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Published online: 18 Apr 2022.

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RESEARCH ARTICLE

Fear of the dark: a cross-cultural study into how perceptions of antisocial behaviour impact the acceptance and use of Twitter

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ABSTRACT

This study investigates the impact of the perceptions of antisocial behaviour on the use of the social media platform Twitter. We extend the Unified Theory of Acceptance and Use of Technology (UTAUT) with the Perception of Antisocial Behaviour as a risk factor, and two supporting constructs: Strategic Self-Presentation and Protective Self-Presentation. We call this extended model Technology Acceptance and Use under Risk (TAUR). We investigate two groups via an online questionnaire, contrasting Anglophone countries (the UK, USA, and Canada, 200 responses), with Saudi Arabia (540 responses). In both cases the data shows that the Perception of Antisocial Behaviour impacts Twitter use, but not directly, rather it negatively impacts the influence of other factors such as Behavioural Intention – it also shows that this affects Anglophones more than Saudis. This indicates that future work should differentiate between different cultural groups, and different solutions may be needed to assuage users' fears in different parts of the world.

1. Introduction

Social Networking Sites (SNSs) are used by millions daily, but despite the huge benefits that SNSs have brought, they also have a dark side as users sometimes experience antisocial behaviour. Many terms exist for this (including trolling, flaming, online hostility, antagonism, hating, or cyberbullying) and the problem has been investigated in various online spaces, for example trolling on Facebook memorial pages (Phillips 2011), and feminists forums (Herring et al. 2002). It is a risk taken by anyone stepping into online social spaces.

Technology acceptance is the willingness of a user to employ technology for a given task (Teo 2011). Although previous studies of technology acceptance have considered the economic risk factors associated with online services (such as internet banking, online shopping, and other e-services (Im, Kim, and Han 2008)), the risk of antisocial behaviour has been almost entirely neglected (Malinen 2015).

Our research objective is therefore to understand to what extent the fear of antisocial behaviour on a particular social media platform (Twitter) impacts the acceptance and use of that platform.

To do this our study extends the Unified Theory of Acceptance and Use of Technology model (UTAUT) (Venkatesh et al. 2003), with constructs representing the perception of antisocial behaviour as a risk factor and two additional supporting constructs drawn from sociology; these are strategic self-presentation and protective self-presentation (Goffman 1959; Rui and Stefanone 2013). We call this extended model Technology Acceptance and Use under Risk (TAUR). Integrating the perception of antisocial behaviour within a technology acceptance model allows us to measure its impact empirically and highlight the most affected factors.

Twitter has been chosen as the target cyberspace for our work as it is reported to be one of the most problematic platforms concerning antisocial behaviour (Hern 2015). None of the existing studies have fully applied acceptance models to Twitter, although one related study made partial use of UTAUT, building a model to study microblogging in the workplace (Schöndienst and Krasnova 2011), and other studies have applied a simplified technology acceptance model which reduced the number of factors (Agrifoglio, Black, and Metallo 2010; Jib, Park, and Joon 2014). As TAUR is a superset of UTAUT our work is therefore not only an

exploration of the impact of antisocial behaviour but also the first full application of UTAUT to Twitter.

We have undertaken our experiment with two different cultures. We have chosen a western culture comprising the Anglophone countries of the UK, USA and Canada, and the non-western Arabic culture of Saudi Arabia. Saudi Arabia had the highest penetration of Twitter worldwide, whereas the UK and the US were in sixth and eighth places respectively.[1] This cross-cultural approach will highlight the cultural differences in Twitter use and reveal how users in the two cultures perceive and react differently to the risk of online antisocial behaviour.

2. Background

2.1. Antisocial behaviour online

Antisocial behaviour can be defined as conduct that lacks consideration or causes harm to others (Berger 2003). There are many other terms used in the literature to describe online antisocial behaviour, such as flaming, hating, provocation, and antagonism. The term 'flaming' used to be common in the literature and is still used by some authors; however, due to high usage by the media 'trolling' is now the most frequently used term. Defining trolling and other terms related to online hostility can be difficult and very controversial because it is difficult for researchers to make moral judgments or classify behaviour (Jane 2015), but despite the controversy over definitions and measurements, scholars from various disciplines have studied the phenomenon in different contexts and specific cyberspaces. Some have looked closely into the behaviour of people who show online hostility and described their disturbing actions (Herring et al. 2002; Karppi 2013; Phillips 2011). others have investigated the motivations or the reasons behind these actions (Moor, Heuvelman, and Verleur 2010), and some have discussed how to control it (Binns 2012). However, most previous work on online hostility tends to be qualitative and it is acknowledged that there is a need for more empirical studies (Cheng, Danescu-niculescu-mizil, and Leskovec 2015).

2.2. Self-presentation and protective online behaviour

Self-presentation is 'the process of controlling how one is perceived by other people' (Leary 1995) and it plays an important role in people's relationships and interactions. People try to maintain their desired image by selectively providing information about themselves (Goffman 1959). Goals vary from one person to another; users could be seeking social acceptance, material gain, or just maintaining self-esteem (Leary and Kowalski 1990). However, self-presentation on SNSs can be challenging as these sites also allow others from the user's network to provide information, creating third party footprints and reducing users' control (Parkinson et al. 2017). This reduces users' control over their SNS profile, which becomes problematic if the information contradicts their strategic self-presented image (Ramirez and Walther 2009). Unlike information provided by profile owners themselves, third party data cannot be easily manipulated, is more credible, and consequently can greatly affect how they are perceived by others (Walther and Van Der Heide 2009).

Profile owners engage in 'protective' self-presentation strategies to overcome or minimise this impact (Leary 1995). Smock (2010) classified these into two categories. *Reputative* strategies include denying unwanted information and providing compensatory self-presentations. *Subtractive* strategies include removing information by deleting unwanted posts or pictures. Goffman also discusses *protective* self-presentation, which mainly aims to avoid disapproval, but also identifies *acquisitive* self-presentation, in which people emphasise constructing their image by highlighting the attractive aspects about themselves (Goffman 1959). People therefore tend to express themselves in neutral and conforming ways, using modest self-disclosure to avoid being rejected by others (Arkin 1981).

2.3. Technology acceptance theories

Technology acceptance theories and models aim to understand, explain and predict individuals' acceptance and use of a certain technology, and have evolved by inheriting characteristics from and elaborating on each other. Each model is typically introduced based on a previous one, having been developed either to overcome a certain limitation or to include a crucial new factor.

The UTAUT (shown in Figure 1) was proposed by Venkatesh, Morris, and Davis (2003) and integrates technology acceptance theories from other influential theories in information science, psychology, and sociology, targeting them towards IT systems (for example, the Acceptance Technology Model (Davis, Bagozzi, and Warshaw 1989) and the Theory of Planned Behaviour (Ajzen 1991)).

UTAUT postulates that four factors affect the user's decision regarding an information system. They are defined as Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC) (see Figure 1). It also defines moderating factors: gender, age, experience, and voluntariness of use. In the original UTAUT proposal by Venkatesh,
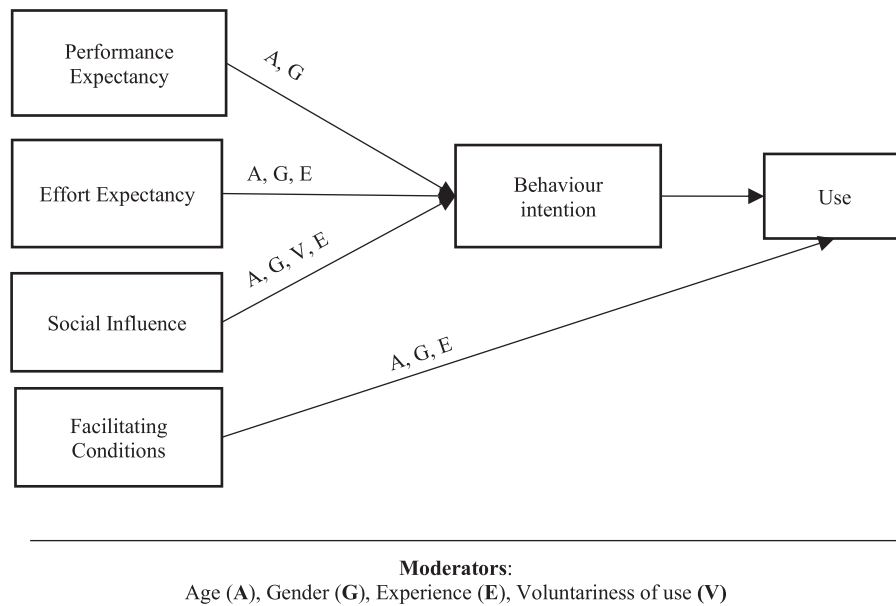
Moderators:
Age (**A**), Gender (**G**), Experience (**E**), Voluntariness of use (**V**)

Figure 1. UTAUT model (Venkatesh, Morris, and Davis 2003).

Morris, and Davis (2003) Facilitating Conditions was only moderated by age and experience, but in later work by Venkatesh and Xiaojun (2010) applying the model to cross-cultural contexts gender was added (as in some cultures it is a factor in those conditions).

UTAUT has become a popular theoretical choice in researching information technology acceptance (Al-Gahtani, Hubona, and Wang 2007; Müller and Stocker 2011), including recent work to understand the adoption of digital tools during the COVID-19 pandemic (Akinnuwesi et al. 2022). It has been applied to the analysis of social media adoption in several diverse contexts, including higher education (Awotunde et al. 2020), charitable donation (Kurniawati, Rosita, and Anggraeni 2021), and government work (Humaid and Ibrahim 2019). Some studies have extended it by other external factors to support the situation being studied (Williams et al. 2011). Some have argued that UTAUT is not necessarily robust when applied in non-western cultures (Simeonova et al. 2010), while yet others have successfully applied it to different cultures and found that it was a robust tool (Im, Hong, and Kang 2011; Oshlyansky, Cairns, and Thimbleby 2007).

2.4. Culture in technology acceptance research

Technology acceptance theories and models were developed and tested in western cultures, and this raises concerns about their applicability to other non-western cultures (Straub, Keil, and Brenner 1997). Table 1 summarises many of the existing studies which have been conducted cross-culturally or in non-western cultures and are ordered by the year of publication.

There are relatively few studies that have integrated cultural frameworks within technology acceptance research (Merchant 2007). Instead, most focus on either (1) examining the applicability of technology acceptance models in less developed countries or (2) investigating the transferability of technology acceptance models within cultures, typically between western and non-western. Several studies use Hofstede's cultural dimensions (Hofstede 1997) to interpret their results, one uses Harrison's ideas on organisational culture (Harrison 1975), and two use the Computer-Based Media Support Index (CMSI), itself derived from Hofstede, as a general comparator, although many others do not attempt any theoretical interpretation at all.

3. Research model and hypotheses

To study how the perceived risk of antisocial behaviour affects Twitter use, this paper proposes the TAUR model (an extension of UTAUT). Figure 2 shows the TAUR model, with extensions depicted using dashed lines. The model was validated using expert reviews in a previous study (Almuhanna et al. 2016).

For this study, we define the four UTAUT factors (in the context of Twitter) as:

Performance Expectancy (PE): the degree to which an individual believes that using Twitter is useful for different tasks. It was found to have a significant positive effect on micro-blogging adoption in the workplace (Schöndienst and Krasnova 2011).

Effort Expectancy (EE): the degree of ease associated with Twitter use. It has been found that the effort associated with microblogging was not a significant factor in

Table 1. Summary of previous cross-cultural studies.

Study	Year	Targeted technology	Model	Countries	Cultural framework used	Result regarding transferability
Straub, Keil, and Brenner (1997)	1997	E-mail	TAM	Japan, Switzerland, US	Hofstede (1997)	Not fully transferable
Rose and Straub (1998)	1998	Personal computers	TAM	Jordan, Saudi, Lebanon, Egypt, Sudan	None	Transferable
Anandarajan, Igbaria, and Anakwe (2000)	2000	Microcomputers	TAM	Nigeria	Explained using Hofstede (1997)	Partially applicable
Loch, Straub, and Kamel (2003)	2003	Diffusion of the Internet	Derived model	Egypt	None	Applicable
Mao and Palvia (2006)	2006	E-mail	TRA, DOI and TAM	China	Explained using Hofstede (1997)	Applicable
Srite (2006)	2006	Computers	Extended TAM	US and China	Hofstede (1997)	Transferable
Al-Gahtani, Hubona, and Wang (2007)	2007	Desktop computer	UTAUT	Saudi Arabia	Explained using Hofstede (1997)	Partially applicable
McCoy, Galletta, and King (2007)	2007	Online teaching techniques	TAM	The US and other countries	Hofstede (1997)	Not fully transferable
Merchant (2007)	2007	Company system	TAM	US, France and China	Harrison (1975)	Not fully transferable
Oshlyansky, Cairns, and Thimbleby (2007)	2007	Website acceptance	UTAUT	US, UK, Czech, Greece, South Africa, Saudi, New Zealand, Malaysia, India	None	Transferable
AbuShanab and Pearson (2007)	2007	Internet Backing	UTAUT	Jordan	None	Applicable
Venkatesh and Xiaojun (2010)	2010	Company system	UTAUT	U.S. and China	None	Transferable
Simeonova et al. (2010)	2010	Virtual Learning Environments	UTAUT	Jordan, Russia, and the UK	None	Not transferable
Im, Hong, and Kang (2011)	2011	Mp3 player and Internet banking	UTAUT	Korea and US	None	Transferable
Nassuora (2012)	2012	Mobile learning	Modified UTAUT	Saudi Arabia	None	Partially applicable
Alshehri and Drew (2012)	2012	E-government services	Extended UTAUT	Saudi Arabia	None	Partially applicable
Al-Adwan, Al-Adwan, and Smedley (2013)	2013	Educational Technology	TAM	Jordan	None	Applicable
Ashraf, Thongpapanl, and Auh (2014)	2014	Online shopping	Extended TAM	Pakistan and Canada	CMSI	Applicable
Tarhini, Hone, and Liu (2015)	2015	Educational Technology	Extended TAM	Britain and Lebanon	Hofstede (1997)	Applicable
Chopdar et al. (2018)	2018	Mobile shopping	UTAUT2	India and USA	CMSI	Partially applicable
Jung et al. (2018)	2018	Augmented Reality Tourist experiences	Modified TAM	South Korea and Ireland	Hofstede (1997)	Applicable
Dutot, Bhatiasevi, and Bellallahom (2019)	2019	Smartwatches	TAM	China, France, and Thailand	None	Applicable
Arpaci, Al-Emran, and Al-Sharafi (2020)	2020	MOOCs	TAM	Malaysia and Turkey	Hofstede (1997)	Applicable

an employee's decision to adopt it at their workplace (Schöndienst and Krasnova 2011). However, the relationship between Effort Expectancy and other factors might be crucial for our study.

Social Influence (SI): the extent to which an individual perceives that others approve of their participation on Twitter. Social pressure on some individuals affects their Behavioural Intention to use the system (Venkatesh, Morris, and Davis 2003).

Facilitating Conditions (FC): the extent to which an individual believes that there is organisational and technical support and control over Twitter use. Reported to be important when using microblogging within enterprises' inter-firm communication (Günther and Krasnova 2009).

The first set of hypotheses are based on the UTAUT, therefore, we hypothesise the following:

- **H1**: Performance Expectancy will have a positive effect on the Behavioural Intention to continue to use Twitter. Confirming (Schöndienst and Krasnova 2011).

- **H2**: Effort Expectancy will have a positive effect on the Behavioural Intention to continue to use Twitter. This was not found to be the case in (Schöndienst and Krasnova 2011).

- **H3**: Social Influence will have a positive effect on the Behavioural Intention to continue to use Twitter. Confirming (Venkatesh, Morris, and Davis 2003)

- **H4**: Facilitating Conditions will have a positive effect on the actual use of Twitter. Confirming (Günther and Krasnova 2009)
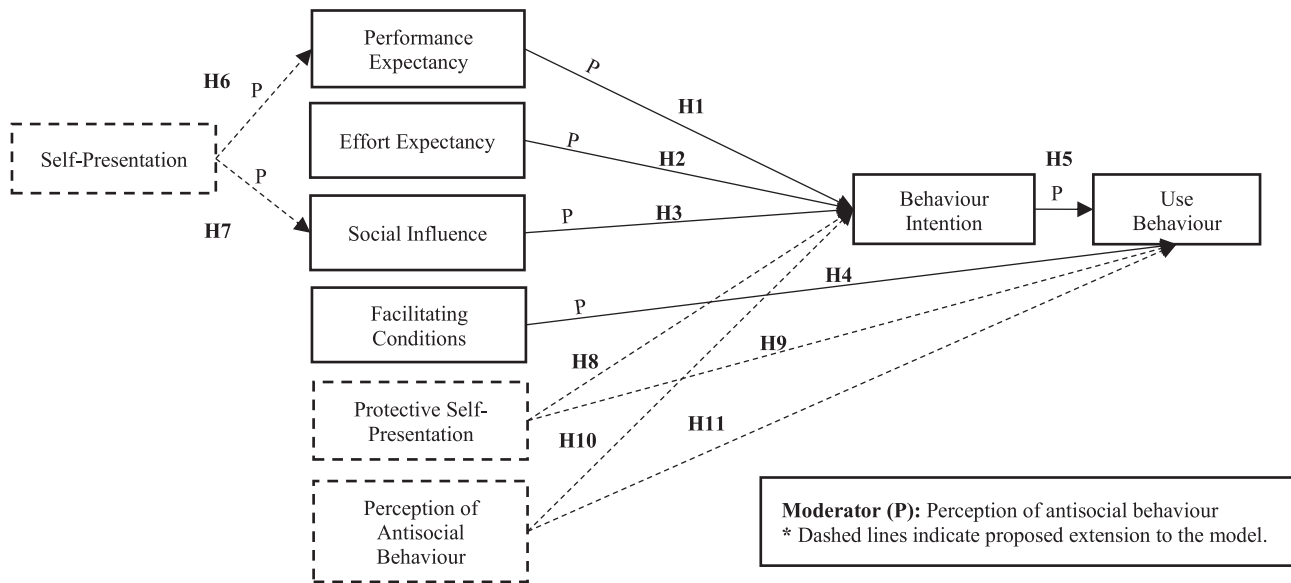
Figure 2. The TAUR model (extension shown with dashed lines).

• **H5**: The users' Behavioural Intention to continue to use Twitter will have a positive effect on their actual use of it.

The UTAUT model does not take into consideration the risk associated with the perception of antisocial behaviour. TAUR fills this gap by adding three additional factors:

Self-Presentation (SP): the extent to which individuals control how they are perceived by others by carefully selecting information to share. It has been reported that Twitter is used for self-presentation (Lebel and Danylchuk 2012).

Based on Self-Presentation we hypothesise the following:

• **H6**: Self-Presentation will have a positive effect on Performance Expectancy.

• **H7**: Self-Presentation will have a positive effect on Social Influence.

Protective Self-Presentation (PSP): Protective Self-Presentation (PSP) is defined as the extent to which an individual is aware of strategies to minimise the impact of antisocial behaviour on one's image. Studies have described individuals tending to employ those strategies to avoid rejection in a social context (Arkin 1981), it has been also reported that these strategies are used in online social networks in different situations (Rui and Stefanone 2013; Smock 2010).

Based on Protective Self-Presentation we hypothesise the following:

• **H8**: Protective Self-Presentation will have a negative effect on the Behavioural Intention to continue to use Twitter.

• **H9**: Protective Self-Presentation will have a negative effect on the actual use of Twitter.

Perception of Antisocial Behaviour (PAB): The Perception of Antisocial Behaviour (PAB) represents the perceived risk of online hostility within Twitter. Some studies revealed that the perception of antisocial behaviour made some users refrain from participating in online communities (Lange 2007; Moor, Heuvelman, and Verleur 2010).

Based on the Perception of Antisocial Behaviour we hypothesise the following:

• **H10**: Perception of Antisocial Behaviour will have a negative effect on the Behavioural Intention to continue to use Twitter.

• **H11**: Perception of Antisocial Behaviour will have a negative effect on the actual use of Twitter.

The effect of perceived risk on technology acceptance was investigated using the Technology Acceptance Model (TAM) (Im, Kim, and Han 2008). Their recommendation was to model it as a moderator rather than as an antecedent to other factors. Therefore, in this study, the perception of antisocial behaviour was considered as a moderator in addition to investigating its direct effect. Therefore, we hypothesise the following:

• **H12**: Perception of Antisocial Behaviour will have an indirect negative effect on the relationships between BI, use and other constructs.

This means that the Perception of Antisocial Behaviour will dampen the positive relationship between the other constructs. H12 is decomposed into seven sub-hypotheses (one for each affected relationship); this will be presented fully in the results section.

4. Research methodology

4.1. Instrument design and data collection

An online self-administered questionnaire technique was chosen for this study because it is easy to manage and disseminate to a large population (Brace 2013). The most common method of conducting a cross-cultural study is to administer the same research instrument to both cultures (Hui and Triandis 1985). In the case of this study, this meant both English and Arabic versions.

The measures for the constructs in this research were adapted from previous work. The original main constructs of UTAUT (performance expectancy, effort expectancy, social influence, facilitating conditions, and behavioural intention) were adapted from Venkatesh, Morris, and Davis (2003). Self-presentation, protective self-presentation, and the perception of antisocial behaviour were adapted from Goffman (1959), and additional statements on the perception of antisocial behaviour were adapted from Moor, Heuvelman, and Verleur (2010). Statements were slightly adjusted to target Twitter (Table 2) and all of the statements are evaluated using a five-point Likert scale (Brace 2013).

An informal pilot was conducted and then followed by expert panel reviews with five experts. Interviews were then conducted with respondents and notes were taken during all of the steps and amendments and improvements were made to the questionnaire.

The original questionnaire was constructed in English and was then translated into Arabic. To ensure item equivalence and reliability it was crucial to follow robust translation methods. We followed the back-translation and bilingual committee approach (Brislin 1970). It is suggested that translating the questionnaire by a native speaker is probably the most important first step (Brace 2013).

After validating the questionnaire in English it was translated to Arabic by a professional bilingual Arabic translator. The Arabic version was then checked by three bilingual doctoral students at the University of Southampton. After that, a cognitive walkthrough with five native speakers was conducted and minor modifications were made. Upon satisfactory review, the Arabic version was back-translated into English by another translator. The final copy was compared to the original instrument to check the translation validity. Minor variations were detected but did not alter meanings.

After reaching satisfactory versions, the questionnaires were sent to 20 participants as a larger scale pilot, where respondents reported the questionnaire to be clear and easy to follow. After finalising the pilot and acquiring formal ethics approval, the two questionnaire versions were publicised online on Twitter and posted in several groups and mailing lists.

4.2. Sample description

The total number of responses to the questionnaire was 901, and after data screening was performed, 39 incomplete questionnaires were discounted. This follows the

Table 2. Construct Items (TAUR factors shown in grey).

Performance Expectancy (PE)		Effort Expectancy (EE)	
PE1	I find Twitter useful in my daily life.	EE1	Learning to use Twitter was easy for me.
PE2	Overall, using Twitter is beneficial.	EE2	Overall, I believe that Twitter is easy to use.
PE3	Twitter increases my effectiveness on my social/professional tasks.	EE3	It was difficult to learn how to use Twitter.
Self-Presentation (SP)		*Facilitating Conditions (FC)*	
SP1	I often share photos on Twitter.	FC1	A specific person (group) from Twitter is available for assistance with technical/social difficulties.
SP2	I share my stories with others on Twitter.	FC2	It was easy for me to find Twitter support page and all the different instructions and tips on how to use it.
SP3	I express my opinions in my tweets.	FC3	I feel that I have control over my Twitter account (e.g. I can delete, retweet, undo retweet, etc …)
SP4	I present information about myself in my Twitter profile.	FC4	Knowing that I can block/mute/report annoying accounts makes me feel more comfortable when using Twitter.
Social Influence (SI)		*Behavioural Intention to continue to use Twitter (BI)*	
SI1	The people in my life whose opinions I value approve using Twitter.	BI1	I intend to continue to use Twitter in the future.
SI2	People who are important to me think that I should use Twitter.	BI2	I predict I will continue to use Twitter in the future.
SI3	Twitter creates a communication channel to share social lives and information.	BI3	I plan to continue to use Twitter in the future.
Protective Self-Presentation (PSP)		*Perception of Antisocial Behaviour (PAB)*	
PSP1	If I receive an unpleasant tweet I would report it to Twitter admins.	PAB1	I have encountered unpleasant tweets in the timeline.
PSP2	If I receive an unpleasant tweet I would block the account.	PAB2	I have encountered unpleasant tweets when I have explored a hashtag.
PSP3	If I read an unpleasant tweet about something/someone I care about I would report it. (e.g. about your country, religion, favourite celebrity, … etc.)	PAB3	I have felt unhappy with the content of Tweets that have involved someone else.
PSP4	If I read an unpleasant tweet about something/someone I care about I would block the account. (e.g. about your country, religion, favourite celebrity, … etc.)	PAB4	I have felt unhappy with the content of tweets in some hashtags.
		PAB5	Antisocial behaviour on Twitter is a problem for me.
Actual use (Use)			
Use	How many times do you typically access Twitter?		

recommendations of Hair et al. (2010). Additionally, 25 questionnaires of under 18 participants were also discounted as our ethical approval did not extend to minors. Four unengaged responses were also discounted, as such outliers can compromise the analysis (Tabachnick and Fidell 2007). Table 3 shows the final sample size for each cultural group.

5. Results

This study applies Structural Equation Modelling (SEM) approach to test the relationships between the constructs in the proposed model. Unlike other approaches such as multiple regression and bivariate correlations, SEM gives a better global model fit (Byrne 2010). It is widely used in behavioural science studies and is popular in Information System research (Straub, Boudreau, and Gefen 2004). SEM tests the theoretical models in two steps. First, is the measurement model, which identifies how measured variables work together to represent latent factors. Second, is the structural model, which evaluates how constructs are related to each other in the model (Hair et al. 2010).

5.1. Measurement level analysis

The measurement model aims to establish inter-relationships between latent variables and measured items. Table 2 shows the latent variables used in this study (the construct items from the model) and their measured items (the statements from the survey). The measurement level of SEM aims to confirm the robustness of the instrument and its reliability and validity (Hair et al. 2010).

A reliability score is considered acceptable if it lies between 0.6 and 0.7, and good if it is higher than 0.7 (Hair et al. 2010). The construct reliability scores of all constructs are presented in Table 4, which shows they all exceeded the minimum threshold, and therefore the constructs are considered reliable for the remaining analysis.

It is suggested that convergent validity can be estimated using the Average Variance Extracted (AVE), and the recommended value of AVE is 0.50 or higher

(Hair et al. 2010). AVE values of SP, SI, FC, PSP, and PAB were initially less than 0.5, therefore, the item with the lowest standardised factor loading from each latent construct was deleted to improve the AVE. After these deletions, the improved AVE of all variables was above 0.5, thus achieving good convergent validity (Table 4).

Discriminant validity is measured by comparing the square root of the AVE of each construct with the correlation estimates of all other constructs. To establish the discriminant validity test, the value of the AVE for each construct should be higher than the correlation estimates between constructs (Hair et al. 2010). As shown in Table 5, the result suggests that good discriminant validity of the constructs is achieved.

5.2. Structural level analysis

There are 11 hypothesised relationships in the model (Figure 2). The 11 hypotheses will be assessed for the Anglophone and the Saudi samples. Each hypothesis is assessed by examining the following variables: p-value, standardised path coefficient β (regression coefficients), and Critical Ratio (CR) (Hair et al. 2010). After that, the p-value for the Chi-square difference ($\Delta X^2/\Delta df$) is also calculated. Table 6 shows the results of the analysis for all hypotheses for both models.

5.2.1. Anglophone model construct relations assessment

In the Anglophone model, the hypothesised relationships involving Social Influence (SI), which are H3 and H7 had high p-values (0.109 and 0.111 respectively). This means that the relationships between SI and BI and between SP and SI have not been shown to be significant ($p < 0.05$). The result implies that social ties do not influence Twitter use for Anglophone users.

The hypothesised relationships between Perception of Antisocial Behaviour (PAB) and Behavioural Intention (BI), and PAB and Use (H10, H11 respectively) were also found to have high p-values (0.635, and 0.359 respectively). Indicating that PAB does not have a *direct* impact on the BI or the use (Note, Section

Table 3. The number of responses by different countries.

	Frequency	Percent
Saudi Arabia	540	64.8%
Anglophone countries	200	24%
United Kingdom	142	17%
United States	47	5.7%
Canada	11	1.3%
Other countries	93	11.1%
Total	833	100.0%

Table 4. Composite reliability and construct validity analysis.

Latent variable	Composite reliability	AVE
Performance expectancy	0.770	0.536
Self-presentation	0.750	0.502
Effort expectancy	0.805	0.532
Social influence	0.733	0.586
Facilitating conditions	0.665	0.503
Protective self-presentation	0.744	0.504
Perception of antisocial behaviour	0.838	0.576
Behavioural intention	0.936	0.831

Table 5. Discriminant validity analysis.

	SP	PE	EE	SI	FC	PSP	PAB	BI
SP	0.708							
PE	0.359	0.727						
EE	0.278	0.540	0.766					
SI	0.163	0.475	0.355	0.766				
FC	0.219	0.514	0.598	0.361	0.707			
PSP	0.048	0.139	0.174	0.095	0.300	0.710		
PAB	0.168	0.271	0.309	0.206	0.312	0.177	0.759	
BI	0.231	0.486	0.369	0.328	0.369	0.055	0.135	0.911

5.2.3 will investigate the *indirect* impact). Protective Self Preservation (PSP) was found to have a significant negative effect on the use of Twitter ($p < 0.05$).

Overall, most of the paths from the base UTAUT model were significant, implying that the UTAUT is mostly applicable in the case of Twitter for Anglophone countries. The only exception was from Social Influence (SI) to Behavioural Intention (BI) (H3). Performance Expectancy (PE) was found to have the strongest effect, implying that the perceived utility of Twitter greatly influences its use. Self-Presentation (SP) had a strong effect on Performance Expectancy (PE) (H6), and this indicates that Anglophone Twitter users strongly associate Twitter with self-presentation.

5.2.2. Saudi model construct relations assessment
The Saudi model also showed support of most hypothesised relationships, and only H8 and H10 had high *p*-values (0.909 and 0.685 respectively), which means that neither Protective Self-Presentation (PSP) nor Perception of Antisocial Behaviour (PAB) were shown to have a direct effect on the Behavioural Intention (BI) to continue to use Twitter. Unexpectedly, H11 showed a significant positive effect between Perception of Antisocial Behaviour (PAB) and the use of Twitter, which is the inverse of the hypothesised relationship. A possible justification is that the perception increases as users' experience of the platform increases. Similar to the Anglophone sample, Protective Self-Presentation (PSP) also has a negative impact on use. Figure 3.

All hypothesised paths from the base UTAUT model were statistically significant ($p < 0.05$), this result give evidence of the transferability of the UTAUT in Saudi culture with regard to Twitter. Like the Anglophone model, Performance Expectation (PE) was the strongest influencer to use Twitter in the Saudi model. Self-Presentation (SP) also influenced both PE and SI, implying that Saudi Twitter users also utilise Twitter to present themselves and to cultivate a particular image.

5.2.3. Assessment of the interaction
The Perception of Antisocial Behaviour (PAB) was not shown to have a significant direct influence on either Behavioural Intention or actual use, but it is still possible that it has an indirect impact as an interacting factor within the relationships in the model.

The interaction hypotheses are listed in Table 7. Figure 4 shows the interactions with PAB in the model. One approach for handling a moderator is to create an interaction between the moderator and the other latent constructs. An interaction construct can be formed to represent the moderating effect by multiplying the latent constructs and the moderator, Table 7 and Figure 4 illustrate the interaction sub-hypotheses. To assess H12, seven underpinning hypotheses need to be assessed. Not all of them were supported, therefore H12 was partially supported for both the Anglophone and the Saudi models.

It is clear that overall, PAB has a negative effect on the hypothesised relationships in the model, dampening

Table 6. Hypothesis analysis for Anglophone and Saudi models.

|	Hypothesised path	Anglophone sample (*N* = 200)			Saudi Sample (*N* = 540)			$\Delta X^2/\Delta df$
		β	CR	P	β	CR	P	P
H1	PE → BI	0.572	6.117	<0.001	0.325	5.035	<0.001	n.s.
H2	EE → BI	0.201	2.548	0.011	0.174	3.345	<0.001	n.s.
H3	SI → BI	−0.121	−1.602	0.109	0.187	3.094	0.002	0.005
H4	FC → Use	0.519	3.707	<0.001	0.229	4.217	<0.001	0.036
H5	BI → Use	0.378	2.439	<0.001	0.189	4.255	<0.001	n.s.
H6	SP → PE	0.534	3.344	<0.001	0.356	5.572	<0.001	<0.001
H7	SP → SI	0.160	1.594	0.111	0.127	2.156	0.031	n.s.
H8	PSP → BI	0.019	0.304	0.761	−0.005	−0.114	0.909	n.s.
H9	PSP → Use	−0.287	−2.329	0.020	−0.106	−2.277	0.023	n.s.
H10	PAB → BI	0.028	0.474	0.635	0.018	0.405	0.685	n.s.
H11	PAB → Use	0.086	0.918	0.359	0.102	2.208	0.027	n.s.
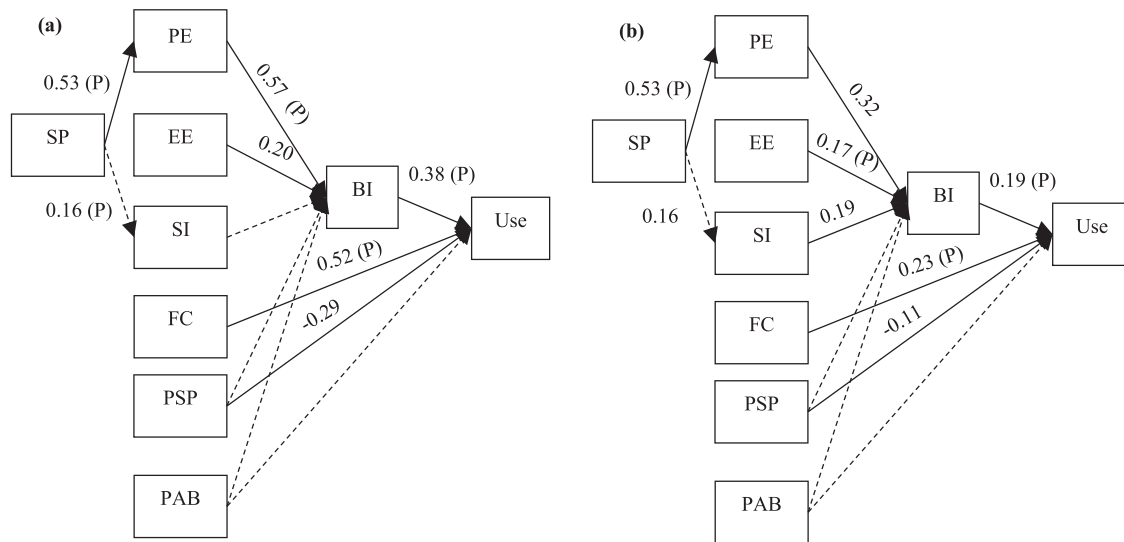
Figure 3. Structured model for the (a) Anglophone and (b) Saudi models. Dashed lines indicate relationships that were not shown to be significant ($p < 0.05$); (P): Perception of antisocial behaviour as a moderator.

Table 7. Interaction hypotheses assessment for the Anglophone and Saudi models.

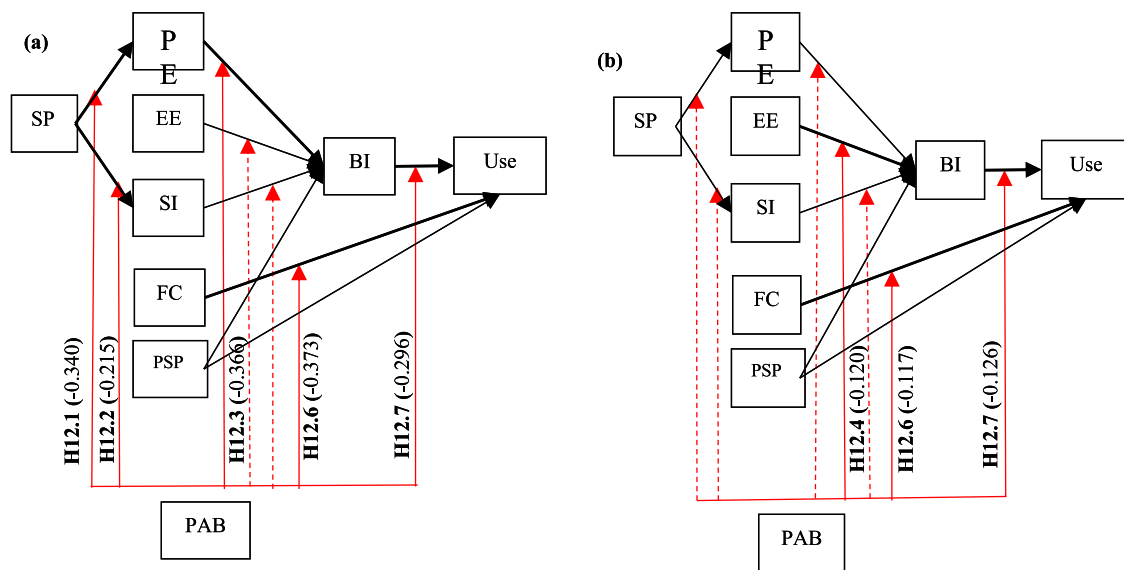|	Hypothesised path			Anglophone		Saudi		$\Delta X^2 / \Delta df$
				β	p-value	β	p-value	p-value
H12.1	SP×PAB	→	PE	−0.340	0.000	−0.019	0.659	n.s.
H12.2	SP×PAB	→	SI	−0.215	0.002	−0.027	0.530	n.s.
H12.3	PE×PAB	→	BI	−0.366	0.000	0.070	0.235	n.s.
H12.4	EE×PAB	→	BI	−0.106	0.185	−0.120	0.014	n.s.
H12.5	SI×PAB	→	BI	0.092	0.262	0.051	0.364	n.s.
H12.6	FC×PAB	→	Use	−0.373	0.000	−0.117	0.007	n.s.
H12.7	BI×PAB	→	Use	−0.296	0.001	−0.126	0.010	n.s.

Figure 4. Interaction hypotheses assessment for the (a) Anglophone and (b) Saudi models.

Table 8. National cultural scores for Anglophone and Saudi Arabia.

	UK	US	Canada	Anglophone Average	Saudi Arabia
Power distance	35	40	39	38	95
Individualism	89	91	80	86.6	25
masculinity	66	62	52	60	60
Uncertainty avoidance	35	46	48	43	80
Long term orientation	51	26	36	37.6	36

the positive relationships. It can also be seen that it tends to impact the Anglophone sample more than the Saudi sample. For the Anglophone sample, PAB had a significant negative effect on all hypotheses except for H12.4 and H12.5, which involve Social Influence (SI) and Effort Expectancy (EE). While in the Saudi sample, PAB had a negative effect on H12.4, which involve EE. It was also found that PAB had a negative effect on both H12.6, and H12.7, which involve the relationships between Behavioural Intention (BI) and Use, and between Facilitating Conditions (FC) and Use.

6. Discussion

6.1. The impact of antisocial behaviour

This study aimed to understand how the perception of antisocial behaviour had an impact on Twitter use. It was proposed that the Perception of Antisocial Behaviour (PAB) was integrated into the UTAUT model as a new risk factor. Other factors related to self-presentation were also integrated to give a deeper understanding of the impact at a personal level. We then examined the direct effect on Behavioural Intention (BI) and Use (H10, H11), and the interaction effect with other constructs (H12).

In the Anglophone model, the analysis did not show that there was a direct significant effect between the Perception of Antisocial Behaviour and the Behavioural Intention to continue to use Twitter, nor between Perception of Antisocial Behaviour and the actual Use. This suggests that users who perceive a problem with antisocial behaviour on Twitter are not less willing to use it.

However, when the impact of the Perception of Antisocial Behaviour was investigated at an interactional level, it was found that it did affect Twitter use by reducing the positive effect of the factors in the model. It lessened the positive relationship between Self-presentation and Performance Expectancy and Social Influence ($\beta = -0.340$, $\beta = -0.215$, respectively). Another strong negative interaction was found with Performance Expectancy ($\beta = -0.366$). In other words, if users felt that the

usefulness of Twitter was being constrained or limited, this would discourage them from using it. In addition, the positive relationship between Facilitating Conditions and Use was significantly reduced by the Perception of Antisocial Behaviour. This interaction showed the strongest impact: with $\beta = -0.373$. These users felt that they had less control over their use of Twitter when their perception of antisocial behaviour increased. Finally, the analysis revealed that the relationship between the Behaviour Intention to continue to use Twitter and the actual use was also reduced by the Perception of Antisocial Behaviour ($\beta = -0.296$).

The Saudi sample was also negatively affected by the interaction of the Perception of Antisocial Behaviour; however, the results showed less impact compared to the Anglophone sample. Only three relationships were affected. These were: the relationships between Effort Expectancy and Behavioural Intention ($\beta = -0.120$), Facilitating Conditions and Use ($\beta = -0.117$), and Behavioural Intention and Use ($\beta = -0.126$).

Just as in the Anglophone sample, this suggests that a person's intention to continue to use Twitter would be negatively affected by antisocial behaviour.

6.2. Anglophone vs. Saudi results

Hofstede's cultural framework provides quantitative measurements for cultural factors and is the most commonly used for cultural comparisons (Hofstede 1997). Published national culture scores allow for national-level analyses and comparisons. The national cultural scores for the Anglophone countries and Saudi Arabia were listed and compared with each other as shown in Table 8. The Anglophone countries' scores were very similar, so the average score was used for comparison with the scores for Saudi Arabia. As shown in Table 8, Saudi Arabia's scores are much higher than the Anglophones' in power distance and uncertainty avoidance; much lower in individualism; and approximately the same in masculinity and long-term orientation.

High power distance indicates the tendency to submit to authority. Individualism reflects loose ties between individuals where everyone is looking after themselves. Masculinity refers to the extent to which a society emphasises achievement and competence versus femininity which focuses on caring and nurturing behaviours. Uncertainty avoidance gauges the extent to which a person feels uncomfortable in uncertain situations. Long term orientation refers to how a society maintains some links with its past while dealing with the challenges of the present and future.

In this study, three significant differences were found between the Anglophone culture and the Saudi culture.

These were the influences of Self-presentation on Performance Expectancy, the Social Influence on Behavioural Intention, and the Facilitating Conditions on the Use.

The Anglophone sample exhibited a stronger effect of Self-Presentation compared to the Saudi sample (β = 0.534, and β = 0.356 respectively), suggesting that the Anglophones tend to express their opinions and share information about themselves more than the Saudis. Individuals in cultures with low power distance tend to express their opinions and disagreement more than individuals in cultures with high power distance, and this possibly explains why the Anglophone Twitter users exhibited higher self-presentation than the Saudi users.

The Social Influence effect was positive and significant in the Saudi culture, while it was negative and not shown to be significant in the Anglophone culture. The score for individualism is much lower for Saudi Arabia, implying that the Saudi culture is a collectivist culture that respects and adheres to in-group values. Consequently, the collective opinions of others would strongly impact individual behavioural intentions and lead to a positive relationship between social influence and behavioural intention. On the other hand, the Anglophone culture is an individualist culture where the opinions of others do not seem to have as great a value. This could explain the different set of results in Social Influence for the two cultures.

The Anglophone sample exhibited a stronger impact of Facilitating Conditions compared to the Saudi sample (β = 0.519, and β = 0.229 respectively). This suggests that the Anglophone Twitter users felt more in control of their Twitter accounts and interactions compared to the Saudi users, which in turn encouraged them to use Twitter. It could be argued that where the Anglophone culture had a low Uncertainty Avoidance score, this made Anglophone users less anxious about using Twitter compared to the Saudi users. However, the result also showed that for Anglophones this relationship was more negatively impacted by Perceptions of Antisocial Behaviour than it was for Saudis (β = −0.373, and β = −0.0117), showing that when Perceptions of Antisocial Behaviour are high the difference between the two cultures is greatly reduced.

7. Conclusion

In this paper, we have taken an alternative *Technology Acceptance* approach to understand the impact of antisocial behaviour on social media use. We have done this building on the established Unified Theory of Acceptance and Use of Technology (UTAUT), extending it with the Perception of Antisocial Behaviour as a risk factor, and two additional supporting constructs drawn from sociology: Strategic Self-Presentation and Protective Self-Presentation. We call this extended model Technology Acceptance and Use under Risk (TAUR).

We have chosen to focus on the Twitter platform specifically as this is regarded as one of the most problematic in terms of antisocial behaviour, and yet has not previously been the subject of acceptance modelling. As TAUR is a superset of UTAUT our work is therefore not only an exploration of the impact of antisocial behaviour but also the first full application of UTAUT to Twitter.

We have gathered data and constructed our model based on 740 responses from two different cultures, which enables us to begin to explore the cultural factors. We have worked with the Anglophone countries of the UK, USA and Canada, and the non-western Arabic culture of Saudi Arabia. All of these countries have high Twitter usage.

Our key findings are that the Perception of Antisocial Behaviour has an *indirect negative moderating* effect on Twitter use as it dampens the positive relationships between the other constructs in the model, including performance expectancy, facilitating conditions, and the behavioural intention to continue to use Twitter. It also affects Self-Presentation on Twitter, especially in the Anglophone culture, which appeared to be more affected by the problem compared to the Saudi culture.

Another key finding was related to the cultural difference between the Anglophone and Saudi Arabia. As Social Influence was much stronger in the Saudi sample compared to the Anglophone, and Self-Presentation and Facilitating Conditions were stronger for the Anglophones. These differences can be explained by the published Hofstede's cultural national scores.

Our work reveals that the Perception of Antisocial Behaviour does negatively impact Twitter use, but that it is not direct. Rather the evidence obtained shows that antisocial behaviour has a negative interaction with other factors that influence Twitter use. The study also shows that it affects Anglophones more than Saudis, indicating that cultural difference is important when studying the impact of online antisocial behaviour online and that different solutions and interventions may be necessary for different cultural groups.

Note

1. Source: http://peerreach.com/. November, 2013. Penetration is defined as the number of monthly active users relative to the total number of internet users in the country.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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