RESEARCH ARTICLE

What drives customers to continue using ride-sharing apps during the COVID-19 pandemic? The case of Uber in Egypt

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Abstract: The outbreak of the COVID-19 pandemic has caused big changes to customers' perceptions and attitudes towards ride-sharing apps. The purpose of this article is to examine the factors that influence customers' intention to continue using ride-sharing services during the pandemic. A conceptual model was developed based on the unified theory of acceptance and use of technology (UTAUT) and an extensive literature review. An online survey was used to collect data from 398 users of Uber ride-sharing services in Egypt. The partial least squares structural equation modeling (PLS-SEM) was used to test and validate the proposed model. The findings showed that customers' intention to continue using the ride-sharing apps during the pandemic is influenced by four factors which are performance expectancy, economic benefits, facilitating conditions and social influence. It indicated that customers' effort expectancy, perceived infectability and fear of COVID-19 do not affect their intention to use these services. The article contributes by examining the UTAUT in the context of ride-sharing apps during the pandemic. It provides some guidelines for companies that provide ride-sharing services to follow to help them survive with the big challenges they have faced during the pandemic.

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PUBLIC INTEREST STATEMENT

With the growth of the sharing economy, many business models have been developed based on this concept. Ride-sharing apps have been widely popular among customers for the multiple advantages that they provide. However, with the outbreak of COVID-19 pandemic, the ride-sharing providers have been facing big challenges with the economic lockdown. This article examines the factors that affect passengers' continuance intention to use the ride-sharing services during the pandemic. Through a study on Uber customers in Egypt, this study found that the performance expectancy, social influence and economic benefits are the major factors that affect customers' acceptance for these innovative services during the pandemic. This article contributes by being one of the first articles that examine consumers' relationships with ride-sharing apps in developing countries during the COVID-19 pandemic.

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1. Introduction

With the rapid penetration of the mobile internet and smartphones among customers, many business models have been introduced to markets depending on the sharing economy concept (Eckhardt et al., 2019; Zhou et al., 2020). The sharing economy has been boosted by mobile apps that have been widely accepted by customers within many business sectors such as vacation rentals (e.g., Airbnb), mobile food delivery apps (e.g., Talabat), health services (e.g., Doctor On Demand), online shopping (e.g., e-bay), freelancing services (e.g., Fiverr) and transportation (e.g., Uber) (Laukkanen & Tura, 2020).

The ride-sharing apps have gained a rapid popularity among consumers worldwide. For instance, Uber is currently operating in over 700 cities in 85 countries (World Population Review, 2021). It has a global market value of more than 72 USD billion with over than 78 million monthly active users worldwide (Business of Apps, 2020). This app depends on the idea of ride-hailing through matching the customers with the vehicle owners through the smartphones (Lee et al., 2018). It follows a dynamic pricing model where the riding fare is determined according the time of the day, traffic jam as well as availability of vehicles (Maziriri et al., 2020). This app has seen a wide penetration among customers for its easiness of use, high availability and speed, fair pricing, safety, and avoiding the problems of taxis (Mourdoukoutas, 2017).

The ride-haring apps have gained a wide popularity among Egyptians (Abd Elmeguid et al., 2018). With a population over 110 million citizens, Egypt is among Uber's top 13 markets globally (World Population Review, 2021). Uber and Careem, the two biggest companies that are operating in Egypt, have more than 5 million users with more than 150, 000 cars operating with these apps (Elwatan news, 2020). Driven by the problems that Egyptian customers have been always suffering from in traditional taxis such as the absence of specific fare, lack of safety, and absence of strict governmental regulations, many Egyptians found that these apps with its user-friendly interfaces, wide availability and fair pricing policies as a solution that can satisfy their transportation needs (Abd Elmeguid et al., 2018). The outbreak of COVID-19 pandemic worldwide has caused destructive impacts on ride-sharing operations. For example, Uber announced in November 2020 that it had lost 5.8 USD billion due to the pandemic (CNN, 2020). This has been mainly caused by the economic shut down, where millions of customers stayed and worked from home to protect themselves from the high infectability of the COVID-19 (Hossain, 2021).

This paper aims to investigate the usage of customers for riding apps in Egypt, where is scarcity in information about the factors that affect customers' intention to continue using ride-sharing services that are booked through mobile apps during the pandemic, especially in developing countries (Mogaji, 2020; Morshed et al., 2021). Building on the unified theory of acceptance and use of technology (UTAUT) that was proposed by Venkatesh et al. (2003), the research study in this article examines the factors that are affecting customers' intention to use these innovative services during the pandemic. The importance of this article lies in the gaps it fills in the marketing literature by revisiting the UTAUT in the context of ride-sharing apps during the COVID-19 pandemic. Much of the recent scholarly work has indicated that the consumption behavior of individuals has been largely affected by the pandemic (Ali et al., 2021; Zwanka & Buff, 2021). Thus, our article expands our knowledge about how customers' continuance intention to use the ride-sharing apps is shaped during the pandemic. Additionally, our study focuses on investigating some factors such as economic benefits, perceived infectability and fear of COVID-19 in influencing consumers' intention to use the ride-sharing apps during the pandemic. This is considered important, where there have been several calls to study the factors that impact the consumption of sharing economy apps during the COVID-19 pandemic (Buheji, 2020; Meenakshi, 2021). The findings of our empirical study provide recommendations and guidelines for companies that provide

the ride-sharing services through mobile apps to follow to be able to survive during and after the COVID-19 pandemic.

This paper is organized as follows: First, a literature review about the mobile apps that depend on the sharing economy concept is introduced. This is followed by a section that discusses how consumer's attitudes and intentions to use these services have been affected by the COVID-19 pandemic. After that, the conceptual framework together with the research hypotheses and its theoretical background are presented. Then, the methodology that was used to collect and analyze data is discussed. Following this, the results and discussion of the main findings are introduced. Finally, the paper presents the theoretical and managerial implications together with the study's limitations and directions of future research.

2. Literature review

### 2.1. The sharing economy and the rise of ride-sharing apps

Within the past few years, a group of innovative sharing business models have been introduced to markets (Belk, 2014). The sharing economy or collaborative consumption refer to forms of exchange that are conducted using online platforms, they include a various group of for-profit and non-profit activities that all depend of sharing resources among individuals (Richardson, 2015). The sharing economy have been boosted with the high penetration of the internet, where it allows individuals to become buyers and sellers at the same time (Görög, 2018). One of the main factors that has facilitated the growth of the sharing economy is that it allows customers to see feedback and reviews from other others before they take part in the exchange process (Bae & Koo, 2018).

One of the apps that have seen a wide popularity among customers with the rise of the sharing economy are the ride-sharing apps (Lee et al., 2018). Several service providers have developed mobile apps that can match passengers with drivers (Mourdoukoutas, 2017). These apps have seen a rapid penetration worldwide where it is estimated that the global ride-sharing market will grow by more than 50% between 2020 and 2021 with an estimated value of more than 117 USD billion in 2021 (Statista, 2020). This rapid growth can be attributed to a number of factors: Passengers, specifically young ones, are looking for cheaper alternatives than owning a car. Also, these apps are popular among customers in big cities where there are high congestion and difficulty in finding parking slots. These apps are better received by customers in countries which have problems in public transportation (Statista, 2020). With the outbreak of COVID-19 worldwide, the performance of ride-sharing companies has been largely affected with the economic lockdown. With the continuous calls of the governments in most countries for its citizens to stay at home to slow down the spread of the coronavirus, the profits of the ride-sharing companies have witnessed a slowdown worldwide (Vinod & Sharma, 2021). This have caused many challenges for the ride-sharing providers and drivers for the reduction in the demand for rides during the quarantine period. However, the ride-sharing companies have taken some precautionary measures to convince their customers that they are applying the highest safety standards. For instance, Uber announced its new slogan "No mask, no ride" to stress wearing masks by drivers and passengers (Uber, 2020). Also, other ride-sharing providers have taken many other precautionary measures such as social distancing, providing cashless payments and providing alcohol-based hand sanitizers in the cars (Bhaduri et al., 2020).

2.2. The conceptual model and research hypotheses

The researchers propose a conceptual model based on an extensive literature review and the UTAUT. As shown in Figure 1, this conceptual model suggests the customers' continuance intention to use ride-sharing services during the pandemic is influenced by seven factors: performance expectancy, effort expectancy, social influence, facilitating conditions, economic benefits, perceived infectability and fear of COVID-19. In the following sections, the research hypotheses are presented together with relevant literature.

Figure 1. Proposed conceptual model.
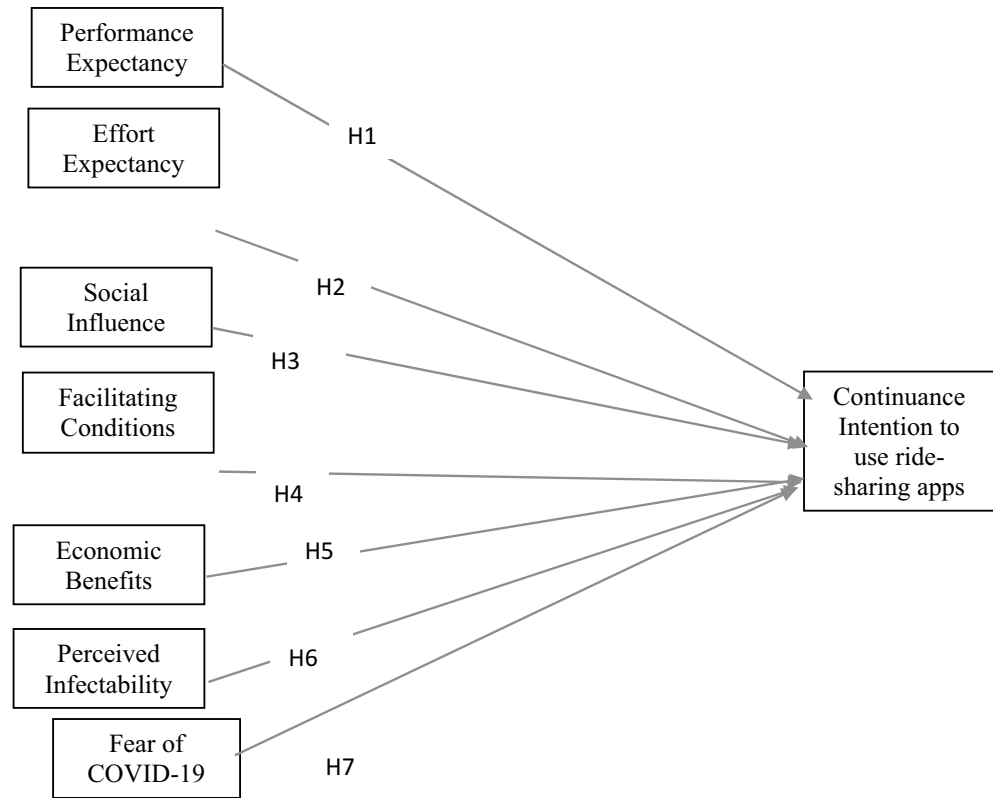
2.3. Performance expectancy and continuance intention to use ride-sharing apps

The unified theory of acceptance and use of technology (UTAUT) is a framework that was developed by Venkatesh et al. (2003) to explain an individual's intention and usage behavior towards an information system. One of the main constructs in the UTAUT is the performance expectancy. It is described as the degree to which an individual thinks a system boosts his or her productivity (Chiu & Wang, 2008; Venkatesh et al., 2012). If users believe that the usage of a certain system improves their performance, they will develop a high performance expectancy. Accordingly, they will be a high intention to use that system to enhance their performance (Venkatesh et al., 2012). According to Morosan (2012) and Gupta et al. (2018), performance expectancy is considered the most effective factor that influences behavioral intention. The role of performance expectancy in influencing customers' continuance intention to use mobile apps have been examined in several academic articles. For example, Tam et al. (2020) found that one of the main factors that underlie the continuance intention to use mobile apps is the performance expectancy. They recommended that service providers should focus on the benefits that these apps provide, which in turn would influence customers' satisfaction with these apps and intentions to use them. Another study by Almunawar et al. (2020) found that performance expectancy of the users of ride-hailing services strongly influences their intention to use the apps. They mentioned that performance expectancy included benefits that users of these services can get from using them, these included their expectations of rapidness and efficiency of the service and accuracy of pickup and arrival time.

Since the ride-apps provide several benefits for customers such as convenience, safety, efficiency and allowing them to reach their destinations quickly, we argue that customers' perception of these benefits would enhance their continuance intention to use their services during the pandemic. From the above arguments, we present the following hypothesis:

H1: Performance expectancy significantly influences customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic.

2.4. Effort expectancy and continuance intention to use ride-sharing apps

Within the UTAUT framework, effort expectancy refers users' perception of using a particular technology to be easy and effortless (Venkatesh et al., 2003). Effort expectancy is synonymous with the perceived ease of use in the technology acceptance model (Saadé & Bahli, 2005; Tam et al., 2020).

One of the main reasons that have enhanced the wide penetration of mobile apps among customers is perceived easiness of effort, where it takes minimal effort to download and use (Maziriri et al., 2020). Specifically, effort expectancy in the context of ride-sharing apps refers to the easiness of use, minimal time and effort needed to become skilled in the usage of these apps. Several empirical articles in the field of mobile apps confirmed the significant influence of effort expectancy on behavioral intention towards these apps (Lai, 2015; Okumus et al., 2018; Tam et al., 2020). Another group of studies confirmed this relationship in the context of ride-sharing apps, e.g., (Bappy et al., 2020; Min et al., 2019). On the other hand, some other articles such as Almunawar et al. (2020) found that effort expectancy doesn't influence customers' intention to use these apps, or actual usage of these apps (Zhou et al., 2020).

In our study, we argue that customers' perception of easiness of use of ride-sharing apps such as Uber plays an important role in enhancing their continuance intention to use these apps during the pandemic. We propose the following hypothesis:

H2: Effort expectancy significantly influences customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic.

2.5. Social influence and continuance intention to use ride-sharing apps

In the context of technology, social influence refers to the degree that individuals believe that other people who are important to them think that they should use a certain system (Venkatesh et al., 2003). It shows the extent to which a person's beliefs, attitudes and intentions are affected by other people (Chiu & Wang, 2008). Within the framework of UTUAT, Venkatesh et al. (2012) argued that social influence plays an important role in influencing peoples' opinions and intentions towards the usage of technology. People can be influenced by referent groups when it comes to technology. These reference groups can include family, friends, peers, colleagues, etc. (Maziriri et al., 2020). Social influence usually results from an individual's desire to enhance his or her image in front of others by purchasing products and using services that have favorable images. Additionally, individuals tend to avoid engaging in activities that cause disapproval from their social groups (Natarajan et al., 2019). Hence, it is critical for organizations to design their marketing communications that appeals to customers' referent groups.

The extant literature provides some empirical evidence on the role of social influence in shaping users' attitudes, acceptance and intentions towards mobile apps. For instance, Maziriri et al. (2020) indicated that one of the drivers of customers' intention to use Uber apps in transportation is the social influence of their friends and family. They recommended that ride-sharing companies should provide incentives to users who refer others or persuade them in order to fully utilize the power of referent groups. Another study showed that customers' acceptance for ride-hailing services is affected by the encouragement from their referent groups (Almunawar et al., 2020).

Since Egypt is a country that is characterized by a collectivistic culture (Mostafa, 2006), it is expected that customers' attitudes and intentions towards using mobile apps is largely influenced

by their social groups and the acceptance of the society at whole. From the previous arguments, it can be assumed that social groups influence customers' intention to use ride-sharing apps.

H3: Social Influence significantly affects customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic.

2.6. Facilitating conditions and continuance intention to use ride-sharing apps

The role of facilitating conditions in enhancing users' intention to adopt technology has been proposed within the UTAUT framework (Venkatesh et al., 2003). Facilitating conditions refer to the degree that a user believes that the organization has adequate technical infrastructure that facilitates the usage of information systems (Venkatesh et al., 2003). It represents an individuals' belief that he has a control over the behavior of usage (Venkatesh et al., 2012). The concept of facilitating conditions captures the external facets of perceived behavioral control that was presented by Ajzen (1991) in the theory of planned behavior.

Based on the UTAUT framework, the role of facilitating conditions in enhancing customers' acceptance and intentions towards technological developments has been widely studied in the marketing literature. For example, Nysveen and Pedersen (2016) argued that customers who have access to a favorable group of facilitating conditions are more willing to have a positive intention towards using that technology. Another study by Maziriri et al. (2020) indicated that facilitating conditions are one of the important antecedents for the usage intentions for Uber mobile apps. Similarly, Peñarroja et al. (2019) found that facilitating conditions play a vital part in enhancing users' acceptance for using virtual communities. Palau-Saumell (2019) further confirmed the relationship between facilitating conditions and customers' acceptance and usage for food delivery apps. However, this relationship has not received empirical support in some other studies, e.g., (Barbosa et al., 2020; Tam et al., 2020).

Facilitating conditions in the ride-sharing apps refer to the platforms infrastructure, its compatibility with smartphones, usage instructions on how to book through these apps and availability of customer support (Almunawar et al., 2020). Based on these discussions, we argue that the facilitating conditions that ride-sharing users have access to during the pandemic have an impact on their intention to continue using these apps. We hypothesize the following:

H4: Facilitating conditions significantly influence customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic.

2.7. Economic benefits and continuance intention to use ride-sharing apps

Individuals tend to perform cognitive tradeoffs between the perceived benefits of the products and services and the monetary cost needed to purchase them (Dodds et al., 1991). They tend to use technological developments such as online shopping to get discounts, compare between prices and to reach to the best deals (Jung et al., 2014). In our study, we integrated economic benefits to the UTAUT to make more applicable to the ride-sharing apps, since a pricing strategy usually impacts customers' decisions in using a technology (Punj, 2012).

The role of economic value in enhancing customers' acceptance and usage for mobile apps have been widely studied in prior literature. For instance, Palau-Saumell et al. (2019) indicated that customers use mobile apps for restaurant reservations in order to get some economic benefits such as saving time and money. Another study by Wan et al. (2016) found that one of the main drivers for users' usage of Uber services is their perception of its price value, as they think that ride-sharing services have more economic benefits than traditional taxis. These findings were further

confirmed in the work of Lee et al. (2018), that showed that one of the main benefits that encourage customers to book trips through ride-sharing apps is the economic benefits of these apps.

Since the ride-sharing apps were developed based on the idea of shared economy, these apps usually provide services that are provide more economic benefits and price value than other alternatives (Abd Elmeguid et al., 2018). We argue that the economic value of ride-sharing apps has a positive impact on customers' intention to use them during the pandemic. Thus, we hypothesize

H5: Economic benefits significantly influence customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic.

2.8. Perceived infectability and continuance intention to use ride-sharing apps

Perceived infectability refers to individuals' beliefs about their ability to get infected by different diseases (Ahmadzadeh et al., 2013). It results from their perception that their immune system will not protect them from most illness that other individuals get (Duncan et al., 2009). People with high perceived infectability usually think that will easily get infected with the outbreak of pandemics (Barbosa et al., 2020).

With the outbreak of COVID-19 pandemic, individuals' social lives and consumption patterns have been significantly affected (Kim, 2020). Recent research that examined the impact of perceived infectability on individuals' behaviors showed that people who have high concerns about being infected are more likely to use take more precautions that limit the infections such as hand washing, avoiding touching their facing, wearing gloves and masks, hand washing and social distancing (Shook et al., 2020).

Very few studies examined the role of perceived infectability on consumers' relationships with mobile apps. For instance, Barbosa et al. (2020) found that the perceived infectability has a significant role in enhancing customers' usage of food delivery apps. They argued that customers perceived that these apps would provide them with a safer option to get the food delivered without making them to visit the crowded restaurants during the pandemic. In light of these discussions, we argue that the ride-sharing services with the precautions they have taken during the pandemic can provide a safer option for transportation with passengers with high perceived infectability. Thus, we present the following hypothesis:

H6: Perceived infectability significantly influences customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic.

2.9. Fear of COVID-19 and continuance intention to use ride-sharing apps

With the outbreak of COVID-19, several recent articles indicated consumers' fear of COVID-19 has caused them to change their consumption patterns (Sheth, 2020; Zwanka & Buff, 2021). This has been mainly caused by the rapid increase of numbers of infections and the continuous governmental campaigns that asked people to stay at home to prevent the rapid spread of infections (Ahmed et al., 2020).

Recent researches showed the fear of COVID-19 had caused negative impacts on life satisfaction where it has been found be positively associated with depression, anxiety and stress (Satici et al., 2020). One of the very few articles that examined the impact of customers' fear of COVID-19 on their acceptance for food delivery apps is the work of Barbosa et al. (2020). They showed that the fear of customers from COVID-19 significantly influences their usage for the apps to order food during the pandemic. They mentioned that these apps were perceived as safe options for

Table 1. Items of the questionnaire		
Variables	**Items**	**Questionnaire Items**
Performance expectancy	PE1	I find the Uber app useful in my daily transportation.
	PE2	Using the Uber app allows me to achieve the things that are important to me.
	PE3	Using the Uber helps me reach my destinations quickly.
	PE4	Using the Uber app makes me more productive.
Effort expectancy	EF1	I find using the Uber app easy for me.
	EF2	I can clearly understand how to book my trips on the Uber app.
	EF3	The Uber app is easy to use.
	EF4	It's easy for me to become skilled in using the Uber app.
Social influence	SI1	My family and friends think that I should use the Uber app.
	SI2	People who influence my behavior think I should use the Uber app.
	SI3	People who are important to me prefer to use the Uber app.
Facilitating conditions	FC1	I have enough money to use the Uber app.
	FC2	I have adequate knowledge to use the Uber app.
	FC3	The Uber app is compatible with the smart phone that I own.
	FC4	I can seek help from friends when I don't know how to use the Uber app.
Economic benefits	EB1	I save money when I use the Uber app.
	EB2	I get financial benefits from using the Uber app.
	EB3	Using the Uber app helps in improve my economic conditions.
	EB4	Using the Uber app in my transportation saves my time.
Perceived Infectability	PI1	I am very sensitive, in general, to colds, flu and other infectious diseases.
	PI2	I usually catch a cold, flu or other illness.
	PI3	If a pandemic is going around, I can become infected easily.
	PI4	My immune system doesn't protect me from most diseases that others get.
	PI5	I am more likely to catch an infectious illness than the persons around me.

(Continued)

Variables	Items	Questionnaire Items
Fear of COVID-19	FCOV1	I am afraid from COVID-19.
	FCOV2	I feel uncomfortable when I think about COVID-19.
	FCOV3	Thinking about COVID-19 makes it hard for me to sleep.
	FCOV4	I am afraid to die because of COVID-19.
	FCOV5	I become nervous when I watch the news about COVID-19.
Continuance intention	CI1	During the COVID-19 pandemic, I plan to continue using the Uber app.
	CI2	During the COVID-19 pandemic, I will keep using the Uber app in my daily life.
	CI3	During the COVID-19 pandemic, I intend to continue using the Uber app regularly.

transportation by customers during the pandemic. In the current study, we assume that Egyptians with the huge problems that they are facing with public transportation (Elshahawany et al., 2017),

will be likely to think of the ride-sharing apps as a better option for their transportation during the pandemic. Thus, we hypothesize the following:

H7: Fear of COVID-19 significantly influences customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic

3. Methods

For the purpose of collecting the empirical data for this study, an online survey was adopted. We used four items to measure performance expectancy, four items to measure effort expectancy, three items to measure social influence, four items to measure facilitating conditions and three items to measure continuance intention adapted from Vankatesh (2012), in developing the questionnaire. On the other hand, economic benefits were measured using four items adapted from Bock et al. (2005), whereas five items were adapted from Duncan et al., 2009) to measure the perceived infectability. Finally, the fear of COVID-19 was measured using five items adapted from Ahorsu et al. (2020). The survey used established measures with five-point Likert type scales (1 = "strongly disagree,"5 = "strongly agree). The questionnaire consisted of three sections. The first section contained an introduction that explained the purpose of the study to the participants, whereas the second part contained some questions that captured the study's constructs. Finally, the last section consisted of some questions related to the demographics of the respondents and their frequency of usage of ride-sharing apps. Table 1 shows the questionnaire items.

To reach our target population which consisted of users of ride-sharing apps in Egypt, we used the social networking Facebook and Instagram to collect our data. A link of the online survey was posted on the official Facebook and Instagram pages of Uber in Egypt. Collecting data online was the most suitable and convenient method during the COVID-19 pandemic, where the official Uber pages had millions of followers. After multiple postings for a period of 3 weeks in October 2020, 398 questionnaires were completely answered. This article adopted a convenience sampling

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Table 2. Demographic characteristics of survey respondents (*n* = 398)			
Demographic profile		**Frequency**	**Percent**
Gender	**Male**	210	52.8
	Female	188	47.2
Age (years)	**18–34**	278	69.8
	35–45	92	23.1
	46–50	18	4.5
	Above 50	10	2.5
Income	**Below 2000 LE**	54	13.6
	2001–5000 LE	107	26.9
	5001–10,000 LE	95	23.9
	Above 10,000 LE	142	35.7
Frequency of usage of Uber ride-sharing services	**1–5 times/ month**	219	55
	6–10 times/month	103	25.9
	More than 10 times/ month	76	19.1

technique (Malhotra et al., 2017), where the respondents voluntarily participated in answering the survey. On the other hand, based on the recommendations of Stevens and Edwards (1996), the sample size must be at least 15 respondents per construct. Since our research study involves eight constructs, the collected sample of 398 questionnaires exceeded the minimum threshold of 120 respondents. To perform statistical analysis, the researchers adopted the Smart Partial Least Squares 3.0 (PLS) approach in the current study (Wong, 2013). Partial least square structural equation modeling (PLS-SEM) has the advantage of being able to deal with small samples (Hair et al., 2019). Also, it doesn't require normal distribution and it can be used to test complex predictive models (Ringle et al., 2012).

Table 2 lists the demographics of the respondents. Most respondents were males (52.8%) and aged 18–34 years (69.8%). Additionally, most respondents had incomes above 10,000 LE (35.7%). The majority of respondents (55%) indicated that they use Uber in their transportation between 1 and 5 times a month.

4. Data analysis and results

4.1. Measurement model
The researchers adopted the SmartPLS 3.0 to perform the statistical analysis. The factorial validity of the questionnaire items was assessed at the beginning, and after that the structural model was evaluated with an empirical sample of 398 ride-sharing customers. For the purpose of ensuring the internal consistency of the study's constructs, the researchers made sure that all constructs possess composite reliability (CR) and Cronbach's alpha values above the required threshold of 0.7 (Peterson, 1994). Also, the loadings of all items were checked to make sure that it above 0.7 (Chin, 1998). The analysis showed that the CR values ranged between 0.864 and 0.943, while the Cronbach's alpha values ranged between 0.767 and 0.910 ensuring the strong reliability of the study's constructs. After checking the items' loadings, two items were dropped (EB4 and FCOV1) because the analysis showed that they have poor outer loadings with values of 0.681 and 0.632 respectively.

For the purpose of ensuring the convergent validity, the average variance extracted (AVE) for all the study's constructs were examined, the results showed that the AVE values of all the study's

Table 3. The results (loading, CR value, Cronbach's alpha, and AVE) from the measurement model estimation					
Constructs	Item	Loading	Cronbach's alpha (α)	Composite reliability (CR)	AVE
Performance expectancy	**PE1**	0.843	0.851	0.900	0.692
	PE2	0.861			
	PE3	0.842			
	PE4	0.780			
Effort expectancy	**EF1**	0.814	0.882	0.912	0.739
	EF2	0.854			
	EF3	0.904			
	EF4	0.824			
Social influence	**SI1**	0.885	0.875	0.923	0.801
	SI2	0.902			
	SI3	0.897			
Facilitating conditions	**FC1**	0.705	0.767	0.847	0.581
	FC2	0.812			
	FC3	0.771			
	FC4	0.756			
Economic benefits	**EB1**	0.780	0.793	0.864	0.616
	EB2	0.824			
	EB3	0.845			
	EB4	0.681			
Perceived infectability	**PI1**	0.765	0.851	0.900	0.692
	PI2	0.822			
	PI3	0.852			
	PI4	0.849			
	PI5	0.863			
Fear of COVID-19	**FCOV1**	0.632	0.862	0.870	0.577
	FCOV2	0.702			
	FCOV3	0.787			
	FCOV4	0.743			
	FCOV5	0.906			
Continuance intention	**CI1**	0.906	0.910	0.943	0.848
	CI2	0.931			
	CI3	0.925			

constructs ranged between 0.577 and 0.848 which is above the required threshold of 0.5 (Fornell & Larcker, 1981). Table 3 demonstrates the item's loadings, Cronbach's alpha, composite reliability (CR) and AVE's values of the study's variables. Also, refer to Appendix 1 for the SmartPLS output of the measurement model.

On the other hand, the researchers followed the recommendations of Fornell and Larcker (1981) for investigating the discriminant validity of the research's constructs. The analysis showed that the study's constructs possess a high discriminant validity where the square root of AVE of each variable is higher than the correlations between the variables and all other variables. Table 4 displays the correlation matrix and psychometric properties of key variables.

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Table 4. Correlation matrix and psychometric properties of key constructs								
	CI	EB	FC	FCOV	PI	EF	PE	SI
Continuance intention	**0.921**							
Economic benefits	0.402	**0.785**						
Facilitating conditions	0.206	0.3	**0.762**					
Fear of COVID-19	0.108	0.188	0.095	**0.76**				
Perceived infectability	0.135	0.256	0.153	0.399	**0.831**			
Effort Expectancy	0.3	0.237	0.656	0.031	0.13	**0.86**		
Performance expectancy	0.535	0.503	0.416	0.236	0.206	0.494	**0.832**	
Social influence	0.486	0.484	0.458	0.276	0.249	0.411	0.598	**0.895**

Note: Diagonal numbers represent square roots of the AVE.

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Henseler et al. (2015) argued that discriminant validity can be checked in PLS-SEM by examining the values of Heterotrait–Monotrait Ratio of Correlations (HTMT). The analysis showed that all items possess adequate discriminant validity where the values of the HTMT ranged between 0.066 and 0.820 which is below the recommended threshold of 0.85. The HTMT values are shown in Appendix 3.

4.2. Structural model assessment

The bootstrapping re-sampling procedure with PLS-SEM was conducted for the purpose of assessment of the proposed model and testing the research's hypotheses (Streukens & Leroi-Werelds, 2016). The values of the path coefficients (β), t-values as well as significance values (p) were checked throughout the analysis. The results showed that H1 was supported, where performance expectancy was found to have a positive significant impact of customers' continuance intention to use ride-sharing services during the COVID-19 pandemic ($\beta = 0.108$, $t = 2.316$, $p = 0.021$). The findings further showed that customers' effort expectancy doesn't influence their continuance intention ($\beta = 0.094$, $t = 1.559$, $p = 0.120$); thus, H2 was rejected. Also, the results confirmed the positive impact of social influence on customers' intention ($\beta = 0.272$, $t = 3.878$, $p = 0.000$), which means that H3 received empirical support. On the other hand, H4 was supported where the findings showed the facilitating conditions has a negative significant impact on customers' continuance intention to use the ride-sharing services during the pandemic ($\beta = -0.146$, $t = 2.372$, $p = 0.018$). The results further confirmed the positive significant impact of economic benefits on customers' continuance intention to use the services ($\beta = 0.108$, $t = 2.316$, $p = 0.021$), accordingly H5 was supported. Finally, H6 and H7 were rejected since the results demonstrated that the perceived infectability ($\beta = 0.003$, $t = 0.047$, $p = 0.963$), and the fear of COVID-19 ($\beta = -0.068$, $t = 1.195$, $p = 0.233$), had an insignificant influence on customers' continuance intention. Appendix 2 summarizes the results of hypotheses testing through the bootstrapping technique with SmartPLS3.

The R^2 of customers' intentions to continue using the ride-sharing was examined. The PLS analysis indicated that the R^2 was 0.355 which demonstrates that our model explains 35.5% of the variance in the continuance intention.

5. Discussion

This study aimed to examine the influence of COVID-19 pandemic on customer behavior towards ride-sharing apps in Egypt. By adding the perceived infectability and fear of COVID-19 to relevant constructs from the UTAUT model, this study highlighted the important factors that influence customers' intention to use ride-sharing apps during the pandemic. In the following part, a discussion for the main findings is discussed.

5.1. Performance expectancy significantly influences customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic

This hypothesis is accepted. The results highlighted the critical role of customers' expectations for the benefits they can get from using the apps in their transportation. For instance, these apps provide a group of benefits for its users such as convenience, reliability and rapid service. The findings indicated that customers' expectations for these benefits play a significant in their continuance intention to use the apps. Our findings are in line with the findings of Almunawar et al. (2020) that indicated that performance expectancy significantly influences customers' acceptance for ride-hailing apps in Indonesia. Tam et al. (2020) also found that performance expectancy is among the most influential factors that determine users' intention to use mobile apps. Our findings showed that customers who have been suffering from the problems in traditional taxis for a long time, have found that ride-sharing apps as a solution for their transportation problems. Thus, it is very critical for ride-sharing apps like Uber to enhance their performance in order to meet the high expectations from Egyptian customers, especially during the COVID-19 pandemic.

5.2. Effort expectancy significantly influences customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic

This hypothesis is rejected. The findings indicated that customers' continuance intention to use the apps are not influenced by their effort expectancy. Our findings are similar to the findings of Haba and Dastane (2018) and Almunawar et al. (2020), which indicated that effort expectancy doesn't impact customers' acceptance for ride-hailing apps. On the other hand, our findings are not in line with the findings of Palau-Saumell et al. (2019) that indicated that effort expectancy is one of the factors that impact customers' acceptance for mobile apps. Our findings indicated that easiness of use of the mobile apps doesn't impact customers' intention to continue using them during the pandemic. This might be because the mobile apps on smart phones have become very popular among customers especially the young generation, where it seems that there are other factors that might impact their intention to continue using these apps during the pandemic.

5.3. Social Influence significantly affects customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic

This hypothesis is accepted. The results showed that customers' continuous intention is significantly influenced by their family, friends and peers. This finding is interesting since the research study in this article was conducted in Egypt where the Arabic culture stresses the collective behavior of individuals (Hofstede, 2009). In collective societies, human behavior is largely affected by what the group thinks, where group protection and loyalty are important to individuals (Kalliny et al., 2006). Hassan and Wood (2020) indicated that technological innovations are easily spread in collectivistic societies like Egypt where the social norms facilitates the rapid penetration of these innovations. The findings of our article largely supports these arguments, where ride-sharing apps provide multiple advantages to customers' families and peers as they are largely perceived as safer, more convenient and easier to track than traditional taxis. Thus, it is expected that customers' behavior towards these apps would be largely affected by what others think about them. Our findings are similar to the findings of some articles that examined the impact of social influence on customers' intention to continue mobile apps such as ride-sharing apps (Maziriri et al., 2020) and diet apps (Tsou et al., 2019).

5.4. Facilitating conditions significantly influence customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic

This hypothesis is accepted. The findings indicated that there is a negative significant influence of facilitating conditions on customers' continuance intention to use to ride-sharing services during the COVID-19 pandemic. This can be explained by the fact that customers' continuance intention can be explained by other factors. Our findings are in line with the findings of Palau-Saumell et al. (2019) which showed that users' intention to use mobile apps for ordering food is significantly influenced by facilitating conductions such as their adequate knowledge about the apps and the compatibility of the apps with their smartphones. However, our findings were different from the findings of Haba and Dastane (2018) and Almunawar et al. (2020) that showed that facilitating conditions don't influence customers' acceptance for ride-hailing apps. Our findings might be attributed to the fact that Egyptian customers have become familiar and knowledgeable with the ride-sharing apps to the degree that they don't understand the importance of facilitating conditions such as knowledge, financial resources, and the compatibility of the apps with their smartphones in deriving their continuance intention to use these apps during the pandemic.

5.5. Economic benefits significantly influence customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic

This hypothesis is supported. Our findings showed that customers' perception of the economic benefits that the ride-sharing apps provide significantly influences their continuance to use these apps during the pandemic. Egyptians like other customers in African countries, have always had problems with traditional taxis before the introduction of ride-sharing apps such as Uber (Mourdoukoutas, 2017). One of these problems is related to pricing where most taxis in Egypt didn't comply with the governmental laws that regulated the fares with customers (Abd Elmeguid

et al., 2018). Since ride-sharing apps use a dynamic pricing model where the price is determined according to the distance, waiting time, number of cars available (Lee et al., 2018), it seems that Egyptian customers think that these apps have helped them to save money and time during the pandemic. Our findings are supported in recent literature that examined users' intentions to participate in sharing economy applications such as Uber. For instance, Lee et al. (2018) argued that economic benefits are one of the main benefits that influence customers' intention to use these apps. Our findings were expected as the sharing economy apps depend on the idea of sharing resources between people rather than owning them (Ballús-Armet et al., 2014). Hence, many sharing economy apps appeal to many customers due to their perception of the economic benefits they can get from using them (Henten & Windekilde, 2015; Hamari et al., 2015).

5.6. Perceived Infectability significantly influences customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic

This hypothesis didn't receive empirical support in the research study in this article; thus, it was rejected. Our findings showed that perceived infectability doesn't influence customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic in Egypt. The outbreak of COVID-19 pandemic has caused big changes to customer behavior due to their fear of getting infected (Karpen & Conduit, 2020). This was boosted by many governmental and health campaigns that encouraged social distancing, wearing masks and the usage of hand sanitizers (Zwanka & Buff, 2021). Our findings can be attributed to the fact that the companies that provide ride-sharing apps have succeeded to convince customers with the precautionary measures that they have taken during the pandemic. For instance, during the COVID-19 pandemic, Uber announced that all passengers and drivers should wear masks, where drivers must upload a selfie picture with the mask on the app before being allowed to get booked by a passenger (Uber, 2020). Another explanation for this finding is that customers perceive ride-sharing apps as more safe than traditional transportation modes. Our findings confirm with the findings of Barbosa et al. (2020) that showed that perceived infectability doesn't have an impact on behavioral intention to use food delivery apps during the COVID-19 pandemic.

5.7. Fear of COVID-19 significantly influences customers' continuance intention to use ride-sharing apps during the COVID-19 pandemic

This hypothesis was not supported by our empirical research. Our findings indicated that the continuance intention to use the ride-sharing apps was not influenced by customers' fear of COVID-19. It appears that the ride-sharing apps in Egypt have succeeded to convince passengers that their services don't lead to the increase in the infection during the pandemic. Due to the high precautionary measures that these companies have taken during the pandemic period, it appears that customers think of these services as being safer than other transportation modes. Our findings are in line with the findings of Barbosa et al. (2020) which indicated that customers' fear of COVID-19 doesn't influence their intention to use food delivery apps. Our findings provide interesting insights since it appears that these apps with the high social distancing capabilities they provide during the pandemic have enabled customers to have safe rides.

6. Implications for theory and practice

With the outbreak of COVID-19, the consumption patterns have been changed into what so-called the new norm (Zwanka & Buff, 2021). Our article adds to the few scholarly work that examined how the pandemic affected customers' relationships with mobile apps. Specifically, our study contributes by revisiting the UTAUT framework to explain customers' intention to continue using the ride-sharing apps during the pandemic. The findings of the research study in this article offers some interesting findings for practitioners. For instance, the findings indicated that customers' continuance intention to use the ride-sharing services are influenced by four factors which are performance expectancy, facilitating conditions, economic benefits and social influence. This provides some insights for marketers of the service providers of ride-sharing apps. Since the findings show the critical importance of performance expectancy in enhancing customers' intention to use these services, ride-sharing apps should focus on communicating and delivering

benefits to their customers. It appears that customers use these services for its usefulness, quick service, efficiency and convenience. Thus, companies should make sure to focus on provide quality services to meet customer' expectations. Also, companies should expand their services in the Egyptian market where most customers reported that they have enough knowledge to use these services. Since the results underscore the importance of social influence in enhancing customers' continuance intention to use the apps, companies can focus on viral marketing campaigns on social media that allow customers to describe their riding experience to their peers and friends. Another important insight that was concluded from the results is that customers' families and friends put pressure on them to use these services. This might be attributed to the safety and convenience that other transportation modes, e.g., taxis don't provide for its poor regulation in countries like Egypt. Also, the findings showed that customers use these services for its economic benefits where they think that it provides better value than other transportation modes. Thus, companies can apply loyalty programs that encourage customers to take more rides by offering them with some incentives and discounts. This is especially important in counties that face harsh economic conditions, especially during the COVID-19 pandemic.

On the other hand, the findings indicated that effort expectancy, perceived infectability and fear of COVID-19 don't influence customers' intention to use these innovative apps. This means that marketers of the ride-sharing apps have succeeded to convince customers that they are using enough precautions to prevent the spread of the virus among its riders. Thus, companies should focus on marketing of the different precautions they have taken such as wearing masks, alcohol usage, etc. Also, since that the effort expectancy had insignificant influence on customers' intention, this means that customers don't consider the ease of use of these applications in booking their trips. This means that most customers are technology oriented which makes their usage for the apps very easy. Thus, marketers should make sure to create user-friendly platforms that encourage customers to book their rides through these apps. In summary, ride-sharing apps have a golden opportunity to expand during the pandemic for the multiple benefits they provide to their customers.

7. Limitations and scope for further research

There are several limitations to this study, which for future research, have interesting avenues. Firstly, the research study in this article only investigated the factors that influence the customers' continuance intention to use ride-sharing applications (e.g., Uber) during the COVID-19 pandemic. Despite the importance of the study in shedding the light on customer behavior during pandemic periods that was not investigated before in the marketing literature, further research needs to be conducted to examine how customer behavior towards these services has been changed during the post-pandemic period. Another important limitation is that the study only investigated customer behavior towards ride-sharing apps in only one country which is Egypt. Despite the wide penetration of these services among customers in Egypt, more studies need to be conducted to compare the results of our study in other developing and developed countries. Also, future studies can adopt a qualitative research approach to deeply understand other factors that affect customers' acceptance for these innovative services. In the current article, we used the UTAUT to examine customers' intention to use the ride-sharing apps. This model has been widely used to explain users' acceptance and behavioral intentions towards technological developments; however, future research can adopt other theories to explain customers' attitudes and behaviors towards these apps such as the theory of reasoned action (Fishbein & Ajzen, 1975). Finally, the data were gathered taking the perspective of ride-sharing users. It would be useful to extend the sample limitation to include the providers of the ride-sharing services to enhance our understanding to the obstacles and challenges that face these organizations during the pandemic.

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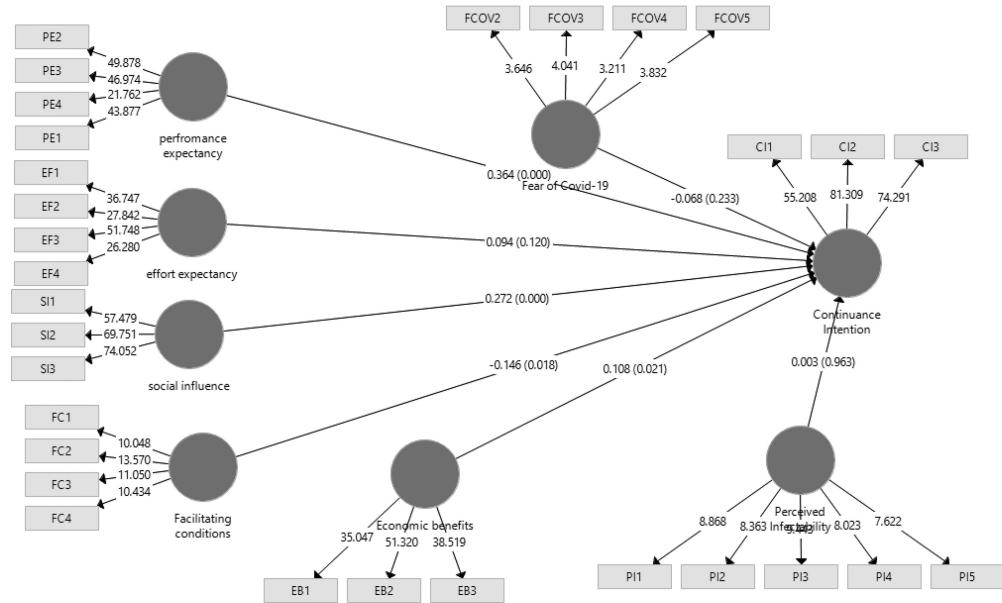
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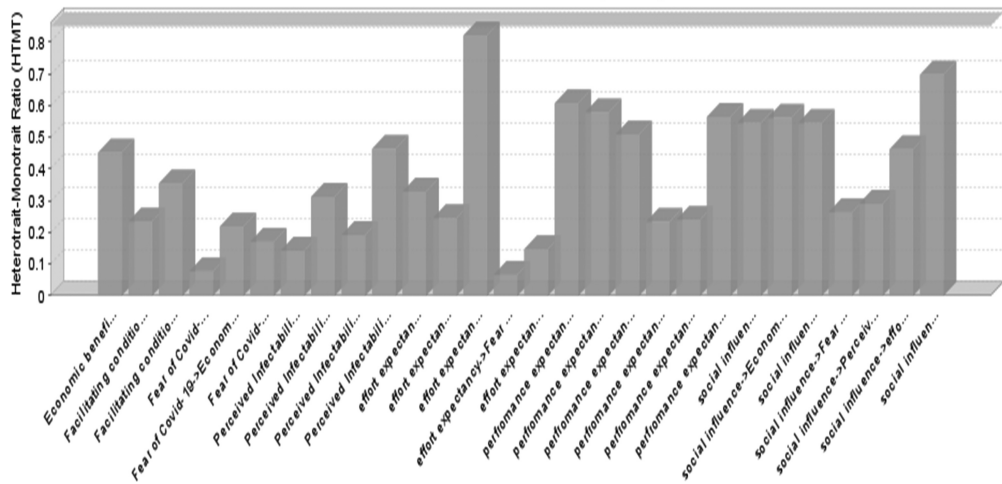
Appendix1: Measurement model (loadings, R^2)
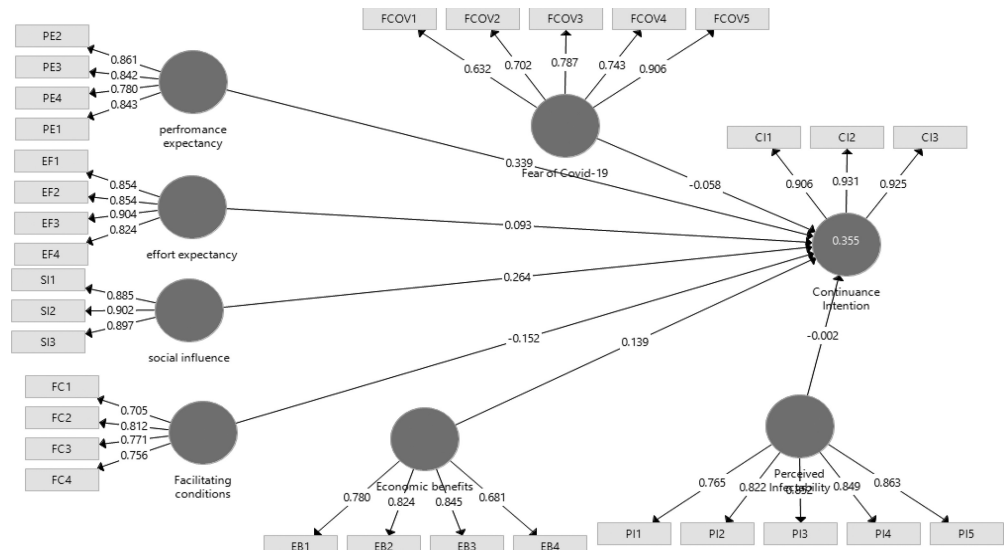
Appendix2 SmartPLS output (bootstrapping, path coefficients and *p*-values) of the study's model

Appendix3 Heterotrait–Monotrait ratio of correlations (HTMT) of the study's constructs

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