ELSEVIER

# To share or not to share – The underlying motives of sharing fake news amidst the COVID-19 pandemic in Malaysia

Vimala Balakrishnan [a,*], Kee S. Ng [b], Hajar Abdul Rahim [c]

[a] Faculty of Computer Science and Information Technology, Universiti Malaya, 50603, Kuala Lumpur, Malaysia
[b] Faculty of Medicine, Universiti Malaya, 50603, Kuala Lumpur, Malaysia
[c] School of Humanities, Universiti Sains Malaysia, Malaysia

## ABSTRACT

This study investigates the underlying motives for online fake news sharing during the COVID-19 pandemic, an unprecedented time that witnessed a spike in the spread of false content. Motives were identified based on a fake news sharing model developed using the SocioCultural-Psychological-Technology (SCulPT) model, Uses and Gratification (U&G) theory and Self-Determination Theory (SDT), and further extended using fake news predictors/gratifications from past studies. A self-administered survey resulted in 869 online Malaysian respondents aged between 18 and 59 years old (Mean = 22.6, Standard deviation = 6.13). Structured equation modelling revealed the fake news sharing model to collectively account for 49.2 % of the variance, with Altruism ($\beta$ = 0.333; $p < 0.001$), Ignorance ($\beta$ = 0.165; $p < 0.001$) and Entertainment ($\beta$ = 0.139; $p < 0.001$) significantly predicting the behaviour. Conversely, Availability/Effort, Pass Time and Fear of Missing Out were found to be insignificant. Our findings indicate that fake news sharing behavior is determined by different motives, hence these need to be understood in order to develop better solutions to mitigate this problem.

## 1. Introduction

Fake news, defined as concocted content that copycat legitimate news, presented subtly to lure the public into believing it is legitimate [1] has become a major burden worldwide due to the popularity of social media and instant messaging applications which permit instant interaction and diffusion of new ideas globally at the touch of a button. Although fake news is often found on malicious websites, platforms such as Facebook, Twitter, WhatsApp, Telegram etc. are popular avenues for the rapid dissemination of unverified content. The spread of fake news has been reported to have significantly influenced political elections worldwide (e.g. Donald Trump's election to his Presidency) and caused problems in public health as well [2,3]. In fact, fake news proliferation has intensified on social media during the COVID-19 pandemic which many experts believe is contributing to the spread of the outbreak by drowning out the voice of official public health releases online [4].

COVID-19 garnered and generated false content at an alarming rate since last year. As people struggled with the constantly changing, unfamiliar circumstances and uncertainties due to restricted movements, social media became their prime source of information. The pandemic therefore brought upon an onslaught of information (both real and fake)

being shared and spread with audience around the world in a matter of seconds. Therefore, while fake news is not new, the speed and magnitude of its spread in the era of the COVID-19 pandemic reached a new level. A Google trend analysis on "misinformation" and "disinformation" spread over the last three years (2018–2020) illustrates the dramatic increase in global fake news dissemination in 2020 (see Fig. 1). Thus, 2020 was a breakout year for online information warfare, with COVID-19 related fake news to be the most common problem around the world. For instance, almost half (46 %) of the United Kingdom population were found to be exposed to COVID-19 related fake news [5] whilst more than 25 % of the most watched YouTube videos on COVID-19 contained false or misleading information, reaching over 62 million views worldwide [6].

The phenomenon has been observed in Malaysia as well, with at least 270 fake news related investigations since January 2020 with 35 being charged in court. The local government has taken a few new initiatives to curb this issue due to the pandemic, namely, by setting up a Rapid Response Troop to counter fake news pertaining to the Movement Control Order, Welfare Department aid and other COVID-19 related topics [7]. Other government attempts include public information campaigns with catchy slogans such as *"tak pasti, jangan kongsi"* ("not

sure, don't share") and *"pastikan sahih"* ("ensure it is verified"), and also the encouragement and promotion of the fact-checking website, www.se benarnya.my, a government-operated one-stop centre for debunking false information. Additionally, the National Security Council periodically sends text messages reminding the public not to spread fake news due to the potential threat to the national security.

A search of the relevant literature revealed a vast majority of fake news studies to be related to detection mechanisms based on social media feed (Twitter, Facebook, online news portals) and platform features (users, content and network etc.) using machine learning algorithms [8–10]. Conversely, empirical studies on fake news were found to be mostly based on content analysis of social media communications [11,12] whilst others focused on linguistic features and writing style, sharing history of the identified fake news, examination of root content and information in the form of comments and articles, among others [13,14]. Other technological attempts to detect fake news include the use of fact-checking websites such as Snopes.com, PolitiFact.com, Fact Check.Org and sebenarnya.my.

Despite the spread of fake news and its deleterious effects, motives behind this harmful behavior are largely unknown and under-researched. Talwar and colleagues [15] examined WhatsApp communications with results indicating online trust, self-disclosure, fear of missing out (FoMO) and social media fatigue to be positively related to intentionally sharing fake news. The authors however, found online trust to have a negative association with authenticating news before sharing. Interestingly, a search of the literature revealed a growing number of studies and publications focusing on fake news dissemination during the COVID-19 pandemic, and thus lending support to the burgeoning issue under-study. For example, authors in Ref. [16] found socialization, information sharing, information seeking and pass time to be the main motives for sharing fake news among a Nigerian sample whilst Islam et al. [17] observed entertainment and self-promotion to drive the spread of unverified information among Bangladesh young adults.

Studies related to fake news are lacking in Malaysia - empirical, theoretical and practical. In fact, a literature search revealed only published opinions on fake news, its potential effects and regulations [18, 19] although news media reports and statistics indicate proliferation of

fake news in the country. According to the Malaysian Communications and Multimedia Commission (MCMC) Internet Users Survey 2017, approximately 83 % of Malaysians trusted online health-related information, irrespective of the source. Malaysians were also reported to be confused and unable to differentiate real news from fake news [20]. Local media reports indicate the spread of fake news have intensified during the COVID-19 pandemic [7], hence it is considered crucial and also timely to investigate the underlying motives behind this harmful behavior. Further, there is also a lack of theoretical framework on understanding the motives behind fake news sharing (accomplished with and/or without malicious intents). Thus, this study was undertaken to bridge these gaps by developing a fake news sharing model comprising predictors adopted from existing models and evidences, namely, Technology, Entertainment, Ignorance, Altruism, Pass Time and FoMO in order to identify the significant motives influencing fake news sharing behavior among Malaysians.

The remainder of the paper is structured as follows: Section 2 presents the background and theories behind fake news sharing, followed by the methodology in Section 3. The results and discussions are provided next, before the paper is finally concluded in Section 6.

## 2. Background

### 2.1. Fake news

The term fake news is often widely used to describe information disorder, and can be categorized as [21]:

i. Misinformation: False information created without any harmful intention,
ii. Disinformation: False information deliberately created to harm an entity (person, social group, organization or country),
iii. Malinformation: Information that is based on reality and used to inflict harm on an entity (person, social group, organization or country).

According to Ref. [22], fake news are "news articles that are



(a) Global misinformation spread between January 1, 2018 and January 1, 2021



(b) Global disinformation spread between January 1, 2018 and January 1, 2021

**Fig. 1.** Global trends for the spread of fake news between 2018 and 2021.

intentionally written to mislead or misinform readers but can be verified as false by means of other sources". The authors further identified three main aspects of fake news, namely, (i) its form as news article, (ii) its deceptive intent (satirical or malicious) and (iii) the verifiability of its content as completely or partially false. Others viewed fake news as any untrue information which includes rumors, myths, hoaxes and conspiracy theories that are distributed intentionally or unintentionally [23]. The Malaysian Parliament defines it as "any news, information, data and reports which is or are wholly or partly false, whether in the form of features, visuals or audio recordings or in any other form capable of suggesting words or ideas" [24]. The present study redefines fake news as "misleading or incorrect information in any forms, disseminated intentionally or unintentionally". In other words, fake news is deemed to encompass misinformation, disinformation and malinformation, spread with or without any intention to inflict harm on another entity.

The rapid spread of fake news during the COVID-19 pandemic fueled unnecessary public panic regarding the outbreak, prompting governments and authorities to urge citizens to confirm the genuineness of news before circulating them [4]. Literature and news articles around the globe show a flurry of false or fabricated COVID-19 information spread through social media, such as those urging people to drink salty or warm water, and bleach as a remedy against the deadly virus [25]. Closer to home, some sample fake news that have been debunked by the relevant authorities include a report urging Malaysians not to consume Mandarin oranges from China deemed to be contaminated with COVID-19 virus and news indicating that the Kuala Lumpur hospital was seeking public contributions in forms of funds and essentials. Such false information may confuse people and cause them to overreact (e.g., unnecessary anxiety, hoarding groceries and other essential items), underreact (e.g., engaging in risky behavior such as not adhering to the Standard Operating Procedures) or adopt harmful remedies (e.g., bleach consumption). Therefore, it is pertinent to investigate the underlying motives contributing to fake news sharing behavior so that more strategic interventions can be designed and developed to increase the quality of information people share online.

### 2.2. Theoretical underpinnings

Fake news articles are mostly found on malicious websites, specifically created to spread misinformation which are often shared on social media platforms by authors, malicious users or social media bots, as well as general public who do not bother to verify the article before dissemination. As sharing/spreading fake news involves the use of technology (particularly social media) with negative consequences, it is deemed appropriate to base our research on existing models focusing on technology/social media and harmful behaviors. Further, the present study also focuses on the psychological aspect of the human with regard to their fake news sharing behavior (i.e., individual differences) including negative attitudes, entertainment or simply to pass their time, among others.

The SocioCultural-Psychology-Technology (SCulPT) model was introduced in Ref. [26] to determine cyberbullying predictors. As the name implies, the model comprised three main motives, namely, SocioCultural (i.e., Social Influence and Social Acceptability), Psychology (i.e., Entertainment, Attitude and Empowerment) and Technology (i.e., Ease of Use, Coverage, Anonymity, Availability and Trust), all of which were collectively found to significantly predict cyberbullying intention (predictive power of 83 %). SocioCultural had the strongest impact, particularly Social Influence (friends and family) and Social Acceptability (embedded as part of one's environment/society). Furthermore, Availability and Ease of Use for Technology were also found to significantly impact cyberbullying intention along with engaging in the heinous act for Entertainment reasons (Psychology). The remaining sub-factors were found to be insignificant. Akin to cyberbullying, fake news sharing is also deemed to be a harmful behavior that mostly takes place online, particularly social media and mobile messaging

applications [15–17], hence Technology and Psychology factors are deemed suitable to investigate the underlying motives for fake news sharing. For instance, the availability of various technological platforms and mechanisms including social media (e.g., Facebook, Twitter), messaging applications (e.g., WhatsApp, Facebook Messenger), websites, click-baits (i.e., text or link designed to entice users to follow the link and read, view, with a defining characteristic of being deceptive), forums etc. may appear to be attractive to false content creators. Conversely, this also means that online users are very much exposed to false content, hence the higher the chances for fake news to be disseminated (knowingly or unknowingly). Interestingly, availability is also closely related to coverage (i.e., a wider audience), and thus a misleading information found on Facebook for example, can be effortlessly shared with hundreds of "friends" who may then share the same content with their respective networks, hence inadvertently broadcast false content online. Therefore, although SCulPT was developed to examine cyberbullying behavior, the model can be suitably adapted to investigate fake news sharing as well.

A popular theory often used to examine (social) media gratifications is the Uses and Gratifications (U&G) theory [27], a theory that implies individuals use technologies which gratify social and psychological needs. In short, the theory argues what people do with media rather than what media does to people. Though initially designed and used to understand reasons behind users' choice of media, the theory was eventually used as an extension of needs and motivation theory [28]. The U&G theory can be divided into mainly four categories, namely, social (social influences and social ties), process (pleasure gained from the engagement in a given experience), content (the exposure/knowledge a person gets to find the relevant information), and technology (gratifications predicted by using different types of technologies) gratifications.

The utilization of U&G theory in the fake news sharing context is deemed appropriate considering the theoretical framework has been widely used and tested in understanding the underlying motives behind engaging with various technological platforms targeting various contexts and domains. For instance, it has been used widely to examine the underlying motives in several technology adoption studies such as food delivery apps [29], mobile shopping [30], social media [31,32] and those examining [fake] news and knowledge sharing behavior [16,33, 34]. For example, authors in Ref. [34] found status-seeking and information-seeking gratification to be associated with news sharing behavior whereas authors in Ref. [16] investigated the motives behind fake news sharing during the COVID-19 pandemic and found the majority of the Nigerian student participants to engage in the said behavior to pass their time whereas entertainment emerged to be insignificant, and thus reaffirming the generalizability of U&G theory across context, countries, and culture as well. Therefore, we contend that process gratifications gained probably lead to fake news sharing (knowingly or unknowingly) among individuals.

On the other hand, the Self Determination Theory (SDT) assesses human motivation and personality, and postulates that individuals have innate psychological needs (i.e., autonomy, competence and relatedness) to fulfill [35]. When these basic needs are fulfilled, the individuals experience growth, wellbeing and integrity; however, unfulfilled needs may result in psychological harm. According to Ref. [36], SDT helps to explain the manifestation of fear of missing out, or popularly known among the millennials as FoMO, fueled by the need for relatedness and sense of belonging. Additionally, it also includes apprehension of missing rewarding and pleasurable experiences [37]. Evidences exist linking FoMO with problematic behaviors such as Internet overuse [38, 39], gaming addiction [38,40], social media addiction [41] and fake news sharing [15]. In the fake news sharing context, authors focusing on social media found FoMO and self-disclosure to be positively associated with intentionally sharing fake news [15]. In another social media study, it was suggested that deficits in psychological needs may increase people's sensitivity to fear missing out on things, which in turn may drive them towards social media [37] as the platform is deemed as an effective

self-regulation tool to satisfy one's psychological needs. In line with this, it is posited an individual may be driven to engage in fake news sharing activities in order to fulfil his/her psychological needs, especially among the young adults who are confined indoor during the prolonged nationwide lockdowns in the country.

Thus, taking also into consideration the spike in the spread of fake news during the COVID-19 pandemic, and the relatively scarce theoretically driven empirical research in this context, it is pertinent to examine this harmful behavior. The present study draws inspiration from SCulPT, U&G and SDT and existing studies on fake news sharing and proposes a fake news sharing model to help identify significant underlying motives behind this harmful behavior. The specific motives adopted and adapted are discussed elaborately in the subsequent section.

## 3. Method

This section presents the fake news sharing model, along with the elaboration of each of the motives. The materials and measures used are also provided, followed by study respondents and statistical analyses used.

### 3.1. Fake news sharing model

Fig. 2 illustrates the research model adopted in this study, with six independent variables and one dependent variable (all reflective), along with their respective operationalization and hypotheses.

Technology, Internet and particularly social media have shaped our daily lives in multitudinous ways, more so during the COVID-19 pandemic where a vast majority of people were forced to work and study from home. This resulted in a high(er) uptake of Internet technologies with reports indicating a spike in Internet and social media use [42–44], a phenomenon that has been linked with negative behaviors as well [38,39]. Similarly, the availability of diverse social media platforms was found to be a significant predictor for cyberbullying, suggesting that individuals are able to engage in a negative behavior as they are not limited to a single source [26]. In the context of fake news sharing, they are often spread through social media (Facebook, Twitter) [16,42,45] and mobile messaging applications such as WhatsApp [15,17,46]. Further, characteristics of social media platforms support the dissemination of fake news as well, for instance, one is able to forward contents effortlessly and efficiently to reach a mass audience. Anonymity which allows one to engage in a negative behavior [26] can be deemed as a potential motive in fake news sharing as well, considering tracking the original source of fake news creators is tedious and the act can be easily accomplished using fake or anonymous profiles. Consistent with these findings, we postulate that Technology has a positive impact on fake news sharing.

**H1.** Technology positively affects fake news sharing

Entertainment is basically a manner for individuals to engage in certain activities as a form of emotional release, escapism and anxiety relief [17]. In technological studies for example, entertainment refers to the use of technologies simply for the fun of it or for escapism. Numerous studies in technology adoption such as Internet, mobile phone and social media etc. have found entertainment to be one of the main motives in using the said technologies [47,48], however the same has been reported by those examining the dark aspect of social media too. For instance Ref. [26], found entertainment to be one of the predictors for cyberbullying perpetration with results indicating bullies engage in the harmful behavior just because they find it thrilling, satisfying and entertaining. In the context of fake news sharing, empirical evidences show mixed results, for instance Refs. [17,33], found people tend to share false content to entertain themselves as well as for fun whereas [16] found no significant impact of entertainment on fake news sharing during COVID-19, regardless of having engaged in the said behavior with or without malicious intentions. As the present study solicited responses during the COVID-19 pandemic which saw many individuals in lockdowns, we posit a higher social media/website use to seek news/information pertaining to the virus, hence an increased tendency to share unverified information (knowingly and/or unknowingly) as a form of entertainment during what is considered a trying time for many. We hypothesize that:

**H2.** Entertainment positively affects fake news sharing

Attitude refers to individual characteristics that portraits either positive or negative behavior and reflection of feeling and knowledge to a certain concept or subject [49]. Attitude has been well studied in technology adoption studies [50,51], with results often indicating a positive attitude promotes good behavior, and vice-versa. In connection with fake news sharing, studies have shown that people who lack information verification skill and self-regulation, and lazy have a higher tendency to share unverified information [17,43,52]. This is especially true during the COVID-19 pandemic when a plethora of pandemic-related news were shared through social media resulting in information and cognitive overload, hence individuals tend to forgo their regulatory behavior and share unverified news unknowingly. In fact, studies have showed that people tend to share fake news without any malicious intentions, suggesting that they often do not know that they are spreading false information [43]. Taking aspects such as lack of awareness or verification skill, and other lackadaisical attitude including laziness or the tendency to trust "certain" sources, we adapt Attitude from SCulPT and relabel it as Ignorance to better reflect all the behaviors related to a negative attitude, and hypothesize that it will have a positive impact on fake news sharing:
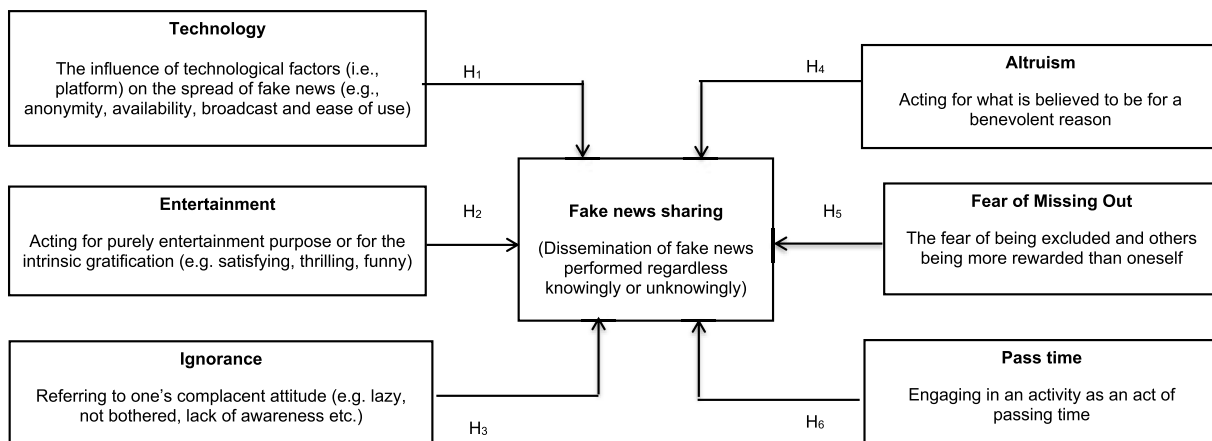


**Fig. 2.** Fake news sharing model.

**H3.** Ignorance positively affects fake news sharing

Altruism is the act of giving/doing something without expecting any favor/reward in return. In the context of fake news sharing, it can be defined as the act of distributing false content without expecting a reward, and thus may result in the person to share news with no other expectation other than as a benevolent act of sharing and with no consideration for the veracity of the news [1,53]. A recent fake news study related to COVID-19 pandemic found altruism to be the most significant factor predicting fake news sharing [16]. Consistent with these studies, we posit that highly altruistic individuals are more likely to share fake news with the intention to help others. Hypothesis four is therefore, formulated as:

**H4.** Altruism positively affects fake news sharing

FoMO can be seen as a psychological reaction that individuals experience due to social exclusion, hence they have a higher tendency to seek popularity and sense of belongingness [36]. According to Ref. [37], FoMO can also be described as a suspicion among social media users that others might have much more rewarding experience than them. FoMO has been found to exacerbate undesirable behavior (e.g., decrease or lack of self-regulation) [54], and thus leading to an increased sharing of fake news. Authors in Ref. [15] for example, found mixed results whereby FoMO was found to positively affect fake news sharing, however there was no correlation between FoMO and authenticating the news prior to sharing. We believe that FoMO will increase an individual's undesirable behavior leading to an increased sharing of fake news, and hence hypothesis five is formulated as follows:

**H5.** Fear of missing out positively affects fake news sharing

Previous studies on the mis(use) of social media have revealed that people tend to use the platforms simply to pass their time [32,55]. Interestingly, studies pertaining to time pass and fake news sharing have produced mixed results, hence warranting further investigation in terms of this motive. For instance Refs. [16,56], found a correlation between sharing false content and pass time whilst others such as [34] found otherwise. The COVID-19 pandemic resulted in several lockdowns in Malaysia forcing people to stay indoors, and thus we expect an increased boredom level among the public. The present study therefore proposes a positive relationship between pass time and fake news sharing, hence hypothesis six is formulated as follows:

**H6.** Pass time positively affects fake news sharing

Table 1 provides the list of motives identified and their respective models/theories/studies.

### 3.2. Materials and measures

A self-administered questionnaire survey was developed in English and piloted among 42 students. The questionnaire was deemed to be simple and easy to understand; hence no further modifications were made. There were three main sections in the survey, as follows:

Section A: Respondents demographic details were solicited through ten questions in this section, namely, age (continuous), gender (dichotomous), status (i.e., tertiary students, working, others), frequency of using online news portals, mobile phone and social media in a day (i.e., less than an hour, 1–5 h, and more than 5 h) and preferred source of information, among others.

Section B: The fake news definition (Section 2.1) begins Section B, followed by an instruction to answer the questions based on the respondents' personal experiences since January 2020 (i.e., coincides with the beginning of the COVID-19 pandemic). This section measures statements related to the dependent variable, that is, fake news sharing (see Fig. 2 for its definition). There were five items in total, adapted from previous fake news sharing studies [15,16,52], with a Cronbach's Alpha (CA) α = 0.823 indicating the measures were reliable. All the five items were intended to measure if the respondents have engaged in fake news sharing behaviour (knowingly and unknowingly) and the medium used to do so. A four-point Likert scale was used to measure the agreement/disagreement levels (1 – strongly disagree; 4 – strongly agree). No neutral point was provided. It is to note that although it is a common practice to use a five-point Likert scale (i.e., with a neutral point), the present study adopted the forced-choice scale by excluding the mid-point. This was done to eliminate the possibility that respondents will misuse the midpoint, which is a common issue in self-reporting questionnaires as shown by numerous studies comparing the five-point and four-point Likert scales [57,58].

Section C: The final section contains all the statements pertaining to the motives, comprising 20 statements encompassing the six independent variables. The instructions in Section B were repeated in this section, with an added statement requesting the respondents to provide their agreement/disagreement levels at the time of sharing fake news (with and/or without any malicious intentions). Items measuring motives related to Technology were adapted from Ref. [26], Pass Time and Entertainment from Refs. [16,34], Altruism from Ref. [16], FoMO from Ref. [15] and Ignorance from Refs. [17,26,43]. The specific number of items and CA for each of the motives are: Technology (N = 5; α = 0.906), Entertainment (N = 4; α = 0.908), Ignorance (N = 3; α = 0.863), Altruism (N = 3; α = 0.935), Fear of Missing Out (N = 2; α = 0.863) and Pass Time (N = 3, α = 0.928). The complete list of items can be found in Table 2 (Section 4). It is to note that the entire premise of the present study is based on the assumption that fake news is shared knowingly (malicious and non-malicious intentions) or unknowingly (non-malicious intention) (provided as part of survey instruction as stated above), and therefore all the measures encompass both these behaviors, except for Entertainment which assumes the respondents are aware of the veracity of the news.

The survey questionnaire was used as part of the project assessment for students undertaking the Probability and Statistics course. Forty-two undergraduate students assisted with the data collection by disseminating the Google Form link through social media platforms including Facebook and WhatsApp. A timeline of ten days was given to the students and they earned credit points for the data collection exercise. All the participation was kept anonymous, voluntary and confidential.

### 3.3. Study respondents

A total of 869 valid responses was collected based on two criteria: respondents to be Malaysians above 18 (inclusive). The demographic profiles of the respondents are provided in Section 4.

### 3.4. Statistical analysis

Two main software were used to analyze the data and the proposed hypotheses. Specifically, the Statistical Package for Social Sciences (SPSS) 26 was utilized to describe the data using mean, standard

**Table 1**
Summary of theories/models adopted/adapted.

| Motives | Theory/ model | Topic | References |
|---|---|---|---|
| Technology | SCulPT | Cyberbullying | [26] |
| Entertainment | SCulPT | Cyberbullying, Fake news, Social media, Internet, mobile phone use etc. | [26] |
| | U&G | | [16] |
| | | | [33] |
| Ignorance | SCulPT, | Cyberbullying | [26] |
| | | | [15] |
| | | | [17,43] |
| Altruism | – | Fake news | [16] |
| Fear of Missing Out | SDT | Social media use Fake news | [26] |
| | | | [36] |
| | | | [37] |
| Pass time | U&G | Fake news, Social media, Internet, mobile phone use etc. | [16] |
| | | | [34] |
| | | | [56] |

**Table 2**

Reliability and convergent validity for fake news sharing model.

| Motive | CA | CR | AVE | Items | Factor loading |
|---|---|---|---|---|---|
| Availability/ Effort | 0.906 | 0.907 | 0.765 | The tools/medium allow users to be anonymous - *Removed* | 0.533 |
| | | | | Fake news can be broadcast to a large audience fast - *Removed* | 0.622 |
| | | | | There are various tools/ medium available (e.g., social media, chat, phone, website) | 0.839 |
| | | | | The tools/medium are available easily (e.g., social media) | 0.860 |
| | | | | The tools/medium are easy to use | 0.924 |
| Entertainment | 0.908 | 0.908 | 0.713 | It is a satisfying experience to spread fake news | 0.770 |
| | | | | It is funny to see others believing the fake news | 0.784 |
| | | | | Spreading fake news makes me popular | 0.903 |
| | | | | It is exciting/thrilling to spread fake news | 0.910 |
| Ignorance | 0.863 | 0.859 | 0.507 | I am lazy to verify news received - *Removed* | 0.622 |
| | | | | I tend to trust source of fake news (e.g., from a superior, lecturer, someone I look up to) | 0.716 |
| | | | | I am not aware of the consequences of sharing fake news | 0.865 |
| Pass Time | 0.928 | 0.928 | 0.811 | I shared fake news as I had nothing much to do | 0.878 |
| | | | | I shared fake news out of habit (tendency to forward/share information) | 0.910 |
| | | | | I shared fake news out of boredom (i.e., just to pass time) | 0.913 |
| Altruism | 0.935 | 0.935 | 0.827 | I shared fake news as I thought I was offering information to others | 0.855 |
| | | | | I shared fake news as I thought I was helping others | 0.908 |
| | | | | I shared fake news as I thought I was motivating/inspiring others | 0.963 |
| FoMO | 0.863 | 0.863 | 0.760 | I fear I will be excluded from my social circle if I do not share fake news | 0.863 |
| | | | | I fear my friends/peers will have more rewarding experience than me by sharing fake news | 0.880 |
| Fake News Sharing | 0.770 | 0.770 | 0.538 | I shared/spread fake news through chats (IM, Skype etc.) - *Removed* | 0.648 |
| | | | | I have shared/spread fake news before knowingly | 0.703 |
| | | | | I have shared/spread fake news before unknowingly | 0.711 |
| | | | | I shared/spread fake news through messaging services (WhatsApp, SMS etc.) | 0.734 |

**Table 2** (*continued*)

| Motive | CA | CR | AVE | Items | Factor loading |
|---|---|---|---|---|---|
| | | | | I shared/spread fake news through social media (Facebook, Twitter etc.) | 0.741 |

*Removed – indicates items removed due to a low factor loading (i.e., <0.7).

deviations (SD), frequency etc., and to perform some preliminary analysis including Common Method Bias (CMB), communalities and co-variances between the items. The CMB was checked using the Harmon's single-factor analysis, with results indicating a variance of 28.7 % (i.e., less than 50 %), whereas the communalities were all more than 0.5. Finally, the Variance Inflation Factor (VIF) was between 1.10 and 3.86 (i.e., less than 5) [59]. Based on these evaluations, no issues were found for CMB and multicollinearity.

On the other hand, the Partial Least Squares - Structural Equation Modelling (PLS-SEM) (Smart PLS 3.2.9) [60] was used to identify the significant underlying motives for fake news sharing (H1 – H6). As per [59]'s recommendation, both the measurement and structural model were estimated. In the measurement model estimation, several analyses were administered to determine the reliability and validity. Specifically, Cronbach Alpha (CA) and Composite Reliability (CR) (both more than 0.7) were used to assess the internal consistency reliability. Convergent validity was established using the average variance-extracted (AVE) scores (i.e., more than 0.5) whilst cross-loadings (i.e., more than 0.7) and the Fornell and Larcker criterion were used to confirm the discriminant validity [61].

Table 2 depicts the results of the measurement model estimation, indicating reliability and convergent validity were established. It is to note that items related to anonymity and coverage in Technology were removed due to a low factor loading (i.e., less than 0.7), hence Technology was renamed to Availability/Effort to reflect the motive better. On the other hand, Table 3 establishes the discriminant validity (i.e., each motive's AVE's square roots surpassed their correlations with other motives – bolded diagonal scores). Further, a check of the Heterotrait-Monotrait Ratio (HTMT) revealed all the values to be lesser than 0.9, hence discriminant validity is confirmed [62].

As for the structural model estimation, Consistent PLS was used to determine the path coefficients (i.e., the closer the estimated coefficient to 1, the stronger its effect, and vice versa), followed by Consistent Bootstrapping (5000 resampling) to perform the significance test [59]. A path coefficient is deemed to be significant if its t-value is more than 1.95 (i.e., $p < 0.05$). All the significancy in this study was set at $p < 0.05$, unless otherwise stated. Additionally, we also assessed the coefficient of determination ($R^2$) and predictive relevance ($Q^2$) of the fake news sharing model. The $Q^2$ was determined using Stone-Geisser's $Q^2$ [63,64] test, achieved through the blindfolding procedure, specifically examined using the cross validated redundancy (CVR) prediction technique. According to this test, if $Q^2 > 0$, then the dependent variable is deemed to have a predictive relevance in the model [59]. Finally, the effect sizes ($f^2$) (i.e., the magnitude of an effect that is independent of sample size) of the significant motives were examined using Cohen's (1988) [65] criteria (i.e., $f^2 \geq 0.35$ - large; $f^2 \geq 0.15$ – medium; $f^2 \geq 0.02$– small).

## 4. Results

### 4.1. Socio-demographic profiles of the respondents

Table 4 depicts the socio-demographic profiles of the 869 respondents. It can be observed that a vast majority of the respondents were females (59.7 % versus 40.3 %), with an average age of 22.7 years old for the overall sample, probably due to the majority of them being tertiary students (80.6 %). Although most of the respondents spent more

**Table 3**
Discriminant validity.

| Motives | Altruism | Ignorance | Entertainment | FoMO | Pass Time | Availability/Effort |
|---|---|---|---|---|---|---|
| Altruism | **0.910** | | | | | |
| Ignorance | 0.388 | **1.00** | | | | |
| Entertainment | 0.464 | 0.363 | **0.844** | | | |
| FoMO | 0.621 | 0.457 | 0.524 | **0.872** | | |
| Pass Time | 0.673 | 0.572 | 0.615 | 0.776 | **0.900** | |
| Availability/Effort | 0.029 | 0.07 | 0.068 | 0.017 | 0.159 | **0.875** |

**Table 4**
Socio-demographic profiles of the respondents (N = 869).

| Demographic variables | Categories | N | % |
|---|---|---|---|
| Gender | Male | 350 | 40.3 |
| | Female | 519 | 59.7 |
| Status | Working | 150 | 17.3 |
| | Students | 700 | 80.6 |
| | Others | 19 | 2.2 |
| Daily Access to Online News Portals (Hours) | <1 | 368 | 42.3 |
| | 1–5 | 382 | 44.0 |
| | >5 | 119 | 13.7 |
| Daily Access to Social Media (Hours) | <1 | 61 | 7.0 |
| | 1–5 | 399 | 45.9 |
| | >5 | 409 | 47.1 |
| Daily use of mobile phone (Hours) | <1 | 21 | 2.4 |
| | 1–5 | 237 | 27.3 |
| | >5 | 611 | 70.3 |
| Main source of information | Social media | 623 | 71.7 |
| | Digital news | 185 | 21.3 |
| | Traditional (printed) | 8 | .9 |
| | Traditional (Radio, TV) | 19 | 2.2 |
| | Family/friends | 34 | 3.9 |
| Frequency of sharing news (real/fake) | Never | 101 | 11.6 |
| | Seldom | 482 | 55.5 |
| | Occasionally | 206 | 23.7 |
| | Frequently | 80 | 9.2 |
| Definition of fake news? | Yes | 772 | 88.8 |
| | No | 6 | 0.7 |
| | Unsure | 91 | 10.5 |
| Does it matter to be reading real news? | Yes | 770 | 88.6 |
| | No | 40 | 4.6 |
| | Don't care | 59 | 6.8 |
| Can identify fake news while reading? | Yes | 337 | 38.8 |
| | No | 102 | 11.7 |
| | Unsure | 430 | 49.5 |
| Action taken on suspicious news | Ignore | 283 | 32.6 |
| | Share/Forward immediately | 19 | 2.2 |
| | Fact checking website | 245 | 28.2 |
| | Google verification | 209 | 24.1 |
| | Family/friends verification | 112 | 12.9 |
| Aware of fact checking website in Malaysia? | Yes | 364 | 41.9 |
| | No | 505 | 58.1 |

than 5 h daily on social media (47.1 %) and mobile phones (70.3 %), only 13 % reported to access online news portals for the same amount of time daily. However, 382 (44 %) of them reported to spend between 1- and 5-h checking news portals, followed by those who spent less than an hour daily doing so (42.3 %). The emergence of social media (71.7 %) as the main source of information is in accordance with the daily usage of social media. Most of the respondents in our sample actively shared news (88.4 %) compared to those who never do so (11.6 %). The majority of the respondents (88.8 %) claimed to know what fake news is, followed by those who were unsure (10.5 %). Unfortunately, close to 50 % of them were not sure about their abilities to identify fake news. Finally, although more than half the sample (58.1 %) were not aware of the existence of a local fact-checking website, the majority (65.2 %) claimed to perform some form of verification, particularly online (i.e., fact-checking websites and Google).

### 4.2. Fake news sharing motives

Fig. 3 illustrates the fake news sharing model, along with the hypotheses, path coefficients and path significance.

Results indicate three motives to significantly and positively predict fake news sharing behavior among the sample, namely, Altruism ($\beta = 0.333$; $p < 0.001$), Ignorance ($\beta = 0.165$; $p < 0.001$) and Entertainment ($\beta = 0.139$; $p < 0.001$), hence supporting H2, H3 and H4. Looking at the path coefficients ($\beta$ values) of the significant motives, it can be concluded that Altruism had the strongest impact on fake news sharing behavior, followed by Ignorance and Entertainment. A further examination of the effect sizes ($f^2$) supports these findings, in which Altruism was found to have a medium effect ($f^2 = 0.265$) along with Ignorance ($f^2 = 0.173$) whereas Entertainment ($f^2 = 0.037$) had a small effect on fake news sharing (see Table 5). Contrarily, Availability/Effort, Pass Time and FoMO were found to be insignificant (i.e., $p > 0.05$).

The overall $R^2$ was found to be 49.2 % whilst the $Q^2$ value of 0.097 (i. e., more than zero) indicates that the predictive relevance of the model is acceptable. As empirical studies exploring the underlying motives of fake news sharing are scarce, an adjusted $R^2$ of 49.2 % is deemed to be excellent [61,66]. Further, the value is also in line with the recommendation of [67] who argued that $R^2$ of 0.20 or more is adequate to judge variance for studies related to consumer and user behavior.

### 5. Discussion

The underlying motives predicting fake news sharing behavior during the COVID-19 pandemic were investigated using a fake news sharing model, mainly based on SCulPT, U&G and SDT models/theories comprising six independent variables, namely, Altruism, Ignorance, Entertainment, Availability/Effort, Pass Time and Fear of Missing Out (FoMO). Structured equation modelling revealed these motives to collectively explain 49.2 % of fake news sharing behavior. This is lower than the 79.1 % of adjusted $R^2$ value reported in a similar study focusing on fake news sharing during COVID-19 in Nigeria [16], however the motives investigated differ except for Pass Time, Altruism and Entertainment. Conversely, our variance score is considerably higher than the 36 % reported in a fake news sharing study among 1022 Pakistani students [15]. This suggests that there are other potential motives for fake news sharing behavior that warrant further investigation, such as information seeking and sharing [16,34,68], exposure to comments/news [33] and self-disclose, online trust and social media fatigue [15], among others.

Altruism, Ignorance and Entertainment were found to significantly and positively affect fake news sharing behavior whilst Availability/ Effort, Pass Time and FoMO were insignificant. The emergence of Altruism as the strongest motive predicting fake news sharing behavior is in accordance with [16] who found the motive to be significant among their Nigerian sample. Though not absolute, Asians (particularly South East Asians) are deemed to be collective (emphasizes on group goals, personal relationships with ones extended network) based compared to the Westerners who are more individualistic (focuses on individual goals) [69]. This probably explains the respondent's tendency to share fake news in the name of helping or assisting others. The COVID-19 pandemic is a whole-new experience for all of us, and as the majority
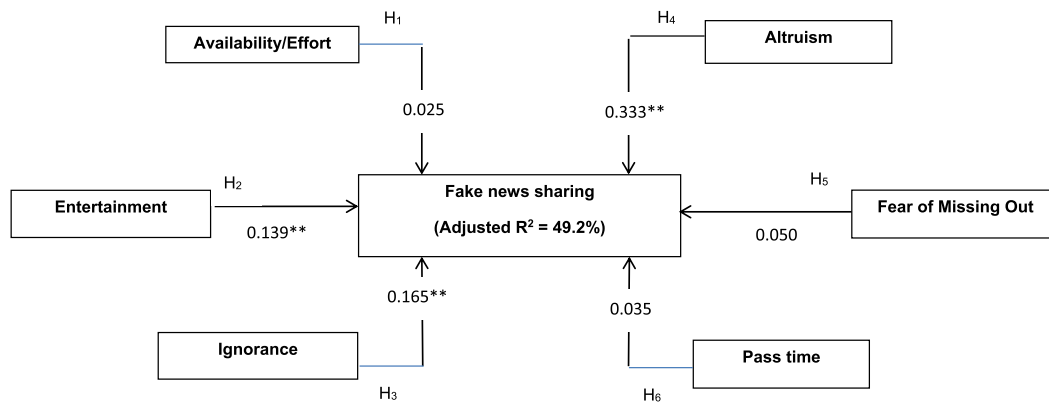
**Fig. 3.** SEM for fake news sharing model.

**Table 5**
Fake news sharing modelling outcomes.

| Hypothesis | Relationships | β | t-value | p-value | Hypothesis |
|---|---|---|---|---|---|
| H1 | AE → FNS | 0.025 | 1.045 | 0.082 | Not supported |
| H2 | Entertainment → FNS | 0.139 | 2.177 | 0.000* | Supported |
| H3 | Ignorance → FNS | 0.165 | 3.416 | 0.000* | Supported |
| H4 | Altruism → FNS | 0.333 | 5.516 | 0.000* | Supported |
| H5 | FoMO → FNS | 0.050 | 0.687 | 0.277 | Not supported |
| H6 | Pass Time → FNS | 0.035 | 0.570 | 0.246 | Not supported |

AE: Availability/Effort; FNS: Fake news sharing; * - significant at $p < 0.05$.

of the respondents are digital natives, they probably engage in sharing (mis)information about the outbreak with others who are not well-versed with the disease/virus or those who are not technology-savvy such as parents, elderlies etc. Our results in Table 4 further supports this notion whereby the majority of the respondents were found to actively share news, regardless of its veracity (88.4 %) – a less desirable (and perhaps deadly) activity accomplished as a benevolent act during a trying time for many, if not all.

An individual's Ignorance was also found to play a significant role in his/her fake news sharing behavior as measured by the tendency to trust a superior source and being unaware of the consequences of sharing fake news. A superior source in this study refers to someone an individual respects or looks up to with regards to their age, experience, education, position etc. such as educators, older adults or highly educated people. Therefore, perhaps there is a tendency for people to trust the information received from such sources, resulting in them not to doubt its veracity and further sharing the said material with others. Additionally, being unaware of the consequences of fake news also propels the respondents to share fake news, a similar pattern reported in other technological studies that found lack of awareness to be negatively affecting a positive behavior [70]. This notion can be associated with Altruism as well, since the respondents could be engaging in fake news sharing with other unsuspecting individuals as a form of assistance, without realizing the damaging effect(s) of their behavior. As a matter of fact, others have echoed this sentiment whereby people have been found to share fake news without any malicious intentions [43,70].

Entertainment emerged to be a significant motive in fake news sharing albeit with a weak effect, a finding that was reflected in Refs. [17,33], though in contrary with [16]. In fact, this motive seems to be commonly reported in other social media studies such as cyberbullying [26,72] and smartphone addictions [73,74]. One of the items used to measure Entertainment is popularity, hence it is disheartening to find that the majority of the respondents who are considerably young to engage in fake news sharing behavior for an easy fame, a pattern that was observed among Pakistani students as well [15]. Further, sharing fake news simply because it is funny when others fall for it, or because it is a thrilling experience shows a level of immaturity among the respondents. As observed, a vast majority of the respondents are in their 20s, and thus this probably explains their lack of tack in sharing unverified information. The issue is also probably made worse by their lack of awareness of the negative consequences of sharing fake news (as indicated by Ignorance). This is especially true during the COVID-19 pandemic whereby the Internet and social media were abuzz with fake news, including eccentric ones such as those urging people to drink salty or warm water to kill the virus. These young individuals (who may know that this is not true) may disseminate such "funny" news with others who are less suspecting for a quick (and rather cheap) thrill. Alternatively, they could have also shared the eccentric/funny fake news to affirm the level of absurdity a fake news is with their contacts.

On the flip side, although characteristics of technology (mobile phone, social media etc.) have been shown to contribute to online antisocial behavior [26], the motive was not found to be significant in predicting fake news sharing. Our respondents mainly belong to Gen Z (below 23 years old) and Y (millennials) – generations that are extremely tech-savvy and known to consume technology differently compared to previous generations [75]. Therefore, this probably explains why Availability/Effort was not deemed to be important in influencing their fake news sharing behavior. Similarly, Pass Time was found to be insignificant as well, in accordance with [34] but in contrast with [16]. This is surprising considering the respondents who were mainly young adults were forced to stay at home due to the nationwide lockdown in the country for almost 4–6 months, hence they were assumed to more likely engage in sharing fake news simply to counter their boredom. Finally, unlike [15], the study found FoMO to be insignificant in predicting fake news behavior as well, suggesting that the majority of the respondents did not feel threatened by being excluded if one does not engage in such a behavior.

## 6. Conclusion, implications and limitations

Fake news is a global issue, and its impact is widespread. Therefore, identifying the underlying motives predicting this negative and harmful behavior is pertinent, especially during the COVID-19 pandemic when

facts and figures indicate a dramatic increase in its dissemination.

Building on the SCulPT, U&G and SDT theories, the present study demonstrated motives predicting fake news sharing among Malaysians. Our findings indicate the fake news sharing model had an excellent predictive relevance, with all six motives accounting for 49.2 % of the phenomenon. Findings also indicate that Altruism, Ignorance and Entertainment to significantly predict fake news sharing whereas Pass Time, Availability/Effort and FoMO did not.

### 6.1. Implications

The findings of the present study provide a substantial contribution to the existing body of knowledge regarding an empirically under-investigated phenomenon, specifically related to a developing country. In fact, the study and its findings are deemed timely and crucial considering a significant spike in fake news dissemination in the midst of the pandemic, globally and locally as well. The fake news sharing model proposed and validated in this study is considered novel in the sense that it is based on three existing theories, namely SCulPT, U&G and SDT. Further, as our findings revealed the inclusion of Altruism in the model resulted in the motive significantly predicting the fake news sharing behaviour. The model, therefore, may serve as a fundamental or base ground for other scholars to further extend and investigate this phenomenon.

In general, all the significant motives found relate to one's psychology matter, hence we strongly suggest campaigns focusing on awareness and media literacy or specifically fake news literacy to be implemented. Media should play a more positive and active role in continuously and consistently promote awareness to fake news issue, and its potential repercussions. Educational institutions including schools and higher education institutes should play their parts in creating awareness to this phenomenon, and potentially introduce programmes or conduct simple workshops/seminars to educate students on media or content creation (to improve their skill in recognizing false content in the forms of text or image) and to improve their analytical skill. The latter is deemed important so that people do not mindlessly accept a content at its face value. News media literacy should therefore be prioritized and formalized in the education system.

A synergistic partnership between governments, the media and the technology industry may also pave the way to a comprehensive approach towards raising awareness about fake news, as well as combating fake news at its source through technological tools that simultaneously detect fake news and improve online accountability [76]. Global level initiatives are also necessary to combat fake news. The public health risks brought about by recent false content on COVID-19 vaccines for instance is a case in point. The harm caused by the global reach of such news is colossal and this is where international bodies such as the World Health Organization (WHO) and the United Nations (UN) should play their roles in helping the global audience with accurate and updated information in an efficient manner. Garnering the trust of the global audience must be a priority of these international bodies that the public rely on for accurate information on health and safety.

### 6.2. Recommendations

This section lists the general recommendations deemed beneficial to relevant authorities including decision-makers, digital technology providers and policymakers, among others.

- *Emphasize on media or fake news literacy* – media, educational institutes and government bodies should play their roles in responsible content creation and management, for example, regularity authorities such as the Malaysian Communications and Multimedia Commission that is solely responsible for monitoring digital content in the country,

- *Improve public awareness on fake news and its harmful consequences* – local authorities for example, should promote fact-checking websites more as many are still unaware of its existence or use. Other than public campaigns and advertisements, other interesting avenues should be explored such as gaming applications. For example, a local version of the Go Viral game (goviralgame.com) – a UK and WHO collaboration effort in which players learn to resist manipulation techniques used to spread misinformation about COVID-19 can be developed to target various demographics (children vs adults),
- *A toll-free helpline* that acts as a one-stop center to help verify dubious news akin to the one set up to help address psychological issues due to the pandemic.
- *Improve fact-checking website* – Instead of manual verifications, fact-checking websites should be improved with AI technologies to rapidly detect false content and alert authorities sooner, so that any attempt to spread unverified news to the general public can be thwarted efficiently. This recommendation also supports the concept on pre-bunking – a premise that once an individual is exposed to fake news it would be difficult to change his/her conceived opinion [77].

### 6.3. Limitations

The study, however, has a few limitations. As the data collection was done completely online, Malaysians from remote or rural areas were naturally excluded. It can be argued that people from such areas often do not have a stable (or no Internet at all), hence they may not be actively engaging in fake news sharing unlike the urbanites. However, the dissemination of fake news is not limited to social media or data-dependent platforms like WhatsApp or Telegram as traditional Short Messaging Service (SMS) is vulnerable as well. According to a recent report by MCMC, an increased mobile-cellular penetration rate was observed in Q4 2020 (133.6 %) compared to Q3 2020 (132.8 %) in Malaysia [78]. Moreover, approximately 511 million SMSs were exchanged by Malaysians in 2020, and thus the rapid dissemination of fake news via trusted networks is still achievable. Therefore, future studies should explore this phenomenon through other means of data collection approach to ensure a wider coverage of respondents. Further, the data were collected by a group of students, hence this probably explains as to why most of the respondents in this study are students. Fake news sharing behavior has been found to be prevalent among the elderlies [79], a cohort that may lack the skill to spot manipulated content. Future studies could replicate the study by targeting respondents of various age groups and demography. Therefore, the findings of the present study can be generalized to other Asian countries sharing similar traits and culture, however caution is advised involving other regions and nations.

Although the total variance explained by the motives investigated is substantial, the score could be further improved with a larger sample, preferably encompassing respondents from all the social and economy strata. Additionally, examining other fake news sharing motives could improve the score too. For instance, the dissemination of fake news probably takes place due to social influence (i.e., peer pressure), a pattern that is more profound among the younger generations who have a high tendency to follow social media influencers who not only provide updates on current issues, but who may also (unknowingly) disseminate false content or voice their opinions on critical matters based on their inherent prejudices or social biases. This can be a very risky behavior considering the increasing proliferation of COVID-19 related false information at the time of this write up. Other possible motives include attention seeking, social media fatigue, online trust and confirmation bias, among others. Therefore, future studies could further extend the fake news sharing framework by incorporating these motives. In addition, fellow researchers could also investigate the moderating effects of socio-demographic variables such as education levels, age, technology skill etc. for a better understanding of the phenomenon.

The present study also did not differentiate between engaging in fake

news sharing knowingly (with and/or without malicious intent) and unknowingly (non-malicious intent). Although the setup is similar to previous studies [16,17], a more profound insight may be unraveled if these two contexts were delineated and examined, as this would allow one to understand the motives behind a deliberate dissemination of false content (i.e., psychological aspect) compared to doing so unawares (i.e., behavioral aspect).

Finally, ours is a cross-sectional study, and thus is prone to methodological biases including the difficulty to determine causality behind a behavior/action [15]. Therefore, future studies could examine the motives in a more robust manner through longitudinal and experimental studies. Findings could also be improved by examining the correlations between certain human characteristics (e.g., individual personality traits such as narcissism, extraversion etc.) and specific platform characteristics (e.g., number of shares/retweets, number of likes etc.) to better understand fake news sharing behavior among individuals.

## Author statement

Vimala Balakrishnan: Conceptualization; Data curation; Formal analysis; Methodology; Writing - original draft and revision; Ng Kee Seong: Visualization; Writing – review and editing; Hajar Abdul Rahim: Writing – review and editing.

## Acknowledgment

## References

[1] A. Duffy, E. Tandoc, R. Ling, Too good to be true, too good not to share: the social utility of fake news, Information, Commun. Soc. 23 (2019) 196–1979, https://doi.org/10.1080/1369118x.2019.1623904.

[2] P.M. Waszak, W. Kasprzycka-Waszak, A. Kubanek, The spread of medical fake news in social media – the pilot quantitative study, Health Pol. Technol. 7 (2018) 115–118, https://doi.org/10.1016/j.hlpt.2018.03.002.

[3] G. Schwitzer, Pollution of health news, BMJ (2017), https://doi.org/10.1136/bmj.j1262.

[4] Z. Hou, F. Du, H. Jiang, X. Zhou, L. Lin, Assessment of public attention, risk perception, emotional and behavioural responses to the COVID-19 outbreak: social media surveillance in China, MedRxiv (2020), https://doi.org/10.1101/2020.03.14.20035956.

[5] Ofcom, Half of UK Adults Exposed to False Claims about Coronavirus, 2020 accessed June 23 2021, https://www.ofcom.org.uk/about-ofcom/latest/features-and-news/half-of-uk-adults-exposed-to-false-claims-about-coronavirus.

[6] H.O.Y. Li, A. Bailey, D. Huynh, J. Chan, YouTube as a source of information on COVID-19: a pandemic of misinformation? BMJ Glob. Health (2020) https://doi.org/10.1136/bmjgh-2020-002604.

[7] Saifuddin, 205 Fake News Items 'busted' by Communications Ministry over Four Weeks: Malaysian Communications and Multimedia Commission (MCMC), Malaysian Communications and Multimedia Commission (MCMC) | Suruhanjaya Komunikasi Dan Multimedia Malaysia (SKMM), 2021 accessed February 25, 2021, https://www.mcmc.gov.my/en/media/press-clippings/saifuddin-205-fake-news-items-%E2%80%98busted%E2%80%99-by-communic.

[8] N. Ruchansky, S. Seo, Y. Liu, CSI, Proceedings of the 2017 ACM on Conference on Information and Knowledge Management, 2017, pp. 797–806, https://doi.org/10.1145/3132847.3132877.

[9] P.H. Faustini, T.F. Covões, Fake news detection in multiple platforms and languages, Expert Syst. Appl. 158 (2020) 113503, https://doi.org/10.1016/j.eswa.2020.113503.

[10] Y.-F. Huang, P.-H. Chen, Fake news detection using an ensemble learning model based on Self-Adaptive Harmony Search algorithms, Expert Syst. Appl. 159 (2020) 113584, https://doi.org/10.1016/j.eswa.2020.113584.

[11] J. Shin, K. Thorson, Partisan selective sharing: the biased diffusion of fact-checking messages on social media, J. Commun. 67 (2017) 233–255, https://doi.org/10.1111/jcom.12284.

[12] S.M. Jang, T. Geng, J.-Y. Queenie Li, R. Xia, C.-T. Huang, H. Kim, et al., A computational approach for examining the roots and spreading patterns of fake news: evolution tree analysis, Comput. Hum. Behav. 84 (2018) 103–113, https://doi.org/10.1016/j.chb.2018.02.032.

[13] S. McGrew, J. Breakstone, T. Ortega, M. Smith, S. Wineburg, Can students evaluate online sources? Learning from assessments of civic online reasoning, Theor. Res. Soc. Educ. 46 (2018) 165–193, https://doi.org/10.1080/00933104.2017.1416320.

[14] B. Horne, S. Adah, This Just In: Fake News Packs a Lot in Title, Uses Simpler, Repetitive Content in Text Body, More Similar to Satire than Real News, (n.d.). https://arxiv.org/abs/1703.09398.

[15] S. Talwar, A. Dhir, P. Kaur, N. Zafar, M. Alrasheedy, Why do people share fake news? Associations between the dark side of social media use and fake news sharing behavior, J. Retailing Consum. Serv. 51 (2019) 72–82, https://doi.org/10.1016/j.jretconser.2019.05.026.

[16] O.D. Apuke, B. Omar, Fake news and COVID-19: modelling the predictors of fake news sharing among social media users, Telematics Inf. 56 (2021) 101475, https://doi.org/10.1016/j.tele.2020.101475.

[17] A.K.M.N. Islam, S. Laato, S. Talukder, E. Sutinen, Misinformation sharing and social media fatigue during COVID-19: an affordance and cognitive load perspective, Technol. Forecast. Soc. Change 159 (2020) 120201, https://doi.org/10.1016/j.techfore.2020.120201.

[18] M. Mohd, Yatid, truth tampering through social media: Malaysia's approach in fighting disinformation & misinformation, IKAT : the Indonesian, J. Southeast Asian Stud. 2 (2019) 203, https://doi.org/10.22146/ikat.v2i2.40482.

[19] M. Daud, S. Zulhuda, Regulating the spread of false content online in Malaysia: issues, challenges and the way forward, Int. J. Bus. Soc. 21 (2020) 32–48, http://www.ijbs.unimas.my/images/repository/pdf/Vol21-S1-paper3.pdf.

[20] T.E. Ries, D.M. Bersoff, S. Adkins, C. Armstrong, J. Bruening (2018) accessed February 26, 2021, http://zmetro.com/pdf/2017/2018_Edelman_Trust_Barometer_Global_Report_Jan.PDF.

[21] C. Wardle, H. Derakshan, Information Disorder: toward an Interdisciplinary Framework for Research and Policy Making, 2017 accessed February 26, 2021, https://rm.coe.int/information-disorder-toward-an-interdisciplinary-framework-for-researc/168076277c.

[22] A. Bondielli, F. Marcelloni, A survey on fake news and rumour detection techniques, Inf. Sci. 497 (2019) 38–55, https://doi.org/10.1016/j.ins.2019.05.035.

[23] Y. Wang, M. McKee, A. Torbica, D. Stuckler, Systematic literature review on the spread of health-related misinformation on social media, Soc. Sci. Med. 240 (2019) 112552, https://doi.org/10.1016/j.socscimed.2019.112552.

[24] K. Buchanan, Malaysia: Anti-fake News Act Comes into Force, 2018 (accessed June 15, 2021), https://www.loc.gov/law/foreign-news/article/malaysia-anti-fake-news-act-comes-into-force/.

[25] V. Lampos, M.S. Majumder, E. Yom-Tov, M. Edelstein, S. Moura, Y. Hamada, et al., Tracking COVID-19 using online search, Npj Digit. Med. 4 (2021), https://doi.org/10.1038/s41746-021-00384-w.

[26] V. Balakrishnan, Unraveling the underlying factors SCulPT-ing cyberbullying behaviours among Malaysian young adults, Comput. Hum. Behav. 75 (2017) 194–205, https://doi.org/10.1016/j.chb.2017.04.062.

[27] J.G. Blumler, E. Katz, The Uses of Mass Communications: Current Perspectives on Gratifications Research, Sage Publications, Beverly Hills, California, 1974.

[28] E. Katz, J.G. Blumler, M. Gurevitch, Uses and gratification research, Publ. Opin. Q. 37 (1973) 509–523, https://doi.org/10.1086/268109.

[29] A. Ray, A. Dhir, P.K. Bala, P. Kaur, Why do people use food delivery apps (FDA)? A uses and gratification theory perspective, J. Retailing Consum. Serv. 51 (2019) 221–230, https://doi.org/10.1016/j.jretconser.2019.05.025.

[30] J. Huang, L. Zhou, Timing of web personalization in mobile shopping: a perspective from Uses and Gratifications Theory, Comput. Hum. Behav. 88 (2018) 103–113, https://doi.org/10.1016/j.chb.2018.06.035.

[31] V. Balakrishnan, A. Shamim, Malaysian Facebookers: motives and addictive behaviours unraveled, Comput. Hum. Behav. 29 (2013) 1342–1349, https://doi.org/10.1016/j.chb.2013.01.010.

[32] S.A. Raza, W. Qazi, N. Shah, M.A. Qureshi, S. Qaiser, R. Ali, Drivers of intensive Facebook usage among university students: an implications of U&G and TPB theories, Technol. Soc. 62 (2020). Article 101331.

[33] N.M. Anspach, T.N. Carlson, What to believe? Social media commentary and belief in misinformation, Polit. Behav. 42 (2018) 697–718, https://doi.org/10.1007/s11109-018-9515-z.

[34] N. Thompson, X. Wang, P. Daya, Determinants of news sharing behavior on social media, J. Comput. Inf. Syst. 60 (2019) 593–601, https://doi.org/10.1080/08874417.2019.1566803.

[35] R.M. Ryan, E.L. Deci, Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being, Am. Psychol. 55 (2000) 68–78, https://doi.org/10.1037/0003-066x.55.1.68.

[36] I. Beyens, E. Frison, S. Eggermont, "I don't want to miss a thing": adolescents' fear of missing out and its relationship to adolescents' social needs, Facebook use, and Facebook related stress, Comput. Hum. Behav. 64 (2016) 1–8, https://doi.org/10.1016/j.chb.2016.05.083.

[37] A.K. Przybylski, K. Murayama, C.R. DeHaan, V. Gladwell, Motivational, emotional, and behavioral correlates of fear of missing out, Comput. Hum. Behav. 29 (2013) 1841–1848, https://doi.org/10.1016/j.chb.2013.02.014.

[38] D.L. King, P.H. Delfabbro, The cognitive psychopathology of Internet gaming disorder in adolescence, J. Abnorm. Child Psychol. 44 (2016) 1635–1645, https://doi.org/10.1007/s10802-016-0135-y.

[39] A.E. Dempsey, K.D. O'Brien, M.F. Tiamiyu, J.D. Elhai, Fear of missing out (FoMO) and rumination mediate relations between social anxiety and problematic Facebook use, Addict. Behav. Reports 9 (2019) 100150, https://doi.org/10.1016/j.abrep.2018.100150.

[40] G. Yuan, J.D. Elhai, B.J. Hall, The influence of depressive symptoms and fear of missing out on severity of problematic smartphone use and Internet gaming disorder among Chinese young adults: a three-wave mediation model, Addict. Behav. 112 (2021) 106648, https://doi.org/10.1016/j.addbeh.2020.106648.

[41] M.A. Fabris, D. Marengo, C. Longobardi, M. Settanni, Investigating the links between fear of missing out, social media addiction, and emotional symptoms in adolescence: the role of stress associated with neglect and negative reactions on social media, Addict. Behav. 106 (2020) 106364, https://doi.org/10.1016/j.addbeh.2020.106364.

[42] T. Kaya, The changes in the effects of social media use of Cypriots due to COVID-19 pandemic, Technol. Soc. 63 (2020) 101380, https://doi.org/10.1016/j.techsoc.2020.101380.

[43] S. Laato, A.K. Islam, M.N. Islam, E. Whelan, What drives unverified information sharing and cyberchondria during the COVID-19 pandemic? Eur. J. Inf. Syst. 29 (2020) 288–305, https://doi.org/10.1080/0960085x.2020.1770632.

[44] Z. Shah, J. Chu, B. Feng, S. Qaisar, U. Ghani, Z. Hassan, If you care, I care: perceived social support and public engagement via SNSs during crises, Technol. Soc. 59 (2019) 101195, https://doi.org/10.1016/j.techsoc.2019.101195.

[45] Y. Lian, Y. Liu, X. Dong, Strategies for controlling false online information during natural disasters: the case of Typhoon Mangkhut in China, Technol. Soc. 62 (2020) 101265, https://doi.org/10.1016/j.techsoc.2020.101265.

[46] S. Vosoughi, D. Roy, S. Aral, The spread of true and false news online, Science 359 (2018) 1146–1151, https://doi.org/10.1126/science.aap9559.

[47] J. Kim, C. Lee, T. Elias, Factors affecting information sharing in social networking sites amongst university students, Online Inf. Rev. 39 (2015) 290–309, https://doi.org/10.1108/oir-01-2015-0022.

[48] Z. Papacharissi, A. Mendelson, Toward a new(er) sociability: uses, gratifications, and social capital on Facebook, in: Media Perspectives for the 21st Century, Routledge, New York, 2011, pp. 212–230.

[49] H.C. Triandis, Some universals of social behavior, personality and social psychology, Bulletin 4 (1978) 1–16, https://doi.org/10.1177/014616727800400101.

[50] R. Scherer, J. Tondeur, F. Siddiq, E. Baran, The importance of attitudes toward technology for pre-service teachers' technological, pedagogical, and content knowledge: comparing structural equation modeling approaches, Comput. Hum. Behav. 80 (2018) 67–80, https://doi.org/10.1016/j.chb.2017.11.003.

[51] C. Belletier, A. Robert, L. Moták, M. Izaute, Toward explicit measures of intention to predict information system use: an exploratory study of the role of implicit attitudes, Comput. Hum. Behav. 86 (2018) 61–68, https://doi.org/10.1016/j.chb.2018.04.029.

[52] M.L. Khan, I.K. Idris, Recognise misinformation and verify before sharing: a reasoned action and information literacy perspective, Behav. Inf. Technol. 38 (2019) 1194–1212, https://doi.org/10.1080/0144929x.2019.1578828.

[53] C.J. Plume, E.L. Slade, Sharing of sponsored advertisements on social media: a uses and gratifications perspective, Inf. Syst. Front 20 (2018) 471–483, https://doi.org/10.1007/s10796-017-9821-8.

[54] R.F. Baumeister, C.N. DeWall, N.J. Ciarocco, J.M. Twenge, Social exclusion impairs self-regulation, J. Pers. Soc. Psychol. 88 (2005) 589–604, https://doi.org/10.1037/0022-3514.88.4.589.

[55] K. Kircaburun, S. Alhabash, Ş.B. Tosuntaş, M.D. Griffiths, Uses and gratifications of problematic social media use among university students: a simultaneous examination of the big five of personality traits, social media platforms, and social media use motives, Int. J. Ment. Health Addiction 18 (2018) 525–547, https://doi.org/10.1007/s11469-018-9940-6.

[56] M. Del Vicario, A. Bessi, F. Zollo, F. Petroni, A. Scala, G. Caldarelli, et al., The spreading of misinformation online, Proc. Natl. Acad. Sci. Unit. States Am. 113 (2016) 554–559, https://doi.org/10.1073/pnas.1517441113.

[57] S.Y. Chyung, K. Roberts, I. Swanson, A. Hankinson, A. Evidence-based survey design: the use of a midpoint on the Likert scale, Perform. Improv. 56 (10) (2017) 15–23.

[58] J.T. Kulas, A.A. Stachowski, Middle category endorsement in odd-numbered Likert response scales: associated item characteristics, cognitive demands, and preferred meanings, J. Res. Pers. 43 (3) (2009) 489–493.

[59] J.F. Hair, M. Sarstedt, Factors versus composites: guidelines for choosing the right structural equation modeling method, Proj. Manag. J. 50 (2019) 619–624, https://doi.org/10.1177/8756972819882132.

[60] C.M. Ringle, M. Sarstedt, R. Schlittgen, C.R. Taylor, PLS path modeling and evolutionary segmentation, J. Bus. Res. 66 (2013) 1318–1324, https://doi.org/10.1016/j.jbusres.2012.02.031.

[61] C. Fornell, D.F. Larcker, Evaluating structural equation models with unobservable variables and measurement error, J. Market. Res. 18 (1981) 39, https://doi.org/10.2307/3151312.

[62] J. Henseler, C.M. Ringle, M. Sarstedt, A new criterion for assessing discriminant validity in variance-based structural equation modeling, J. Acad. Market. Sci. 43 (2014) 115–135, https://doi.org/10.1007/s11747-014-0403-8.

[63] M. Stone, Cross-validatory choice and assessment of statistical predictions, J. Roy. Stat. Soc. B 36 (2) (1974) 111–133.

[64] S. Geisser, A predictive approach to the random effect model, Biometrika 61 (1) (1974) 101–107.

[65] J. Cohen, Statistical Power Analysis for the Behavioral Sciences, second ed., Lawrence Earlbaum Associates, New Jersey, USA, 1988.

[66] J. Benitez, J. Henseler, A. Castillo, F. Schuberth, How to perform and report an impactful analysis using partial least squares: guidelines for confirmatory and explanatory IS research, Inf. Manag. 57 (2020) 103168.

[67] J.F. Hair, C.M. Ringle, M. Sarstedt, PLS-SEM: indeed a silver bullet, J. Market. Theor. Pract. 19 (2) (2011) 139–151.

[68] C.S. Lee, L. Ma, News sharing in social media: the effect of gratifications and prior experience, Comput. Hum. Behav. 28 (2) (2012) 331–339, https://doi.org/10.1016/j.chb.2011.10.002.

[69] A.M. Krassner, M.A. Gartstein, C. Park, W.Ł. Dragan, F. Lecannelier, S.P. Putnam, East–west, collectivist-individualist: a cross-cultural examination of temperament in toddlers from Chile, Poland, South Korea, and the U.S, Eur. J. Dev. Psychol. 14 (2016) 449–464, https://doi.org/10.1080/17405629.2016.1236722.

[70] T. Oliveira, M. Thomas, G. Baptista, F. Campos, Mobile payment: understanding the determinants of customer adoption and intention to recommend the technology, Comput. Hum. Behav. 61 (2016) 404–414, https://doi.org/10.1016/j.chb.2016.03.030.

[72] N. Wong, C. McBride, Fun over conscience: fun-seeking tendencies in cyberbullying perpetration, Comput. Hum. Behav. 86 (2018) 319–329, https://doi.org/10.1016/j.chb.2018.05.009.

[73] S.-H. Jeong, H.J. Kim, J.-Y. Yum, Y. Hwang, What type of content are smartphone users addicted to?: SNS vs. games, Comput. Hum. Behav. 54 (2016) 10–17, https://doi.org/10.1016/j.chb.2015.07.035.

[74] M. Salehan, A. Negahban, Social networking on smartphones: when mobile phones become addictive, Comput. Hum. Behav. 29 (2013) 2632–2639, https://doi.org/10.1016/j.chb.2013.07.003.

[75] M. Au-Yong-Oliveira, R. Gonçalves, J. Martins, F. Branco, The social impact of technology on millennials and consequences for higher education and leadership, Telematics Inf. 35 (2018) 954–963, https://doi.org/10.1016/j.tele.2017.10.007.

[76] D.M. West, How to combat fake news and disinformation, Center for Technology Innovation, 2017 (accessed June 28, 2021), https://www.brookings.edu/research/how-to-combat-fake-news-and-disinformation/.

[77] S. van der Linden, The conspiracy-effect: exposure to conspiracy theories (about Global Warming) decreases pro-social behavior and science acceptance, Pers. Indiv. Diff. 87 (2015) 171–173.

[78] Malaysian Communications And Multimedia Commission (MCMC), 4Q: Facts and Figures, available at: https://www.mcmc.gov.my/skmmgovmy/media/General/pdf/4Q-C-M-2020_.pdf, accessed July 10 2021.

[79] N. Grinberg, K. Joseph, L. Friedland, B. Swire-Thompson, D. Lazer, Fake news on Twitter during the 2016 U.S. presidential election, Science 363 (2019) 374–378, https://doi.org/10.1126/science.aau2706.