Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria

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Keywords:	*Abstract*
Artificial Intelligence (AI); conversational; cybercrimes; social media addictions	*The emergence of artificial intelligence (AI) affects several aspects of life. While AI has positive impacts, it also leads to adverse impacts such as the rise of gadget addiction and cybercrime. This study investigated the role of perceived usage of the conversational GPT-4 AI model in cybercrimes and social media addictions among residents in Makurdi Nigeria. The cross-sectional survey involved 200 participants who used the latest conversational GPT-4 AI model in their smartphones. Participants were selected using convenience sampling techniques. The results revealed a relationship between the usage of the conversational GPT-4 AI model and cybercrime incidence ($R=0.255$, $R^2=0.065$, $F(1, 189)=13.223$, $p< 0.01$). The baseline usage of the conversational GPT-4 AI model was also found to significantly predict an increase in social media addictions ($R=0.434$, $R^2=0.188$, $F(5, 195)=24.147$, $p<0.01$). The study also revealed that the usage of the conversational GPT-4 AI model was significantly associated with an increase in both cybercrime and social media addictions ($R=0.474$, $R^2=0.226$, $F(2, 185)=5.991$; $p<0.01$). Based on the study's findings, there is a need to develop and deliver educational programs to inform users about the responsible use of AI technologies, including the GPT-4 model.*

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

170

	Abstrak
Kata kunci: kecerdasan buatan; percakapan; kejahatan siber; kecanduan media sosial	Perkembangan kecerdasan buatan (*Artifical Intelligence/*AI) mempengaruhi beberapa aspek kehidupan. Meskipun AI memiliki dampak positif, terdapat beberapa efek negatif, seperti maraknya kecanduan gawai dan kejahatan siber. Penelitian ini menyelidiki peran persepsi penggunaan model AI GPT-4 terhadap kejahatan siber dan kecanduan media sosial pada penduduk di Makurdi Nigeria. Survei *cross-sectional* ini melibatkan 200 peserta pengguna model AI GPT-4 versi *mobile* yang dipilih menggunakan teknik *convenience sampling*. Hasil analisis menunjukkan bahwa terdapat hubungan yang signifikan antara penggunaan model AI GPT-4 percakapan dengan kejadian kejahatan siber (R=0,255; R^2=0.065; F(1, 189)=13.223, p<0.01). Penelitian ini juga menemukan bahwa penggunaan awal AI GPT-4 secara signifikan memprediksi peningkatan kecanduan media sosial (R=0.434, R^2=0.188, F(5, 195)=24.147, p<.01). Hasil penelitian juga menunjukkan bahwa penggunaan model AI GPT-4 secara signifikan berhubungan dengan peningkatan kejahatan siber dan kecanduan media sosial (R=0.474, R^2=0.226, F(2, 185)=5.991; p<0.01). Berdasarkan penelitian ini, ada kebutuhan untuk mengembangkan dan memberikan program pendidikan yang bertujuan untuk menginformasikan pengguna tentang penggunaan teknologi AI yang bertanggung jawab, termasuk model GPT-4.

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INTRODUCTION

Background Of The Study

Artificial intelligence (AI) technology and applications have the potential to tackle many of humanity's most urgent issues. These include preparing the world against diseases and hunger, increasing productivity, educating people better, and equipping humanity to combat climate change. However, this potential is accompanied by risks, e.g., entrenched and amplified social inequality, addiction to social media, and cybercrimes (Hagerty & Rubinov, 2019). Liu & Lin (2020) noted that the term 'AI' was first coined by John McCarthy and colleagues in 1955, but it did not

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

171

gain significant attention until decades later. As of 2021, AI has evolved from a conceptual idea to an emerging and disruptive technology (Onah, 2024a), driven by machine learning to develop smart systems capable of significant global transformation (Onah, 2023).

Economically, the Generative Pre-trained Transformer (GPT-4) AI model is projected to generate an economy worth around $13 trillion and more, underscoring its benefits for industries and the economy. According to Weili (2020), three different schools of thought have emerged regarding AI: *semiotics*, which believes the GPT-4 AI model stems from mathematical logic; *connectionists*, which attribute the technology to bionics; and *behaviorists*, who argue that the technology emerges from action and perception. Technical and capital capacities are needed for full implementations of AI applications and tools in organizations (Solow-Niederman, 2019). Talib et al. (2021) said that deep learning algorithms, such as the GPT-4 AI model, require substantial storage to handle large databases and powerful processors to function autonomously. This suggests that while implementing AI systems requires significant capital, the resulting benefits in terms of cost reduction and increased efficiency are substantial.

However, it has been reported that the GPT-4 AI model, when trained on non-representative or biased data, can reinforce existing social and economic inequalities. AI systems tend to replicate the gaps and biases present in their training data sets (Powles & Nissenbaum, 2018). Additionally, big tech firms might use the GPT-4 AI model to solidify their economic and social power, while authorities could potentially exploit it to infringe on privacy and conduct human rights violations. In contemporary African settings, including Nigeria, the benefits and risks of the GPT-4 AI model are evident. Brandusescu, Freuler, & Thakur (2017) highlighted innovative AI applications in Kenya, Nigeria, and South Africa that address needs in health, agriculture, and other sectors (Onah & Ogwuche, 2023; Onah, 2024a). Smith & Neupane (2018) provided further examples from these countries, as well as Uganda and Ethiopia, demonstrating AI's positive impact in areas such as point-of-care testing, government service delivery, wildlife conservation, crop monitoring, water management, enterprise development, and financial services (Gwagwa, 2018).

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

172

UN Global Pulse tested advanced AI natural language processing (NLP) tools to identify Somali social media posts related to peace-building and Ugandan radio content that indicated social conflict (UN Global Pulse, 2018). In Accra, Google's AI Laboratory has been developing compressed algorithms that can run on mobile phones (Adeoye, 2019). Additionally, IBM's mobile open-source platform, Hello Tractor, is providing Nigerian farmers with AI-based on-demand tractor access (Assefa, 2018). However, AI also presents significant challenges and risks in Africa. Following the public listing of Nigeria's online marketplace Jumia, much of its equity was transferred to foreign owners, raising concerns that such developments may stifle Africa's homegrown tech industries (Madowo, 2020; Onah, 2024b).

Meanwhile, over the past few decades, social media has been described as a web-based tool that allows users to create profiles, build networks, and interact with others (Xenos, Vromen, & Loader 2014). Through social media, people can create online profiles, making it easier to connect, share opinions, and disseminate information. Popular platforms include Facebook, Twitter, YouTube, Google+, MySpace, blogs, wikis, and Snapchat (Boulianne, 2015). Rodrigues & Niemann (2017) noted that social media facilitates two-way communication and enhances participation. It serves as a convenient, personalized digital medium for communication and information sharing among people.

It's important to distinguish between social media and social networking sites. Social media refers to computer-based technologies that support the creation and distribution of information, ideas, feelings, career interests, and other forms of expression through virtual communities and networks (Obar & Wildman, 2015). Although "social media" is often used interchangeably with "social network," social networks allow for more active and interactive sharing and communication than other forms of social media. Extensive research has shown that over the past decade, social networking sites (SNSs) have seen a significant increase in both number and popularity (Duggan et al., 2015; Olufadi, 2016). The rise of the internet has led to young people becoming increasingly engaged, often excessively so, with social media. This has sparked considerable research into the issue of technological and social networking addictions (Carbonell & Panova, 2017). A growing body of evidence indicates that

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

173

these sites have become an essential part of youths' social lives and daily routines, no matter where they are (Tiwari, 2017).

In Nigeria, then Minister of Communication Shittu Adebayo noted that "about 75 percent of Nigeria's internet users are on social media," with the majority being youth (Ogunkola, 2018). Consequently, a large portion of this generation's social, emotional, and mental development occurs online (Ononogbu & Chiroma, 2018). Social media has become particularly popular among young people, who often prioritize social platforms on their mobile devices. Social media helps youth stay connected, offering quick and ubiquitous access to information flow (Tarimo, 2016). For many young people, it is their preferred means of communication and has proven to be an effective tool. However, the excessive use of social media by youth is concerning.

The amount of time spent on these networks has raised alarms about its impact on their lifestyles, the content they consume, and its effects on social relationships and beliefs. Additionally, social media use can lead to negative outcomes (Noori, Sayes, & Anwari, 2023), such as addiction, (Pan, Qiu, Hu, & Li, 2024; Feher et al., 2024), sexting (Dodaj, Sesar, Prijatelj, Mandić, & Bursać, 2024), pornography (Meilani, Hariadi, & Haryadi, 2023; Olaleye & Ajuwon, 2022), cyberbullying (Craig et al., 2020), and other antisocial behaviours (Hameed & Irfan, 2021; Haythornthwaite, 2023) or crimes (Agara et al., 2021; Almadhoor, Alserhani, & Humayun, 2021; Kaur, et al., 2024). Other potential negative consequences include a lack of privacy, declining learning and research abilities, decreased face-to-face interaction and writing skills, increased vulnerability to crime, emotional distress, anxiety, and severe isolation. These issues can significantly harm one's career and life (Ononogbu & Chiroma, 2018).

Similar to social media addiction, the rise of cybercrime in Nigeria can be traced back to the country's efforts in the 1980s to modernize its economy by aligning with global transaction standards. This transition involved moving from analog computing to digital technology. Information and Communication Technologies (ICTs) that facilitate these transactions also contribute to social addiction, cybercrime, and internet fraud, as fraudsters exploit unsuspecting victims worldwide. Cybercrime is a global issue requiring complex solutions due to its significant impact on the global economy

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

174

and security. While street crimes often receive more attention, the economic damage caused by cybercrime to individuals, organizations, and governments is substantial.

According to a study by Lewis (2018), in collaboration with the Centre for Strategic and International Studies (CSIS) and the global security software company McAfee, the global annual financial loss to cybercrime is nearly $600 billion, almost 1 percent of global GDP, up from US$445 billion before 2014. The influx of foreign investors into Nigeria, attracted by its vast market and population of almost 200 million, has created opportunities for cybercriminals to exploit (Terwase et al., 2014). Cybercrime in Nigeria has evolved alongside advancements in technology and social media platforms. The internet's ubiquitous and anonymous nature allows criminals to commit crimes from remote locations. Ogunwale (2020) notes a global campaign against the rising tide of cybercrime, which, if not properly addressed, could lead to a lasting disaster for the national economy. He also mentions that the Central Bank of Nigeria's (CBN) bank verification number project has thwarted criminals' attempts to duplicate identities for fraud. Despite these efforts, banks have reported losses of NGN 203 billion to debit and credit fraud over the past 14 years, with many cases going unrecorded.

Awoyemi, Omotayo, & Mpapalika (2021) argued that high unemployment rates, the relentless pursuit of wealth among youths, poor security of personal devices, and ineffective cybercrime laws have significantly contributed to the rise in cybercrime, making it a serious problem for Nigeria. Similarly, Onuora et al., (2017) claimed that in recent years, many criminals in Nigeria have used modern telecommunication networks, such as the internet and mobile phones, to commit crimes that damage the country's global reputation. Omodunbi et al. (2016) confirmed that phishing scams are rapidly increasing and have become one of the fastest-growing cybercrimes in Nigeria. Kovacs (2022) emphasized that legislation is crucial for combating various types of cybercrime in Nigeria. Politicians, the general public, security professionals, and academics should prioritize research conducted by cybercrime scholars to develop effective strategies to reduce cybercrime. With an estimated population of 200 million, Nigeria boasts over 100 million internet users and approximately 150 million mobile telecommunications subscribers (Orji, 2019). According to Renals & Conant (2016),

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

175

unlike the sophisticated cybercrimes prevalent in more developed parts of the world, Nigerian scammers are better known for traditional yet effective cybercrimes, such as phishing, hacking, malware attacks, electronic card fraud, Automated Teller Machine (ATM) scams, identity theft, marriage scams, mail fraud, and more recently, Business Email Compromise (BEC) fraud. Furthermore, this landscape is continuously evolving.

A recent National Cyber Security Policy and Strategy (NCPS, 2021) report identified seven emerging threats, including cybercrime. The other six threats are online child abuse, pandemic-induced cyber threats, online gender exploitation, cyber-terrorism, election interference, and other cyber threats. Nigerian cyber criminals operate both domestically and internationally, and their activities abroad frequently attract attention. For instance, in 2019, the United States Federal Bureau of Investigation (FBI) arrested several Nigerians involved in fraudulent activities and online scams, resulting in a loss of $6 million and potential further losses of about $40 million (US Department of Justice, 2019). This crackdown was the result of joint operations between the FBI and Nigeria's Economic and Financial Crime Commission (EFCC) (Techxplore, 2019).

In July 2020, another sting operation led to the arrest of several scammers in Dubai, including a popular social media "celebrity" known as "Hushpuppy," who was involved in BEC-type frauds. These recent joint operations are noteworthy, though it remains to be seen if they will lead to a significant reduction in cybercrime in Nigeria (Techxplore, 2019).

Research Gap

While a considerable number of studies and theories have been carried out in Nigerian on how cybercrimes and social media addiction affect the well-being of citizenries (Awoyemi, Omotayo, & Mpapalika (2021); Omodunbi et al. 2016), many of the studies have only focused on youths and adolescents with little limited studies on the models the triggers these addictions and criminal behavior among residents. For instance, Eysenck's Theory of Criminality (2013) posits that personality traits influence the likelihood of engaging in criminal behavior. Eysenck identified three primary dimensions of personality: Extraversion (E): People with high extraversion are more sociable, active, and seek excitement. Neuroticism (N): High levels of neuroticism are

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

176

associated with emotional instability and anxiety. Psychoticism (P): High psychoticism is linked to aggressiveness, impersonal attitudes, and a lack of empathy.

According to Eysenck (2013), individuals with high scores on these dimensions, particularly psychoticism, are more prone to criminal behavior due to their inherent personality traits combined with a lack of conditioned fear of punishment. In regard to this study, high extraversion may lead to increased social media use, seeking interaction and excitement, potentially exposing users to cybercrime risks. Hence, high neuroticism might make individuals more susceptible to social media addiction as a coping mechanism for anxiety and stress. Further, individuals with high psychoticism may be more inclined towards engaging in or being less deterred by cybercriminal activities.

Also, the social learning theory, proposed by Bandura (1977), suggests that people learn behaviors through observation, imitation, and modeling. It emphasizes the importance of Attention: Observing the behavior of others. Retention: Remembering the behavior observed. Reproduction: The ability to replicate the behavior. Motivation: The will to perform the behavior, influenced by rewards and punishments.

In the context of this study, users, especially young residents, may observe and imitate behaviors seen on various social media platforms, including both positive interactions and cybercriminal activities. Also, repeated exposure to and interaction with engaging content on social media enhanced by the GPT-4 model can reinforce addictive behaviors. Thus, the influence of AI interaction with AI models like the current GPT-4 model can shape user behavior by providing immediate responses, modeling inappropriate behaviors (OpenAI, 2019), and influencing the type of content users are exposed to. Conclusively, various kinds of literature primarily focus on general perceptions and impacts of AI technologies in education and business settings but lack a comprehensive theoretical framework specific to the interplay between AI usage, cybercrime, and social media addiction in Makurdi and Nigeria at large.

Rationale Of The Study

Research has revealed that AI's negative consequences in some cases have been exacerbated by a lack of transparency and accountability as these systems are scaled up

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

177

(Koene et al., 2019). AI's potential risks are particularly acute in developing countries like Nigeria. Hamann (2018) said that "the new technologies […] may build upon and exacerbate existing inequalities—both within developing countries as well as between developing and more developed regions." Similarly, Smith & Neupane (2018) warned that in developing nations, "if we continue blindly forward, we should expect to see increased inequality alongside economic disruption, social unrest, and in some cases, political instability, with the technologically disadvantaged and underrepresented faring the worst."

Social media addiction is becoming a growing problem for youth, many of whom have become obsessed with the media. Many young people are so attached to their smartphones that they spend nights surfing the internet and social media. This obsession has contributed to an increase in cybercrime, as technology-oriented scammers use advanced tools, such as the GPT-4 AI model and hacking technology, to steal from their victims. Interpersonal psychological scammers use personal relationships to trick victims into providing means to steal from them by gathering personal data from various social media platforms.

Fake web clones, cyber hacking, phishing, and malware infiltration are examples of technology-oriented financial cybercrimes (Goldstein, et al., 2023). On the other hand, romance fraud is an example of an interpersonal psychological scam. These scams affect different targets: interpersonal psychological scams impact internet users seeking online relationships, while technology-oriented fraud hacks into organizations' databases to steal information. Romance scams are notably prevalent in West Africa, specifically Nigeria. Given this context, we sought to investigate the roles of social media addictions and cybercrimes, particularly focusing on the interaction of the conversational GPT-4 Artificial Intelligence (AI) model.

Novelty Of The Study

This research is different from previous studies as it specifically targeted the latest conversational GPT-4 AI model released by OpenAI in 2023, offering current and relevant data on its influence, which is critical given the rapid advancements in AI technology and its growing integration into our daily lives. Also, by simultaneously analyzing the relationship between AI usage, cybercrime, and social media addiction,

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

178

the study provides a comprehensive view of how modern AI tools influence various aspects of digital behavior.

Purposes Of The Study

There were several objectives that we sought to achieve via this study, namely:

1. To what extent does the perceived use of the conversational GPT-4 AI model predict an increase in cybercrimes among residents in Makurdi, Nigeria?

2. To what extent does the perceived use of the conversational GPT-4 AI model predict an increase in social media addictions among residents in Makurdi, Nigeria?

3. To what extent does perceived use of the conversational GPT-4 AI model predict an increase in cybercrime and social media addictions among residents in Makurdi, Nigeria?

Hypothesis Of The Study

Based on the literature review above, the researchers proposed the following hypotheses:

1. Perceived use of conversational GPT-4 AI model significantly predicts an increase in cybercrimes among residents in Makurdi, Nigeria

2. Perceived use of conversational GPT-4 AI model significantly predicts an increase in social media addictions among residents in Makurdi, Nigeria

3. Perceived use of conversational GPT-4 AI model significantly predicts an increase in both cybercrime and social media addictions among residents in Makurdi, Nigeria.

METHODS

Research Design

This study utilized the cross-sectional design, which is a method used to gather data at a specific point in time to make inferences about a particular population. This design is appropriate for this study as it allows the researcher to collect data from a cross-section of flooding activities in Makurdi, Nigeria. However, in this study, the independent variable for this study was the perceived use of the conversational GPT-4 AI model—this refers to how residents believe they are using the GPT-4 AI model for various conversational purposes. The dependent variables were: *cybercrimes*, referring to negative online activities by residents, such as online fraud, hacking, identity theft,

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

179

and cyberbullying, and *social media addictions*, which are behavioral addictions characterized by excessive concern about social media, an uncontrollable urge to use social media, and devoting so much time and effort to social media that it impairs other important life areas.

Research Settings

This study was carried out in Makurdi, the capital of Benue State in east-central Nigeria. The city lies on the south bank of the Benue River. Founded around 1927 when the railroad from Port Harcourt (279 miles [449 km] south-southwest) was extended to Jos and Kaduna, Makurdi rapidly developed into a transportation and market center. In 1976, following the division of Benue-Plateau into two states, Makurdi was selected as the capital of Benue.

Sampling Technique And Research Sample

Convenience sampling was employed in this study, because it is the most straightforward method and requires minimal planning, making it quick to implement. In this study, samples were obtained based on accessibility, availability, and use of the GPT-4 model. Table 1 describes the characteristics of study participants.

Table 1.

Characteristics Of The Participants

Age range	Frequency	Percentage	Valid Percentage
Below 18 years old	40%	20%	20%
19-23 years old	20%	10%	10%
24-28 years old	20%	10%	10%
29-33 years old	20%	10%	10%
34-38 years old	20%	10%	10%
39-43 years old	40%	20%	20%
44-48 years old	20%	10%	10%
49 years old and above	20%	10%	10%
Total	200%	100%	100%
Religion	Frequency	Percentage	Valid Percentage
Christianity	140%	70%	70%
Islam	40%	20%	20%
Others	20%	20%	10%
Total	**200**	**100**%	**100**%
Marital Status	Frequency	Percentage	Valid Percentage
Singles	60	30%	30%

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

Married	30	30%	30%
Separated	40	20%	20%
Divorced	40	20%	20%
Total	200	100%	100%
Ethnicity	**Frequency**	**Percentage**	**Valid Percentage**
Tiv	100	50%	50%
Idoma	80	40%	40%
Igede	20	10%	10%
Total	200	100%	100%
Employment status	**Frequency**	**Percentage**	**Valid Percentage**
Self-employed	100	50%	50%
Contract employment	75	37.5%	37.5%
Permanent employment	25	12.5%	12.5%
Total	200	100%	100%
Gadget Brands	**Frequency**	**Percentage**	**Valid Percentage**
Samsung	50	25%	25%
Apple	20	10%	10%
Huawei	40	20%	20%
Xiaomi	76	38%	38%
Oppo	30	15%	15%
Techno	14	7%	7%
Total	200	100%	100%
Social Media	**Frequency**	**Percentage**	**Valid Percentage**
X (formerly Twitter)	40	20%	20%
Facebook	65	32.5%	32.5%
Instagram	35	17.5%	17.5%
TikTok	30	15%	15%
LinkedIn	30	15%	15%
Total	**200**	**100**%	**100**%

Instruments Of Measurement

Three major instruments were used for data collection. First, the *Criminal Sentiment Scale (CSS-M)* developed by Shields & Simourd (1991), Simourd (1997), and Simourd & van de Ven (1999). The CSS-M has demonstrated satisfactory reliability and validity in both adult and youth populations. It consists of 41 items assessing three subscales: Attitudes Toward the Law (ATL), Tolerance for Law Violations (TLV), and Identification with Criminal Others (ICO). Further, The CSS-M has high internal consistency, with reliability coefficients ranging from α = 0.55 to 0.88 for its subscales. The overall scale has shown adequate test-retest reliability, with coefficients ranging

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

181

from 0.68 to 0.85 over 2 weeks, and 0.57 to 0.72 over 12 weeks. In terms of validity, the CSS-M has shown moderate correlations of 0.25 to 0.37 with established measures of criminal risk, such as the Level of Service Inventory-Revised, General Statistical Information on Recidivism Scale, and Hare Psychopathy Checklist-Revised. The subscale correlations ranged from 0.08 to 0.41, with all subscales significantly correlated to at least two criminal risk measures.

Second, *Bergen Social Media Addiction Scale* that developed by Andreassen et al., (2012). This scale is a brief and effective psychometric instrument designed to assess social media addiction. The BSMAS has high internal consistency, with a Cronbach's α of 0.88, indicating excellent reliability. The scale also showed adequate test-retest reliability over 3 weeks (r = 0.82, p < 0.001). In terms of validity, the BSMAS showed strong correlations with measures of Facebook addiction (r = 0.65, p < 0.001) and problematic social media use (r = 0.70, p < 0.001), providing evidence of convergent validity. The scale has also been found to be able to significantly differentiate between addicted and non-addicted social media users, supporting its discriminate validity. The item discrimination index, which indicates how well each item differentiates between high and low scorers on the scale, ranged from 0.57 to 0.77 for the BSMAS items, all of which were statistically significant (p < 0.001). This suggests that each item contributes to the overall measurement of social media addiction.

Third, *The Bot Usability Scale (BUS-15)* that developed by Borsci, et al., (2022); BUS-15 is a 15-item questionnaire developed to measure user satisfaction after interacting with chatbots and social media. The BUS-15 has high internal consistency, with a Cronbach's α of 0.90 for the overall scale, indicating excellent reliability. The Cronbach's α for the individual factors ranged from 0.70 to 0.87, all within the acceptable range. In terms of validity, the BUS-15 showed moderate to strong correlations with the UMUX-LITE, another measure of user satisfaction, with Kendall's τ coefficients ranging from 0.40 to 0.60 for the different factors. This provides evidence of convergent validity, indicating that the BUS-15 is measuring a similar construct to the UMUX-LITE. The BUS-15's item discrimination indices, which indicate how well each item differentiates between high and low scorers on the scale, ranged from 0.57 to 0.77, all of which were statistically significant (p < 0.001). Confirmatory factor analysis

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

182

supported the five-factor structure of the BUS-15, with factor loadings above 0.60 for most items and model fit indices within acceptable ranges (CFI=0.924, RMSEA=0.065, SRMR=0.039).

Data Collection Technique

In the data collection process, two research assistants who were graduate students of the Department of Psychology at Benue State University helped distribute and retrieve copies of the questionnaires. We instructed the research assistants to provide explanations to the participants on certain topics that might be unclear, such as the meaning of AI. The participants could freely quit participation in the study at any time. During data collection, the researchers carefully reviewed the completeness of the questionnaires to ensure the accuracy of the scoring. Finally, to prevent scoring drift, scores we carefully screened the questionnaires, and those found to have discrepancies were not included in the analysis.

Data Analysis Technique

Data in this study were analyzed using simple linear regression and multiple linear regressions. Simple linear regression was used to test the first hypothesis, multiple linear regression for hypothesis two, and the standard multiple regression for the third hypothesis. Descriptive statistics, such as percentages, were also used to analyze respondents' demographic characteristics.

RESULTS AND DISCUSSION

Research Results

Table 2 shows the categorization of the research variables, while Table 3 shows descriptive statistics for the variables. Pearson's correlation coefficients (Table 3) indicate a moderate positive correlation between GPT-4 usage and cybercrimes (r= 0.347, p<0.01), which means as the use of the GPT-4 increases, cybercrime incidences tend to increase as well. However, the correlation is not very strong, indicating that other factors might also be influencing cybercrimes.

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

183

Table 2. Categorization Of Each Variables

Category	Conversational GPT-4 Use			Cybercrimes			Social Media Addiction		
	Score	Frequency	Percentage	Score	Frequency	Percentage	Score	Frequency	Percentage
Very High	90-100	70	35%	90-100	20	10%	90-100	40	20%
High	70-89	40	20%	70-89	50	25%	70-89	60	30%
Average	50-69	30	15%	50-69	80	40%	50-69	50	25%
Low	30-49	40	20%	30-39	30	10%	30-49	30	15%
Very Low	< 29	20	10%	<29	20	10%	< 29	20	10%
Total		200	100%		200	100%		200	100%

Table 3. Mean, Standard Deviation, And Variable Intercorrelation

Variables	M	SD	Conversational GPT-4 Use	Cyber Crimes	Social Media Addiction
1 Conversational GPT-4 Use	48.82	9.02	1.00		
2 Cyber Crimes	30.34	6.24	0.347**	1.00	
3 Social Media Addiction	40.03	7.06	0.475**	0.706**	1.00
**. Correlation is significant at the 0.01 level (2-tailed). SD = Standard deviation					

Table 4.
Simple Linear Regression Between Conversational GPT-4 AI Use And Cybercrimes

Variables	R	R^2	df	F	β	t	p
Constant	0.255	0.065	1, 189	13.223		4.412	0.000
Cybercrimes					0.235	3.531	0.000
*Notes: * p < 0.05*							

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

184

Further, the result showed a moderate positive correlation between GPT-4 use and social media addiction (r=0.475, p<0.01). This suggests that higher use of GPT-4 is associated with higher levels of social media addiction. The relationship is stronger than the one between GPT-4 use and cybercrimes, indicating a more noticeable connection.

Results showed a strong positive correlation between cybercrimes and social media addiction (r=0.706, p<0.01). This means that as the level of social media addiction increases, the incidence of cybercrimes also increases significantly. The strong correlation suggests a substantial relationship between these two variables.

Table 4 shows a simple linear regression analysis to test the first hypothesis: conversational GPT-4 AI use significantly predicts an increase Of cybercrimes among residents in Makurdi, Nigeria.

The result presented in Table 4 indicates conversational GPT-4 use as a predictor of increased cybercrime among residents in Makurdi (R=0.255, R^2=0.065, F(1, 189)=13.223, p<0.01). The result further revealed that conversational GPT-4 model usage accounted for 6.5% of the total variance observed in cybercrime among residents in Makurdi. Based on this finding, hypothesis one was accepted.

Table 5 shows multiple linear regression analysis for the second hypothesis: conversational GPT-4 AI model use significantly predicts an increase in social media addictions among residents in Makurdi, Nigeria.

Table 5.
Multiple Linear Regression Between Conversational GPT-4 AI Use And Social Media Addiction

Variables	*R*	R^2	df	F	β	t	p
Constant	0.434	0.188	5, 185	24.147		15.759	0.000
Twitter(X)					0.241	17.504	0.000
Facebook					-0.237	11.071	0.008
Instagram					-0.216	10.019	0.011
TikTok					-0.306	11.891	0.001
LinkedIn					-0.237	11.028	0.001
*Notes: * p < 0.05*							

The result in Table 5 indicates that conversational GPT-4 AI model use predicted the increase in social media addictions among residents in Makurdi

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

185

($R=0.434$, $R^2=0.188$, $F(5, 195)=24.147$, $p<0.01$). The result further revealed that conversational GPT-4 use accounted for 18.8% of the variance in social media addictions among residents in Makurdi. Individually, Twitter/(X) usage ($\beta = 0.241$, $p = 0.000$) was positively and significantly associated with the dependent variable. Facebook ($\beta=-0.237$, $p = 0.008$), Instagram ($\beta=-0.216$, $p=0.011$), TikTok ($\beta=-0.306$, $p=0.001$), and LinkedIn ($\beta=-0.237$, $p=0.001$) were negatively and significantly associated with the dependent variable. With this result, hypothesis two was accepted.

Table 6 shows standard linear regression for the third hypothesis: conversational GPT-4 use significantly predicts an increase in cybercrime and social media addictions among residents in Makurdi, Nigeria.

Table 6
Standard Multiple Regression Between Conversational GPT-4 AI Use And
Cybercrimes And Social Media Addiction

Variables	R	R^2	df	F	β	T	p
Constant	0.474	0.226	2, 188	5.991		2.526	0.000
Cybercrime					0.173	4.886	0.002
Social media addiction					0.492	1.365	0.001
*Notes: * p < 0.05*							

The result in Table 6 indicated that conversational GPT-4 AI model use predicted an increase in cybercrimes and social media addictions among residents in Makurdi [$R=0.474$, $R^2=0.226$, $F(2, 185) = 5.991$; $p<0.01$]. Individually, the increase in the usage of the GPT-4 AI model was associated with an increase in cybercrime ($\beta=0.173$; $T=4.886$; $p<0.01$). Further, an increase in the usage of the GPT-4 AI model was associated with an increase in social media addictions ($\beta=0.492$; $T=1.365$; $p<0.01$). Additionally, the result shows that the perceived use of conversational AI models accounted for 22.6% of the variance in cybercrime and social media addictions among residents in Makurdi. Based on these findings, hypothesis three was accepted.

Discussion

There was a statistically significant but weak positive relationship between the usage of the conversational GPT-4 AI model and the incidence of cybercrime among residents in Makurdi ($R=0.255$, $R^2=0.065$, $F(1, 189)= 13.223$, $p<0.01$). Although the usage of the GPT-4 AI model was a significant predictor, it only explains a small portion of

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

186

the variance in cybercrime, indicating that other factors should also be considered in understanding and predicting cybercrime.

This aligns with the study of Bahrini et al., (2023), which says that while ChatGPT has revolutionized natural language processing and has the potential to save time and money by automating routine tasks, it is essential to be mindful of the potential threats and take steps to mitigate them, as it can produce misleading results and biases, raise ethical concerns (Goldstein, et al., 2023), and be misused. That is why some countries, such as Italy, have banned the use of this AI (Rodriguez, 2023; McCallum, 2023) specifically in some devices, and responsible use of ChatGPT must be a top priority to ensure that everyone benefits from its use.

Further, from cognitive load and accessibility perspectives; the GPT-4 AI model simplifies access to vast amounts of information, making it easier for individuals to engage in both positive and negative online behaviors (Gain, 2023). This accessibility can increase the tendency to commit cybercrimes as individuals might feel emboldened by the perceived anonymity and ease of manipulating the information provided by such AI models. Furthermore, constant interaction with AI models and devices can lead to cognitive overload, where individuals are bombarded with information and responses. This can impair judgment and increase susceptibility to engaging in impulsive or unethical behaviors online, including cybercrimes (Onah, Ogwuche, & Sohn, 2024; Volodin & Vanunu, 2023).

Then, the baseline usage of the conversational GPT-4 AI model significantly predicts social media addiction among residents in Makurdi (R=0.434, R²=0.188, F(5, 195)=24.147, p<0.01). Further, among social media platforms, Twitter/(X) usage has a significant positive association with social media addiction, while Facebook, Instagram, TikTok, and LinkedIn usage have significant negative associations. This suggests that while increased usage of applications of GPT-4 AI might be associated with higher levels of social media addiction, the effects of different social media platforms can vary. However, it's important to note that this conclusion is based on the association found in the regression analysis even though, social media addiction can result from constant interaction leading to some form of disorder (Andreassen et al., 2016; Baccarella, 2018). While these models have shown impressive capabilities, we

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

187

believe it is unlikely that they will be able to fully replace humans or individuals in all tasks and situations (Werb, 2023). Machines may struggle to replicate human intuition, emotion, creativity, and intelligence, which are essential for many tasks; however, they can assist humans in developing new ideas and insights that may lead to addictions based on existing data and may be able to create entirely new concepts with human input (Chen, Zaharia, & Zhou, 2023; Osman-Gani & Paik, 2016).

Further, research has shown that behavioral reinforcement is a key factor in instant gratification; the AI model provides immediate responses and feedback, which can reinforce compulsive use (Parra & Chatterjee, 2024; Andreassen et al., 2016). For social media, this translates to increased screen time and addictive behaviors as users seek continuous interaction and validation (Onah, Ogwuche, & Sohn, 2024). However, repeated exposure to AI-driven interactions can desensitize individuals to the consequences of their online actions, reducing the psychological barrier to engaging in cybercrimes.

Hypothesis three revealed that the usage of the conversational GPT-4 AI model is significantly associated with an increase in both cybercrime and social media addictions among residents in Makurdi (R=0.474, R^2=0.226, F(2, 185)= 5.991; p<0.01). The regression model further suggests that as the usage of the GPT-4 AI model increases, the levels of cybercrime and social media addictions also increase. This study also agrees with the study of (Stein et al., 2024) who established significant connections between general AI attitudes and two selected personality traits. They assert that it is especially the observed association with participants' conspiracy mentality that holds notable relevance in our increasingly complex world.

If AI developers cannot find suitable ways to make their technology appear innocuous to observers (in particular to those who tend to seek out post-factual explanations), it might become increasingly challenging to establish innovations on a larger scale. However, they emphasized that negative attitudes and objections against AI technology are not necessarily unjustified; hence (Elhai et al., 2016), when educating the public on AI technologies, people should be encouraged to reflect upon both potential risks and benefits (Bartneck et al., 2021; Park & Woo, 2022).

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

188

This study also aligns with other research on anxiety and stress; frequent use of AI and social media has been reported to lead to increased anxiety and stress (Keles, McCrae, & Grealis, 2020; Vannucci, Flannery, & Ohannessian, 2017). The pressure to maintain an online presence and engage with AI can create a cycle of stress and dependency, contributing to addictive behaviors. While social media is designed to connect people, excessive use can lead to feelings of loneliness and isolation. The AI model's interactions might replace human connections, exacerbating feelings of isolation and potentially leading to behaviors associated with cybercrime as a form of acting out (Reer, Tang, & Quandt, 2019; Twenge et al., 2018).

Interaction with conversational AI creates a false sense of control and mastery over technology, which might encourage risky behaviors, including cybercrimes. Users might overestimate their ability to avoid detection or consequences (Di Domenico et al., 2021; Hawi & Samaha, 2017) resulting in diminished self-regulation, which erodes resident's ability to self-regulate, making it harder to resist addictive behaviors and unethical online activities (Bányai et al., 2017).

Further, based on Bandura's social learning theory, individuals learn behaviors by observing others. If the use of AI is seen as a means to achieve certain outcomes (e.g., social validation, and financial gain through cybercrime), individuals are more likely to imitate these behaviors. Interaction with AI-generated content and social media can stimulate the brain's reward pathways, releasing dopamine and reinforcing addictive patterns (Andreassen et al., 2016). The more individuals interact with AI, the more they seek rewarding feedback, leading to increased usage and potential addiction (Hou et al., 2019; Andreassen, 2015). Finally, according to the stain theory, individuals engage in deviant behavior when they experience strain or stress. The interaction with AI contents and models like the GPT-4 model serves as a coping mechanism for individuals facing social, economic, or psychological strain, leading to increased cybercrime and social media addiction as outlets for their frustrations (Onah, 2024a).

There were several limitations in this research. The study's sample size of 200 participants, though sufficient for statistical analysis, might not be large enough to generalize findings to the broader population of Benue State and other regions of Nigeria. The cross-sectional nature of the study means it captured a snapshot in time

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

189

and could not establish causality. Longitudinal studies would be needed to determine causal relationships between GPT-4 usage, cybercrimes, and social media addictions. While on the field, it was discovered that there were differences in participants' technological literacy and familiarity with AI-generated content which influenced their perceptions and interactions with the GPT-4 model, affecting the consistency of the data.

CONCLUSIONS AND SUGGESTIONS

Conclusions

Based on this current study, there was a positive relationship between the use of the conversational GPT-4 AI model, cybercrimes, and social media addiction among residents in Makurdi. The finding suggests that an increase in conversational GPT-4 use leads to an increase in cybercrimes and social media addiction, respectively.

Suggestions

This study highlights the need to develop and deliver educational programs aimed at informing residents about the responsible use of AI technologies, including GPT-4. These educational programs should emphasize potential risks, such as cybercrime and social media addiction, and provide guidelines on safe and ethical usage. Education can empower users to leverage AI's benefits while mitigating negative outcomes.

Further, to reduce the risk for new conspiracy theories, there is need to further encourage industry professionals to stay as transparent as possible when introducing their innovations to the public. There is a need to strengthen cybersecurity protocols and measures to protect users from the potential increase in cybercrime associated with AI usage. This can include regular updates on security practices, promoting the use of robust passwords, two-factor authentication, and raising awareness about phishing scams and other cyber threats.

Establishing a regulatory framework to monitor and govern the deployment and use of AI technologies is also necessary. This framework should ensure compliance with ethical standards, privacy protections, and security measures. By regulating AI usage, authorities can help prevent misuse and address any negative impacts

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

190

proactively. Authorities should also introduce initiatives focused on mental health and social media literacy to help residents manage their social media usage and prevent addiction. These initiatives can include workshops, counselling services by psychologists, or clinicians and the promotion of healthy online habits. Encouraging a balanced approach to social media can help mitigate the risks of addiction highlighted in the study.

Lawmakers should also push AI developers and industry professionals to maintain transparency in their operations and innovations. Thus, OpenAI and other organizations responsible for the development and deployment of AI models and application should take responsibilities in ensuring this. Further, clear communication about how AI technologies work, their potential risks, and benefits can build public trust and reduce fears. Transparent practices can also address conspiracy tendencies and negative attitudes toward AI and its models, facilitating more informed and balanced public discourse and use.

AUTHORS CONTRIBUTION STATEMENT

Caleb Onah: Conceptualization; Formal Analysis; Investigation; Methodology; Writing Original Draft; Writing, Review & Editing.

Chinelo Helen Ogwuche: Data Curation; Funding Acquisition; Methodology; Resources; Validation; Writing, Review & Editing.

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Caleb Onah, Chinelo Helen Ogwuche

191

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Caleb Onah, Chinelo Helen Ogwuche

192

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Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

193

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Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

194

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Caleb Onah, Chinelo Helen Ogwuche

195

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Caleb Onah, Chinelo Helen Ogwuche

196

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Caleb Onah, Chinelo Helen Ogwuche

197

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Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

198

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Caleb Onah, Chinelo Helen Ogwuche

199

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Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche

200

Cybercrimes And Social Media Addictions: The Role Of Perceived Use Of Conversational GPT-4 AI
Model Among Residents In Nigeria
Caleb Onah, Chinelo Helen Ogwuche