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Factors Influencing Users' Interest in Using Online Dating Apps with Age as the Moderator

Kyra Law Ley Sy[1*], Ponco Budi Sulistyo[2], Elizabeth Serwaa Boateng Koomson[3], Karma Yezer[4]

[1]Faculty of Management, Multimedia University, Cyberjaya, Selangor, Malaysia
[2]Faculty of Communication, Universitas Mercu Buana, Jakarta, Indonesia
[3] Institute of Management, Warsaw University of Life Sciences, Warsaw, Poland
[4]Gedu College of Business Studies, Royal University of Bhutan, Thimphu, Bhutan

*Corresponding author: kyralaw@mmu.edu.my; ORCID iD: 0000-0001-7034-5002

ABSTRACT

A mobile dating software app advertises itself as a social discovery tool and helps users start new, possibly romantic interactions. Online dating apps' entry into personal life is promoted as a well-liked and distinctive method of establishing relationships. It is a sign of rising information and communication technology (ICT) use in this area. Previous studies have also shown that age may be a significant factor that influences individuals in using dating apps, especially among the younger generations. Various studies have been conducted in different countries but there is a lack of evidence that focuses on Malaysians and age. Thus, this research was conducted with 103 respondents through convenience sampling, in which participants completed an online survey. Using the SmartPLS, the analysis for the direct relationships and moderating relationships was conducted. The results showed that attraction, mood and selective swipers trigger users' interest in using dating apps although age did not interfere with the relationships. Age may not seem to be a vital factor in using dating apps. This study recognised the evolution of dating apps for mobile devices, the need for more data on how dating apps facilitated user relationship initiation and any possible implications for relationship developmental stages.

Keywords: dating apps, relationships, online dating, smartPLS, age

Introduction

Online dating applications (apps) allow users to start a personal relationship with the touch of a screen (Chisom, 2021; LeFebvre, 2018). In the past, the beginning of a relationship was dependent on proximity to potential partners (Ranzini et al., 2022). Relationships remained dependent on in-person contact before online dating services and smartphone applications (Regan, 2015; Wu & Trottier, 2022). Due to easily available smartphone capabilities, geolocation features, and user-friendly platforms, mobile apps now boost convenience with a finger swipe. Opportunities to become acquainted with, talk with, and meet potential partners are provided by online dating apps. The dating app combines closeness, convenience, and technology to encourage social engagement and facilitate both physical and psychological interactions (Quiroz, 2013; Rochadiat et al., 2020). Online dating apps' technical advancements and software skills enable closed couples to have a real-time dating experience (Isisag, 2020; LeFebvre, 2018).

Younger dating app users first asked about their studies, interests, or preferences. The creation of reciprocal identification seemed to be essential for the growth of relationship closeness. According to research, matched online dating app users were able to communicate congruent viewpoints, unity, and resemblance by giving favourable feedback or laughing (Roca-Cuberes et al., 2023). A Rakuten Insight survey on mobile dating apps from February 2022 indicated that roughly 55 per cent of Malaysian participants who used these apps said they used Tinder. According to the same survey, 34 per cent of Malaysian participants used smartphone dating apps. Although relationships are continuous and are daily endeavours; they emerged from dull socio-relational and interactional contexts. Additionally, it displayed negative traits including poor communication and little to no attention, which might have caused chaos and lacked understandings (Chisom, 2021).

The research on online dating apps came with different key findings, such as experiences using dating apps, users' demographic profiles, purposes of dating online, and many more. Research in the United States claimed that online dating has grown to be a big industry in the US, changing how some people meet potential partners (Vogels & McClain, 2023). According to the research, younger individuals are more likely to date online. Fifty-three per cent of those under 30 claimed that they had used a dating website or app, compared to 37 per cent of those in the 30 to 49 age group, 20 per cent of users in the 50 to 64 age group, and 13 per cent of users aged 65 and above. Even so, there was a lack of research evidence in Malaysia to explore the factors of users' interest in using online dating apps, especially when users' age varies. This study would provide academics with a clearer perspective when examining the reasons behind users' interest in using online dating apps. Additionally, it offers relevant data on specific user age ranges that influence Malaysian users' tendency in using dating apps. Hence, to better recognise the general users' interest in online dating apps with the game theory as the underpinning theory, this study explores two research questions:

1. What are the possible factors that trigger users' interest in using online dating apps?
2. How does age moderate users' interest as they use online dating apps?

Utilising a quantitative method, this study investigates the interest of online dating app users in using the app to locate partners. The users' backgrounds and marital status were varied. This study may serve as a guide for researchers in the future as they construct their investigations, particularly those that deal with online dating apps. The contributions of this study were diverse as it would increase people's understanding of dating apps and their usage, specifically, users' interest in dating apps based on their age.

Literature Review

Game Theory as Underpinning Theory

Game theory (GT) technology offers a mathematical model for optimising complex problems, allowing mobile users to stay connected in highly dynamic and unstable environments. This approach enables multiple users to either compete for limited resources or collaborate to maximise shared interests (Sun et al., 2021). The theory is applicable in psychology, economics, and the political and social sciences (Traulsen & Glynatsi, 2023). The double-blind rule, which is perhaps the most significant of the app's technologically supported rules, requires that matches adhere to it; each user likes others without knowing if the respective others may like him or her back. This implies that unless both users choose to like each other, users will never know if the other user likes him or her in return. Hence, these social dynamics constitute a case of mathematical game theory (Garda & Karhulahti, 2021). By providing repeating points, incentives, badges, gifts, challenges, and ranks, gamification can encourage habit-building. The components then encourage regular and consistent involvement in online dating platform partners (Liew et al., 2023). There is a clearer explanation and quick interest in the underlying game theory of this interaction. Online dating apps are generally best characterised as conquest games in which points are the primary unit of account. Engagement with matches is an additional source of fun, building on the app's design that influences how users can interact with other users (Sobieraj & Humphreys, 2022). The research framework is shown in Figure 1.

Online Dating Apps

With the help of technology, users may now interact, meet, date, and find love in new ways. Online chat rooms that allow users to connect have enabled users to rely on text to represent themselves since the early 1990s (Kennedy, 2010; Wu & Trottier, 2022). Since then, digital dating has been a part of online interactions. Users can now submit basic and personal information on online personal sites. These sites' information discloses desirable partner characteristics and helps pave changes from traditional dating to internet-based dating. Traditional online dating services have turned into a social norm, desensitising stigmas (Conner, 2023; Finkel et al., 2012; Stephure et al., 2009). Online access points were widely used, with 55 per cent of those in marriages or serious partnerships saying they met through dating apps (Her & Timmermans, 2021; Sawyer et al., 2018; Smith & Anderson, 2016). As time passed, changes boosted proximity features, provided user anonymity, and supported greater accessibility. In contrast to earlier dating sites, the emergence of mobile dating apps was sparked by new technology and structural affordances, adaptations for smartphones, satellite geolocation features, and significantly improved options for relationships.

Users can access potential partners within certain miles after creating a dating profile. Users' initial name, age, employment, and education are to be listed in their profiles. By simply importing profile data from photo uploads or social media, dating apps emphasise efficiency while providing access to social network data (i.e. photos, education, employment, and likes). With these data, dating apps can discover potential matches in the area based on users' preferences for gender, sexual orientation, or age. Users can choose specific photos and provide biographies on their profile page. The user-friendly platforms allow for quick initial setup, positioning the user to swipe instantaneously. The app operates through digitally embodied self-presentations that rely on first impressions, snap judgments, or initial attraction (De Ridder, 2022). Therefore, the current study proposes to examine the following hypotheses:

> **H1$_a$:** Attraction significantly influences the interest of dating app users.

Users specifically start deciding who they are romantically interested in using a self-selection method with a see-and-swipe option. Men and women spend an average of 7.2 minutes and 8.5 minutes respectively, swiping in a single session (Bolton, 2014; Garda & Karhulahti, 2021). As users anonymously swipe through their deck of suitors, quick selections are made. Technically, swiping left on a user's profile signifies disinterest. The chance to make a match is lost when the profile vanishes. When a user swipes up to *"super like"*, they may find out that someone likes them. Individuals are permitted to utilise the "up" swipe, a new function, once per 12 hours on a freemium account (Stoicescu & Rughiniş, 2021). Right swipes signify interest. *Right swipes* from both parties result in a match, which enables the two potential partners to communicate privately (de Vries, 2024). Users also have the option to be anonymous when using direct messaging to decide whether one or both partners want to continue talking. Therefore, the current study proposes to examine the following hypotheses:

> **H1$_b$:** Mood dependence significantly influences the interest of dating app users.

> **H1$_c$:** Selective swiper significantly influences the interest of dating app users.

Online Dating in Malaysia

According to a study in Malaysia, users were more likely to say that they wanted to meet new individuals (Ong, 2019). Therefore, it was equally likely that online dating services were not solely driven by the desire to find romantic partners (Liew et al., 2023). In the empirical study in Malaysia, the usage of dating apps was considered low as people still preferred to find their partner without using the Internet rather than traditional methods (Daniel Adam et al., 2020). The authors also claimed that people, in general, were yet ready and believed in using online dating apps to meet and find their love. The thoughts and assessments of significant individuals, such as family members, friends, coworkers, and respected members of society, were crucial motivators for younger individuals in Malaysia to continue using online dating services.

Age as a Moderator

Dating apps have completely transformed the way young individuals approach relationships. Finding possible companions is more efficient with the ease of swiping right or left. Age is a common moderator in research, and it is not surprising that it might moderate the interest of dating app users. The research by Castro et al. (2020) stated that older Spanish youth were more likely to be current and previous dating app users. According to the authors, the rise in popularity of dating apps has altered how single people connect and meet. Similarly, a study in Portland showed that despite knowing the potential risks associated with face-to-face interactions, younger individuals seem to continue with their routines in using dating apps (Winking, 2021). Although the past literature rarely mentioned the developmental perspective of young adults using dating apps, Sumter and Vandenbosch (2019) claimed that younger adults could be an interesting group to study as it was the key period of young adulthood. Hence, the current study proposes to examine the following hypothesis:

H2: Age moderates the relationship of attraction, mood dependence, selective swiper, and interest in using dating apps.

Figure 1

Research Framework
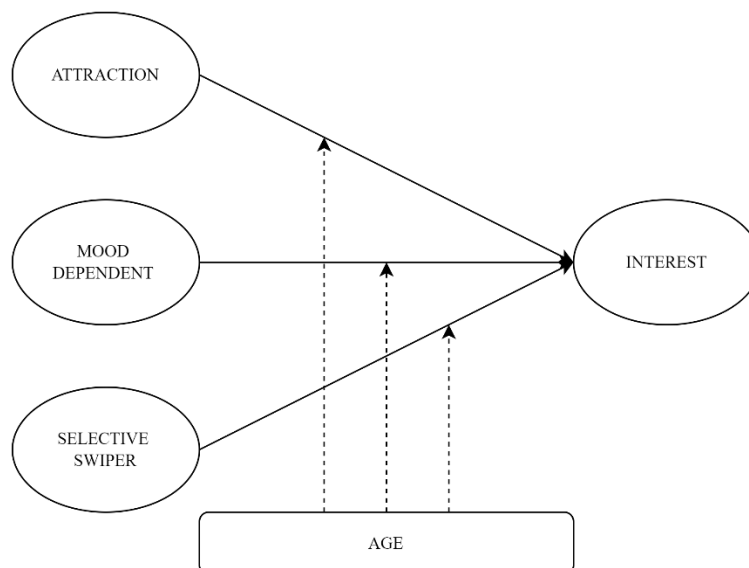
Adapted from: LeFebvre (2018)

Methods

This study employed a quantitative approach with 103 participants. Cohen's *ds* and phi coefficients are used to report the effect sizes of significant group differences. Cohen's *ds* of 0.20, 0.50, and 0.80, by traditional measures, correspond to small, moderate, and large effect sizes, respectively (Cohen, 1988). Thomas et al. (2023) stated that moderate effect size (b= 0.17) indicated that the impacts of habitual smartphone use vary depending on the individual and situations (or users) that do not lose themselves in the swipe. Hence, in this study, considering a minimal predictor of 4 variables of small effect size, a level of significance of 0.05, a power of 0.80, and an effect size of 0.08, at least 101 were required. This study therefore recruitted 103 participants to participate through an online questionnaire shared across dating apps such as Tinder, Bumble and Coffee Meets Bagel which were widely used in Malaysia. Participants in this study had to have used dating apps, or they might have used them in the past. The requirements for inclusion were that participants must be Malaysian, literate in English, and at least sixteen years old. The study included the interest in online dating as well as individual and relationship demographics. The questionnaire as the research instrument was adapted from LeFebvre (2018) and included 3 to 4 items in each variable (Table 1). In addition, a variance-based Partial Least Square (PLS)

tool in Structural Equation Modelling (SEM) was included in the study. Due to its flexibility, SEM is a more advanced tool for statistical analytic procedures, and its acceptance is growing (Hair et al., 2019, 2021). Using a 5-point Likert scale, participants indicated how much they agreed or disagreed with each topic (1 being strongly disagree, and 5 being strongly agree).

Table 1

Summary of Constructs, Items, and Measurement Scales in the Questionnaire

Constructs	Sources	Questions	Measurement scales
Demographic profile	N/A	1. First time user 2. Age 3. Education background 4. Ethnicity 5. Relationship status	Descriptive
Attraction	LeFebvre (2018)	1. I have strong, occasionally superficial standards that are easy to determine without viewing a bio. 2. Their face either took my breath away or they were somewhat attractive with great things in their bio. 3. Many people have raunchy profiles/ seem like bots, so I ignore them and swipe right if I'm interested.	1 = strongly disagree 2 = disagree 3 = neutral 4 = agree 5 = strongly agree
Selective swiper		1. Sometimes it's 100 per cent obvious, right off the bat, that the user is a waste of my time. 2. I'm selective! Less fish in the pond, but higher quality fish. 3. I've been a person on the internet for most of my life at this point. I have taste and a host of my issues and I'm a little shy.	
Mood dependent		1. I never message first, so I swipe right to everyone. 2. I get more matches and then sift through them. 3. If someone gross messages me, I am just unmatched with them. 4. I just went with what felt right to me.	
Interest		1. If I like the bio and information the person provides and I think they're attractive, I want to let them know. 2. I look for someone creative, intelligent, has friends, doesn't take car selfies, and that I find physically attractive. 3. Tinder is judging a person on whether you are physically attracted to them or not. 4. Judging by their personality (or photos if that's all they provide), I assume some people won't like me or be interested in my interests.	

Adapted from*: LeFebvre (2018)

Results

Descriptive statistics and participant background data were used in this study. Individual or relational demographics were covered in the survey (i.e. age, education, ethnicity, relationship status, and first-time user) (Table 2). A total of 103 par responded to this research questionnaire. 49.5 per cent of the participants were new users of dating apps, and most of them were from the younger generation aged from 16 to 20 years old (37.9 per cent). Most of the participants were of Chinese ethnicity (60.2 per cent), had obtained a bachelor's degree (54.4 per cent), and were single in their relationship status (89.3 per cent).

Table 2

Summary of Participants' Profile

First-time user?		Percentage
Yes	51	49.5
No	52	50.5
Age		
16-20 years old.	39	37.9
21-25 years old.	30	29.1
26-30 years old.	11	10.7
31-35 years old.	15	14.5
36-40 years old.	5	4.9
41-45 years old.	2	1.9
51 years old and above	1	1.0
Education		
High school	7	6.8
Foundation/ Diploma/ A-level	15	14.6
Bachelor Degree	56	54.4
Master Degree	16	15.5
PhD	9	8.7
Relationship status		
Single	92	89.3
Married	7	6.8
Widow	1	1.0
Divorced	3	2.9
Ethnicity		
Malay	22	21.4
Chinese	62	60.2
Indian	2	1.9
Others	17	16.5

Measurement Scale

PLS-SEM could be used with smaller samples, although the nature of the population dictates situations where small sample sizes are acceptable (Hair et al., 2019). To determine the AVE, square the loading of each indicator on a construct and then calculate the average. An AVE of 0.50 or higher is considered acceptable, signifying that the construct accounts for at least 50 per cent of the variance in the items. (Purwanto, 2021). In this research, mood dependent (0.387) did not meet the minimum acceptable AVE of 0.50, whereas attraction (0.509), selective swiper (0.562) and interest (0.548) met the acceptable AVE range. If the AVE was below 0.50 but the composite reliability was above 0.60, the construct's convergent validity remains sufficient (Cheung et al., 2023; Huang et al., 2013; Muhamad Safiih & Azreen, 2016).

Hair et al. (2019) suggested to use bootstrap confidence intervals to determine if composite reliability significantly exceeds the recommended minimum. Specifically, composite reliability is considered acceptable if the lower bound of the 95 per cent confidence interval is greater than 0.70. In this research, mood dependent (0.687) did not meet the minimum of 0.70. On the other hand, attraction (0.756), selective swiper (0.791) and interest (0.828) met the minimum composite reliability.

It was more reasonable to target a desired Cronbach's alpha between 0.7 to 0.8 with an acceptable sample size (Bujang et al., 2018). However, it is important to recognise that achieving a high alpha value is quite challenging when the scale has fewer than 10 items. In this study, an alpha value greater than 0.5 is deemed acceptable (Pallant, 2010). The results tabulated in Table 3 show that Cronbach's alpha values of attraction (0.516), mood dependent (0.505), selective swiper (0.618) and interest (0.721) exceeded the acceptable level (0.50). Therefore, all constructs met the required reliability.

Table 3

Summary of Reliability Analysis

Construct	AVE	Composite reliability	Cronbach's alpha
Attraction	0.509	0.756	0.516
Mood Dependent	0.387	0.687	0.505
Selective swiper	0.562	0.791	0.618
Interest	0.548	0.828	0.721

Discriminant Validity

Discriminant validity was done to ensure that each concept of each latent variable was different from other latent variables The results of discriminant validity testing use the AVE square value, which looks at the Heterotrait-monotrait ratio (HTMT) (Table 4). When the HTMT value between two reflective constructs is less than 0.90, the discriminant validity between the two reflective constructs is acknowledged. Referring to Table 4, HTMT ratio values range between 0.105 the lowest to 1.079 the highest. The criteria to indicate a lack of discriminant validity could be uncertain, even when two constructs have an extremely high correlation with a value near 1.0, especially when the loadings were high.

Table 4

Summary of Discriminant Validity

Constructs	ATT	Age	INT	MD	SS	Age x SS	Age x ATT
ATT							
Age	0.181						
INT	0.984	0.080					
MD	0.966	0.183	0.741				
SS	1.079	0.186	0.989	0.886			
Age x SS	0.267	0.048	0.187	0.229	0.135		
Age x ATT	0.086	0.075	0.130	0.178	0.218	0.657	
Age x MD	0.190	0.105	0.144	0.178	0.178	0.676	0.664

The value of the R^2 for each exogenous and endogenous latent variable could be used to evaluate the structural model's quality. With the bootstrapping technique, the R^2 value and significance test value were obtained, as shown in Table 5. The R^2 value of 0.556 indicated that the independent variables in the model caused 55.6 per cent of the deviations observed.

Table 5

Summary of r-square

R-square	R-square adjusted
0.556	0.524

Common Bias Method (Collinearity Inner Model)

Common method bias, in the context of PLS-SEM, is a phenomenon that arises not from the network of causes and effects in the model under examination, but from the measuring technique employed in an SEM report. Common method bias may happen when the independent and dependent variables are measured in the same survey using the same response method (Kock et al., 2021). Since the questionnaire was adapted from a single study, common method bias was conducted for this research. A VIF score in PLS-SEM of more than 3.3 at the factor level indicated the presence of both the common method bias issue and the collinearity issue (Yıldız, 2023). The VIF value for the four variables did not exceed 3.3, with the highest being 2.113 and the lowest being 1.681 as shown in Table 6.

Table 6

Summary of Common Method Bias (Collinearity Inner Model)

Constructs	INT
ATT	2.101
MD	1.681
SS	2.113

Predictive Relevance (Blindfolding for Q^2)

The predictive significance is evaluated using Stone Geisser's Q^2 test (Geisser, 1974; Stone, 1974). This involves a cross-validated redundancy approach that examines both the structural and measurement models. It also involves a validation of commonality based on the scores of the target endogenous variables, independent of the structural model. If the Q^2 value exceeds zero (as shown in Table 7), it suggests that the exogenous latent constructs within the structural model are likely to be predictively relevant to the endogenous latent constructs (Hair et al., 2021).

Table 7

Construct Cross-validated Redundancy

Constructs	SSO	SSE	Q² (=1-SSE/SSO)
Age	103.000	103.000	-
ATT	309.000	309.000	-
MD	412.000	412.000	-
SS	309.000	309.000	-
INT	412.000	305.588	0.258

Path Coefficient

In a structural model (Figure 2), path coefficients calculate the path correlations between latent exogenous and endogenous variables. The values of the path coefficients are like the regression analysis' standardised beta (β) (Hair et al., 2019). A hypothesis based on the association between two latent variables in the expected hypothetical model is indicated by each path coefficient value (Harris & Gleason, 2022). A positive and strong link is indicated by a path coefficient value closer to +1, and vice versa for negative sign values.

Figure 2

Findings of the Structural Model
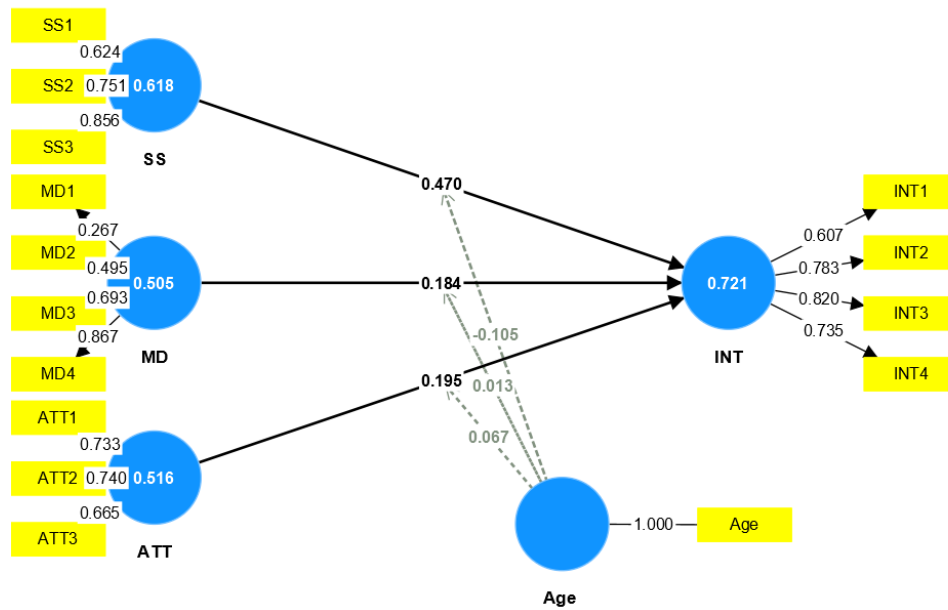
Note: p < 0.5 and p < 0.01

Note: ATT= Attraction, MD= Mood dependent, SS= Selective swiper, INT= Interest

Hypothesis Testing

Analysis of the assessment and structural model results suggested that the proposed theoretical model was suitable for further hypothesis testing. The results in Table 8 illustrate the hypothesis and the conclusion drawn from the empirical data.

Table 8

Summary of Hypothesis Testing

Relationship	Standard beta β	P value	T value	Decision
H1$_a$ Attraction → Interest	0.113	0.043	1.722	Supported
H1$_b$ Mood dependent → Interest	0.098	0.030	1.876	Supported
H1$_c$ Selective swiper → Interest	0.104	0.000	4.526	Supported
Moderating effects				
Moderating Relationship (H2)	Standard beta β	P value	T value	Decision
Attraction*Age → Interest	0.131	0.305	0.509	Not supported
Mood dependent*Age → Interest	0.100	0.450	0.509	Not supported
Selective swiper*Age → Interest	0.142	0.231	0.737	Not supported

Discussion

It is vital to learn the triggers of users' interest in using dating app users as it was a recent and relevant phenomenon (Castro et al., 2020). The way prospective users meet and communicate has altered with the rise in popularity of dating apps in recent years. While some research has indicated that different users utilise dating apps in different ways, this research aimed to find out the factors that trigger users' interest in using online dating apps. In this study, the findings confirmed the three potential factors: attraction, mood dependent and selective swiper. The results show attraction (p-value = $p > 0.043$, t-value = 1.722, and β= 0.113), mood-dependent (p-value = $p > 0.030$, t-value = 1.876, and β= 0.098) and selective swiper (p-value = $p > 0.000$, t-value = 4.526, and β= 0.104) using the 1- tailed tests. The primary benefit of a one-tailed test is that it offers greater statistical power compared to a two-tailed test when both are set at the same level of significance α.

The quantitative data offer further insights beyond the common assumptions associated with online dating applications. The results are aligned with a past study in which online dating apps discovered potential matches in users' areas based on users' preferences, though the research was conducted in a different region. Equality arises from reciprocal interest, which must be demonstrated by both parties before one can start a conversation (LeFebvre, 2018). These results supported the game theory (GT) by Garda and Karhulahti (2021) that users gain access to the potentially recurring promise of happiness with the engagement between two individuals. Using the game equilibrium criteria, the interaction between two Internet of Things (IoT) devices is transformed into a game, and the conflict can be resolved (Chi et al., 2021). New media technologies challenge traditional social norms and values, potentially blurring the boundaries between established relationship categories (Wu, 2021). The architecture of dating apps resembles that of mainstream video games and slot machines, encouraging a form of interaction where social connections and potential partnerships are treated as stakes, monetary units, and rewards. It is now up to individuals to manage their use of online dating applications and regulate their engagement.

Age plays a role in choosing a partner and the nature of a relationship. Research indicates that the typical age of individuals in such studies might be higher, potentially averaging around 31 years old (Anzani et al., 2018). For instance, 40 per cent of undergraduate students aged 18 to 26 years old use dating apps (Shapiro et al., 2017). In this research, the participants were above sixteen years old. The results in this research, however, show that age did not moderate these relationships as the data collected were from participants of similar age groups. This potentially shows that age does not matter when using dating apps. The samplings estimated the true percentage of users of dating apps, even though there are distinct explanations for the lower occurrence of dating app use in this study as opposed to those in earlier research. This research suggests that attraction, mood, and selective swipers trigger users' interest in dating apps, although age does not seem to interfere with users' interest. It provides a better understanding of users using dating apps and creates further development of an individual lifestyle by using technology (Johnson et al., 2017).

Implications

The broader implication of this research shows that users could consider the benefits and boundaries of using dating apps. Verification of identity does not always reduce negative effects; on the contrary, it increases normativity about gender, age, race, and many more (Sobieraj & Humphreys, 2022). Like past research, online dating participants are more likely to describe their entire experience with these platforms as positive than unfavourable (Anderson et al., 2020). Dating apps have been studied from different perspectives. For instance, the previous literature has indicated that user interactions, like scrolling, tapping, and typing, are linked to smartphone addiction. Since dating apps have comparable user interaction designs, similar patterns of obsessive use might be observed. These changing dynamics have sparked a wider discussion about the effects of online dating on romantic relationships.

Limitations

Some advantages of using online dating apps are broadening one's social network, meeting new people, and experiencing a sense of control and safety. However, there are also drawbacks, including the time

investment, potential lack of success, receiving unsolicited sexual messages, and the risk of encountering false information from other users. When evaluating the findings, it is important to consider the limitations of the study, for instance, from individuals who use dating apps for months in search of a romantic relationship to those who use them to find more friends. With 103 participants, the sample size was modest. It was also challenging to extrapolate the outcomes to all users worldwide. Therefore, longitudinal studies that enabled the assessment of evolution in various and more specific areas as well as their interest in using dating apps would be intriguing to conduct. Based on individual variations, a profile of dating app users was created, with particular attention to sociodemographic factors (ethnicity, relationship status, and educational background). Thus, they could all be used to predict interest. The crucial question was whether there were any empirical or theoretical grounds to believe that the targeted sample would affect the validity. With the samples, this was not the case for the game theory measure.

Conclusion

Overall, this research confirms that attraction, mood and selective swipers trigger users' interest in using dating apps although age does not moderate any of these relationships. Although this study shows that age does not interfere with the users' interest, it could be seen as a groundwork for future studies investigating other potential interfering variables. This research acknowledges the variations in dating apps for mobile devices and the need to provide more information about how dating apps help users start relationships and the potential ramifications for the developmental stages of pre-interaction relationships.

Conflict of Interest

The authors have declared that no competing interests exist.

Author Contribution Statement

All authors contributed to the conception, design, writing and revision of the manuscript.

Ethics Statements

This article adheres to the ethical standards set by the Committee on Publication Ethics (COPE).

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