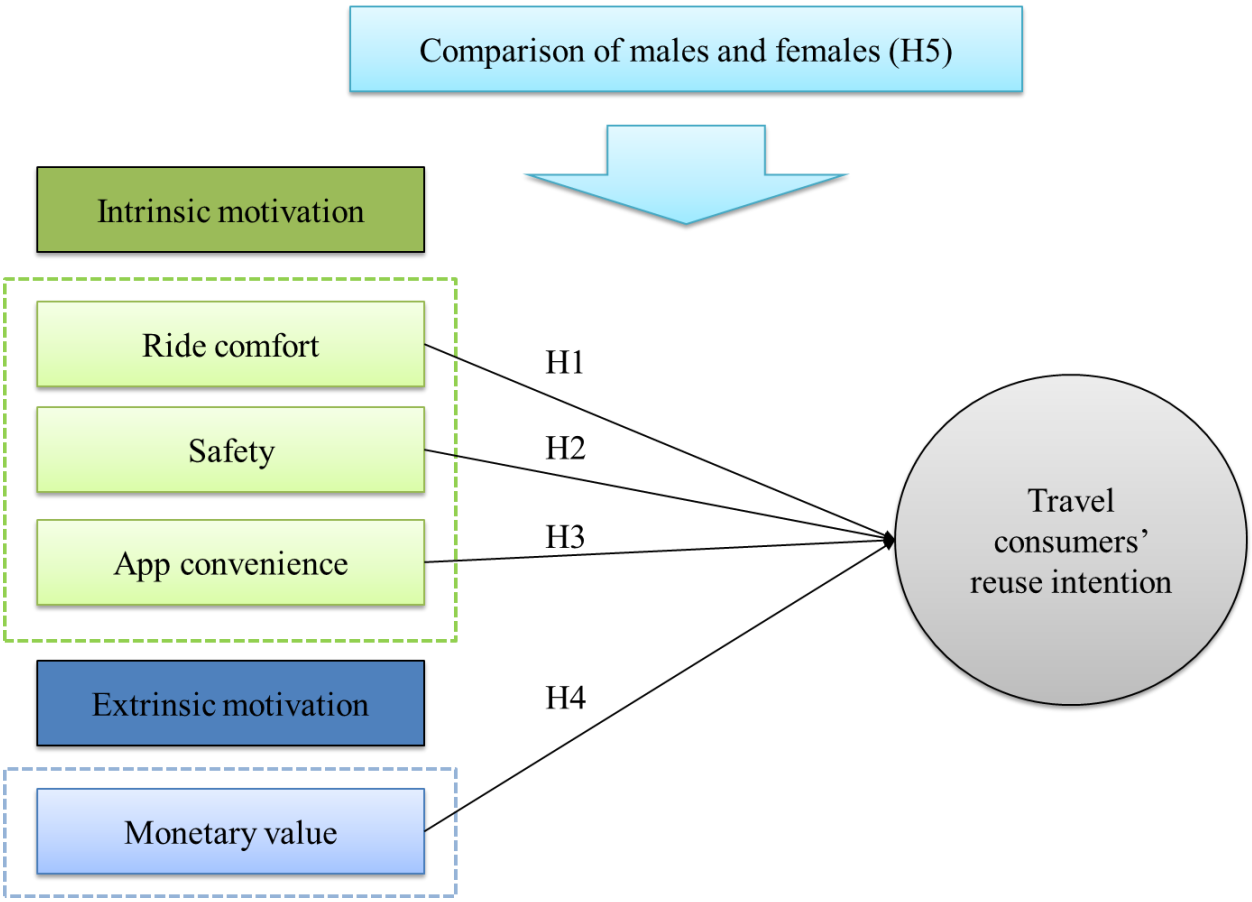

Figure 1 Proposed research model
Source: Authors created the figure

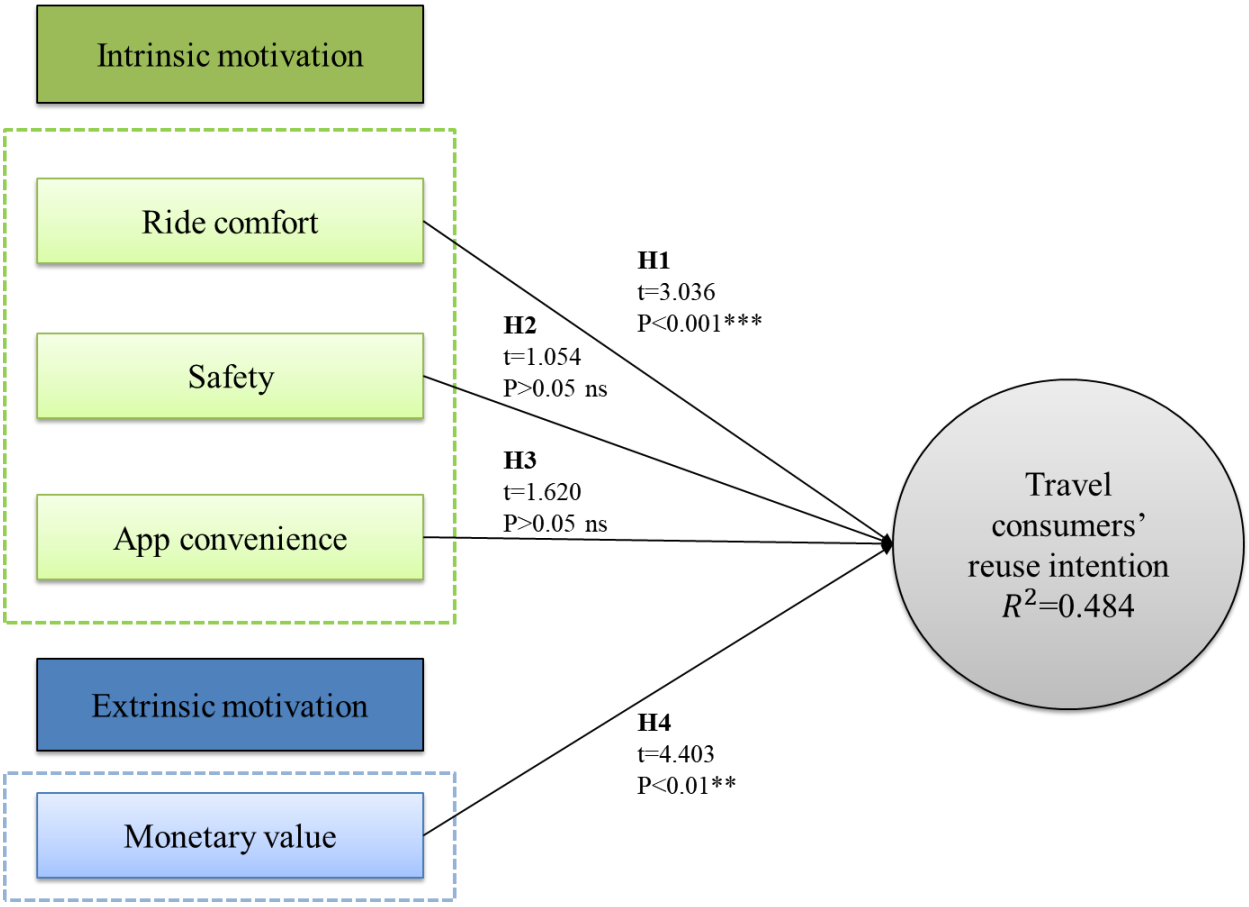

Figure 2 Proposed research model with results.
Note: ***p-value<0.001, ** p-value<0.01, ns=non-significant.
Source: Authors created the figure

Chung, C., Kim, M. J., Chung, N., & Olya, H. (2024). Motivations to reuse smart mobility: unpacking behavioral dynamics through a multi-analytical approach. *Journal of Hospitality and Tourism Technology*. https://doi.org/10.1108/JHTT-03-2024-0206

Supplementary A.

Questionnaire

Survey on smart mobility users

Hello,

This survey was designed to identify the experience and satisfaction of smart mobility users. We would like to inform you that the results of the survey are used for research purposes only, and that all responding surveys will be anonymous. We will use all the valuable surveys you answered faithfully as research data. The survey will take about five minutes. Thank you very much for your help in the research despite your busy schedule.

We greatly appreciate your time and cooperation in completing this questionnaire.

Thank you very much!

Screening question (SQ)

SQ1. Have you used smart mobility within the past six months?

1. Yes (Proceed to the next part)
2. No (End of the survey)

Perception questions (PQ)

The following questions ask your perception of smart mobility.

PQ1. What is the main reason for you to use smart mobility?

1. Wide and comfortable space
2. Friendly driver
3. Costs
4. Fast dispatch
5. Convenient call service
6. Others ( )

PQ2. What do you think makes smart mobility different from other mobilities? (Descriptive Answer)

PQ3. How many calling attempts do you make when you use smart mobility? (Descriptive Answer)

PQ4. How long does it take for the vehicle to arrive after the dispatch is confirmed? (Descriptive Answer)

PQ5. How long does it take for you to arrive at your destination? (Descriptive Answer)

PQ6. Where is your main boarding spot and destination of arrival? (Descriptive Answer)

Survey constructs

The following questions ask your motivations and perceptions in using smart mobility

Please choose a value on a scale that best represents your level of agreement or disagreement when evaluating these statements (1-Strongly Disagree to 5-Strongly Agree).

Monetary value	Strongly disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
1. Smart mobility is reasonably priced.	1	2	3	4	5
2. Smart mobility offers the value for the user price.	1	2	3	4	5
3. Smart mobility provides good value for the current price.	1	2	3	4	5
4. Overall, I perceive a superior value in using smart mobility.	1	2	3	4	5

Ride comfort	Strongly disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree

1. Smart mobility has a better-differentiated service.	1	2	3	4	5
2. Smart mobility is larger and more comfortable.	1	2	3	4	5
3. Smart mobility doesn't smell and have any mephitis	1	2	3	4	5
4. Smart mobility driver is young and friendly	1	2	3	4	5
5. Smart mobility doesn't speed and is stably operated	1	2	3	4	5

Safety	Strongly disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
1. I feel safe since I can check the driver's identity and vehicle in advance.	1	2	3	4	5
2. I feel safer using smart mobility rather than normal mobilities.	1	2	3	4	5
3. I can send a relief message to my friends.	1	2	3	4	5
4. I can make bookings and check the location in real-time.	1	2	3	4	5
5. I can call the smart mobility to my pick-up point.	1	2	3	4	5

App convenience	Strongly disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
1. I don't need to tell the direction after getting in the vehicle.	1	2	3	4	5
2. Smart mobility has multiple paying methods.	1	2	3	4	5
3. Smart mobility can go to the exact place that I want to.	1	2	3	4	5
4. I can check the estimated time of arrival and distance in advance.	1	2	3	4	5
5. Smart mobility app is convenient compared to other apps.	1	2	3	4	5

Reuse intentions	Strongly disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
1. If I have a chance, I will re-use mart mobility in the future.	1	2	3	4	5
2. I am willing to re-use smart mobility with my friends or family.	1	2	3	4	5
3. I intend to keep re-using smart mobility.	1	2	3	4	5

Demographic questions (DQ)

The following questions ask your demographic profiles.

DQ1. What is your gender?

1. Male
2. Female
3. Others ( )

DQ2. What is your age?

1. Below 30
2. Between 30 and 39 years old
3. Between 40 and 49 years old
4. Between 50 and 59 years old
5. 60 years old and over

DQ3. What is your highest education level?

1. High School
2. University
3. Graduate school or higher
4. Others( )

DQ4. What is your current occupation?

1. Professional
2. Service Worker
3. Office/administrative/clerical worker
4. Technician

5. Home maker
6. Student
7. Others ()

DQ5. What is your monthly income level?

1. Less than KRW 2.000
2. From KRW 2.000 to 2.999 million
3. From KRW 3.000 to 3.999 million
4. From KRW 4.000 to 4.999 million
5. Above KRW 5.000

DQ6. What is your marital status?

1. Not married
2. Married
3. Others ( )

Supplementary B.

Common method bias tests

Test method	Test	Result
Harmon single-factor test	Four factors appeared. (the total 64.1% variance explained) First factor: 41.2% Second factor: 11.1% Third factor: 6.2% Fourth factor: 5.6%	Since more than one factor appears, and the first factor has less than 50% variance, common method bias is not an issue (Podsakoff *et al*., 2003).

Note: The current test shows that common method bias is not problem in this study.

Source: Authors created the table

Supplementary C.

Demographic characteristics from the entire group

Characteristics	320 (n)	100 (%)
Gender		
Male	145	45.3
Female	175	54.7
Other	0	0.0
Age		
Below 30 years old	66	20.6
Between 30 and 39 years old	141	44.1
Between 40 and 49 years old	78	24.4
Between 50 and 59 years old	28	8.7
60 years old and over	7	2.2
Educational level		
High school diploma	44	13.8
University	210	65.6
Graduate school or higher	66	20.6
Marital status		
Single	162	50.6
Married	153	47.8
Other	5	1.6
Monthly household income		
Less than KRW* 2.000 million	25	7.8

From KRW 2.000 to 2.999 million	58	18.1
From KRW 3.000 to 3.999 million	75	23.4
From KRW 4.000 to 4.999 million	38	11.9
Above KRW 5.000 million	124	38.8
Occupation		
Professional	72	22.5
Service worker	46	14.4
Office/administrative/clerical worker	124	38.7
Technician	5	1.6
Home maker	16	5.0
Student	15	4.7
Others	42	13.1

Note: * 1 million Korean Won ~ 720 USD.

Source: Authors created the table

Chung, C., Kim, M. J., Chung, N., & Olya, H. (2024). Motivations to reuse smart mobility: unpacking behavioral dynamics through a multi-analytical approach. *Journal of Hospitality and Tourism Technology*. https://doi.org/10.1108/JHTT-03-2024-0206

Supplementary D.

Demographic characteristics of men and women

Characteristics	Men (%)	Women (%)
Gender		
Male	100	0.0
Female	0.0	100
Age		
Below 30 years old	15.9	24.6
Between 30 and 39 years old	35.9	50.8
Between 40 and 49 years old	31.0	18.9
Between 50 and 59 years old	13.1	5.1
60 years old and over	4.1	0.6
Educational level		
High school diploma	14.5	13.1
University	61.4	69.2
Graduate school or higher	24.1	17.7
Marital status		
Single	49.0	52.0
Married	49.6	46.3
Other	1.4	1.7
Monthly household income		
Less than KRW* 2.000 million	6.2	9.1
From KRW 2.000 to 2.999 million	13.8	21.8

From KRW 3.000 to 3.999 million	17.9	28.0
From KRW 4.000 to 4.999 million	11.8	12.0
Above KRW 5.000 million	50.3	29.1
Occupation		
Professional	25.5	20.0
Service worker	14.5	14.3
Office/administrative/clerical worker	37.2	40.0
Technician	2.8	0.6
Home maker	0.0	9.1
Student	4.8	4.6
Others	15.2	11.4

Note: * 1 million Korean Won ~ 720 USD.

Source: Authors created the table

Chung, C., Kim, M. J., Chung, N., & Olya, H. (2024). Motivations to reuse smart mobility: unpacking behavioral dynamics through a multi-analytical approach. *Journal of Hospitality and Tourism Technology*. https://doi.org/10.1108/JHTT-03-2024-0206

Supplementary E.

Measurements

Constructs	Loadings	t-value	VIF**
Monetary value			
1. Smart mobility offers the value for the user price.	0.699	11.486	1.940
2. Smart mobility provides good value for the current price.	0.721	12.181	1.956
3. Overall, I perceive a superior value in using smart mobility.	0.891	18.172	1.660
Ride comfort			
1. Smart mobility has a better-differentiated service.	0.779	11.519	1.703
2. Smart mobility is larger and more comfortable.	0.594	7.703	1.878
3. Smart mobility doesn't smell and have any mephitis	0.624	8.557	1.610
4. Smart mobility driver is young and friendly	0.593	7.596	1.596
5. Smart mobility doesn't speed and is stably operated	0.679	9.326	1.681
Safety			
1. I feel safe since I can check the driver's identity and vehicle in advance.	0.660	6.619	2.173
2. I feel safer using smart mobility rather than normal mobilities.	0.849	10.202	1.923
3. I can send a relief message to my friends.	0.554	6.053	2.071
4. I can make bookings and check the location in real-time.	0.798	10.464	2.791
5. I can call a call the smart mobility to my pick-up point.	0.859	10.005	1.969

App convenience			
1. I don't need to tell the direction after getting in the vehicle.	0.864	12.915	2.307
2. Smart mobility has multiple paying methods.	0.766	11.067	1.855
3. Smart mobility can go to the exact place that I want to.	0.797	10.904	3.306
4. I can check the estimated time of arrival and distance in advance.	0.850	16.119	3.700
5. Smart mobility app is convenient compared to other apps.	0.585	6.973	1.630
Reuse intentions			
1. If I have a chance, I will re-use mart mobility in the future.	0.828	24.264	3.457
2. I am willing to re-use smart mobility with my friends or family.	0.838	22.935	3.134
3. I intend to keep re-using smart mobility.	0.857	23.088	1.905

Source: Authors created the table

Supplementary F.

Reliability and discriminant validity

Construct	Fornell & Larcker (1981)				
	1	2	3	4	5
1. App Convenience	0.825				
2. Ride Comfort	0.600	0.738			
3. Monetary Value	0.329	0.456	0.814		
4. Reuse Intentions	0.457	0.535	0.476	0.898	
5. Safety	0.751	0.542	0.353	0.392	0.811
Mean	4.242	3.718	4.328	3.995	4.110
Standard deviation	0.666	0.770	0.704	0.858	0.819
Cronbach's alpha $\geq$ 0.7	0.881	0.791	0.834	0.879	0.871
Rho_A (reliability coefficient) $\geq$ 0.7	0.894	0.798	0.866	0.879	0.881
Composite reliability $\geq$ 0.7	0.914	0.857	0.887	0.926	0.906
AVE $\geq$ 0.5	0.681	0.545	0.663	0.806	0.658
Effect size (Q^2) > 0	-	-	-	-	0.352

Source: Authors created the table

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Supplementary G.

Differences of the path coefficients among gender groups

Path	Path difference	p-value	Hypothesis test
Ride Comfort > Reuse Intention	-0.198	0.122	Not Supported
Safety > Reuse Intention	-0.127	0.343	Not Supported
App Convenience > Reuse Intention	0.151	0.302	Not Supported
Monetary Value > Reuse Intention	0.236	0.019	Supported

Source: Authors created the table

Chung, C., Kim, M. J., Chung, N., & Olya, H. (2024). Motivations to reuse smart mobility: unpacking behavioral dynamics through a multi-analytical approach. *Journal of Hospitality and Tourism Technology*. https://doi.org/10.1108/JHTT-03-2024-0206

Supplementary H.

Results of necessary conditions for males and females in predicting the reuse behaviors of smart mobility.

Antecedent Condition (Males)	**Consistency**	**Coverage**	**Results**
Ride comfort	0.930516	0.929014	Necessary
Safety	0.849209	0.937031	Unnecessary
App convenience	0.894626	0.941551	Unnecessary
Monetary Value	0.808811	0.924198	Unnecessary
Antecedent Condition (Females)	**Consistency**	**Coverage**	**Results**
Ride comfort	0.942271	0.958370	Necessary
Safety	0.886341	0.965577	Unnecessary
App convenience	0.906873	0.959312	Necessary
Monetary Value	0.771083	0.948581	Unnecessary

Source: Authors created the table

Chung, C., Kim, M. J., Chung, N., & Olya, H. (2024). Motivations to reuse smart mobility: unpacking behavioral dynamics through a multi-analytical approach. *Journal of Hospitality and Tourism Technology*. https://doi.org/10.1108/JHTT-03-2024-0206

Supplementary I.

Results of the configuration models for males and females on their behavioral intention towards smart mobility reuse intention.

Configurational Models (Males) (**Coverage: 0.900; Consistency: 0.937**)	**Raw Coverage**	**Unique Coverage**	**Consistency**
S1: MonetaryValue*RideComfort	0.775	0.084	0.952
S2: MonetaryValue*Safety*AppConvenience	0.705	0.014	0.975
S3: Safety*RideComfort*AppConvenience	0.800	0.109	0.960
Configurational Models (Females) (**Coverage: 0.792; Consistency: 0.967**)	**Raw Coverage**	**Unique Coverage**	**Consistency**
S1: MonetaryValue*~AppConvenience	0.204	0.006	0.976
S2: MonetaryValue*RideComfort	0.745	0.393	0.969
S3: ~MonetaryValue*Safety*AppConvenience	0.333	0.040	0.993

Note: S: Solution
Source: Authors created the table